Manual No.'22・PAC-DB-425

MITSUBISHI HEAVY INDUSTRIES

DATA BOOK

INVERTER PACKAGED AIR-CONDITIONERS

(Split system, air to air heat pump type)

HYPER INVERTER
FLOOR STANDING TYPE

Single type	Twin type
FDF71VNXWVH	FDF140VNXWPVH
100VNXWVH	140VSXWPVH
100VSXWVH	
125VNXWVH	
125VSXWVH	
140VNXWVH	
140VSXWVH	

MICRO INVERTER
FLOOR STANDING TYPE

Single type	Twin type
FDF100VNAWVH	FDF140VNAWPVH
100VSAWVH	140VSAWPVH
125VNAWVH	200VSAWPVH
125VSAWVH	250VSAWPVH
140VNAWVH	280VSAWPVH
140VSAWVH	

STANDARD INVERTER
FLOOR STANDING TYPE

Single type
FDF71VNPWVH
90VNPWVH
100VNPWVH

MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.

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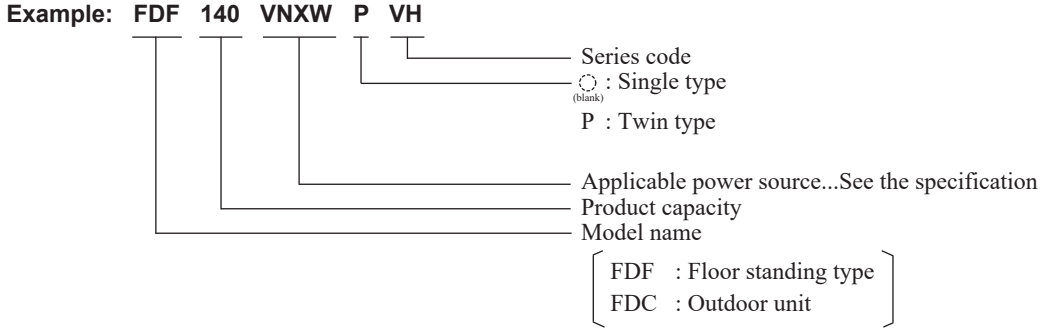
■ How to read the model name



1.1 SPECIFICATIONS

(1) Single type

Item				Model	FDF71VNXWVH	
					Indoor unit **FDF71VH**	Outdoor unit **FDC71VNX-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	7.1 [3.2 (Min.) - 8.0 (Max.)]	
	Nominal heating capacity (range)			kW	8.0 [3.6 (Min.) - 9.0 (Max.)]	
	Power consumption		Cooling	kW	1.97	
			Heating		2.21	
	Max power consumption				4.11	
	Running current		Cooling	A	8.7 / 9.1	
			Heating		9.9 / 10.4	
	Inrush current, max current				5 , 19.1	
	Power factor		Cooling	%	98	
			Heating		97	
	EER		Cooling		3.61	
	COP		Heating		3.62	
	Sound power level		Cooling	dB(A)	55	66
			Heating			
	Sound pressure level		Cooling		P-Hi : 42 Hi : 39 Me : 35 Lo : 33	51
			Heating			51
	Silent mode sound pressure level		Cooling		—	49.0 / 47.0 (Normal / Silent)
			Heating		—	46.5 / 45.5 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	750 × 880 (+88) × 340
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	47	60
Compressor type & Q'ty					—	RMT5118SWP1 × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.675 (DIAMOND FREEZE MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 2.75 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 18 Hi : 16 Me : 14 Lo : 12	60
			Heating			50
Available external static pressure				Pa	0	—
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Compressor overheat protection, Overcurrent protection, Frost protection, Serial signal error protection, Indoor fan motor error protection, Refrigerant leak detection Heating overload protection (High pressure control), Cooling overload protection,	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
			Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.30 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 4 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				ϕ1.6mm × 3 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

Item			Model	FDF100VNXWVH	
				Indoor unit **FDF100VH**	Outdoor unit **FDC100VNX-W**
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	10.0 [3.5 (Min.) - 11.2 (Max.)]	
	Nominal heating capacity (range)		kW	11.2 [2.7 (Min.) - 12.5 (Max.)]	
	Power consumption	Cooling	kW	2.66	
		Heating		2.94	
	Max power consumption			7.10	
	Running current	Cooling	A	11.8 / 12.3	
		Heating		12.9 / 13.5	
	Inrush current, max current			5 , 25	
	Power factor	Cooling	%	98	
		Heating		99	
	EER	Cooling		3.76	
	COP	Heating		3.81	
	Sound power level	Cooling	dB(A)	65	67
		Heating			
	Sound pressure level	Cooling		P-Hi : 53 Hi : 51 Me : 49 Lo : 44	53
		Heating			51
	Silent mode sound pressure level	Cooling		—	49.0 / 48.0 (Normal / Silent)
		Heating		—	48.0 / 48.0 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)			mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)				Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight			kg	49	97
Compressor type & Q'ty				—	RMT5126SWP3 × 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)			kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Centrifugal fan × 1	Propeller fan × 2
Fan motor (Starting method)			W	157 < Direct line start >	86 × 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 27 Hi : 26 Me : 23 Lo : 19	100
		Heating			
Available external static pressure			Pa	0	0
Outside air intake				Not possible	—
Air filter, Quality / Quantity				Plastic net × 1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)	Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
		Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U		m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose			Hose connectable with VP20	Hole size ϕ20 × 3 pcs.
Drain pump, max lift height			mm	—	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size × Core number			ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit	—
Option parts				Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C		7˚C	6˚C	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

Item				Model	FDF100VSXWVH	
					Indoor unit **FDF100VH**	Outdoor unit **FDC100VSX-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	10.0 [3.5 (Min.) - 11.2 (Max.)]	
	Nominal heating capacity (range)			kW	11.2 [2.7 (Min.) - 16.0 (Max.)]	
	Power consumption		Cooling	kW	2.66	
			Heating		2.95	
	Max power consumption				8.90	
	Running current		Cooling	A	4.6 / 4.8	
			Heating		5.0 / 5.2	
	Inrush current, max current				5 , 14	
	Power factor		Cooling	%	84	
			Heating		86	
	EER		Cooling		3.76	
	COP		Heating		3.80	
	Sound power level		Cooling	dB(A)	65	67
			Heating			
	Sound pressure level		Cooling		P-Hi : 53 Hi : 51 Me : 49 Lo : 44	53
			Heating			51
	Silent mode sound pressure level		Cooling		—	49.0 / 48.0 (Normal / Silent)
			Heating		—	48.0 / 48.0 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	99
Compressor type & Q'ty					—	RMT5134SWP4 × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 2
Fan motor (Starting method)				W	157 < Direct line start >	86 × 2 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 27 Hi : 26 Me : 23 Lo : 19	100
			Heating			
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
			Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

Item			Model	FDF125VNXWVH	
				Indoor unit **FDF125VH**	Outdoor unit **FDC125VNX-W**
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	12.5 [3.5 (Min.) - 14.0 (Max.)]	
	Nominal heating capacity (range)		kW	14.0 [2.7 (Min.) - 17.0 (Max.)]	
	Power consumption	Cooling	kW	3.74	
		Heating		3.88	
	Max power consumption			7.10	
	Running current	Cooling	A	16.4 / 17.2	
		Heating		17.0 / 17.8	
	Inrush current, max current			5 , 27	
	Power factor	Cooling	%	99	
		Heating		99	
	EER	Cooling		3.34	
	COP	Heating		3.61	
	Sound power level	Cooling	dB(A)	67	68
		Heating			70
	Sound pressure level	Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	53
		Heating			54
	Silent mode sound pressure level	Cooling		—	50.0 / 49.0 (Normal / Silent)
		Heating		—	50.0 / 48.0 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)			mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)				Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight			kg	49	97
Compressor type & Q'ty				—	RMT5134SWP3 × 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)			kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Centrifugal fan × 1	Propeller fan × 2
Fan motor (Starting method)			W	157 < Direct line start >	86 × 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	100
		Heating			
Available external static pressure			Pa	0	0
Outside air intake				Not possible	—
Air filter, Quality / Quantity				Plastic net × 1 (Washable)	
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)	Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
		Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U		m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose			Hose connectable with VP20	Hole size ϕ20 × 3 pcs.
Drain pump, max lift height			mm	—	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size × Core number			ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit	—
Option parts				Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C		7˚C	6˚C	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

Item				Model	FDF125VSXWVH	
					Indoor unit **FDF125VH**	Outdoor unit **FDC125VSX-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	12.5 [3.5 (Min.) - 14.0 (Max.)]	
	Nominal heating capacity (range)			kW	14.0 [2.7 (Min.) - 18.0 (Max.)]	
	Power consumption		Cooling	kW	3.74	
			Heating		3.88	
	Max power consumption				8.90	
	Running current		Cooling	A	6.1 / 6.4	
			Heating		6.4 / 6.7	
	Inrush current, max current				5 , 14	
	Power factor		Cooling	%	89	
			Heating		88	
	EER		Cooling		3.34	
	COP		Heating		3.61	
	Sound power level		Cooling	dB(A)	67	68
			Heating			70
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	53
			Heating			54
	Silent mode sound pressure level		Cooling			50 / 49 (Normal / Silent)
			Heating		—	50 / 48 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	99
Compressor type & Q'ty					—	RMT5134SWP4 × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan ×2
Fan motor (Starting method)				W	157 < Direct line start >	86 x 2 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	100
			Heating			
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
			Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

Item				Model	FDF140VNXWVH	
					Indoor unit **FDF140VH**	Outdoor unit **FDC140VNX-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	14.0 [3.5 (Min.) - 16.0 (Max.)]	
	Nominal heating capacity (range)			kW	16.0 [2.7 (Min.) - 18.0 (Max.)]	
	Power consumption		Cooling	kW	4.62	
			Heating		4.69	
	Max power consumption				7.10	
	Running current		Cooling	A	20.3 / 21.2	
			Heating		20.6 / 21.5	
	Inrush current, max current				5 , 27	
	Power factor		Cooling	%	99	
			Heating		99	
	EER		Cooling		3.03	
	COP		Heating		3.41	
	Sound power level		Cooling	dB(A)	67	69
			Heating			71
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	57
			Heating			
	Silent mode sound pressure level		Cooling		—	50 / 49 (Normal / Silent)
			Heating		—	51 / 48 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	97
Compressor type & Q'ty					—	RMT5134SWP3 × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 2
Fan motor (Starting method)				W	157 < Direct line start >	86 × 2 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	100
			Heating			
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
			Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Holes size ϕ20 × 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C		7˚C	6˚C	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

Item				Model	FDF140VSXWVH	
					Indoor unit **FDF140VH**	Outdoor unit **FDC140VSX-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	14.0 [3.5 (Min.) - 16.0 (Max.)]	
	Nominal heating capacity (range)			kW	16.0 [2.7 (Min.) - 20.0 (Max.)]	
	Power consumption		Cooling	kW	4.62	
			Heating		4.70	
	Max power consumption				8.90	
	Running current		Cooling	A	7.4 / 7.7	
			Heating		7.7 / 8.0	
	Inrush current, max current				5 , 14	
	Power factor		Cooling	%	91	
			Heating		89	
	EER		Cooling		3.03	
	COP		Heating		3.41	
	Sound power level		Cooling	dB(A)	67	69
			Heating			71
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	54
			Heating			
	Silent mode sound pressure level		Cooling		—	50 / 49 (Normal / Silent)
			Heating		—	51 / 48 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	99
Compressor type & Q'ty					—	RMT5134SWP4 × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 2
Fan motor (Starting method)				W	157 < Direct line start >	86 × 2 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	100
			Heating			
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-T-5AW-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
			Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

(2) Twin type

Item				Model	FDF140VNXWPVH	
					Indoor unit **FDF71VH (2 units)**	Outdoor unit **FDC140VNX-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	14.0 [3.5 (Min.) - 16.0 (Max.)]	
	Nominal heating capacity (range)			kW	16.0 [2.7 (Min.) - 18.0 (Max.)]	
	Power consumption		Cooling	kW	3.78	
			Heating		4.26	
	Max power consumption				7.10	
	Running current		Cooling	A	16.6 / 17.4	
			Heating		18.7 / 19.6	
	Inrush current, max current				5 , 27	
	Power factor		Cooling	%	99	
			Heating		99	
	EER		Cooling		3.71	
	COP		Heating		3.75	
	Sound power level		Cooling	dB(A)	55	69
			Heating			71
	Sound pressure level		Cooling		P-Hi : 42 Hi : 39 Me : 35 Lo : 33	54
			Heating			
	Silent mode sound pressure level		Cooling		—	50 / 49 (Normal / Silent)
			Heating		—	51 / 48 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	47	97
Compressor type & Q'ty					—	RMT5134SWP3 × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 2
Fan motor (Starting method)				W	157 < Direct line start >	86 × 2 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 18 Hi : 16 Me : 14 Lo : 12	100
			Heating			
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") ②ϕ9.52 (3/8") × 0.8 ①ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
			Gas line		ϕ15.88 (5/8") ②ϕ15.88 (5/8") × 1.0 ①ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C		7˚C	6˚C	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G"×1 (Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item				Model	FDF140VSXWPVH	
					Indoor unit **FDF71VH (2 units)**	Outdoor unit **FDC140VSX-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	14.0 [3.5 (Min.) - 16.0 (Max.)]	
	Nominal heating capacity (range)			kW	16.0 [2.7 (Min.) - 20.0 (Max.)]	
	Power consumption		Cooling	kW	3.78	
			Heating		4.27	
	Max power consumption				8.90	
	Running current		Cooling	A	6.1 / 6.4	
			Heating		7.0 / 7.3	
	Inrush current, max current				5 , 14	
	Power factor		Cooling	%	90	
			Heating		89	
	EER		Cooling		3.71	
	COP		Heating		3.75	
	Sound power level		Cooling	dB(A)	55	69
			Heating			71
	Sound pressure level		Cooling		P-Hi : 42 Hi : 39 Me : 35 Lo : 33	54
			Heating			
	Silent mode sound pressure level		Cooling		—	50 / 49 (Normal / Silent)
			Heating		—	51 / 48 (Normal / Silent)
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	1300 × 970 × 370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	47	99
Compressor type & Q'ty					—	RMT5134SWP4 × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 4.0 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 2
Fan motor (Starting method)				W	157 < Direct line start >	86 × 2 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 18 Hi : 16 Me : 14 Lo : 12	100
			Heating			
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor Frost protection thermostat, Refrigerant leak detection Internal thermostat for fan motor Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") ②ϕ9.52 (3/8") × 0.8 ①ϕ9.52 (3/8") × 0.8 O/U ϕ9.52 (3/8")	
			Gas line		ϕ15.88 (5/8") ②ϕ15.88 (5/8") × 1.0 ①ϕ15.88 (5/8") × 1.0 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Min.3, Max.100	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				ϕ1.6mm × 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

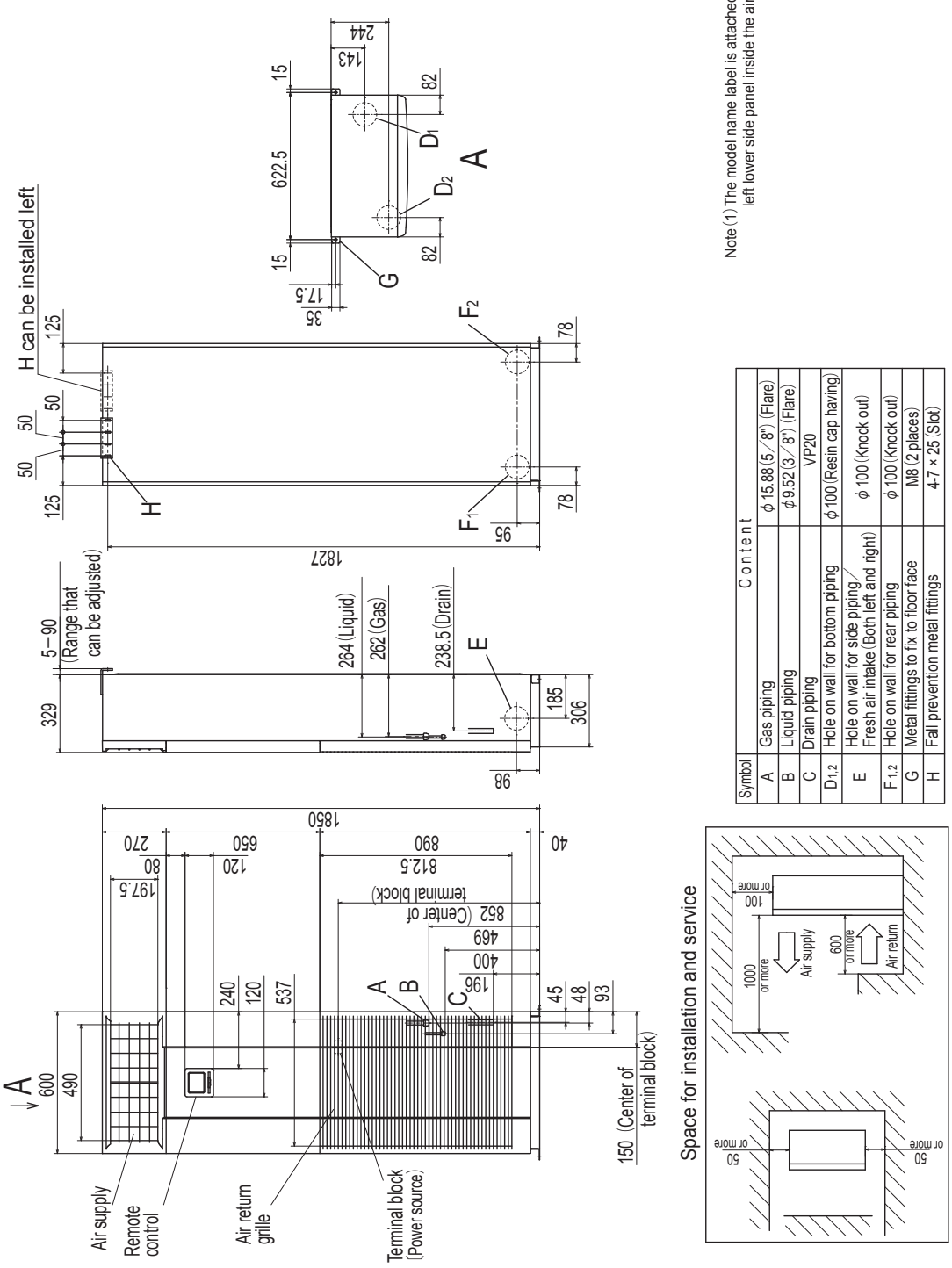
(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G"×1 (Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

PGA000Z841 B

1.2 EXTERIOR DIMENSIONS

(1) Indoor units

Models FDF71VH, 100VH, 125VH, 140VH



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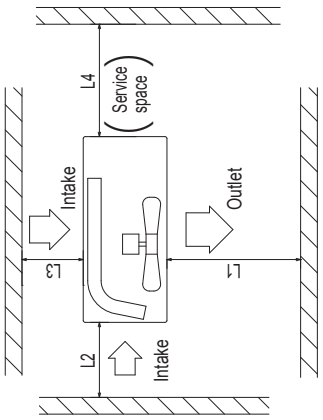
(2) Outdoor unit

Model FDC71VNX-W

Notes
(1) It must not be surrounded by walls on the four sides.
(2) The unit must be fixed with anchor bolts. An anchor bolt must not protrude more the 15mm.
(3) Where the unit is subject to strong winds, lay it in such a direction that the blower outlet faces perpendicularly to the dominant wind direction.
(4) Leave 1m or more space above the unit.
(5) A wall in front of the blower outlet must not exceed the units height.
(6) The model name label is attached on the lower right corner of the front.

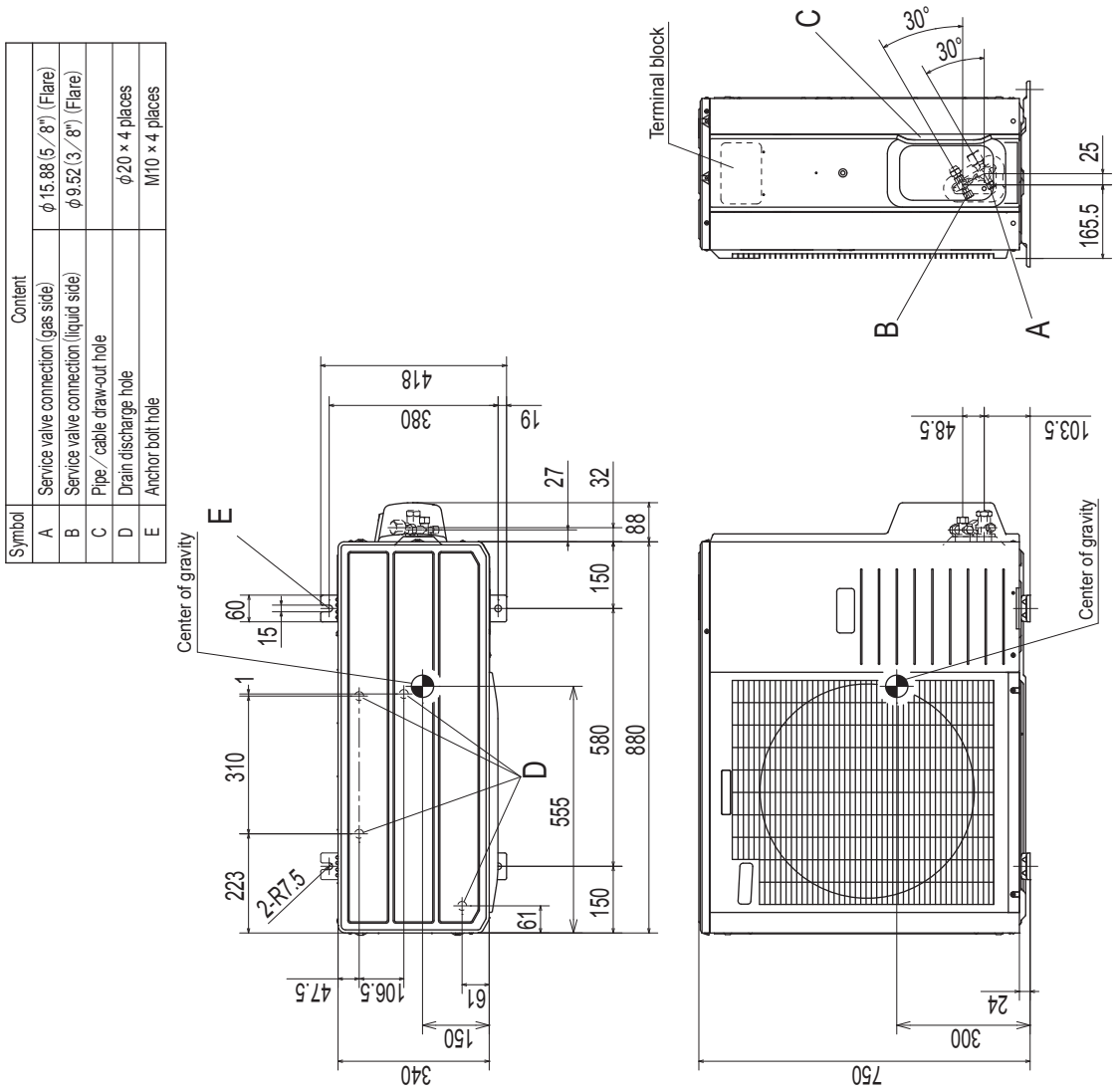


Minimum installation space

Examples of installation / Dimensions	I	II	III
L1	Open	Open	500
L2	300	250	Open
L3	100	150	100
L4	250	250	250

Unit:mm

Symbol	Content	
A	Service valve connection (gas side)	ϕ15.88 (5/8") (Flare)
B	Service valve connection (liquid side)	ϕ9.52 (3/8") (Flare)
C	Pipe/ cable draw-out hole	
D	Drain discharge hole	ϕ20 × 4 places
E	Anchor bolt hole	M10 × 4 places



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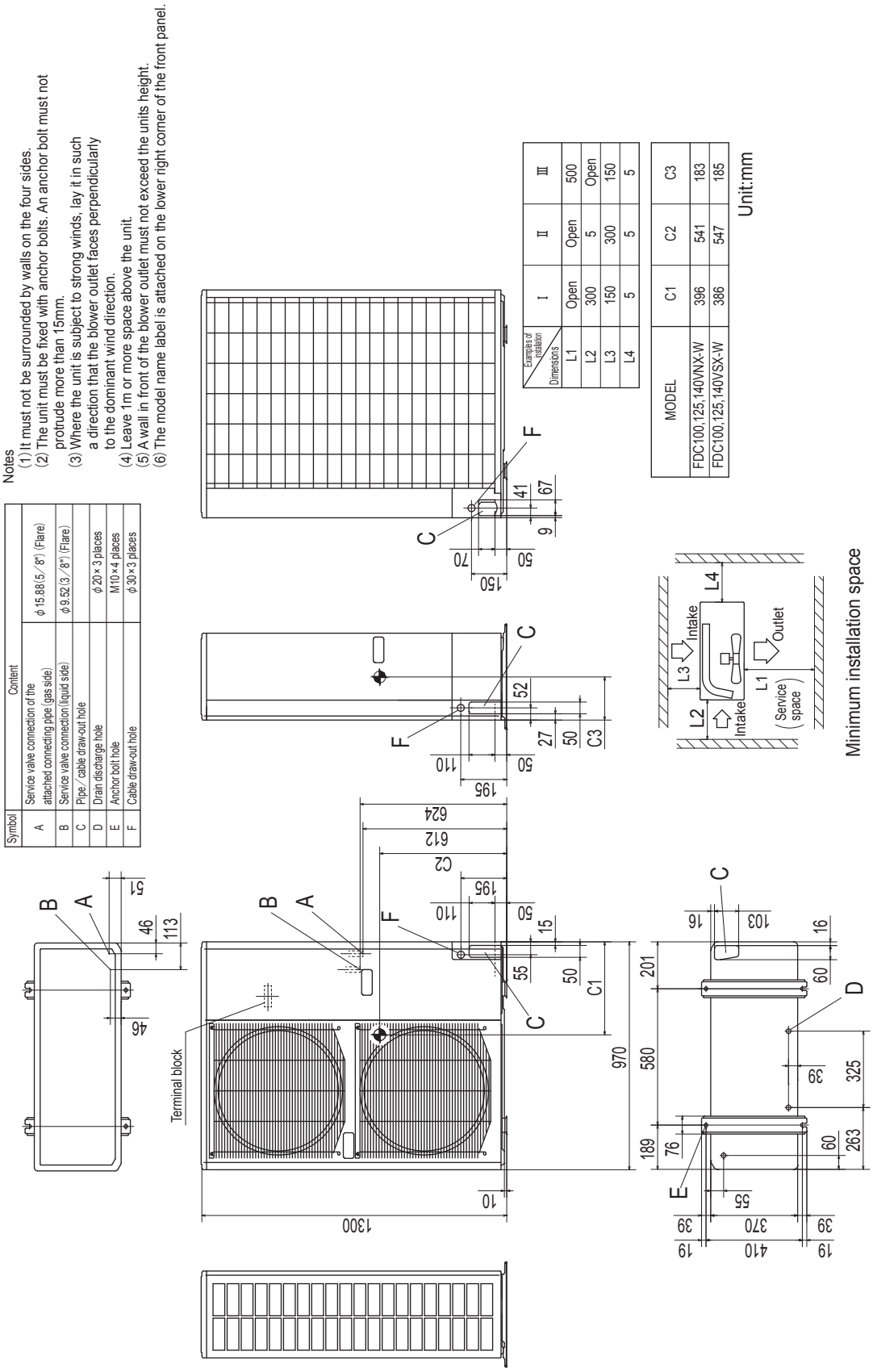
Models FDC100VNX-W, 125VNX-W, 140VNX-W
100VSX-W, 125VSX-W, 140VSX-W



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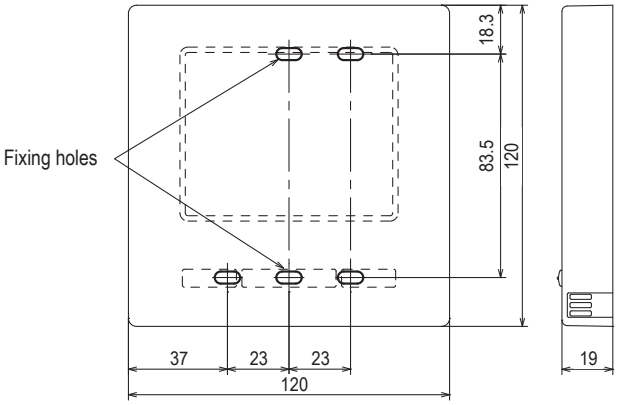
(3) Remote control (Option parts)

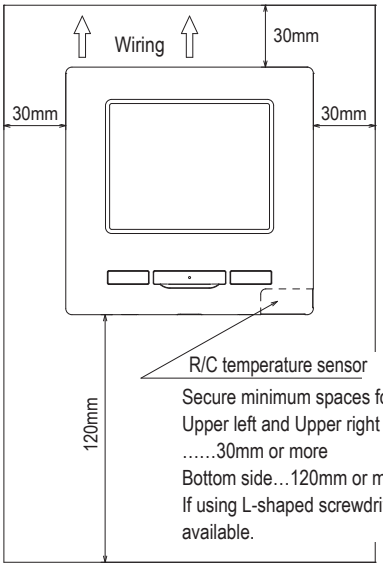
(a) Wired remote control

Model RC-EX3A

Dimensions (Viewed from front)



Installation space



Secure minimum spaces for disassembling the case.
Upper left and Upper right sides
……30mm or more
Bottom side…120mm or more
If using L-shaped screwdriver, 50mm or more is available.

• Do not install the remote control at following places.

1) It could cause break-down or deformation of remote control.
   - Where it is exposed to direct sunlight
   - Where the ambient temperature becomes 0 °C or below, or 40 °C or above
   - Where the surface is not flat
   - Where the strength of installation area is insufficient

2) Moisture may be attached to internal parts of the remote control, resulting in a display failure.
   - Place with high humidity where condensation occurs on the remote control
   - Where the remote control gets wet

3) Accurate room temperature may not be detected using the temperature sensor of the remote control.
   - Where the average room temperature cannot be detected
   - Place near the equipment to generate heat
   - Place affected by outside air in opening/closing the door
   - Place exposed to direct sunlight or wind from air-conditioner
   - Where the difference between wall and room temperature is large

4) When you are using the automatic grille up and down panel in the IU, you may not be able to confirm the up and down motion.
   - Where the IU cannot be visually confirmed

R/C cable:0.3mm² x 2 cores

When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm² . Connect them to wires of larger size near the outside of R/C. When wires are connected, take measures to prevent water, etc. from entering inside.

≦ 200 m	0.5 mm² x 2 cores
≦ 300m	0.75 mm² x 2 cores
≦ 400m	1.25 mm² x 2 cores
≦ 600m	2.0 mm² x 2 cores

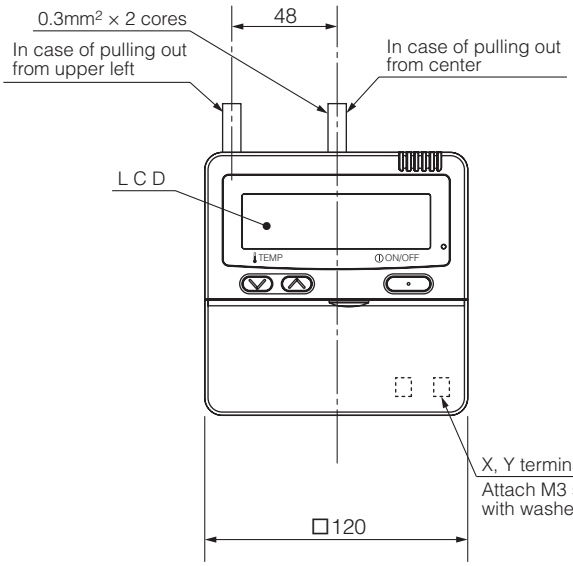
• When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.

It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.
The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.

Adapted RoHS directive

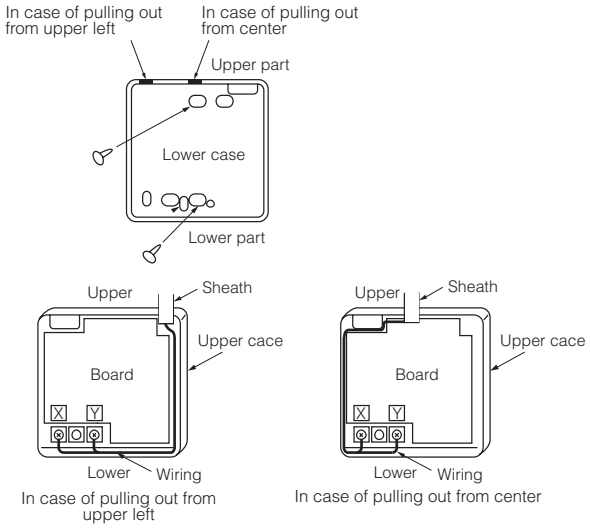
Model RC-E5

Exposed mounting



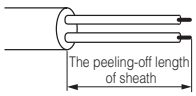
Exterior appearance (Munsell color)	Pearl white (N8.5) near equivalent

Wiring outlet
Cut off the upper thin part of remote control lower case with a nipper or knife, and grind burrs with a file etc.

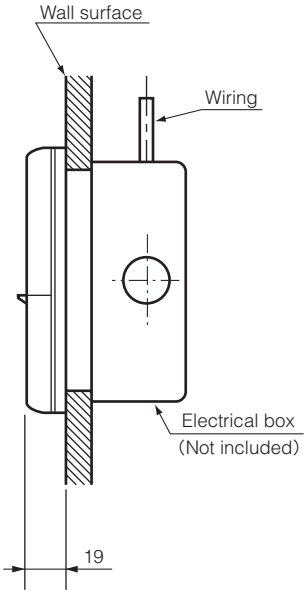


The peeling-off length of sheath

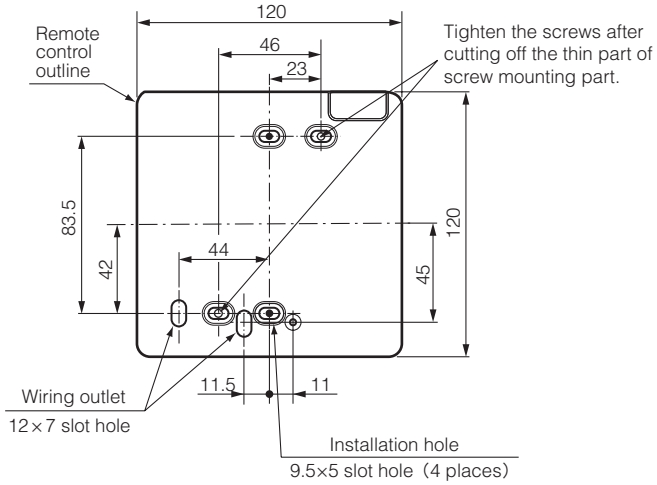
Pulling out from upper left	Pulling out from center
X wiring : 215mm Y wiring : 195mm	X wiring : 170mm Y wiring : 190mm



Embedded mounting



Remote control installation dimensions



1) Installation screw for remote control
M4 screw (2 pieces)

Unit:mm

Wiring specifications

1) If the prolongation is over 100m, change to the size below.
But, wiring in the remote control case should be under 0.5mm². Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

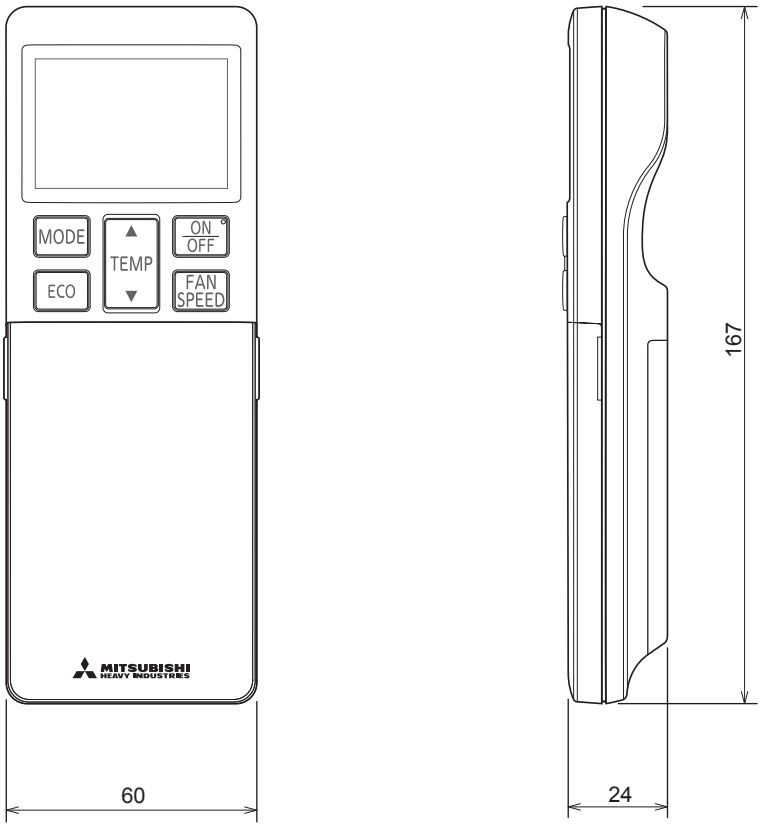
Length	Wiring thickness
100 to 200m	0.5mm² × 2 cores
Under 300m	0.75mm² × 2 cores
Under 400m	1.25mm² × 2 cores
Under 600m	2.0mm² × 2 cores

PJZ000Z295

(b) Wireless remote control

RCN-E2

Unit: mm



1.3 ELECTRICAL WIRING

(1) Indoor units

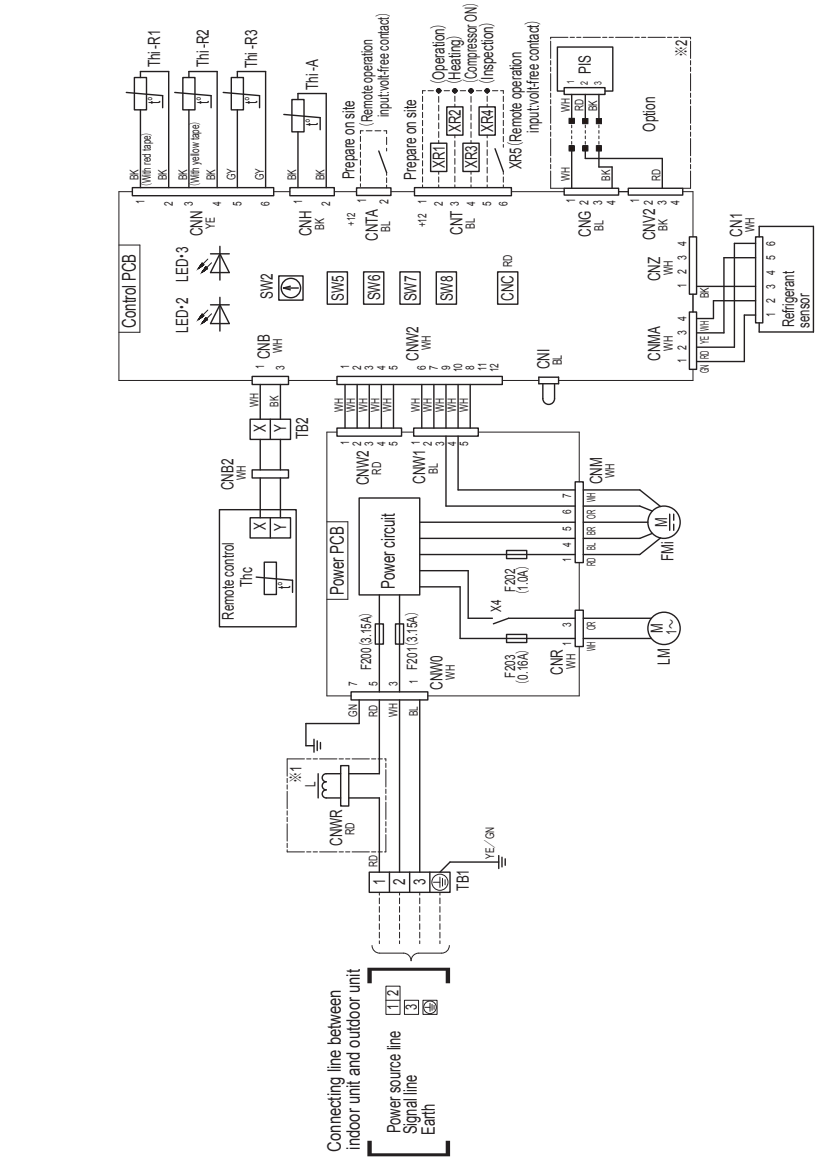
Models FDF71VH, 100VH, 125VH, 140VH

Meaning of marks

Item	Description
CNB−Z	Connector
F200−203	Fuse
FMi	Fan motor
L	Reactor
LED-2	Indication lamp (Green-Normal operation)
LED-3	Indication lamp (Red-Inspection)
PIS	Motion sensor
LM	Louver motor
SW2	Remote control communication address
SW5	Plural units Master／Slave setting
SW6	Model capacity setting
SW7-1	Operation check
SW8-4	Reset the alarm of refrigerant sensor
TB1	Terminal block (Power source) (□mark)
TB2	Terminal block (Signal line) (□mark)
Thc	Temperature sensor (Remote control)
Thi-A	Temperature sensor (Return air)
Thi-R1,2,3	Temperature sensor (Heat exchanger)
X4	Relay for LM
■mark	Closed-end connector

Color marks

Mark	Color	Mark	Color
BK	Black	OR	Orange
BL	Blue	RD	Red
BR	Brown	WH	White
GN	Green	YE	Yellow
GY	Gray	YE/GN	Yellow/Green



Notes 1. ----- indicates wiring on site.
2. See the wiring diagram of outdoor unit about the line between indoor unit and outdoor unit.
3. Use twin core cord (0.3mm^2 × 2) at remote control line.
See spec sheet of remote control in case that the total length is more than 100m.
4. Do not put remote control line alongside power source line.
5. Section 1 (※1) is provided on the models 100-140 only.
6. Section 2 (※2) shows electric circuit of motion sensor (Option).
7. The alarm of refrigerant sensor can reset until 2 times.

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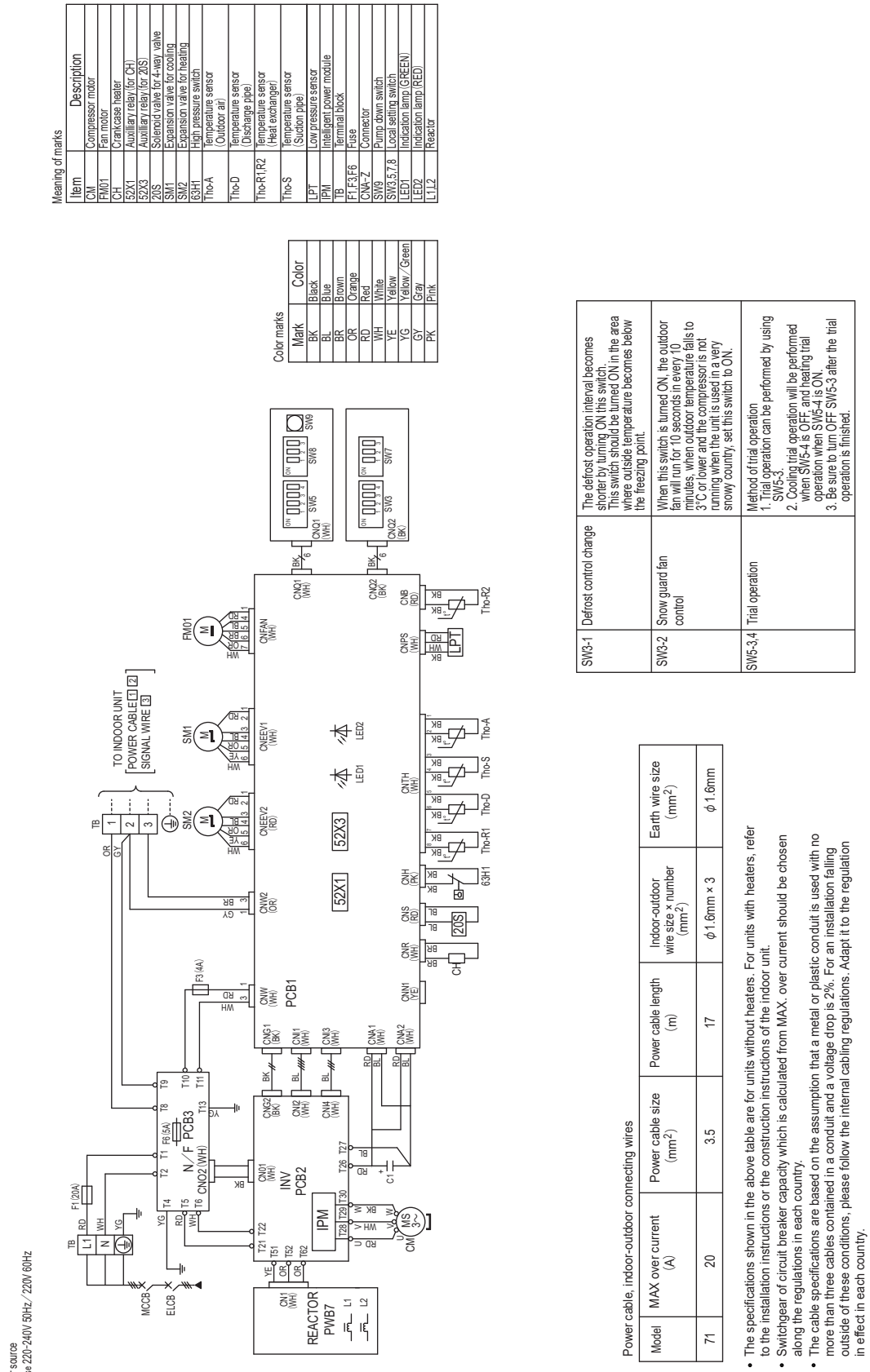
(2) Outdoor units

Model FDC71VNX-W



SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW5-3,4	Trial operation	Method of trial operation 1. Trial operation can be performed by using SW5-3. 2. Cooling trial operation will be performed when SW5-4 is OFF, and heating trial operation when SW5-4 is ON. 3. Be sure to turn OFF SW5-3 after the trial operation is finished.

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number (mm^2)	Earth wire size (mm^2)
71	20	3.5	17	ϕ1.6mm × 3	ϕ1.6mm

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.
- Refer to installation manual or technical manual about usage of local setting switch.
- Don't operate SW3-3,SW5-1,SW5-2,SW7,SW8

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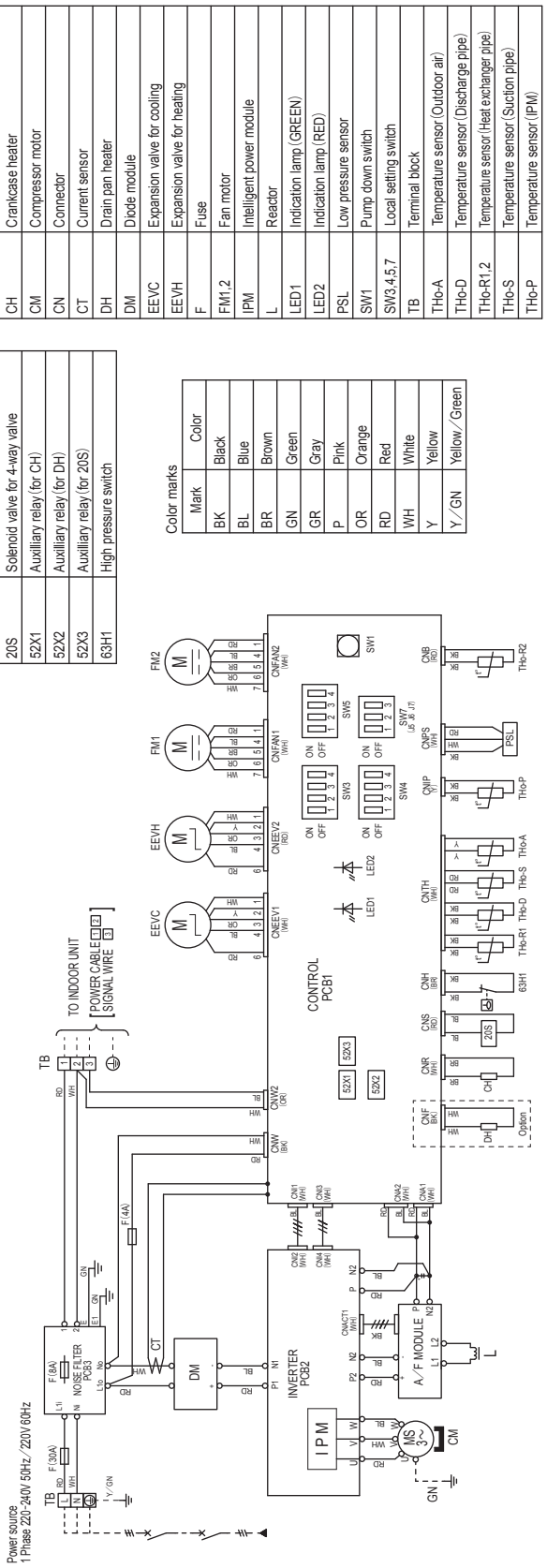
Models FDC100VNX-W, 125VNX-W, 140VNX-W



Meaning of marks

Item	Description
20S	Solenoid valve for 4-way valve
52X1	Auxiliary relay (for CH)
52X2	Auxiliary relay (for DH)
52X3	Auxiliary relay (for 20S)
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
GR	Gray
P	Pink
OR	Orange
RD	Red
WH	White
Y	Yellow
Y／GN	Yellow／Green

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1,2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
SW1	Pump down switch
SW3,4,5,7	Local setting switch
TB	Terminal block
THo-A	Temperature sensor (Outdoor air)
THo-D	Temperature sensor (Discharge pipe)
THo-R1,2	Temperature sensor (Heat exchanger pipe)
THo-S	Temperature sensor (Suction pipe)
THo-P	Temperature sensor (IPM)

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number	Earth wire size (mm)
100	25	5.5	21	φ1.6mm × 3	φ1.6
125	27		20		
140					

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- Power source cable: Use the cable which is conformed with 60245 IEC57.
  When selecting the power source cable length, make sure that voltage drop is less than 2% .
  If the wire length gets longer, increase the wire diameter.
- Indoor-outdoor connecting wires: Use the wires which is conformed with 60245 IEC57.

Local setting switch SW3,4,5 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④Be sure to turn OFF SW3-3 after the trial operation is finished.
SW4-1	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.

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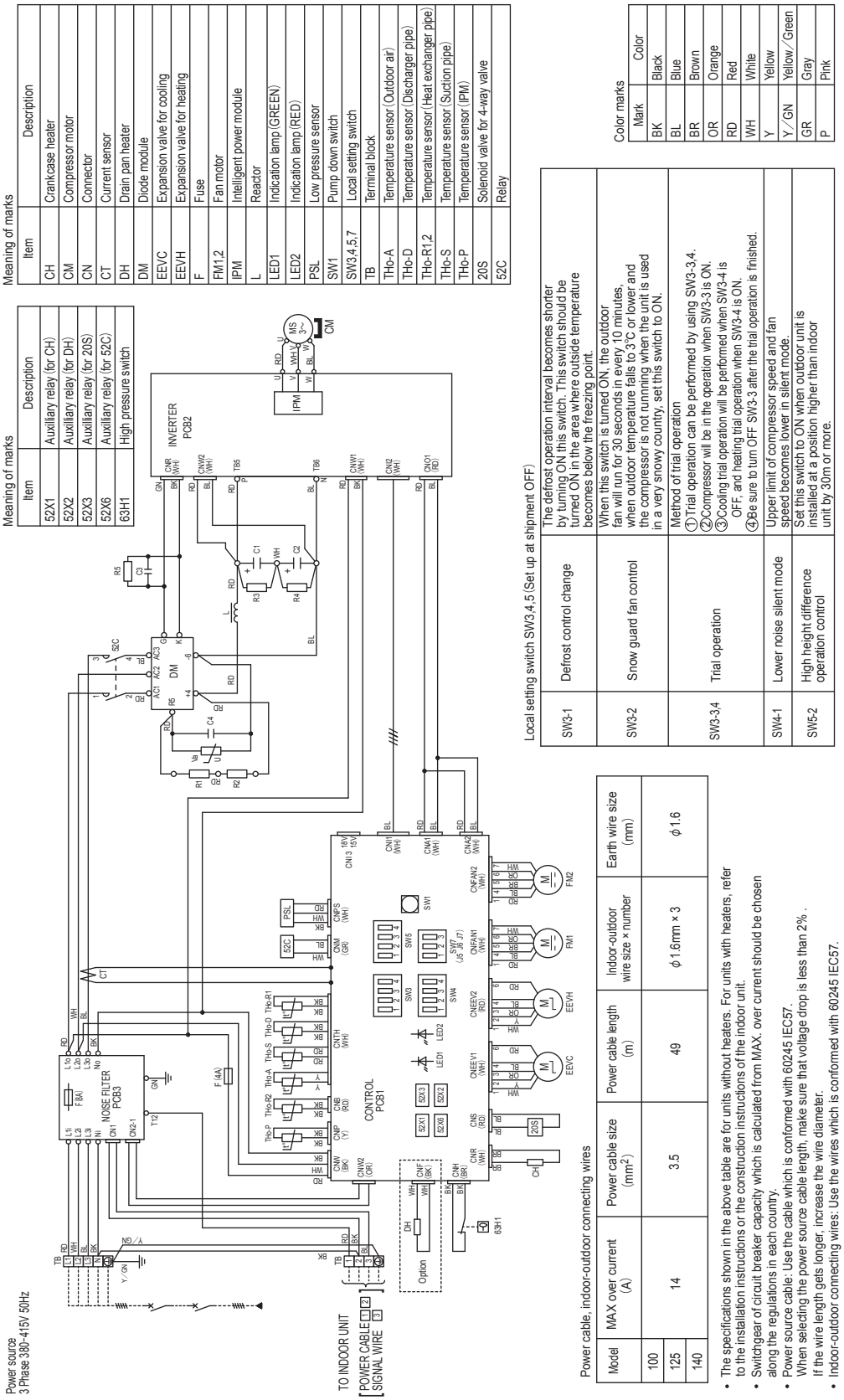
Models FDC100VSX-W, 125VSX-W, 140VSX-W



Meaning of marks

Item	Description
52X1	Auxiliary relay (for CH)
52X2	Auxiliary relay (for DH)
52X3	Auxiliary relay (for 20S)
52X6	Auxiliary relay (for 52C)
63H1	High pressure switch

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1,2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
SW1	Pump down switch
SW3,4,5,7	Local setting switch
TB	Terminal block
THo-A	Temperature sensor (Outdoor air)
THo-D	Temperature sensor (Discharger pipe)
THo-R1,2	Temperature sensor (Heat exchanger pipe)
THo-S	Temperature sensor (Suction pipe)
THo-P	Temperature sensor (IPM)
20S	Solenoid valve for 4-way valve
52C	Relay

Local setting switch SW3,4,5 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not runnning when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④Be sure to turn OFF SW3-3 after the trial operation is finished.
SW4-1	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
OR	Orange
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green
GR	Gray
P	Pink

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number	Earth wire size (mm)
100	14	3.5	49	ϕ 1.6mm × 3	ϕ 1.6
125					
140					

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- Power source cable: Use the cable which is conformed with 60245 IEC57.
  When selecting the power source cable length, make sure that voltage drop is less than 2% .
  If the wire length gets longer, increase the wire diameter.
- Indoor-outdoor connecting wires: Use the wires which is conformed with 60245 IEC57.

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1.4 NOISE LEVEL

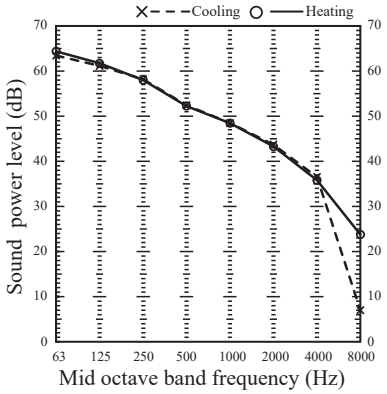
Notes (1) The data are based on the following conditions.
Ambient air temperature: Indoor unit 27℃WB. Outdoor unit 35℃DB.
(2) The data in the chart are measured in an anechoic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor units

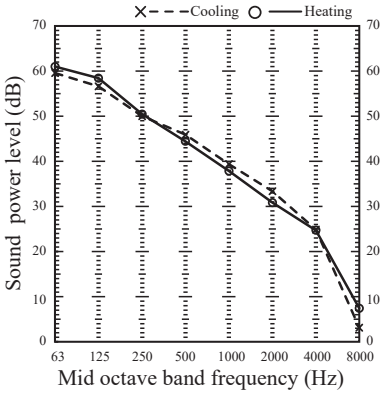
(a) Sound power level

1) Model FDF71VH

a) Air flow:P-Hi
Noise level Cooling:55 dB (A)
Heating:55 dB (A)

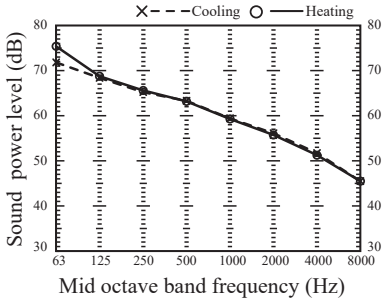


b) Air flow:Lo
Noise level Cooling:47 dB (A)
Heating:47 dB (A)

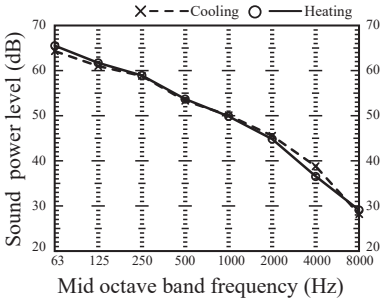


2) Model FDF100VH

a) Air flow:P-Hi
Noise level Cooling:65 dB (A)
Heating:65 dB (A)

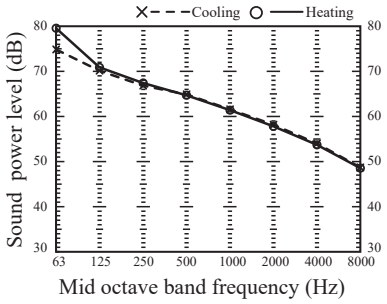


b) Air flow:Lo
Noise level Cooling:56 dB (A)
Heating:56 dB (A)

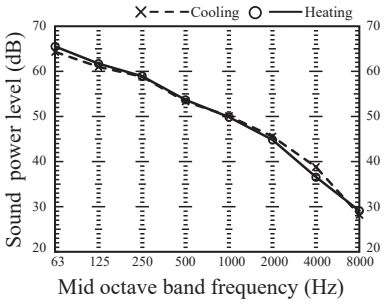


3) Models FDF125,140VH

a) Air flow:P-Hi
Noise level Cooling:67 dB (A)
Heating:67 dB (A)



b) Air flow:Lo
Noise level Cooling:56 dB (A)
Heating:56 dB (A)



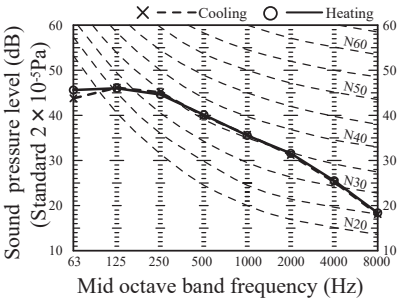
(b) Sound pressure level

Measured based on JIS B 8616
Mike position as right

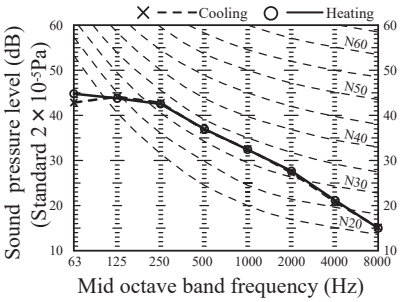
Mike (1 m each at front face, forward & height)

1) Model FDF71VH

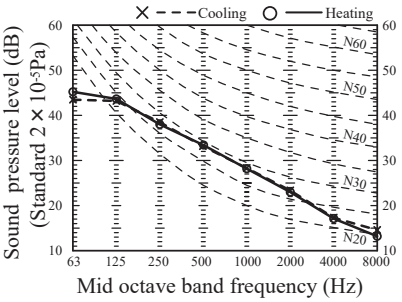
a) Air flow:P-Hi
Noise level Cooling:42 dB (A)
Heating:42 dB (A)



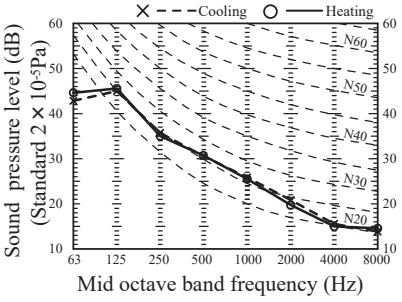
b) Air flow:Hi
Noise level Cooling:39 dB (A)
Heating:39 dB (A)



c) Air flow:Me
Noise level Cooling:35 dB (A)
Heating:35 dB (A)

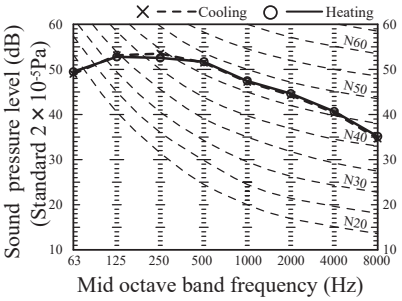


d) Air flow:Lo
Noise level Cooling:33 dB (A)
Heating:33 dB (A)

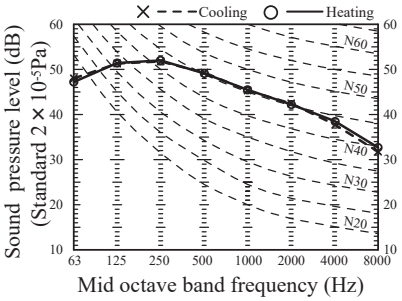


2) Model FDF100VH

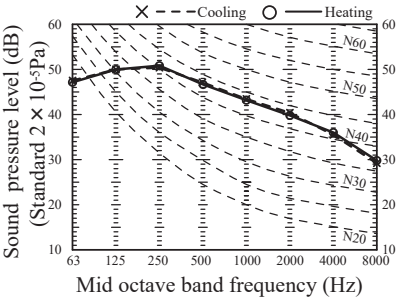
a) Air flow:P-Hi
Noise level Cooling:53 dB (A)
Heating:53 dB (A)



b) Air flow:Hi
Noise level Cooling:51 dB (A)
Heating:51 dB (A)

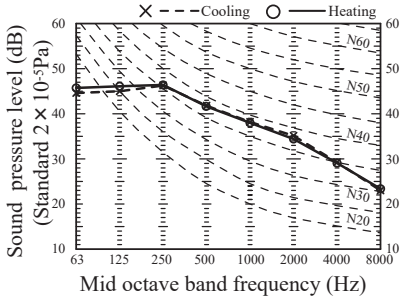


c) Air flow:Me
Noise level Cooling:49 dB (A)
Heating:49 dB (A)



d) Air flow:Lo

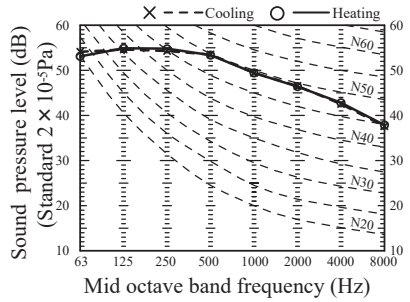
Noise level Cooling:44 dB (A)
Heating:44 dB (A)



3) Models FDF125,140VH

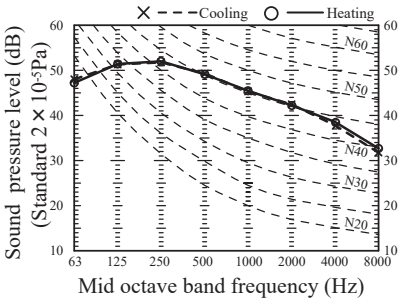
a) Air flow:P-Hi

Noise level Cooling:55 dB (A)
Heating:55 dB (A)



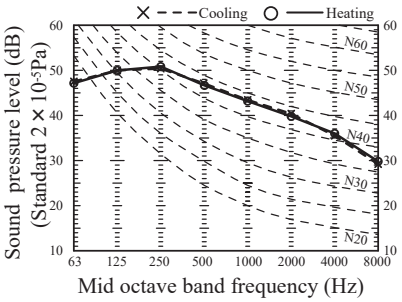
b) Air flow:Hi

Noise level Cooling:51 dB (A)
Heating:51 dB (A)



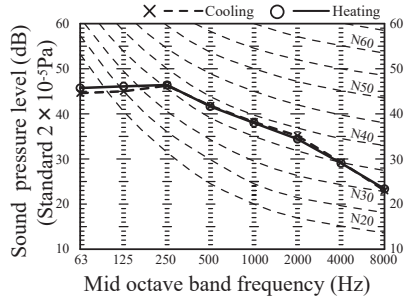
c) Air flow:Me

Noise level Cooling:49 dB (A)
Heating:49 dB (A)



d) Air flow:Lo

Noise level Cooling:44 dB (A)
Heating:44 dB (A)

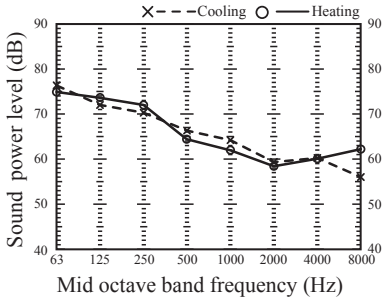


(2) Outdoor units

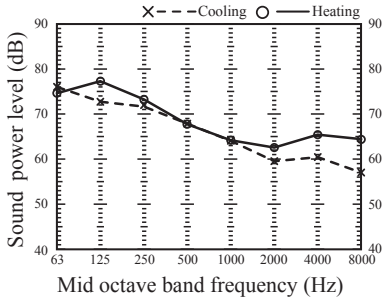
(a) Sound power level

(i) Rated capacity value

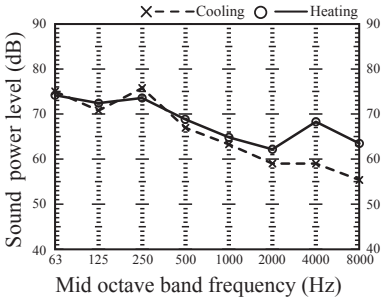
Models FDC100VNX-W,100VSX-W
Cooling noise level 67 dB (A)
Heating noise level 67 dB (A)



Models FDC125VNX-W,125VSX-W
Cooling noise level 68 dB (A)
Heating noise level 70 dB (A)

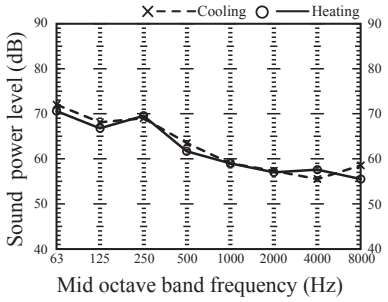


Models FDC140VNX-W,140VSX-W
Cooling noise level 69 dB (A)
Heating noise level 71 dB (A)

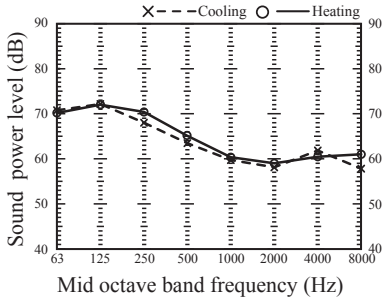


(ii) Silent mode (Normal)

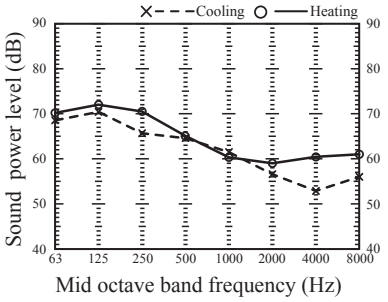
Models FDC100VNX-W,100VSX-W
Cooling noise level 65 dB (A)
Heating noise level 64 dB (A)



Models FDC125VNX-W,125VSX-W
Cooling noise level 66 dB (A)
Heating noise level 67 dB (A)

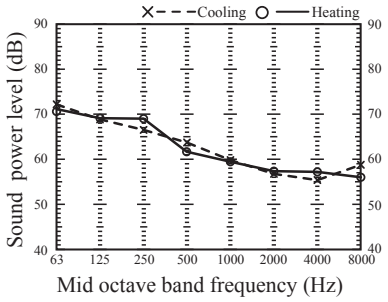


Models FDC140VNX-W,140VSX-W
Cooling noise level 68 dB (A)
Heating noise level 67 dB (A)

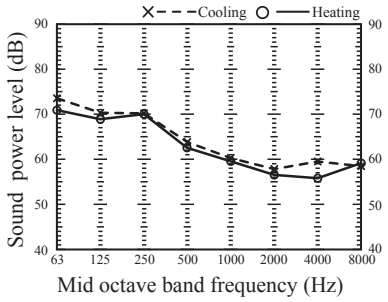


(iii) Silent mode (Silent)

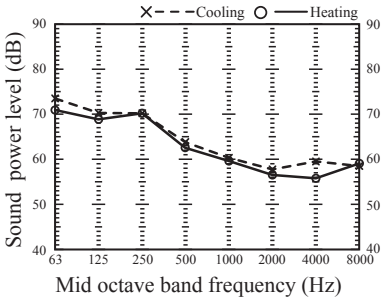
Models FDC100VNX-W,100VSX-W
Cooling noise level 64 dB (A)
Heating noise level 64 dB (A)



Models FDC125VNX-W,125VSX-W
Cooling noise level 65 dB (A)
Heating noise level 64 dB (A)



Models FDC140VNX-W,140VSX-W
Cooling noise level 65 dB (A)
Heating noise level 64 dB (A)

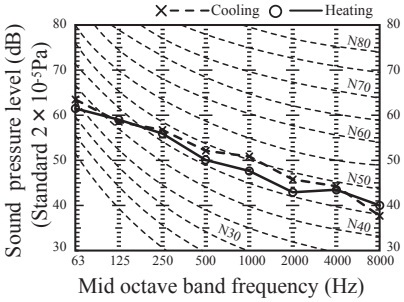


(b) Sound pressure level

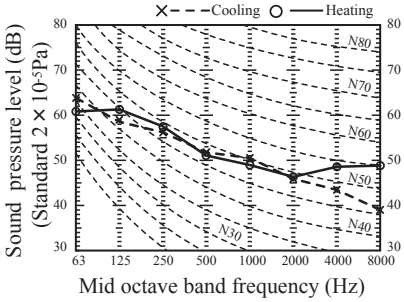
Measured based on JIS B 8616
Mike position: at highest noise level in position as mentioned below
Distance from front side 1m
Height 1m

(i) Rated capacity value

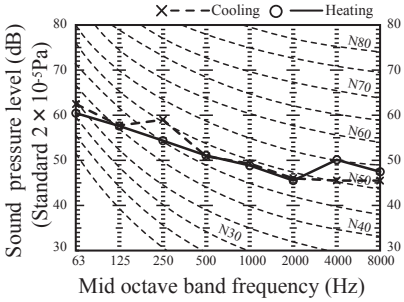
Models FDC100VNX-W,100VSX-W
Cooling noise level 53 dB (A)
Heating noise level 51 dB (A)



Models FDC125VNX-W,125VSX-W
Cooling noise level 53 dB (A)
Heating noise level 54 dB (A)

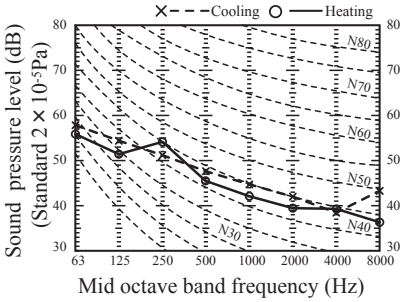


Models FDC140VNX-W,140VSX-W
Cooling noise level 54 dB (A)
Heating noise level 54 dB (A)

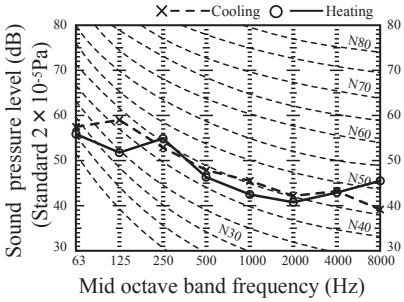


(ii) Silent mode (Normal)

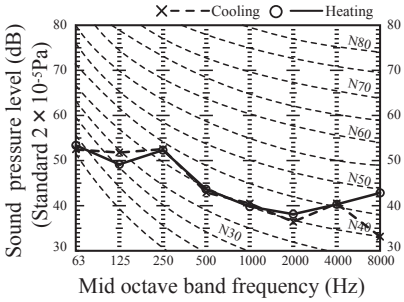
Models FDC100VNX-W,100VSX-W
Cooling noise level 49 dB (A)
Heating noise level 48 dB (A)



Models FDC125VNX-W,125VSX-W
Cooling noise level 50 dB (A)
Heating noise level 50 dB (A)

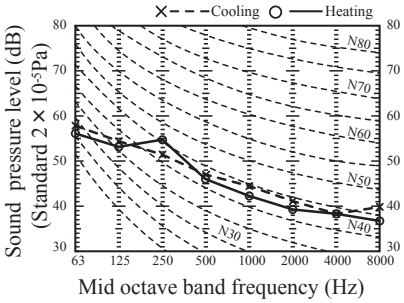


Models FDC140VNX-W,140VSX-W
Cooling noise level 50 dB (A)
Heating noise level 51 dB (A)

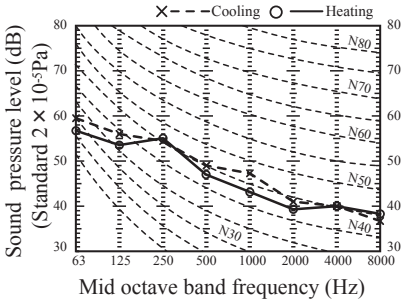


(iii) Silent mode (Silent)

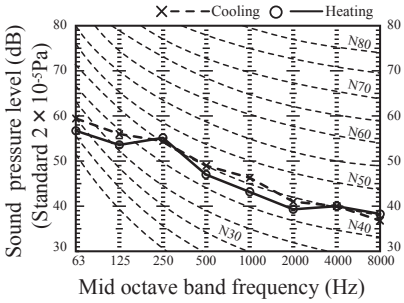
Models FDC100VNX-W,100VSX-W
Cooling noise level 48 dB (A)
Heating noise level 48 dB (A)



Models FDC125VNX-W,125VSX-W
Cooling noise level 49 dB (A)
Heating noise level 48 dB (A)



Models FDC140VNX-W,140VSX-W
Cooling noise level 49 dB (A)
Heating noise level 48 dB (A)

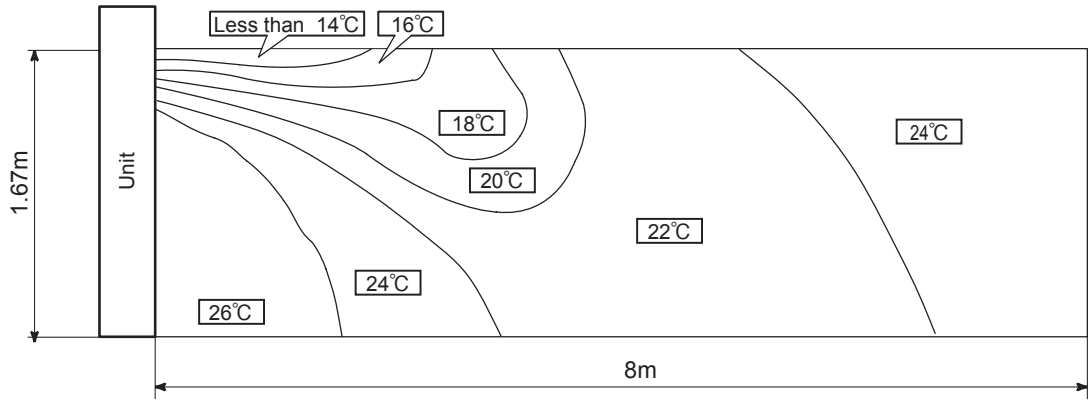


1.5 TEMPERATURE DISTRIBUTION

Indoor temperature
Cooling 27°CDB / 19°CWB
Heating 20°CDB
Note: These figures represent the typical main range of temperature at the center of air outlet within the published conditions.
In the actual installation, they may differ from the typical figures under the influence of air temperature conditions, ceiling height, operation conditions and obstacles.

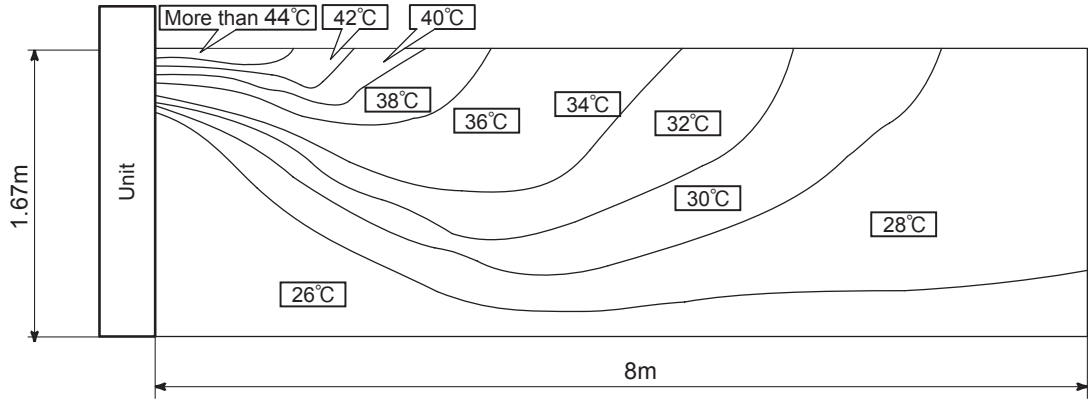
Cooling Air flow:Hi (Louver position:Horizontal)

Temperature distribution



Heating Air flow:Hi (Louver position:Horizontal)

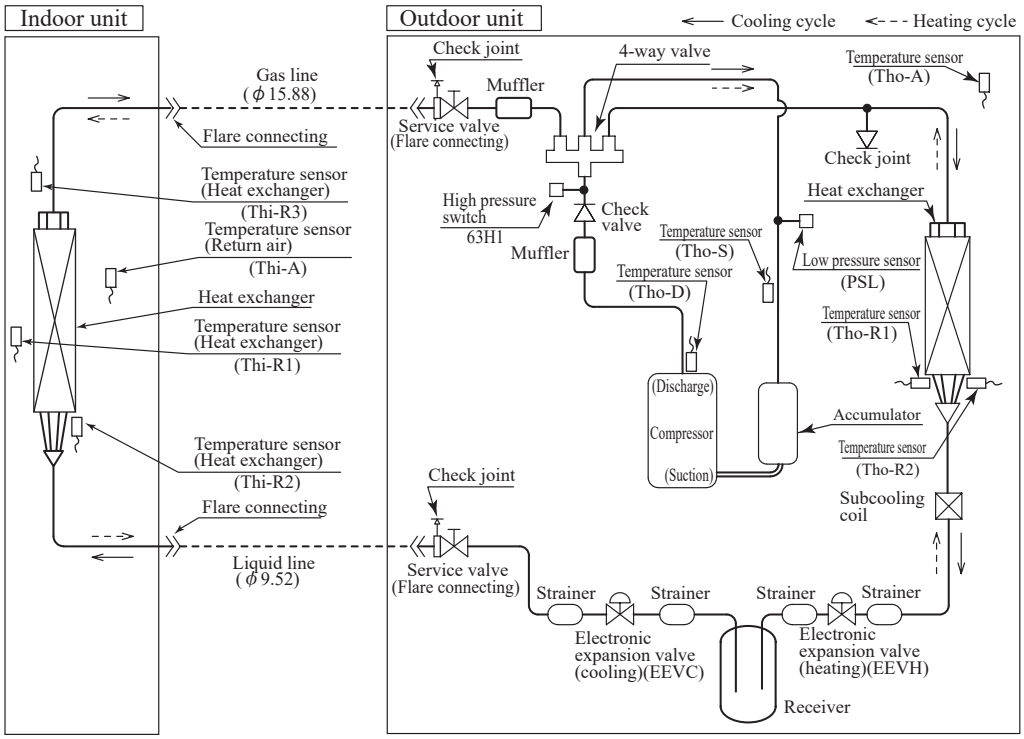
Temperature distribution



1.6 PIPING SYSTEM

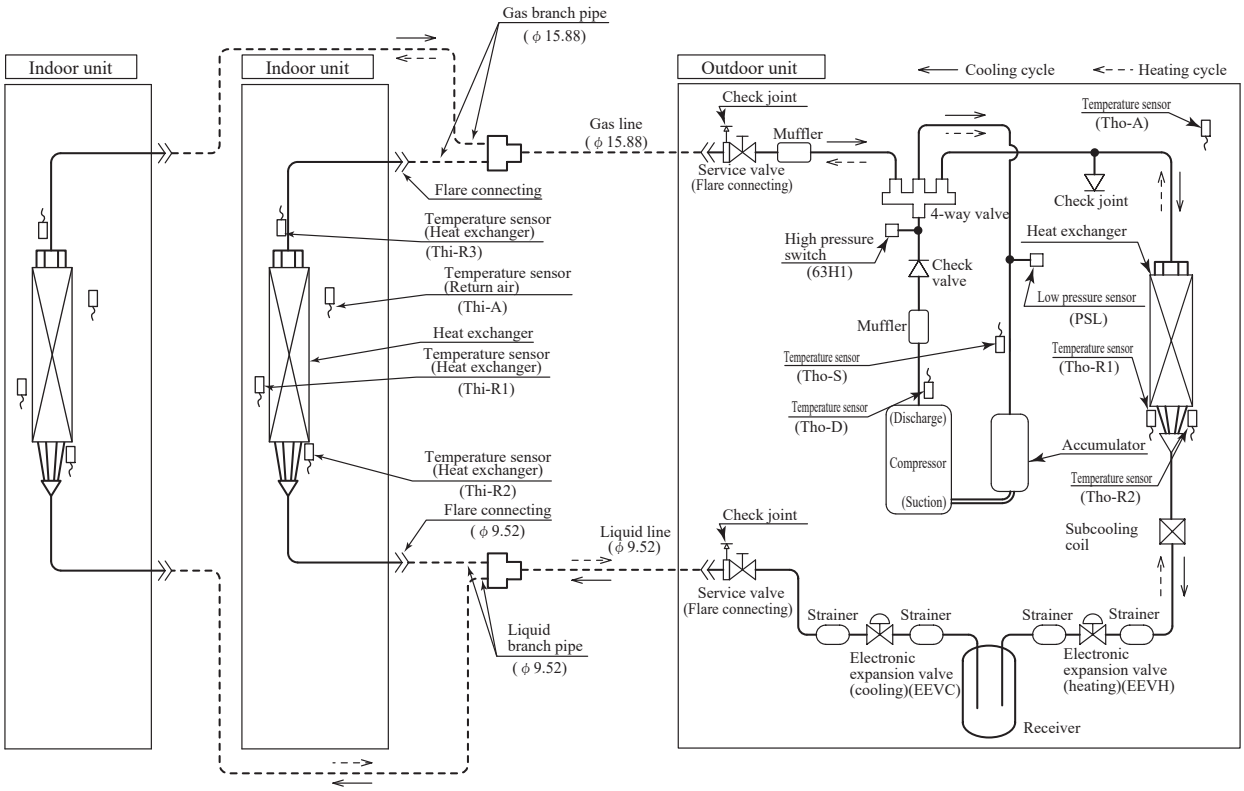
(1) Single type

Models 71, 100, 125, 140



(2) Twin type

Model 140



Preset point of the protective devices

Parts name	Mark	Equipped unit	100, 125, 140 model
Temperature sensor (for protection overloading in heating)	**Thi-R**	Indoor unit	Active 63℃ Inactive 56℃
Temperature sensor (for frost prevention)	**Thi-R**	Indoor unit	Active 1.0℃ Inactive 10℃
Temperature sensor (for protection high pressure in cooling)	**Tho-R**	Outdoor unit	Active 63℃ Inactive 51℃
Temperature sensor (for detecting discharge pipe temperature)	**Tho-D**	Outdoor unit	Active 115℃ Inactive 85℃
High pressure switch (for protection)	**63H1**	Outdoor unit	Active 4.15MPa Inactive 3.15MPa
Low pressure sensor (for protection)	**PSL**	Outdoor unit	Active 0.079MPa Inactive 0.227MPa

1.7 RANGE OF USAGE & LIMITATIONS

Operating temperature range		See next page.
		When used below -5˚C, install a snow hood (locally procured).
Recommendable area to install		Considering to get sufficient heating capacity, the area where the averaged lowest ambient air temperature in day time during winter is above 0˚C, and it has no accumulation of snow.
Installation site		The limitations of installation space are shown in the page for exterior dimensions. Install the indoor unit at least 2.5m higher than the floor surface.
Temperature and humidity conditions surrounding the indoor unit in the ceiling (Note 2)		Dew point temperature : 23˚C or less, relative hummdity : 80% or less
Limitations on unit and piping installation		See page 32.
Compressor ON-OFF cycling	Cycle Time	7 minutes or more (from OFF to OFF) or (from ON to ON)
	Stop Time	3 minutes or more
Power source	Voltage range	Rating ±10%
	Voltage drop at start-up	Min.85% of rating
	Phase-to-phase unbalance	3% or less

Note (1) Do not install the unit in places which :
1) Flammable gas may leak.
2) Carbon fiber, metal particles, powder, etc. are floating.
3) Cosmetic or special sprays are used frequently.
4) Exposed to oil splashes or steam (e.g. kitchen and machine plant).
5) Exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent).
6) Exposed to ammonia substance (e.g. organic fertilizer).
7) Matters affecting devices, such as sulfuric gas, chlorine gas, acid, alkali, etc. may generate or accumulate.
8) Chimney smoke is hanging.
9) Sucking the exhaust gas from heat exchanger.
10) Adjacent to equipment generating electromagnetic waves or high frequency waves.
11) There is light beams that affect the receiving device of indoor unit in case of the wireless specification.
12) Snow falls heavily.
13) At an elevation of 1000 meters or higher.
14) On mobile machine (e.g. vehicle, ship, etc.)
15) Splashed with water to indoor unit (e.g. laundry room).
16) Indoor units of twin and triple specifications separately in a room with partition.

Note (2) If ambient temperature and humidity exceed the above conditions, add polyurethane foam insulation (10mm or thicker) on the outer plate of indoor unit.

Note (3) Both gas and liquid pipes need to be coverd with 20mm or thicker heat insulation materials at the place where humidity exceeds 70%.

Note (4) When snow accumulate, install a snow hood on site.

Note (5) The indoor unit shall be installed in a room with minimum installation area or more according to the refrigerant charge amount. (for details, refer to installation sheet)

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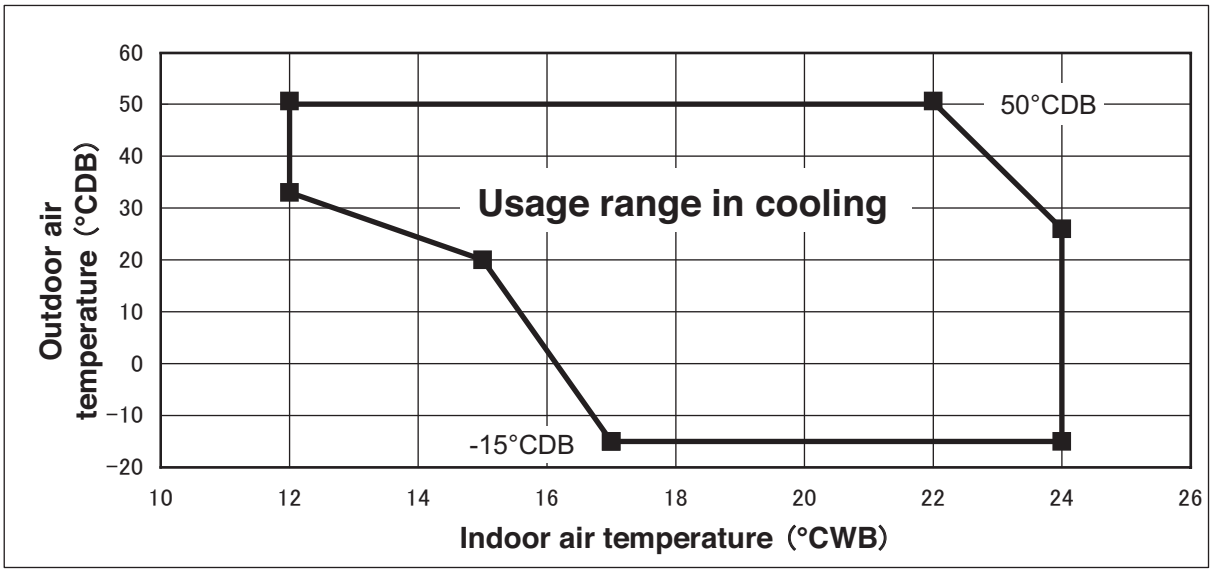
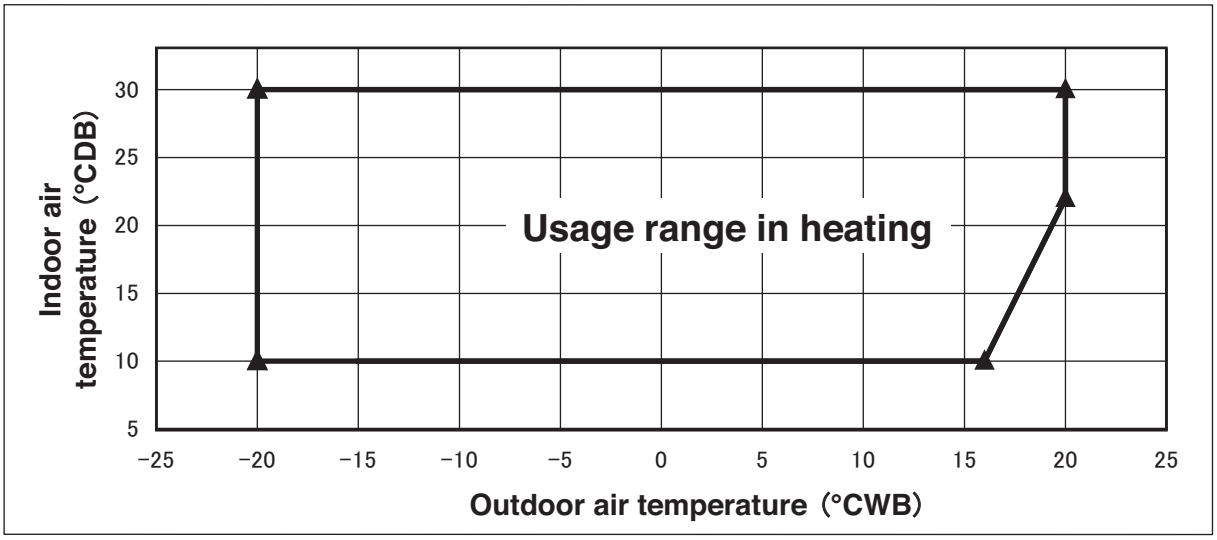
Operating temperature range

■ **Cooling**



■ **Heating**



Decline in cooling and heating capacity or operation stop may occur when the outdoor unit is installed in places where natural wind can increase or decrease its design air flow rate.

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"CAUTION" Cooling operation under low outdoor air temperature conditions

PAC models can be operated in cooling mode at low outdoor air temperature condition within above temperature range. However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.

[Precaution]

In case of severely low temperature condition

1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, mount the flex flow adapter (prepared as option part) or like such devices onto the outdoor unit in order to divert the strong wind.

[Reason]

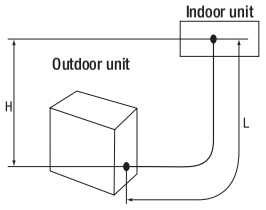
Under the low outdoor air temperature conditions of -5°C or lower, the outdoor fan is controlled at lower or lowest speed by outdoor fan control, but if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop more.

This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

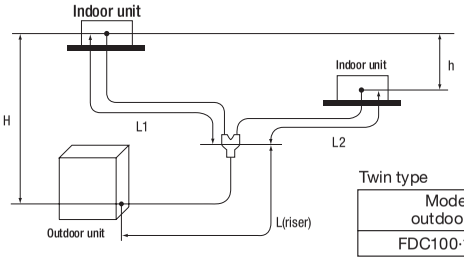
Limitation on unit and piping installation - single, twin.

Descriptions	Models for outdoor unit		Dimensional limitations	Marks appearing in the drawing	
				Single type	Twin type
One-way pipe length	FDC71		≦ 50m	L	
	FDC100·125·140		3 ≦ L ≦ 100m		L + L1 + L2
Main pipe length	FDC100·125·140		≦ 100m		L
One-way pipe length after first branch	FDC100·125·140		≦ 30m		L1, L2
One-way pipe length difference from the first branch to the indoor unit	FDC100·125		≦ 10m		L1 - L2 L2 - L1
	FDC140		≦ 3m		
			≦ 10m		
Elevation difference between indoor and outdoor units	When outdoor unit is positioned higher	FDC71	≦ 30m	H	H
		FDC100 · 125 · 140	≦ 50m (2)		
	When outdoor unit is positioned lower	FDC71	≦ 15m	H	H
		FDC100·125·140			
Elevation difference between indoor units			≦ 0.5m		h

Single type



Twin type



Twin type

Model for outdoor units	Branch piping set (option)
FDC100·125·140	DIS-WA1G

(1) A riser pipe must be part of the main.
A branching pipe set should be installed horizontally at point as close to an indoor unit as possible.
(2) In case of the outdoor unit is positioned higher, dimensional limitation change from 30m to 50m by changing SW5-2 of outdoor unit control PCB to ON.

1.8 SELECTION CHART

Correct the cooling and heating capacity in accordance with the operating conditions. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown in the capacity tables (1.8.1) × Correction factors shown in the table (1.8.2) (1.8.3) (1.8.4)

Caution: In case that the cooling operation during low outdoor air temperature below -5°C is expected, install the outdoor unit where it is not influenced by natural wind. Otherwise protection control by low pressure will be activated much more frequently and it will cause insufficient capacity or breakdown of the compressor in worst case.

1.8.1 Capacity tables

(1) Single type

Model FDF71VNXWVH Indoor unit FDF71VH Outdoor unit FDC71VNX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
-10							6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
-5							6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
0					5.98	4.66	6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
5					5.98	4.66	6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
11					5.98	4.66	6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
13					5.98	4.66	6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
15					5.98	4.66	6.36	5.01	6.54	4.97	6.74	4.93	7.15	5.19	7.55	6.30
17					6.40	4.84	6.81	5.19	7.01	5.15	7.23	5.10	7.66	5.36	8.10	6.75
19					6.83	5.02	7.26	5.37	7.47	5.32	7.71	5.28	8.18	5.53	8.65	7.21
21					6.78	5.00	7.20	5.35	7.41	5.30	7.65	5.26	8.13	5.51	8.61	7.17
23					6.72	4.98	7.14	5.32	7.35	5.28	7.60	5.24	8.08	5.50	8.57	7.14
25			6.28	5.09	6.69	4.96	7.11	5.31	7.33	5.27	7.57	5.23	8.06	5.49	8.55	7.12
27			6.25	5.07	6.66	4.95	7.08	5.30	7.30	5.26	7.64	5.26	7.99	5.46		
29			6.11	5.01	6.53	4.89	6.99	5.26	7.25	5.24	7.55	5.22	7.86	5.42		
31			5.98	4.95	6.39	4.83	6.90	5.23	7.20	5.22	7.46	5.19	7.73	5.38		
33	5.52	4.59	5.78	4.86	6.26	4.78	6.81	5.19	7.15	5.20	7.37	5.16	7.60	5.33		
35	5.33	4.50	5.62	4.79	6.12	4.72	6.72	5.15	7.10	5.18	7.28	5.12	7.47	5.29		
37	5.20	4.43	5.48	4.72	5.96	4.65	6.50	5.07	6.85	5.09	7.05	5.04	7.26	5.22		
39	5.06	4.37	5.34	4.66	5.79	4.58	6.28	4.98	6.60	4.99	6.82	4.96	7.04	5.15		
41	4.93	4.30	5.20	4.60	5.62	4.51	6.06	4.90	6.34	4.90	6.59	4.88	6.83	5.09		
43	4.80	4.24	5.06	4.54	5.46	4.44	5.84	4.82	6.09	4.81	6.36	4.80	6.62	5.02		
46	4.60	4.15	4.85	4.45	5.21	4.34	5.52	4.70	5.71	4.67	6.01	4.68	6.31	4.92		
50	3.73	3.66	3.96	3.88	4.29	3.98	4.59	4.36	4.77	4.34	4.91	4.31	5.05	4.54		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	5.17	5.09	5.00	4.91	4.83
-17.7	-18	5.35	5.26	5.18	5.09	5.00
-15.7	-16	5.52	5.44	5.36	5.27	5.18
-13.5	-14	5.65	5.57	5.49	5.40	5.30
-11.5	-12	5.92	5.83	5.74	5.65	5.56
-9.5	-10	6.18	6.09	6.00	5.90	5.81
-7.5	-8	6.45	6.35	6.26	6.16	6.06
-5.5	-6	6.63	6.53	6.43	6.33	6.23
-3.0	-4	6.81	6.70	6.60	6.49	6.39
-1.0	-2	6.99	6.88	6.77	6.66	6.56
1.0	0	7.17	7.06	6.94	6.83	6.72
2.0	1	7.26	7.14	7.03	6.91	6.80
3.0	2	7.42	7.32	7.22	7.11	6.99
5.0	4	7.73	7.67	7.61	7.49	7.36
7.0	6	8.05	8.02	8.00	7.87	7.74
9.0	8	8.37	8.37	8.38	8.21	8.05
11.5	10	8.69	8.72	8.76	8.56	8.35
13.5	12	9.08	9.13	9.17	8.99	8.82
15.5	14	9.48	9.53	9.58	9.43	9.28
16.5	16	9.68	9.73	9.78	9.65	9.51

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Model FDF100VNXWVH Indoor unit FDF100VH Outdoor unit FDC100VNX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.26	8.30	11.76	8.31	12.09	8.23	12.75	8.58	13.41	8.39
-10							11.26	8.30	11.76	8.31	12.09	8.23	12.75	8.58	13.41	8.39
-5							11.26	8.30	11.76	8.31	12.09	8.23	12.75	8.58	13.41	8.39
0					10.51	7.74	11.35	8.34	11.76	8.31	12.11	8.24	12.80	8.60	13.49	8.41
5					10.77	7.85	11.43	8.38	11.76	8.31	12.13	8.24	12.85	8.62	13.58	8.44
11					10.68	7.81	11.33	8.33	11.66	8.27	12.02	8.20	12.75	8.58	13.47	8.41
13					10.59	7.77	11.23	8.29	11.56	8.22	11.92	8.16	12.64	8.54	13.36	8.37
15					10.50	7.73	11.13	8.25	11.45	8.18	11.81	8.12	12.54	8.51	13.26	8.34
17					10.34	7.66	10.98	8.19	11.30	8.12	11.65	8.06	12.37	8.45	13.08	8.28
19					10.21	7.60	10.82	8.12	11.14	8.06	11.49	8.00	12.20	8.39	12.90	8.22
21					10.10	7.55	10.71	8.08	11.02	8.01	11.36	7.95	12.03	8.33	12.71	8.16
23					9.98	7.50	10.59	8.03	10.90	7.96	11.22	7.90	11.87	8.27	12.52	8.10
25			9.35	7.67	9.93	7.48	10.53	8.00	10.83	7.94	11.15	7.87	11.79	8.25	12.43	8.08
27			9.30	7.65	9.87	7.46	10.47	7.98	10.77	7.92	11.27	7.92	11.77	8.24		
29			9.12	7.56	9.70	7.38	10.29	7.91	10.58	7.84	11.10	7.85	11.63	8.19		
31			8.94	7.48	9.53	7.30	10.10	7.83	10.39	7.77	10.94	7.79	11.48	8.14		
33	8.48	7.04	8.77	7.40	9.35	7.23	9.92	7.76	10.19	7.69	10.77	7.73	11.34	8.09		
35	8.22	6.91	8.55	7.30	9.18	7.16	9.74	7.69	10.00	7.62	10.60	7.67	11.20	8.04		
37	7.99	6.80	8.33	7.20	8.97	7.07	9.53	7.61	9.80	7.54	10.37	7.58	10.93	7.96		
39	7.76	6.69	8.11	7.10	8.76	6.98	9.33	7.52	9.60	7.47	10.14	7.50	10.67	7.87		
41	7.53	6.58	7.89	7.00	8.55	6.89	9.12	7.44	9.40	7.39	9.90	7.42	10.41	7.78		
43	7.30	6.47	7.68	6.91	8.34	6.80	8.91	7.36	9.20	7.32	9.67	7.33	10.15	7.70		
46	6.78	6.22	7.16	6.68	7.83	6.59	8.44	7.18	8.75	7.15	9.24	7.18	9.73	7.56		
50	6.27	5.98	6.64	6.45	7.32	6.38	7.96	7.00	8.30	6.99	8.81	7.03	9.32	7.43		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	10.06	9.87	9.70	9.53	9.35
-17.7	-18	10.14	9.98	9.82	9.65	9.47
-15.7	-16	10.23	10.08	9.94	9.77	9.59
-13.5	-14	10.55	10.37	10.20	10.01	9.81
-11.5	-12	11.14	10.93	10.70	10.47	10.23
-9.5	-10	11.31	11.25	11.20	10.95	10.71
-7.5	-8	11.31	11.25	11.20	10.96	10.73
-5.5	-6	11.31	11.25	11.20	10.96	10.73
-3.0	-4	11.31	11.25	11.20	10.96	10.73
-1.0	-2	11.31	11.25	11.20	10.96	10.73
1.0	0	11.31	11.25	11.20	10.96	10.73
2.0	1	11.31	11.25	11.20	10.96	10.73
3.0	2	11.31	11.25	11.20	10.96	10.73
5.0	4	11.31	11.25	11.20	10.96	10.73
7.0	6	11.31	11.25	11.20	10.96	10.73
9.0	8	11.85	11.78	11.70	11.47	11.24
11.5	10	12.39	12.30	12.21	11.98	11.76
13.5	12	12.94	12.88	12.82	12.66	12.49
15.5	14	13.49	13.46	13.43	13.33	13.22
16.5	16	13.77	13.75	13.74	13.66	13.59

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF100VSXWVH Indoor unit FDF100VH Outdoor unit FDC100VSX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.26	8.30	11.76	8.31	12.09	8.23	12.75	8.58	13.41	8.39
-10							11.26	8.30	11.76	8.31	12.09	8.23	12.75	8.58	13.41	8.39
-5							11.26	8.30	11.76	8.31	12.09	8.23	12.75	8.58	13.41	8.39
0					10.51	7.74	11.35	8.34	11.76	8.31	12.11	8.24	12.80	8.60	13.49	8.41
5					10.77	7.85	11.43	8.38	11.76	8.31	12.13	8.24	12.85	8.62	13.58	8.44
11					10.68	7.81	11.33	8.33	11.66	8.27	12.02	8.20	12.75	8.58	13.47	8.41
13					10.59	7.77	11.23	8.29	11.56	8.22	11.92	8.16	12.64	8.54	13.36	8.37
15					10.50	7.73	11.13	8.25	11.45	8.18	11.81	8.12	12.54	8.51	13.26	8.34
17					10.34	7.66	10.98	8.19	11.30	8.12	11.65	8.06	12.37	8.45	13.08	8.28
19					10.21	7.60	10.82	8.12	11.14	8.06	11.49	8.00	12.20	8.39	12.90	8.22
21					10.10	7.55	10.71	8.08	11.02	8.01	11.36	7.95	12.03	8.33	12.71	8.16
23					9.98	7.50	10.59	8.03	10.90	7.96	11.22	7.90	11.87	8.27	12.52	8.10
25			9.35	7.67	9.93	7.48	10.53	8.00	10.83	7.94	11.15	7.87	11.79	8.25	12.43	8.08
27			9.30	7.65	9.87	7.46	10.47	7.98	10.77	7.92	11.27	7.92	11.77	8.24		
29			9.12	7.56	9.70	7.38	10.29	7.91	10.58	7.84	11.10	7.85	11.63	8.19		
31			8.94	7.48	9.53	7.30	10.10	7.83	10.39	7.77	10.94	7.79	11.48	8.14		
33	8.48	7.04	8.77	7.40	9.35	7.23	9.92	7.76	10.19	7.69	10.77	7.73	11.34	8.09		
35	8.22	6.91	8.55	7.30	9.18	7.16	9.74	7.69	10.00	7.62	10.60	7.67	11.20	8.04		
37	7.99	6.80	8.33	7.20	8.97	7.07	9.53	7.61	9.80	7.54	10.37	7.58	10.93	7.96		
39	7.76	6.69	8.11	7.10	8.76	6.98	9.33	7.52	9.60	7.47	10.14	7.50	10.67	7.87		
41	7.53	6.58	7.89	7.00	8.55	6.89	9.12	7.44	9.40	7.39	9.90	7.42	10.41	7.78		
43	7.30	6.47	7.68	6.91	8.34	6.80	8.91	7.36	9.20	7.32	9.67	7.33	10.15	7.70		
46	6.78	6.22	7.16	6.68	7.83	6.59	8.44	7.18	8.75	7.15	9.24	7.18	9.73	7.56		
50	6.27	5.98	6.64	6.45	7.32	6.38	7.96	7.00	8.30	6.99	8.81	7.03	9.32	7.43		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	10.22	9.96	9.70	9.40	9.10
-17.7	-18	10.76	10.60	10.45	10.16	9.88
-15.7	-16	11.31	11.25	11.19	10.92	10.65
-13.5	-14	11.31	11.25	11.19	10.93	10.67
-11.5	-12	11.31	11.25	11.20	10.94	10.69
-9.5	-10	11.31	11.25	11.20	10.95	10.71
-7.5	-8	11.31	11.25	11.20	10.96	10.73
-5.5	-6	11.31	11.25	11.20	10.96	10.73
-3.0	-4	11.31	11.25	11.20	10.96	10.73
-1.0	-2	11.31	11.25	11.20	10.96	10.73
1.0	0	11.31	11.25	11.20	10.96	10.73
2.0	1	11.31	11.25	11.20	10.96	10.73
3.0	2	11.31	11.25	11.20	10.96	10.73
5.0	4	11.31	11.25	11.20	10.96	10.73
7.0	6	11.31	11.25	11.20	10.96	10.73
9.0	8	11.85	11.78	11.70	11.47	11.24
11.5	10	12.39	12.30	12.21	11.98	11.76
13.5	12	12.94	12.88	12.82	12.66	12.49
15.5	14	13.49	13.46	13.43	13.33	13.22
16.5	16	13.77	13.75	13.74	13.66	13.59

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Model FDF125VNXWVH Indoor unit FDF125VH Outdoor unit FDC125VNX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.89	8.83	12.37	8.82	12.71	8.73	13.39	9.11	14.07	8.90
-10							11.89	8.83	12.37	8.82	12.71	8.73	13.39	9.11	14.07	8.90
-5							11.95	8.86	12.57	8.90	12.94	8.82	13.67	9.21	14.40	9.01
0					11.69	8.49	12.71	9.18	13.21	9.16	13.61	9.08	14.40	9.47	15.19	9.26
5					12.68	8.95	13.46	9.50	13.85	9.42	14.28	9.35	15.14	9.74	15.99	9.53
11					12.84	9.02	13.62	9.57	14.01	9.49	14.44	9.41	15.31	9.80	16.18	9.60
13					12.99	9.09	13.77	9.63	14.16	9.55	14.60	9.48	15.49	9.87	16.38	9.66
15					13.14	9.16	13.92	9.70	14.31	9.61	14.77	9.54	15.67	9.93	16.57	9.73
17					12.94	9.07	13.73	9.62	14.12	9.53	14.57	9.46	15.46	9.85	16.35	9.65
19					12.76	8.98	13.53	9.53	13.93	9.45	14.37	9.38	15.24	9.78	16.12	9.57
21					12.62	8.92	13.38	9.46	13.77	9.39	14.20	9.31	15.04	9.70	15.89	9.50
23					12.48	8.85	13.23	9.40	13.62	9.32	14.03	9.25	14.84	9.63	15.65	9.42
25			11.69	9.04	12.41	8.82	13.16	9.37	13.54	9.29	13.94	9.21	14.74	9.59	15.54	9.38
27			11.62	9.00	12.34	8.79	13.08	9.34	13.46	9.26	14.09	9.27	14.71	9.58		
29			11.40	8.89	12.12	8.69	12.86	9.24	13.22	9.16	13.88	9.19	14.53	9.52		
31			11.17	8.78	11.91	8.59	12.63	9.14	12.98	9.06	13.67	9.10	14.35	9.45		
33	10.36	8.20	10.84	8.62	11.69	8.49	12.40	9.05	12.74	8.97	13.46	9.02	14.18	9.39		
35	10.33	8.19	10.71	8.56	11.47	8.39	12.18	8.95	12.50	8.87	13.25	8.94	14.00	9.32		
37	10.03	8.03	10.43	8.43	11.21	8.28	11.92	8.85	12.25	8.77	12.96	8.83	13.67	9.21		
39	9.73	7.88	10.16	8.30	10.95	8.16	11.66	8.74	12.00	8.67	12.67	8.72	13.34	9.09		
41	9.43	7.73	9.88	8.17	10.68	8.04	11.40	8.63	11.75	8.57	12.38	8.61	13.01	8.98		
43	9.13	7.58	9.60	8.04	10.42	7.93	11.14	8.53	11.50	8.47	12.09	8.50	12.69	8.86		
46	8.49	7.26	8.96	7.74	9.81	7.66	10.44	8.25	10.70	8.17	11.08	8.13	11.47	8.45		
50	7.85	6.95	8.33	7.45	9.19	7.40	9.74	7.97	9.90	7.87	10.08	7.76	10.26	8.06		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	10.37	10.18	10.00	9.82	9.64
-17.7	-18	10.43	10.26	10.10	9.92	9.74
-15.7	-16	10.49	10.34	10.19	10.02	9.84
-13.5	-14	10.79	10.61	10.44	10.24	10.04
-11.5	-12	11.37	11.15	10.92	10.68	10.44
-9.5	-10	11.96	11.68	11.40	11.12	10.84
-7.5	-8	12.55	12.22	11.88	11.56	11.23
-5.5	-6	12.90	12.63	12.35	12.03	11.72
-3.0	-4	13.25	13.04	12.82	12.51	12.20
-1.0	-2	13.61	13.45	13.29	12.99	12.69
1.0	0	13.96	13.86	13.76	13.47	13.17
2.0	1	14.13	14.07	14.00	13.71	13.41
3.0	2	14.13	14.07	14.00	13.71	13.41
5.0	4	14.13	14.07	14.00	13.71	13.41
7.0	6	14.13	14.07	14.00	13.71	13.41
9.0	8	14.81	14.72	14.63	14.34	14.06
11.5	10	15.49	15.37	15.26	14.98	14.70
13.5	12	16.18	16.10	16.02	15.74	15.45
15.5	14	16.87	16.83	16.79	16.49	16.20
16.5	16	17.21	17.19	17.17	16.87	16.57

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF125VSXWVH Indoor unit FDF125VH Outdoor unit FDC125VSX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.89	8.83	12.37	8.82	12.71	8.73	13.39	9.11	14.07	8.90
-10							11.89	8.83	12.37	8.82	12.71	8.73	13.39	9.11	14.07	8.90
-5							11.95	8.86	12.57	8.90	12.94	8.82	13.67	9.21	14.40	9.01
0					11.69	8.49	12.71	9.18	13.21	9.16	13.61	9.08	14.40	9.47	15.19	9.26
5					12.68	8.95	13.46	9.50	13.85	9.42	14.28	9.35	15.14	9.74	15.99	9.53
11					12.84	9.02	13.62	9.57	14.01	9.49	14.44	9.41	15.31	9.80	16.18	9.60
13					12.99	9.09	13.77	9.63	14.16	9.55	14.60	9.48	15.49	9.87	16.38	9.66
15					13.14	9.16	13.92	9.70	14.31	9.61	14.77	9.54	15.67	9.93	16.57	9.73
17					12.94	9.07	13.73	9.62	14.12	9.53	14.57	9.46	15.46	9.85	16.35	9.65
19					12.76	8.98	13.53	9.53	13.93	9.45	14.37	9.38	15.24	9.78	16.12	9.57
21					12.62	8.92	13.38	9.46	13.77	9.39	14.20	9.31	15.04	9.70	15.89	9.50
23					12.48	8.85	13.23	9.40	13.62	9.32	14.03	9.25	14.84	9.63	15.65	9.42
25			11.69	9.04	12.41	8.82	13.16	9.37	13.54	9.29	13.94	9.21	14.74	9.59	15.54	9.38
27			11.62	9.00	12.34	8.79	13.08	9.34	13.46	9.26	14.09	9.27	14.71	9.58		
29			11.40	8.89	12.12	8.69	12.86	9.24	13.22	9.16	13.88	9.19	14.53	9.52		
31			11.17	8.78	11.91	8.59	12.63	9.14	12.98	9.06	13.67	9.10	14.35	9.45		
33	10.36	8.20	10.84	8.62	11.69	8.49	12.40	9.05	12.74	8.97	13.46	9.02	14.18	9.39		
35	10.33	8.19	10.71	8.56	11.47	8.39	12.18	8.95	12.50	8.87	13.25	8.94	14.00	9.32		
37	10.03	8.03	10.43	8.43	11.21	8.28	11.92	8.85	12.25	8.77	12.96	8.83	13.67	9.21		
39	9.73	7.88	10.16	8.30	10.95	8.16	11.66	8.74	12.00	8.67	12.67	8.72	13.34	9.09		
41	9.43	7.73	9.88	8.17	10.68	8.04	11.40	8.63	11.75	8.57	12.38	8.61	13.01	8.98		
43	9.13	7.58	9.60	8.04	10.42	7.93	11.14	8.53	11.50	8.47	12.09	8.50	12.69	8.86		
46	8.49	7.26	8.96	7.74	9.81	7.66	10.44	8.25	10.70	8.17	11.08	8.13	11.47	8.45		
50	7.85	6.95	8.33	7.45	9.19	7.40	9.74	7.97	9.90	7.87	10.08	7.76	10.26	8.06		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature				
		°CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	11.30	11.10	10.90	10.70	10.50
-17.7	-18	11.98	11.75	11.52	11.34	11.16
-15.7	-16	12.63	12.45	12.27	12.05	11.84
-13.5	-14	12.84	12.68	12.51	12.29	12.06
-11.5	-12	13.27	13.14	13.01	12.76	12.51
-9.5	-10	14.13	14.07	14.00	13.71	13.41
-7.5	-8	14.13	14.07	14.00	13.71	13.41
-5.5	-6	14.13	14.07	14.00	13.71	13.41
-3.0	-4	14.13	14.07	14.00	13.71	13.41
-1.0	-2	14.13	14.07	14.00	13.71	13.41
1.0	0	14.13	14.07	14.00	13.71	13.41
2.0	1	14.13	14.07	14.00	13.71	13.41
3.0	2	14.13	14.07	14.00	13.71	13.41
5.0	4	14.13	14.07	14.00	13.71	13.41
7.0	6	14.13	14.07	14.00	13.71	13.41
9.0	8	14.81	14.72	14.63	14.34	14.06
11.5	10	15.49	15.37	15.26	14.98	14.70
13.5	12	16.18	16.10	16.02	15.74	15.45
15.5	14	16.87	16.83	16.79	16.49	16.20
16.5	16	17.21	17.19	17.17	16.87	16.57

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Model FDF140VNXWVH Indoor unit FDF140VH Outdoor unit FDC140VNX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.46	8.66	12.05	8.69	12.38	8.61	13.04	8.99	13.70	8.78
-10							11.46	8.66	12.05	8.69	12.38	8.61	13.04	8.99	13.70	8.78
-5							11.48	8.67	12.08	8.70	12.43	8.63	13.13	9.02	13.84	8.83
0					11.06	8.21	12.02	8.89	12.51	8.87	12.88	8.80	13.63	9.19	14.38	9.00
5					11.84	8.56	12.57	9.12	12.93	9.04	13.33	8.97	14.13	9.37	14.93	9.18
11					12.32	8.78	13.17	9.37	13.59	9.31	14.01	9.24	14.86	9.63	15.70	9.43
13					12.80	9.00	13.77	9.63	14.25	9.59	14.70	9.52	15.59	9.90	16.48	9.70
15					13.28	9.23	14.37	9.90	14.91	9.87	15.38	9.80	16.32	10.18	17.26	9.97
17					13.49	9.33	14.46	9.94	14.94	9.88	15.42	9.81	16.36	10.19	17.30	9.98
19					13.50	9.33	14.55	9.98	14.98	9.90	15.45	9.83	16.40	10.21	17.34	9.99
21					13.56	9.36	14.54	9.97	14.97	9.89	15.43	9.81	16.35	10.19	17.26	9.97
23					13.63	9.39	14.53	9.97	14.95	9.89	15.40	9.80	16.29	10.17	17.19	9.94
25			12.78	9.59	13.66	9.41	14.52	9.97	14.95	9.88	15.39	9.80	16.27	10.16	17.15	9.93
27			12.89	9.65	13.69	9.42	14.52	9.96	14.94	9.88	15.63	9.90	16.33	10.18		
29			12.64	9.52	13.45	9.31	14.28	9.86	14.70	9.78	15.42	9.81	16.13	10.11		
31			12.39	9.39	13.21	9.20	14.05	9.75	14.47	9.68	15.20	9.72	15.93	10.03		
33	10.35	8.20	11.45	8.92	12.97	9.08	13.81	9.65	14.24	9.58	14.98	9.63	15.73	9.96		
35	10.27	8.16	11.29	8.84	12.73	8.97	13.57	9.55	14.00	9.48	14.76	9.54	15.53	9.88		
37	10.21	8.13	11.14	8.77	12.48	8.85	13.31	9.43	13.73	9.37	14.47	9.42	15.21	9.76		
39	10.15	8.10	10.98	8.69	12.22	8.73	13.05	9.32	13.46	9.26	14.18	9.31	14.89	9.65		
41	10.10	8.07	10.83	8.62	11.97	8.62	12.78	9.21	13.19	9.15	13.89	9.19	14.58	9.53		
43	10.04	8.04	10.68	8.54	11.72	8.50	12.52	9.10	12.92	9.04	13.59	9.07	14.26	9.42		
46	9.24	7.63	9.77	8.11	10.56	7.99	11.11	8.52	11.40	8.44	11.83	8.40	12.25	8.72		
50	8.45	7.24	8.86	7.70	9.40	7.49	9.71	7.96	9.88	7.86	10.06	7.76	10.24	8.05		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature				
		°CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	11.01	10.95	10.90	10.66	10.42
-17.7	-18	11.50	11.28	11.05	10.70	10.34
-15.7	-16	12.33	12.06	11.78	11.42	11.06
-13.5	-14	12.60	12.31	12.03	11.67	11.31
-11.5	-12	13.15	12.83	12.51	12.15	11.79
-9.5	-10	13.70	13.35	13.00	12.63	12.27
-7.5	-8	14.25	13.87	13.49	13.12	12.75
-5.5	-6	14.67	14.36	14.04	13.68	13.32
-3.0	-4	15.09	14.85	14.60	14.25	13.90
-1.0	-2	15.52	15.34	15.16	14.82	14.47
1.0	0	15.94	15.83	15.72	15.38	15.04
2.0	1	16.15	16.08	16.00	15.66	15.33
3.0	2	16.15	16.08	16.00	15.66	15.33
5.0	4	16.15	16.08	16.00	15.66	15.33
7.0	6	16.15	16.08	16.00	15.66	15.33
9.0	8	16.93	16.82	16.72	16.39	16.06
11.5	10	17.70	17.57	17.44	17.12	16.80
13.5	12	18.49	18.28	18.08	17.43	16.78
15.5	14	19.27	19.00	18.72	17.74	16.75
16.5	16	19.67	19.36	19.04	17.89	16.74

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF140VSXWVH Indoor unit FDF140VH Outdoor unit FDC140VSX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.46	8.66	12.05	8.69	12.38	8.61	13.04	8.99	13.70	8.78
-10							11.46	8.66	12.05	8.69	12.38	8.61	13.04	8.99	13.70	8.78
-5							11.48	8.67	12.08	8.70	12.43	8.63	13.13	9.02	13.84	8.83
0					11.06	8.21	12.02	8.89	12.51	8.87	12.88	8.80	13.63	9.19	14.38	9.00
5					11.84	8.56	12.57	9.12	12.93	9.04	13.33	8.97	14.13	9.37	14.93	9.18
11					12.32	8.78	13.17	9.37	13.59	9.31	14.01	9.24	14.86	9.63	15.70	9.43
13					12.80	9.00	13.77	9.63	14.25	9.59	14.70	9.52	15.59	9.90	16.48	9.70
15					13.28	9.23	14.37	9.90	14.91	9.87	15.38	9.80	16.32	10.18	17.26	9.97
17					13.49	9.33	14.46	9.94	14.94	9.88	15.42	9.81	16.36	10.19	17.30	9.98
19					13.50	9.33	14.55	9.98	14.98	9.90	15.45	9.83	16.40	10.21	17.34	9.99
21					13.56	9.36	14.54	9.97	14.97	9.89	15.43	9.81	16.35	10.19	17.26	9.97
23					13.63	9.39	14.53	9.97	14.95	9.89	15.40	9.80	16.29	10.17	17.19	9.94
25			12.78	9.59	13.66	9.41	14.52	9.97	14.95	9.88	15.39	9.80	16.27	10.16	17.15	9.93
27			12.89	9.65	13.69	9.42	14.52	9.96	14.94	9.88	15.63	9.90	16.33	10.18		
29			12.64	9.52	13.45	9.31	14.28	9.86	14.70	9.78	15.42	9.81	16.13	10.11		
31			12.39	9.39	13.21	9.20	14.05	9.75	14.47	9.68	15.20	9.72	15.93	10.03		
33	10.35	8.20	11.45	8.92	12.97	9.08	13.81	9.65	14.24	9.58	14.98	9.63	15.73	9.96		
35	10.27	8.16	11.29	8.84	12.73	8.97	13.57	9.55	14.00	9.48	14.76	9.54	15.53	9.88		
37	10.21	8.13	11.14	8.77	12.48	8.85	13.31	9.43	13.73	9.37	14.47	9.42	15.21	9.76		
39	10.15	8.10	10.98	8.69	12.22	8.73	13.05	9.32	13.46	9.26	14.18	9.31	14.89	9.65		
41	10.10	8.07	10.83	8.62	11.97	8.62	12.78	9.21	13.19	9.15	13.89	9.19	14.58	9.53		
43	10.04	8.04	10.68	8.54	11.72	8.50	12.52	9.10	12.92	9.04	13.59	9.07	14.26	9.42		
46	9.24	7.63	9.77	8.11	10.56	7.99	11.11	8.52	11.40	8.44	11.83	8.40	12.25	8.72		
50	8.45	7.24	8.86	7.70	9.40	7.49	9.71	7.96	9.88	7.86	10.06	7.76	10.24	8.05		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	12.26	12.08	11.90	11.84	11.77
-17.7	-18	13.37	13.22	13.07	12.83	12.59
-15.7	-16	14.48	14.36	14.24	13.82	13.40
-13.5	-14	14.76	14.63	14.49	14.11	13.72
-11.5	-12	15.34	15.17	15.00	14.68	14.36
-9.5	-10	15.91	15.70	15.50	15.25	15.00
-7.5	-8	16.48	16.24	16.00	15.82	15.64
-5.5	-6	16.48	16.24	16.00	15.82	15.64
-3.0	-4	16.48	16.24	16.00	15.82	15.64
-1.0	-2	16.48	16.24	16.00	15.82	15.64
1.0	0	16.48	16.24	16.00	15.82	15.64
2.0	1	16.48	16.24	16.00	15.82	15.64
3.0	2	16.48	16.24	16.00	15.82	15.64
5.0	4	16.48	16.24	16.00	15.82	15.64
7.0	6	16.48	16.24	16.00	15.82	15.64
9.0	8	17.27	17.08	16.90	16.64	16.39
11.5	10	18.06	17.93	17.79	17.47	17.14
13.5	12	18.86	18.66	18.45	17.78	17.12
15.5	14	19.67	19.39	19.10	18.10	17.09
16.5	16	20.07	19.75	19.43	18.26	17.08

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(2) Twin type

Model FDF140VNXWPVH Indoor unit FDF71VH (2 units) Outdoor unit FDC140VNX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.46	9.55	12.05	9.56	12.38	9.47	13.04	9.97	13.70	9.75
-10							11.46	9.55	12.05	9.56	12.38	9.47	13.04	9.97	13.70	9.75
-5							11.48	9.56	12.08	9.58	12.43	9.49	13.13	10.00	13.84	9.79
0					11.06	8.95	12.02	9.76	12.51	9.73	12.88	9.65	13.63	10.16	14.38	9.95
5					11.84	9.27	12.57	9.97	12.93	9.89	13.33	9.81	14.13	10.32	14.93	10.11
11					12.32	9.47	13.17	10.20	13.59	10.13	14.01	10.05	14.86	10.56	15.70	10.34
13					12.80	9.67	13.77	10.44	14.25	10.38	14.70	10.30	15.59	10.80	16.48	10.57
15					13.28	9.88	14.37	10.68	14.91	10.63	15.38	10.55	16.32	11.05	17.26	10.81
17					13.49	9.97	14.46	10.72	14.94	10.65	15.42	10.56	16.36	11.06	17.30	10.82
19					13.50	9.98	14.55	10.76	14.98	10.66	15.45	10.58	16.40	11.07	17.34	10.83
21					13.56	10.00	14.54	10.75	14.97	10.66	15.43	10.57	16.35	11.05	17.26	10.81
23					13.63	10.03	14.53	10.75	14.95	10.65	15.40	10.56	16.29	11.04	17.19	10.79
25			12.78	10.28	13.66	10.05	14.52	10.74	14.95	10.65	15.39	10.55	16.27	11.03	17.15	10.78
27			12.89	10.33	13.69	10.06	14.52	10.74	14.94	10.65	15.63	10.64	16.33	11.05		
29			12.64	10.22	13.45	9.96	14.28	10.65	14.70	10.55	15.42	10.56	16.13	10.98		
31			12.39	10.10	13.21	9.85	14.05	10.55	14.47	10.46	15.20	10.48	15.93	10.91		
33	10.35	8.84	11.45	9.67	12.97	9.75	13.81	10.46	14.24	10.38	14.98	10.40	15.73	10.84		
35	10.27	8.81	11.29	9.60	12.73	9.65	13.57	10.36	14.00	10.29	14.76	10.32	15.53	10.78		
37	10.21	8.78	11.14	9.53	12.48	9.54	13.31	10.26	13.73	10.18	14.47	10.21	15.21	10.67		
39	10.15	8.75	10.98	9.46	12.22	9.43	13.05	10.16	13.46	10.08	14.18	10.11	14.89	10.57		
41	10.10	8.72	10.83	9.39	11.97	9.32	12.78	10.06	13.19	9.98	13.89	10.00	14.58	10.47		
43	10.04	8.69	10.68	9.32	11.72	9.22	12.52	9.95	12.92	9.88	13.59	9.90	14.26	10.36		
46	9.24	8.32	9.77	8.92	10.56	8.74	11.11	9.42	11.40	9.33	11.83	9.28	12.25	9.73		
50	8.45	7.95	8.86	8.53	9.40	8.28	9.71	8.91	9.88	8.80	10.06	8.70	10.24	9.12		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	11.01	10.95	10.90	10.66	10.42
-17.7	-18	11.50	11.28	11.05	10.70	10.34
-15.7	-16	12.33	12.06	11.78	11.42	11.06
-13.5	-14	12.60	12.31	12.03	11.67	11.31
-11.5	-12	13.15	12.83	12.51	12.15	11.79
-9.5	-10	13.70	13.35	13.00	12.63	12.27
-7.5	-8	14.25	13.87	13.49	13.12	12.75
-5.5	-6	14.67	14.36	14.04	13.68	13.32
-3.0	-4	15.09	14.85	14.60	14.25	13.90
-1.0	-2	15.52	15.34	15.16	14.82	14.47
1.0	0	15.94	15.83	15.72	15.38	15.04
2.0	1	16.15	16.08	16.00	15.66	15.33
3.0	2	16.15	16.08	16.00	15.66	15.33
5.0	4	16.15	16.08	16.00	15.66	15.33
7.0	6	16.15	16.08	16.00	15.66	15.33
9.0	8	16.93	16.82	16.72	16.39	16.06
11.5	10	17.70	17.57	17.44	17.12	16.80
13.5	12	18.49	18.28	18.08	17.43	16.78
15.5	14	19.27	19.00	18.72	17.74	16.75
16.5	16	19.67	19.36	19.04	17.89	16.74

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF140VSXWPVH Indoor unit FDF71VH (2 units) Outdoor unit FDC140VSX-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.46	9.55	12.05	9.56	12.38	9.47	13.04	9.97	13.70	9.75
-10							11.46	9.55	12.05	9.56	12.38	9.47	13.04	9.97	13.70	9.75
-5							11.48	9.56	12.08	9.58	12.43	9.49	13.13	10.00	13.84	9.79
0					11.06	8.95	12.02	9.76	12.51	9.73	12.88	9.65	13.63	10.16	14.38	9.95
5					11.84	9.27	12.57	9.97	12.93	9.89	13.33	9.81	14.13	10.32	14.93	10.11
11					12.32	9.47	13.17	10.20	13.59	10.13	14.01	10.05	14.86	10.56	15.70	10.34
13					12.80	9.67	13.77	10.44	14.25	10.38	14.70	10.30	15.59	10.80	16.48	10.57
15					13.28	9.88	14.37	10.68	14.91	10.63	15.38	10.55	16.32	11.05	17.26	10.81
17					13.49	9.97	14.46	10.72	14.94	10.65	15.42	10.56	16.36	11.06	17.30	10.82
19					13.50	9.98	14.55	10.76	14.98	10.66	15.45	10.58	16.40	11.07	17.34	10.83
21					13.56	10.00	14.54	10.75	14.97	10.66	15.43	10.57	16.35	11.05	17.26	10.81
23					13.63	10.03	14.53	10.75	14.95	10.65	15.40	10.56	16.29	11.04	17.19	10.79
25			12.78	10.28	13.66	10.05	14.52	10.74	14.95	10.65	15.39	10.55	16.27	11.03	17.15	10.78
27			12.89	10.33	13.69	10.06	14.52	10.74	14.94	10.65	15.63	10.64	16.33	11.05		
29			12.64	10.22	13.45	9.96	14.28	10.65	14.70	10.55	15.42	10.56	16.13	10.98		
31			12.39	10.10	13.21	9.85	14.05	10.55	14.47	10.46	15.20	10.48	15.93	10.91		
33	10.35	8.84	11.45	9.67	12.97	9.75	13.81	10.46	14.24	10.38	14.98	10.40	15.73	10.84		
35	10.27	8.81	11.29	9.60	12.73	9.65	13.57	10.36	14.00	10.29	14.76	10.32	15.53	10.78		
37	10.21	8.78	11.14	9.53	12.48	9.54	13.31	10.26	13.73	10.18	14.47	10.21	15.21	10.67		
39	10.15	8.75	10.98	9.46	12.22	9.43	13.05	10.16	13.46	10.08	14.18	10.11	14.89	10.57		
41	10.10	8.72	10.83	9.39	11.97	9.32	12.78	10.06	13.19	9.98	13.89	10.00	14.58	10.47		
43	10.04	8.69	10.68	9.32	11.72	9.22	12.52	9.95	12.92	9.88	13.59	9.90	14.26	10.36		
46	9.24	8.32	9.77	8.92	10.56	8.74	11.11	9.42	11.40	9.33	11.83	9.28	12.25	9.73		
50	8.45	7.95	8.86	8.53	9.40	8.28	9.71	8.91	9.88	8.80	10.06	8.70	10.24	9.12		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature				
		°CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	12.26	12.08	11.90	11.84	11.77
-17.7	-18	13.37	13.22	13.07	12.83	12.59
-15.7	-16	14.48	14.36	14.24	13.82	13.40
-13.5	-14	14.76	14.63	14.49	14.11	13.72
-11.5	-12	15.34	15.17	15.00	14.68	14.36
-9.5	-10	15.91	15.70	15.50	15.25	15.00
-7.5	-8	16.48	16.24	16.00	15.82	15.64
-5.5	-6	16.48	16.24	16.00	15.82	15.64
-3.0	-4	16.48	16.24	16.00	15.82	15.64
-1.0	-2	16.48	16.24	16.00	15.82	15.64
1.0	0	16.48	16.24	16.00	15.82	15.64
2.0	1	16.48	16.24	16.00	15.82	15.64
3.0	2	16.48	16.24	16.00	15.82	15.64
5.0	4	16.48	16.24	16.00	15.82	15.64
7.0	6	16.48	16.24	16.00	15.82	15.64
9.0	8	17.27	17.08	16.90	16.64	16.39
11.5	10	18.06	17.93	17.79	17.47	17.14
13.5	12	18.86	18.66	18.45	17.78	17.12
15.5	14	19.67	19.39	19.10	18.10	17.09
16.5	16	20.07	19.75	19.43	18.26	17.08

PGA000Z846

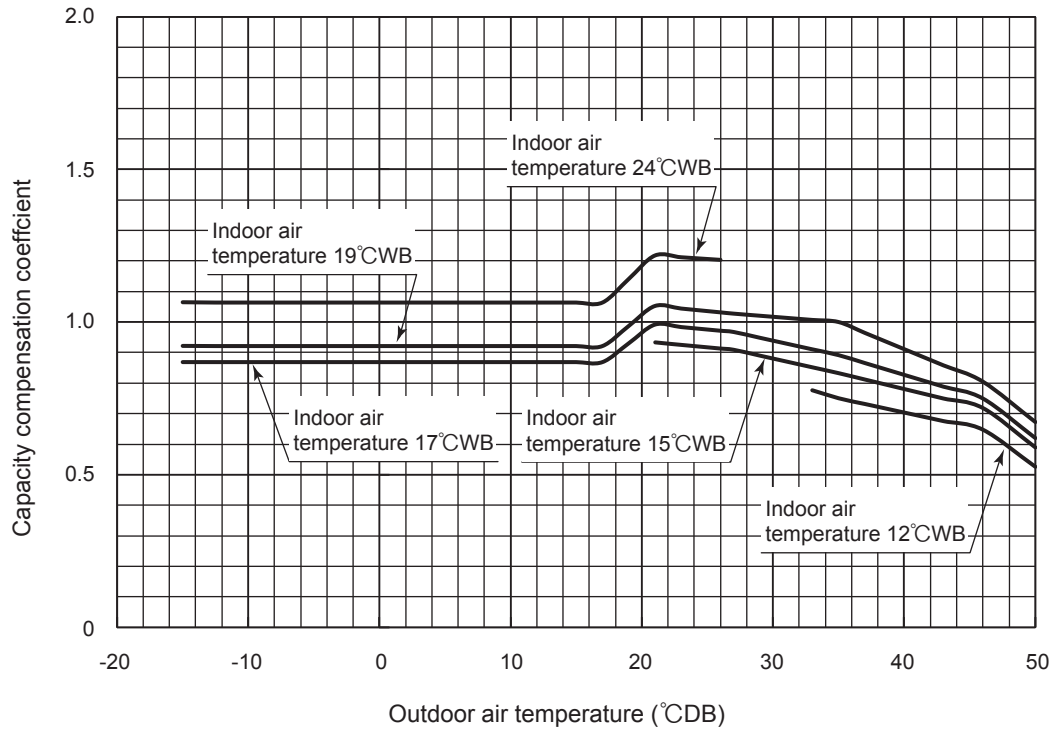
Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

[References data]

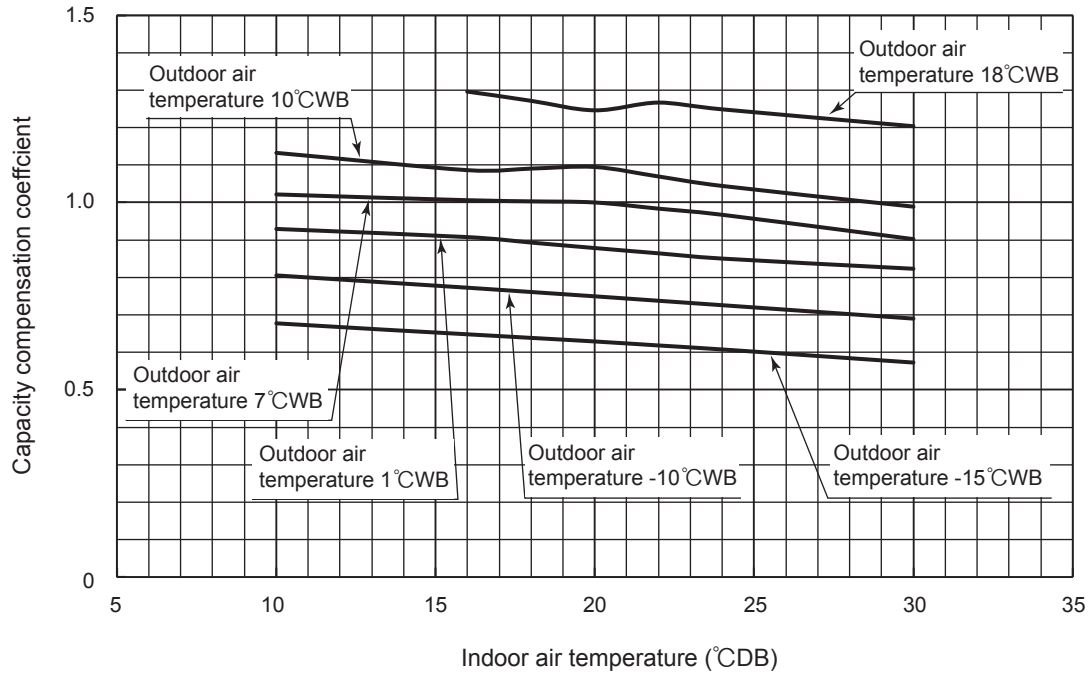
The following figures show capacity variation against outdoor and indoor temperature. Capacity compensation coefficient shows the ratio of maximum capacity at any temperature to nominal capacity.

(I)Model FDC71VNX-W

①Cooling

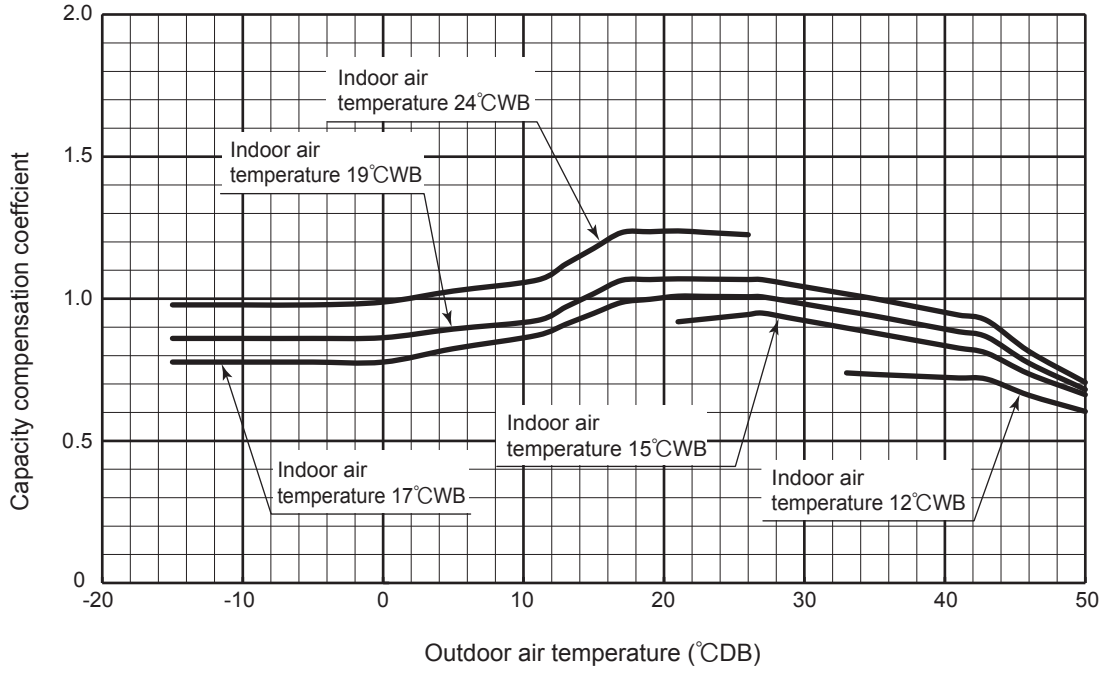


②Heating

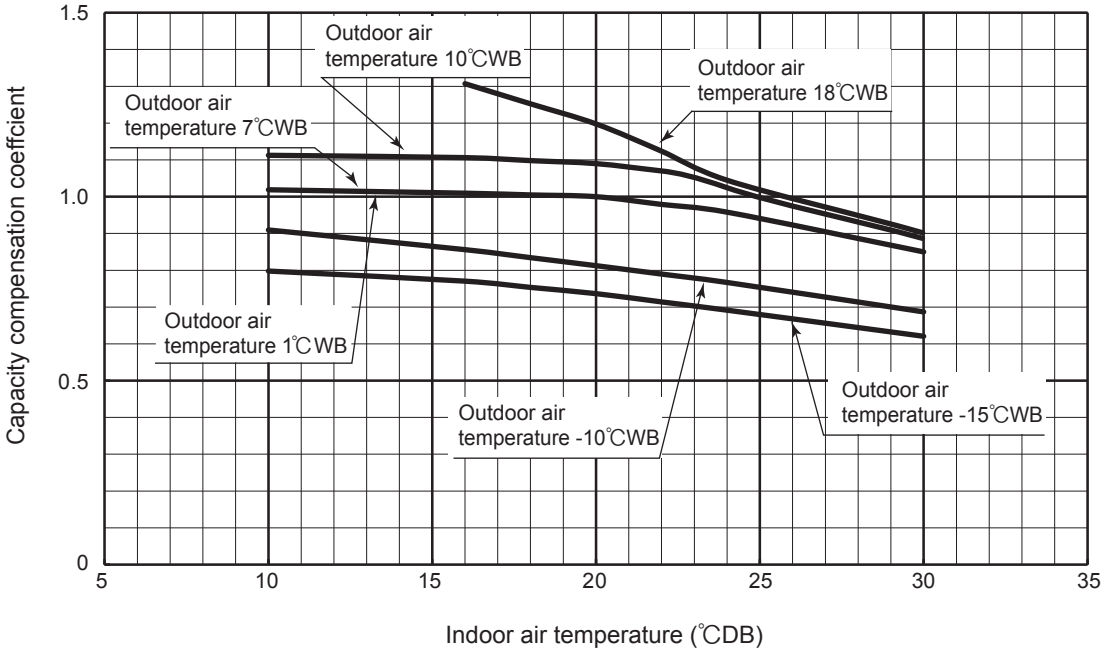


⑵Models FDC100, 125, 140VNX-W, 100, 125, 140VSX-W

①Cooling



②Heating



1.8.2 Correction of cooling and heating capacity in relation to air flow rate control (fan speed)

Fan speed	P-Hi or Hi	Me	Lo
Coefficient	1.00	0.97	0.95

1.8.3 Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

Models 71-140

Equivalent piping length(1) (m)			7.5	10	15	20	25	30	35	40	45	50	55
Heating			1	1	1	1	1	0.998	0.998	0.993	0.993	0.988	0.988
Cooling	71 model	ϕ15.88	1	0.996	0.989	0.982	0.975	0.968	0.961	0.954	0.947	0.940	0.933
	100 model		1	0.991	0.978	0.964	0.951	0.937	0.924	0.910	0.897	0.883	0.870
	125 model		1	0.986	0.968	0.950	0.932	0.914	0.896	0.878	0.860	0.842	0.824
	140 model		1	0.985	0.966	0.946	0.927	0.907	0.888	0.868	0.849	0.829	0.810
	71 model	ϕ19.05	1.008	1.006	1.003	1	0.997	0.994	0.991	0.988	0.985	0.982	0.979
	100 model		1.016	1.013	1.007	1.002	0.996	0.991	0.985	0.980	0.974	0.969	0.963
	125 model		1.022	1.018	1.009	1.001	0.992	0.984	0.975	0.967	0.958	0.950	0.941
	140 model		1.026	1.021	1.011	1.002	0.992	0.983	0.973	0.964	0.954	0.945	0.935

Equivalent piping length(1) (m)			60	65	70	75	80	85	90	95	100	105
Heating			0.983	0.983	0.978	0.978	0.973	0.973	0.968	0.968	0.963	0.963
Cooling	71 model	ϕ15.88	—	—	—	—	—	—	—	—	—	—
	100 model		0.856	0.834	0.829	0.816	0.803	0.789	0.776	0.762	0.749	0.736
	125 model		0.806	0.788	0.770	0.752	0.734	0.716	0.698	0.680	0.662	0.644
	140 model		0.790	0.771	0.751	0.732	0.712	0.693	0.673	0.654	0.634	0.615
	71 model	ϕ19.05	—	—	—	—	—	—	—	—	—	—
	100 model		0.959	0.955	0.951	0.948	0.944	0.940	0.936	0.932	0.929	0.926
	125 model		0.935	0.929	0.924	0.919	0.912	0.908	0.902	0.897	0.892	0.887
	140 model		0.928	0.920	0.913	0.907	0.900	0.894	0.888	0.882	0.876	0.870

Note (1) Calculate the equivalent length using the following formula.
However, install the piping so that the piping length is within +5 m of the limit length (actual length) for the respective types.

• Equivalent length =Actual length + (Equivalent bend length x number of bends in the piping.)
Equivalent length per bend.

Gas pipe diameter (mm)	ϕ12.7	ϕ15.88	ϕ19.05
Equivalent bend length	0.20	0.25	0.30

1.8.4 Height difference between the indoor unit and outdoor unit

When the outdoor unit is located below indoor units in cooling mode, or when the outdoor unit is located above indoor units in heating mode, the correction coefficient mentioned in the below table should be subtracted from the value in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	5m	10m	15m	20m	25m	30m
Adjustment coefficient	0.99	0.98	0.97	0.96	0.95	0.94

Height difference between the indoor unit and outdoor unit in the vertical height difference	35m	40m	45m	50m
Adjustment coefficient	0.93	0.92	0.91	0.90

Piping length limitations

Item \ Model	FDC71VNX-W	FDC100-140VNX-W, FDC100-140VSX-W
Max. one way piping length	50m	100m
Max. vertical height difference	Outdoor unit is higher 30m Outdoor unit is lower 15m	Outdoor unit is higher 50m Outdoor unit is lower 15m

Note (1) Values in the table indicate the one way piping length between the indoor and outdoor units.

How to obtain the cooling and heating capacity

Example : The net cooling capacity of the model FDF100VNXWVH with the air flow “P-High”, the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulb temperature at 19.0℃ and outdoor dry-bulb temperature 35℃ is

Net cooling capacity = 10.0 × 1.00 × 0.978 × 0.99 ≒ 9.7kW

- 10.0: Net cooling total capacity of FDF100VNXWVH (Outdoor temp. : 35℃DB Indoor temp. : 19℃WB) shown in table 1.8.1
- 1.00: Air flow : P-High shown in table 1.8.2
- 0.978: Piping length :15m (Gas pipe size is ϕ15.88) shown in table 1.8.3
- 0.99: Height diff. :5m (Outdoor unit : below) shown in table 1.8.4

1.9 APPLICATION DATA

1.9.1 Installation of indoor unit

PGA012D418

This manual is for the installation of the indoor unit.
For electrical wiring work (Indoor unit), refer to page 46.
For remote control installation, refer to page 54.
For wireless remote control installation, refer to page 207.
For wireless (Outdoor unit) and refrigerant pipe work installation for outdoor unit, refer to page 66.
For motion sensor kit installation, refer to page 217.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ⚠CAUTION .
  ⚠WARNING : Wrong installation would cause serious consequences such as injuries or death.
  ⚠CAUTION : Wrong installation might cause serious consequences depending on circumstances.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.
- The meanings of "Marks" used here are as shown on the right:
  ⃠ Never do it under any circumstances. | ❗ Always do it according to the instruction.
- After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about "SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit.
  Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.

⚠WARNING

- **Installation should be performed by the specialist.**
  If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit.
- **Install the system correctly according to these installation manuals.**
  Improper installation may cause explosion, injury, water leakage, electric shock, and fire.
- **Check the density refered by the formula (accordance with ISO5149).**
  If the density exceeds the limit density, please consult the dealer and install the ventilation system.
- **Use the genuine accessories and the specified parts for installation.**
  If parts unspecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit.
- **Ventilate the working area well in case the refrigerant leaks during installation.**
  If the refrigerant contacts the fire, toxic gas is produced.
  In case of R32, the refrigerant could be ignited because of its flammability.
- **Install the unit in a location that can hold heavy weight.**
  Improper installation may cause the unit to fall leading to accidents.
- **Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes.**
  Improper installation may cause the unit to fall leading to accidents.
- **Do not mix air in to the cooling cycle on installation or removal of the air-conditioner.**
  If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and injuries.
- **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**
  Power source with insufficient capacity and improper work can cause electric shock and fire.
- **Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal.**
  Loose connections or hold could result in abnormal heat generation or fire.
- **Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel property.**
  Improper fitting may cause abnormal heat and fire.
- **Check for refrigerant gas leakage after installation is completed.**
  If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced.
- **Use the specified pipe, flare nut, and tools for R32 or R410A.**
  Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle.
- **Tighten the flare nut according to the specified method by with torque wrench.**
  If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period.
- **Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulfide gas can occur.**
  Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. This can also cause the corrosion of the indoor unit and a resultant unit failure or refrigerant leak.
- **Connect the pipes for refrigeration circuit securely in installation work before compressor is operated.**
  If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system.
- **Stop the compressor before removing the pipe after shutting the service valve on pump down work.**
  If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.
- **Only use prescribed option parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not repair by yourself. And consult with the dealer about repair.**
  Improper repair may cause water leakage, electric shock or fire.
- **Consult the dealer or a specialist about removal of the air-conditioner.**
  Improper installation may cause water leakage, electric shock or fire.
- **Turn off the power source during servicing or inspection work.**
  If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- **Do not run the unit when the panel or protection guard are taken off.**
  Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get burned, or electric shock.
- **Shut off the power before electrical wiring work.**
  It could cause electric shock, unit failure and improper running.

⚠ CAUTION

- **Perform earth wiring surely.**
  Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock due to a short-circuit.
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause electric shocks.
- **Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.**
  Using the incorrect one could cause the system failure and fire.
- **Do not use any materials other than a fuse of correct capacity where a fuse should be used.**
  Connecting the circuit by wire or copper wire could cause unit failure and fire.
- **Do not install the indoor unit near the location where there is possibility of flammable gas leakages.**
  If the gas leaks and gathers around the unit, it could cause fire.
- **Do not install and use the unit where corrosive gas (such as sulfurous acid gas etc.) or flammable gas (such as thinner, petroleum etc.) may be generated or accumulated, it could be sprayed with chemicals, or volatile flammable substances are handled.**
  It could cause the corrosion of heat exchanger, breakage of plastic parts etc. And inflammable gas could cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **Do not use the indoor unit at the place where water splashes such as laundry.**
  Indoor unit is not waterproof. It could cause electric shock and fire.
- **Do not use the indoor unit for a special purpose such as food storage, cooling for precision instrument, preservation of animals, plants, and a work of art.**
  It could cause the damage of the items.
- **Do not install nor use the system near equipments which generate electromagnetic wave or high harmonics.**
  Equipments like inverter equipment, private power generator, high-frequency medical equipment, or telecommunication equipment might influence the air-conditioner and cause a malfunction and breakdown. Or the air-conditioner might influence medical equipments or telecommunication equipments, and obstruct their medical activity or cause jamming.
- **Do not install the remote control at the direct sunlight.**
  It could cause breakdown or deformation of the remote control.
- **Do not install the indoor unit at the place listed below.**
  · Places where flammable gas could leak.
  · Places where carbon fiber, metal powder or any powder is floated.
  · Place where the substances which affect the air-conditioner are generated such as sulfide gas, chloride gas, acid, alkali or ammonic atmospheres.
  · Places exposed to oil mist or steam directly.
  · On vehicles and ships
  · Places where machinery which generates high harmonics is used.
  · Places where cosmetics or special sprays are frequently used.
  · Highly salted area such as beach.
  · Heavy snow area
  · Places where the system is affected by smoke from a chimney.
  · Altitude over 1000m
- **Do not install the indoor unit in the locations listed below (Be sure to install the indoor unit according to the installation manual for each model because each indoor unit has each limitation)**
  · Locations with any obstacles which can prevent inlet and outlet air of the unit
  · Locations where vibration can be amplified due to insufficient strength of structure.
  · Locations where the infrared receiver is exposed to the direct sunlight or the strong light beam. (in case of the infrared specification unit)
  · Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  · Locations where drainage cannot run off safely.
  It can affect performance or function and etc..
  Do not install the motion sensor mounting panel at following places. It could cause detection error, incapacity of detection, or characteristic degradation.
  • Place where vibration is applied to it for a long period of time.
  • Place where static electricity or electromagnetic wave generates.
  • Place where it is exposed to high temperature or humidity for a long period of time.
  • Dusty place or where the lens face could be fouled or damaged.
- **Do not put any valuables which will break down by getting wet under the air-conditioner.**
  Condensation could drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's belongings.
- **Do not use the base frame for the outdoor unit which is corroded or damaged after a long period of use.**
  It could cause the unit falling down and injury.
- **Pay attention not to damage the drain pan by weld sputter when brazing work is done near the unit.**
  If sputter entered into the unit during brazing work, it could cause damage (pinhole) of drain pan and leakage of water. To avoid damaging, keep the indoor unit packed or cover the indoor unit.
- **Install the drain pipe to drain the water surely according to the installation manual.**
  Water may drip in the room, damaging user's belongings, unless it is worked as instructed.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **For drain pipe installation, be sure to make descending slope of greater than 1/100, not to make traps, and not to make air-bleeding.**
  Check if the drainage is correctly done during commissioning and ensure the space for inspection and maintenance.
- **Ensure the insulation on the pipes for refrigeration circuit so as not to condense water.**
  Incomplete insulation could cause condensation and it would wet ceiling, floor, and any other valuables.
- **Do not install the outdoor unit where is likely to be a nest for insects and small animals.**
  Insects and small animals could come into the electronic components and cause breakdown and fire. Instruct the user to keep the surroundings clean.
- **Pay extra attention, carrying the unit by hand.**
  Carry the unit with 2 people or more if it is heavier than 20kg. Do not use the plastic straps but the grabbing place, moving the unit by hand. Use protective gloves in order to avoid injury.
- **Make sure to dispose of the packaging material.**
  Leaving the materials may cause injury as metals like nail and woods are used in the package.
- **Do not operate the system without the air filter.**
  It may cause the breakdown of the system due to clogging of the heat exchanger.
- **Do not touch any button with wet hands.**
  It could cause electric shock.
- **Do not touch the refrigerant piping with bare hands when in operation.**
  The pipe during operation would become very hot or cold according to the operating condition, and it could cause a burn or frostbite.
- **Do not clean up the air-conditioner with water, and do not spray disinfectants etc. directly over the air-conditioner.**
  It could cause electrical shock or corrode parts.
- **Do not turn off the power source immediately after stopping the operation.**
  Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown.
- **Do not control the operation with the circuit breaker.**
  It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.

⚠ CAUTION

- **When the power source breaker is turned on, take care of running fan.**
  Since the fan starts automatically if the refrigerant sensor detects leaked refrigerant, it could cause injury.
- **Do not install the unit in the environment where combustible gas is used.**
  If the refrigerant sensor detects any error erroneously and stops the unit with the error stop, it makes impossible to run the unit.
- **Connect refrigerant pipes and drain pipes with care to prevent dewing on the refrigerant sensor.**
  If the refrigerant sensor is wetted with water, it could damage the sensor or cause electric shock or fire.
- **This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.**
- **Disposal and cleaning of refrigerant should be handled by a qualified specialist.**
  Contact the sales company for details.

①Before installation

○ Install the unit properly according to this installation manual.
○ Is it in accordance with the construction plan?

Model and power source specification
Check.
Pipes, wires and small parts
Accessory

(1) **For heat insulation of flare nut** *1

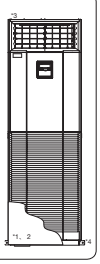
1	Pipe cover		1 pc.	For gas side
2	Pipe cover		1 pc.	For liquid side
3	Strap		4 pcs.	

(2) **For installation**

1	Fall-prevention fitting		1 pc.	*3
2	Wood screw		2 pcs.	For No. 1
3	Washer		2 pcs.	For No. 2 wood screw
4	Rubber bushing		1 pc.	For refrigerant and drain pipes
5	L fitting		2 pcs.	*4

Where the accessories are put in

*1. Open the air inlet grill and No. (1) will be found in the unit.
*2. No. (2)-2-4 will be found at the same place as 1.
*3. Fall-prevention fitting is mounting on the top panel of the unit.
*4. L-fittings are mounted on the bottom part of the unit.

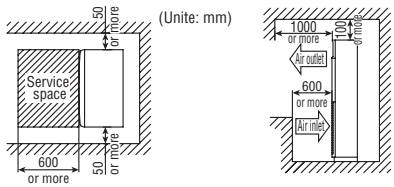


②Selection of installation place for the indoor unit

① Select the suitable areas to install the unit under approval of the user.
- Areas where the indoor unit can deliver hot and cold wind sufficiently. Suggest to the user to use a circulator if the ceiling height is over 3m to avoid warm air being accumulated on the ceiling.
- Areas where there is enough space to install and service.
- Areas where it can be drained properly. Areas where drain pipe descending slope can be taken.
- Areas where there is no obstruction of air flow on both air return grille and air supply port.
- Areas where fire alarm will not be accidentally activated by the air-conditioner.
- Areas where the supply air does not short-circuit.
- Areas where it is not influenced by draft air.
- Areas not exposed to direct sunlight.
- Areas where dew point is lower than around 23°C and relative humidity is lower than 80%.
  There is some risk of condensation drop if the air-conditioner is operated under the severer condition than mentioned above.
  If there is a possibility to use it under such a condition, attach additional insulation of 10 to 20mm thick for entire surface of indoor unit, refrigeration pipe and drain pipe.
- Areas where TV and radio stays away more than 1m. (It could cause jamming and noise.)
- Areas where any items which will be damaged by getting wet are not placed such as food, table wares, server, or medical equipment under the unit.
- Areas where there is no influence by the heat which cookware generates.
- Areas where not exposed to oil mist, powder and/or steam directly such as above fryer.
- Areas where lighting device such as fluorescent light or incandescent light doesn't affect the operation. (A beam from lighting device sometimes affects the infrared receiver for the wireless remote control and the air-conditioner might not work properly.)
- When operating the suction air processing unit independently, it operates in the outdoor air processing mode. Blowout temperatures are not same at the standard unit operation and the outdoor air processing mode operations. Since the temperatures become higher during cooling or lower during heating, take care of the direction of blowout outlet.
  Avoid directing the blowout outlet to the space where people are present.

② Check if the place where the air-conditioner is installed can hold the weight of the unit. If it is not able to hold, reinforce the structure with boards and beams strong enough to hold it. If the strength is not enough, it could cause injury due to unit falling.

Space for installation and service



ATTENTION
- Secure sufficient spaces for inspection and maintenance.

⚠WARNING
- Install the unit securely on a floor that can endure its weight sufficiently Insufficient strength or incorrect installation could result in injuries if the unit falls.

③Carrying-in and installation of the unit

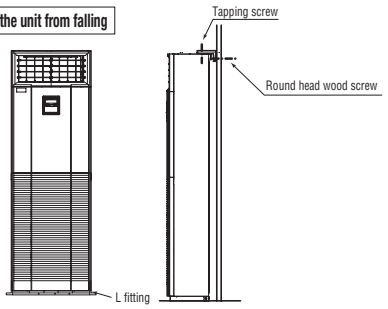
Carrying-in

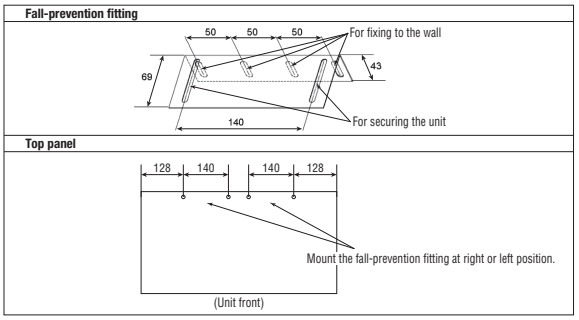
Carry with the front face at top.

ATTENTION
- Carry in the unit kept in a package as near as possible to the installation place.
- When it is necessary to unpack the unit before carrying in, sufficient care must be taken not to damage it by using nylon slings or the like.
  Note) Do not hold on the air inlet grill, air outlet louver or other sections made of plastics.
- When placing the unit on the floor after unpacking, be sure to have its front face at the top.

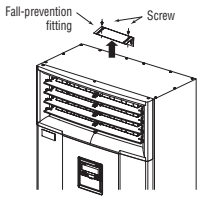
⚠WARNING
- Refrigerant R32 is combustible, though slightly. For this reason, make sure to observe following instructions.
  When working indoors to install, repair or relocate a floor standing indoor unit, always carry a refrigerant sensor. If refrigerant leaks accidentally, it could cause intoxication or catch fire.

Procedure for preventing the unit from falling



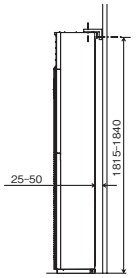
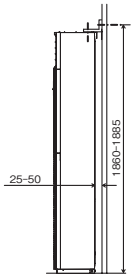


◆Procedure
(1) Fixing the unit with the fall-prevention fitting



①Loosen screws (2 pcs.) and remove the fall-prevention fitting.
②Select a position to fix the fall-prevention fitting as illustrated and fix it to the top of unit and the wall.

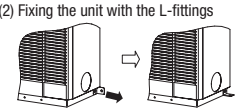
Fixing position (Fall-prevention fitting)

Fitting facing upward	Fitting facing downward
	

- Dimensions indicate the allowance for adjustment between the unit and the wall or floor.
- Fix the longer side of fitting to the unit.
- When the fitting is faced downward, fix it to the wall first.

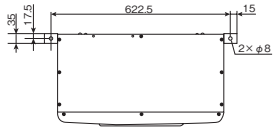
③Carrying-in and installation of the unit (Continued)

(2) Fixing the unit with the L-fittings



①Remove the L-fittings mounted on the unit with screws.
②Turn over the L-fittings and fix it to the unit and either the floor or the wall as illustrated.
・ Fixing position of the L-fittings are as illustrated below.

Fixing position (L fitting)



ATTENTION

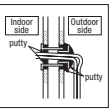
• Install the unit on the level.
Inclination must be less than 1°in fore-aft and right-left directions.

⚠ WARNING

Completely seal the hole in the wall with putty. If not sealed properly, dust, insects, small animals, and highly humid air may enter the room from outside, which could result in fire or other hazards.

⚠ CAUTION

Completely seal the hole in the wall with putty.
If not sealed properly, furniture and other fixtures may be damaged by water leakage or condensation.

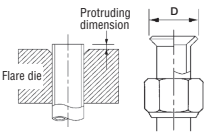


④Refrigerant piping

Caution

●Be sure to use new pipes for the refrigerant pipes. Use the flare nut attached to the product.
Regarding whether existing pipes can be reused or not, and the washing method, refer to the instruction manual of the outdoor unit, catalogue or technical data.
1) In case of reuse: Do not use old flare nut, but use the nut attached to the unit.
2) In case of reuse: Flare the end of pipe replaced partially for R32 or R410A.

⚠WARNING : When flared joints are reused indoors, the flare part shall be re-fabricated. (only for R32)

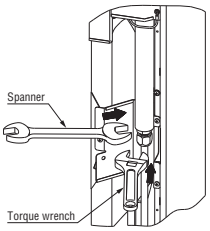


Pipe diameter d mm	Min. pipe wall thickness mm	Protruding dimension for flare, mm		Flare O.D. D mm	Flare nut tightening torque N·m
		Rigid (Clutch type)			
		For R410A	Conventional tool		
6.35	0.8	0 − 0.5	0.7 − 1.3	8.9 − 9.1	14 − 18
9.52	0.8			12.8 − 13.2	34 − 42
12.7	0.8			16.2 − 16.6	49 − 61
15.88	1			19.3 − 19.7	68 − 82
19.05	1.2			23.6 − 24.0	100 − 120

●Use phosphorus deoxidized copper alloy seamless pipe (C1220T) for refrigeration pipe installation. In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.
●Do not use any refrigerant other than the designated refrigerant.
Using other refrigerant except the designated refrigerant, may degrade inside refrigeration oil. And air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.
●Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.
●Use special tools for R32 or R410A refrigerant.

Work procedure

1. Remove the flare nut and blind flanges on the pipe of the indoor unit.
 ＊ Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them.
 (Gas may come out at this time, but it is not abnormal.)
 ● Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit.
 ＊ Bend radius of pipe must be 4D or larger. Once a pipe is bent, do not readjust the bending.
 Do not twist a pipe or collapse to 2/3D or smaller.
 ● Make sure to use flare nuts assembled on the unions. Usage of other flare nuts could cause refrigerant leakage.
 ＊ Do a flare connection as follows:
 ● Make sure to hold the nut on indoor unit pipe side using double spanner method as indicated when fastening / loosening flare nuts in order to prevent unintentional twisting of the copper pipe.
 ● When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table above.

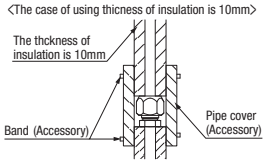


3. Cover the flare connection part of the indoor unit with attached insulation material after a gas leakage inspection, and tighten both ends with attached straps.
 ● Make sure to insulate both gas pipes and liquid pipes completely.
 ＊ Incomplete insulation may cause dew condensation or water dropping.
 ● Use heat-resistant (120 °C or more) insulations on the gas side pipes.
 ● In case of using at high humidity condition, reinforce insulation of refrigerant pipes.
 Surface of insulation may cause dew condition or water dropping, if insulations are not reinfoced.
4. Refrigerant is charged in the outdoor unit.
 As for the additional refrigerant charge for the indoor unit and piping, refer to the installation manual attached to the outdoor unit.

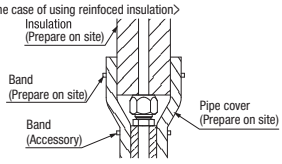
Caution:
Refrigerating machine oil should not be applied to the threads of union or external surface of flare. It is because, even if the same tightening torque is applied, the oil is likely to decrease the slide friction force on the threads and increase, in turn, the axial component force so that it could crack the flare by the stress corrosion. Refrigerating machine oil may be applied to the internal surface of flare only.

④Refrigerant piping (Continued)

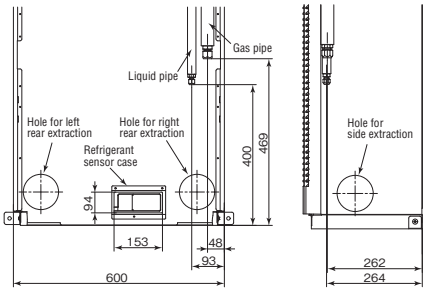
<The case of using thickness of insulation is 10mm>



<The case of using reinfoced insulation>



◆ **Pipe and wire extracting position**



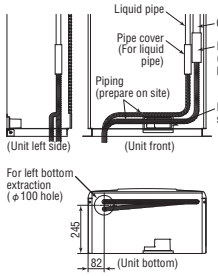
⚠ ATTENTION

• Do not cut off the flange at the hole on the base plate for the downward extraction.

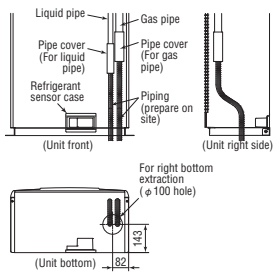
⚠ CAUTION

• Do not run refrigerant pipes above the refrigerant sensor case. If they are splashed with water, it could cause failures.

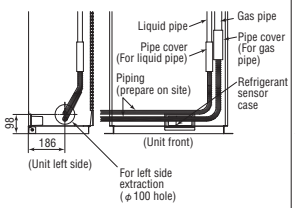
In case of left bottom extraction



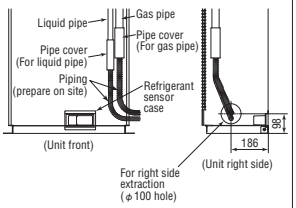
In case of right bottom extraction



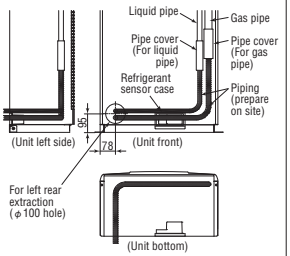
In case of left side extraction



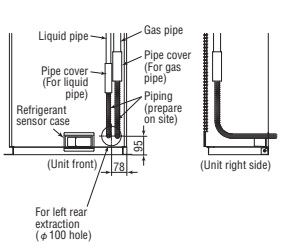
In case of right side extraction



In case of left rear extraction



In case of right rear extraction



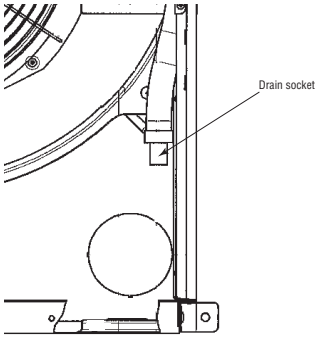
⑤Drain pipe

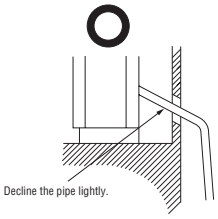
Caution

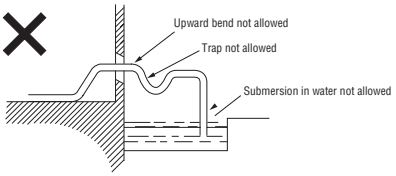
- Install the drain pipe according to the installation manual in order to drain properly. Imperfection in draining may cause flood indoors and wetting the household goods,etc.
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is generated. Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency of oxygen). In addition, it may cause corrosion of heat exchanger and bad smell.
- Connect the pipe securely to avoid water leakage from the joint.
- Insulate the pipe properly to avoid condensation drop.
- Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.
- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway. In addition, do not put air vent on the drain pipe. Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

Procedure

1. Connect the drain socket to the drain pipe (VP20) provided at site and fix the joint with adhesive tape, or the like.
2. When the pipe provided at site runs through a room, insulate the pipe with a commercial insulator (Polyethylene foam: Specific gravity 0.03, thickness 15mm or more) to prevent dewing.







⚠CAUTION

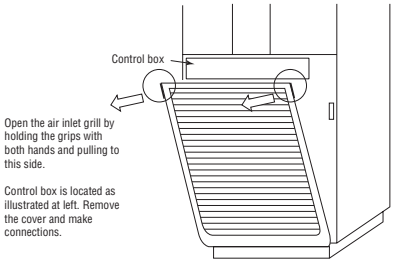
- Do not run drain pipes above the refrigerant sensor case. If water is splashed over them, it could cause troubles.

⑥Wire position and wiring connecton

Control box position and power source cable connection

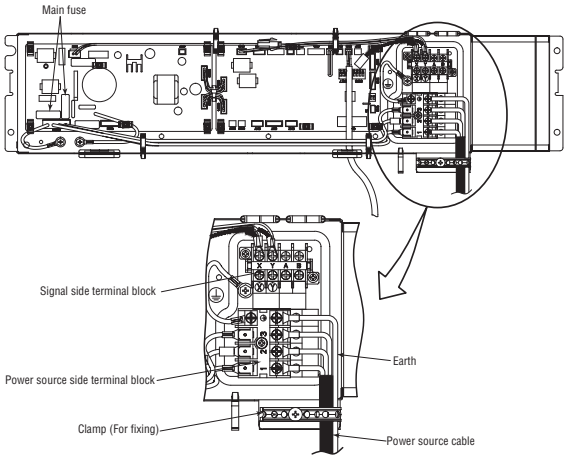
- Electric work must be made by qualified electricians according to the "Engineering standards concerning electric equipment", "Extension wiring regulations" and the electric wiring work manual. Be sure to use dedicated electric circuits.
- Make sure to use specified wires for wiring, and connect them securely. Clamp the wires to protect the terminal connection from external force.
- Make sure to protect the unit with the D-type grounding work.
- For details of wiring work, refer to the attached electric wiring work manual.

⑥Wire position and wiring connecton (Continued)



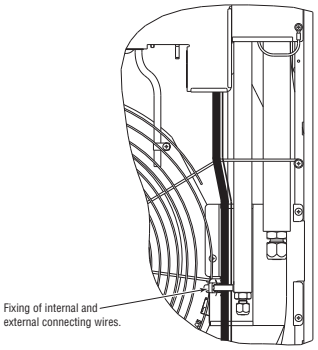
Procedure

①Remove the control box cover (fixed with a screw).
②Introduce wires in the unit and connect securely on the terminals.
③Fix each wire with a clamp (for fixing).
④Install removed parts as they were.



Main fuse specification

Specification	Part No.
T3.15A L250V	SSA564A149AF



• Make sure to pass the power source cable through the clamp (for guide).

⑦Check list after installation

●Check the following items after all installation work completed.

Check if;	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for gas leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Power source voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
There is mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks air flow on air inlet and outlet?	Insufficient capacity	

1.9.2 Electric wiring work installation

PGA012D419A A

Electrical wiring work must be performed by an electrician qualified by a local power provider according to the electrical installation technical standards and interior wiring regulations applicable to the installation site.

SAFETY PRECAUTIONS

- **Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.**
- **The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ⚠CAUTION.**
  ⚠WARNING : Wrong installation would cause serious consequences such as injuries or death.
  ⚠CAUTION : Wrong installation might cause serious consequences depending on circumstances.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.
- **The meanings of "Marks" used here are as shown on the right:**

⃠	Never do it under any circumstances.	❗	Always do it according to the instruction.

- **Accord with following items. Otherwise, there will be the risks of electric shock and fire caused by overheating or short-circuit.**

⚠WARNING

- **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**
  Power source with insufficient capacity and improper work can cause electric shock and fire.
- **This appliance shall be installed in accordance with national wiring regulations.**
- **Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal.**
  Loose connections or hold could result in abnormal heat generation or fire.
- **Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel property.**
  Improper fitting may cause abnormal heat and fire.
- **Use the genuine option parts. And installation should be performed by a specialist.**
  If you install the unit by yourself, it could cause water leakage, electric shock and fire.
- **Do not repair by yourself. And consult with the dealer about repair.**
  Improper repair may cause water leakage, electric shock or fire.
- **Consult the dealer or a specialist about removal of the air-conditioner.**
  Improper installation may cause water leakage, electric shock or fire.
- **Turn off the power source during servicing or inspection work.**
  If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- **Shut off the power source before electrical wiring work.**
  It could cause electric shock, unit failure and improper running.

⚠CAUTION

- **Perform earth wiring surely.**
  Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock due to a short-circuit.
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause electric shocks.
- **Make sure to install earth leakage breaker on power source line. (countermeasure thing to high harmonics.)**
  Absence of breaker could cause electric shock.
- **Use the circuit breaker of correct capacity. Use an all poles disconnection device with a contact gap of 3mm or more according to overvoltage category III.**
  Using the incorrect one could cause the system failure and fire.
- **Do not use any materials other than a fuse of correct capacity where a fuse should be used.**
  Connecting the circuit by wire or copper wire could cause unit failure and fire.
- **Use power source line of correct capacity.**
  Using incorrect capacity one could cause electric leak, abnormal heat generation and fire.
- **Do not mingle solid cord and stranded cord on power source and signal side terminal block.**
  In addition, do not mingle difference capacity solid or stranded cord.
  Inappropriate cord setting could cause loosing screw on terminal block, bad electrical contact, smoke and fire.
- **Do not turn off the power source immediately after stopping the operation.**
  Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown.
- **Do not control the operation with the circuit breaker.**
  It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.
- **If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.**

Control mode switching

- The control content of indoor units can be switched in following way. (☐ is the default setting)

Switch No.	Control content	Switch No.	Control content	
SW2	Indoor unit address (0-Fh)	SW6-1–4	Model capacity setting	
SW5-1	Master/Slave Switching (plural /Slave unit Setting)	SW7-1	ON	Operation check, Drain motor test run
SW5-2			☐ OFF	Normal operation

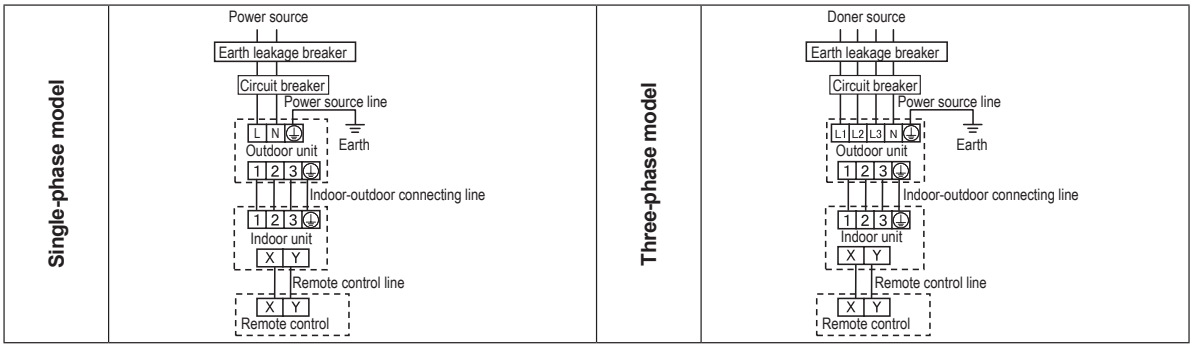
① Electrical wiring connection

- Electrical wiring work must be performed by an electrician an qualified by a local power provider. These wiring specifications are determined on the assumption that the following instructions are observed:
  - ① Do not use cords other than copper ones.
    Do not use any supply line lighter than one specified in parentheses for each type below.
    – ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
    – ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53);
  - ② Connect the power source to the outdoor unit.
  - ③ Pay extra attention so as not to confuse signal line and power source line connection, because an error in their connection can be burn all the boards at once.
- Connect ground wires before connecting wires between the indoor and outdoor units and between indoor units. The ground wires need to be longer than the wires between the indoor and outdoor units, and protected from undue stress.
- Do not turn on the power source before completing the work.
- The ground wires must be connected by the Class D grounding connection.
- Use the round crimp terminals for connections to the terminal block.

- Use dedicated branch circuits, avoiding combination with other devices. Otherwise, it could trip the power source breaker, resulting in secondary accidents.
- Install the overcurrent and earth leakage breakers (sensitivity current: 30 mA) specified to respective models.
- Do not connect indoor and outdoor signal cables to extension cables on the way. If the joint is wetted with intruding water, it could cause a ground insulation failure or poor connection, resulting in communication errors. (If it is inevitable to connect cables on the way, make sure to prevent the water intrusion completely.)
- When running wires (wires for power source, remote control, connecting between indoor and outdoor units, or other) behind the ceiling, protect them using copper or other pipes against assault by rat, or other.
- It is up to 3.5 mm^2 the size of power source cables connected to indoor units. When using cables of 5.5 mm^2 or larger, provide a dedicated pull box for branching connection to indoor units.
- If signal and power source cables are connected mistakenly, it could burn down all PCBs.
  - ① Even if the power source of 220/240/380/415 V is connected mistakenly to A-B signal cable, it is protected at initial occasion only.
  - ② If the remote control fails to detect the unit No. (address) at 15 minutes after turning the power on, check and repair all signal cables for misconnection.
  - ③ Cut the jumper wire J10SL1 of burnt PCB, and reconnect connectors CnK (yellow) and CnK1 (white) to CnK2 (black).
  - ④ If any anomaly is found on wires between the A-B terminal block and the PCB, replace them.
- At the outside of indoor and outdoor units, take care to avoid direct contacts between remote control and power source cables.
- In no event connect the power source of 220/240/380/415 V to the remote control terminal block. It could cause failures.
- Connections of wiring between units, ground wire and remote control cable
  - ① When connecting wires between units, ground wire or remote control wire, connect them according to the number of terminals on the power source terminal block or signal terminal block in the control box. Connect the ground wire to the ground terminal on the power source terminal block.
  - ② Make sure to install an earth leakage breaker for the power source. Select a breaker for inverter circuit.
  - ③ When the earth leakage breaker is exclusive for the earth leakage protection, it is necessary to connect also an isolating switch (Switch + Class B fuse) or wiring circuit breaker in series to the earth leakage breaker.
  - ④ Install the isolating switch close to the unit.
- Connect wires securing by tightening screws firmly. Confirm also no connector or wire (from terminal) is disconnected in the control box.
- When installing an auxiliary electric heater, consult the electric heater manual or technical data.

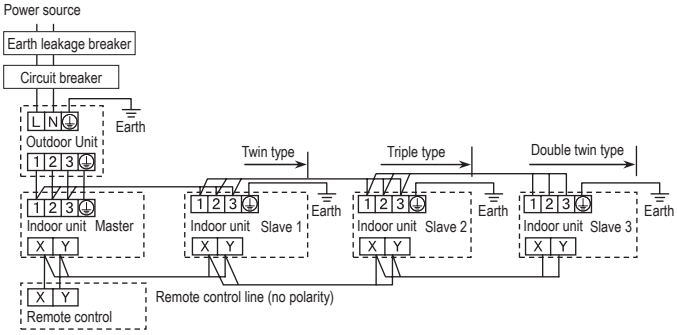
Cable connection for single unit installation

①As for connecting method of power source, select from following connecting patterns. In principle, do not directly connect power source line to inside unit.
* As for exceptional connecting method of power source, discuss with the power provider of the country with referring to technical documents, and follow its instruction.
②For cable size and circuit breaker selection, refer to the outdoor unit installation manual.



Cable connection for a V multi configuration installation

①Connect the same pairs number of terminal block "①, ②, and ③" and "Ⓧ and Ⓨ" between master and slave indoor units.
②Do the same address setting of all inside units belong to same refrigerant system by rotary switch SW2 on indoor unit's PCB (Printed circuit board).
③Set slave indoor unit as "slave 1" through "slave 3" by address switch SW5-1, 5-2 on PCB.
④When the AIR CON NO. button on the remote control unit is pressed after turning on the power, an indoor unit's address number will be displayed. Do not fail to confirm that the connected indoor unit's numbers are displayed on the remote control unit by pressing the ▲ or ▼ button.



Method of setting Master/Slave of indoor unit

(Factory setting: "Master")

Indoor unit		Master	Slave 1	Slave 2	Slave 3
PCB SW	SW5–1	OFF	OFF	ON	ON
	SW5–2	OFF	ON	OFF	ON

② Remote control, wiring and functions

●Do not install it on the following places
① Places exposed to direct sunlight
② Places near heat devices
③ High humidity places
④ Hot surface or cold surface enough to generate condensation
⑤ Places exposed to oil mist or steam directly.
⑥ Uneven surface

Installation and wiring of remote control

① Install remote control referring to the attached installation manual.

② Wiring of remote control should use 0.3mm^2 × 2 core wires or cables.

The insulation thickness is 1mm or more. (on-site configuration)

③ Maximum prolongation of remote control wiring is 600 m.

If the prolongation is over 100m, change to the size below.

But, wiring in the remote control case should be under 0.5mm^2. Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

100 - 200m ..... 0.5mm^2 × 2 cores

Under 300m ..... 0.75mm^2 × 2 cores

Under 400m ..... 1.25mm^2 × 2 cores

Under 600m ..... 2.0mm^2 × 2 cores

④ Avoid using multi-core cables to prevent malfunction.

⑤ Keep remote control line away from earth (frame or any metal of building).

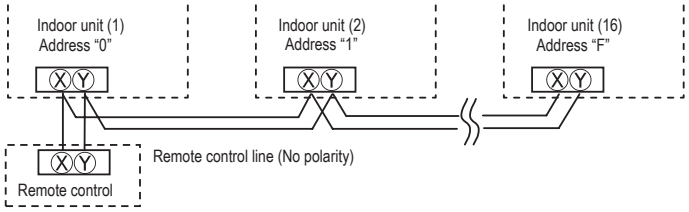
⑥ Make sure to connect remote control line to the remote control and terminal block of indoor unit. (No polarity)

Control plural indoor units by a single remote control

① A remote control can control plural indoor units (Up to 16).
In above setting, all plural indoor units will operate under same mode and temperature setting.

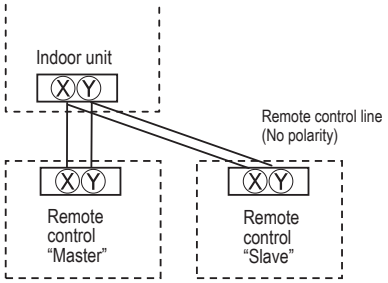
② Connect all indoor units with 2 core remote control line.

③ Set unique remote control communication address from "0" to "F" to each inside unit by the rotary switch SW2 on the indoor unit's PCB.



Master/ slave setting when more than one remote control unit are used

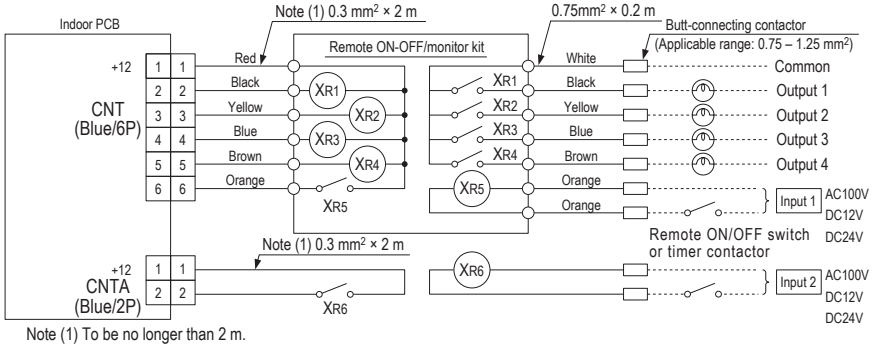
A maximum of two remote control units can be connected to one indoor unit (or one group of indoor units.)
The air-conditioner operation follows the last operation of the remote control regardless of the master/slave setting of it.
Acceptable combination is "two (2) wired remote controls", "one (1) wired remote control and one (1) wireless kit" or "two (2) wireless kits".
Set one to "Master" and the other to "Slave".
Note: The setting "Remote control unit sensor enabled" is only selectable with the master remote control unit in the position where you want to check room temperature.



③ Operation and confirmation from remote control

No.	Item	Operation from the eco touch remote control (RC-EX series)
1	Check the number of units connected in the multi remote control system.	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [IU address]
2	Check if each unit is connected properly in the remote control system.	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [IU address] ⇒ [Check run mode]
3	Setting main/sub remote controls	[Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Service password] ⇒ [Main/Sub of R/C]
4	Checking operation data	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [Operation data]
5	Checking inspection display	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [Error display]
6	Cooling test run from remote control	[Menu] ⇒ [Service setting] ⇒ [Installation settings] ⇒ [Service password] ⇒ [Test run] ⇒ [Cooling test run] ⇒ [Start]
7	Trial operation of drain pump from remote control	[Menu] ⇒ [Service setting] ⇒ [Installation settings] ⇒ [Service password] ⇒ [Test run] ⇒ [Drain pump test run] ⇒ [Run]

④ Function of CNT connector of indoor printed circuit board



Note (1) To be no longer than 2 m.

- X_{R1-4} are DC 12V relays. (Equivalent to Omron's LY2F)
- X_{R5} is a DC 12V, 24V or 100V relay. (Equivalent to Omron's MY2F)
- Maker and model of CNT connector (Site side)
  Connector : Molex 5264-06
  Terminal : Molex 5263T
- CNTA connector is used on FDT, or other. <Check with the specifications.> (Site side) Maker and model
  Connector : J.S.T. Mfg. XAP02V-1-E
  Terminal : J.S.T. Mfg. SXA-01T-P0.6
- Output 1 – 4 and input1/2 can be selected/set as required from following items.

Output

①	RUN output
②	Heating output
③	Compressor ON output
④	Inspection (error) output
⑤	Cooling output
⑥	Fan ON output 1
⑦	Fan ON output 2

⑧	Fan ON output 3
⑨	Defrost/oil return output
⑩	Ventilation output
⑪	Heater output
⑫	Free cleaning output
⑬	Indoor overload error output

Input

①	RUN/STOP
②	RUN permit prohibition
③	Emergency stop
④	Cooling/Heating

⑤	Setting temp. shift
⑥	Compulsory thermostat OFF
⑦	Temporary stop
⑧	Silent mode

Factory default setting

CNT-2	Output 1	RUN output
CNT-3	Output 2	Heating output
CNT-4	Output 3	Compressor ON output

CNT-5	Output 4	Inspection (error) output
CNT-6	Input 1	RUN/STOP
CNTA	Input 2	RUN/STOP

- For the setting method, refer to the technical data.

⑤ Operation and setting from remote control

A : Refer to the instruction manual
B : Refer to this installation manual
C : Loading a utility software vie Internet

Setting & display item			Description	RC-EX series
1.Remote controller network				
1	Control plural indoor units by a single remote controller		A remote control can control plural indoor units up to 16 (in one group of remote control network). An address is set to each indoor unit.	
2	Main/sub setting of remote controllers		A pair of remote controls (including option wireless remote control) can be connected within the remote control network. Set one to “Main” and the other to “Sub”.	B
2.TOP screen, Switch manipulation				
1	Menu		"Control", "State", or "Details" can be selected. (3-8)	A
2	Operation mode		"Cooling", "Heating", "Fan", "Dry" or "Auto" can be set.	A
3	Set temp.		"Set temperature" can be set by 0.5˚C interval.	A
4	Air flow direction		"Air flow direction" [Individual flap control] can be set.	A
5	Fan speed		"Fan speed" can be set.	A
6	Timer setting		"Timer operation" can be set.	A
7	ON/OFF		"On/Off operation of the system" can be done.	A
8	F1 SW		The system operates and is controlled according to the function specified to the F1 switch.	A
9	F2 SW		The system operates and is controlled according to the function specified to the F2 switch.	A
10	Select the language		Select the language to display on the remote control. ▪ Select from English, German, French, Spanish, Italian, Dutch, Turkish, Portuguese, Russian, Polish, Japanese and Chinese.	A
3.Useful functions				
1	Timer settings	Set On timer by hour	The period of time to start operation after stopping can be set. ▪ The period of set time can be set within range of 1hour-12houres (1hr interval). ▪ The operation mode, set temperature and fan speed at starting operation can be set.	A
		Set Off timer by hour	The period of time to stop operation after starting can be set. ▪ The period of set time can be set within range of 1hour-12houres (1hr interval).	A
		Set On timer by clock	The clock time to start operation can be set. ▪ The set clock time can be set by 5 minutes interval. ▪ [Once (one time only)] or [Everyday] operation can be switched. ▪ The operation mode, set temperature and fan speed at starting operation can be set.	A
		Set Off timer by clock	The clock time to stop operation can be set. ▪ The set clock time can be set by 5 minutes interval. ▪ [Once (one time only)] or [Everyday] operation can be switched.	A
		Confirmation of timer settings	Status of timer settings can be seen.	A
2	Favorite setting [Administrator password]		Set the operation mode, setting temperature, air flow capacity and air flow direction for the choice setting operations. Set them for the Favorite set 1 and the Favorite set 2 respectively.	A
3	Weekly timer		On timer and Off timer on weekly basis can be set. ▪ 8-operation patterns per day can be set at a maximum. ▪ The setting clock time can be set by 5 minutes interval. ▪ Holiday setting is available. ▪ The operation mode, set temperature and fan speed at starting operation can be set.	A
4	Home leave mode [Administrator password]		When leaving home for a long period like a vacation leave, the unit can be operated to maintain the room temperature not to be hotter in summer or not to be colder in winter. ▪ The judgment to switch the operation mode (Cooling ⇔ Heating) is done by the both factors of the set temperature and outdoor air temperature. ▪ The set temperature and fan speed can be set.	A
5	External Ventilation When the ventilator is combined.		On/Off operation of the external ventilator can be done. It is necessary to set from [Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Ventilation setting]. ▪ If the “Independent” is selected for the ventilation setting, the ventilator can be operated or stopped.	A

⑤ Operation and setting from remote control (continued)

Setting & display item			Description	RC-EX series
6	Select the language		Select the language to display on the remote control. ▪ Select from English, German, French, Spanish, Italian, Dutch, Turkish, Portuguese, Russian,Polish, Japanese and Chinese.	A
7	Silent mode control		The period of time to operate the unit by prioritizing the quietness can be set. ▪ Start and end can be set for the silent mode	A
4.Energy-saving setting			Administrator password	
1	Sleep timer		To prevent the timer from keeping ON, set hours to stop operation automatically with this timer. ▪ The selectable range of setting time is from 30 to 240 minutes. (10 minutes interval) ▪ When setting is "Enable", this timer will activate whenever the ON timer is set.	A
2	Peak-cut timer		Power consumption can be reduced by restricting the maximum capacity. Set the [Start time], the [End time] and the capacity limit % (Peak-cut %). ▪ 4-operation patterns per day can be set at maximum. ▪ The setting time can be changed by 5-minutes interval. ▪ The selectable range of capacity limit %(Peak-cut %) is from 0% to 40-80% (20% interval) ▪ Holiday setting is available.	A
3	Automatic temp set back		After the elapse of the set time period, the current set temperature will be set back to the [Set back time.] ▪ The setting can be done in cooling and heating mode respectively. ▪ Selectable range of the set time is from 20 min. to 120 min. (10 min. interval). ▪ Set the [Set back temp.] by 1˚C interval.	A
4	Motion sensor control When the panel with the motion sensor is assembled.		When the motion sensor is used, it is necessary to set Enable or Disable for the “Power control” and the “Auto-off”.	A
5.Filter				
1	Filter sign reset	Filter sign reset	The filter sign can be reset.	A
		Setting next cleaning date	The next cleaning date can be set.	A
6.User setting				
1	Internal settings	Clock setting	The current date and time can be set or revised. ▪ If a power failure continues no longer than 80 hours, the clock continues to tick by the built-in power source.	A
		Date and time display	[Display] or [Hide] the date and/or time can be set, and [12H] or [24H] display can be set.	A
		Summer time	When select [Enable], the +1hour adjustment of current time can be set. When select [Disable], the [Summer time] adjustment can be reset.	A
		Contrast	The contrast of LCD can be adjusted higher or lower.	A
		Backlight	Switching on/off a light can be set and period of the lighting time can be set within the range of 5 sec.-90 sec. (5 sec. interval).	A
		Controller sound	It can set with or without [Control sound (beep sound)] at touch panel.	A
		Operation lamp luminance	This is used to adjust the luminance of operation lamp.	A
2	Administrator settings [Administrator password]	Permission/Prohibition setting	▪ Permission/Prohibition setting of operation can be set. [On/Off] [Change set temp] [Change operation mode] [Change flap direction] [Change fan speed] [High power operation] [Energy-saving operation] [Timer] Request for administrator can be set. [Individual flap control] [Weekly timer] [Select the language] [Anti draft setting]	A
		Outdoor unit silent mode timer	The period of time to operate the outdoor unit by prioritizing the quietness can be set. ▪ The [Start time] and the [End time] for operating outdoor unit in silent mode can be set. ▪ The period of the operation time can be set once a day by 5 minute intervals.	A
		Setting temp range	The upper/lower limit of temperature setting range can be set. ▪ The limitation of indoor temperature setting range can be set for each operation mode in cooling and heating.	A

⑤ Operation and setting from remote control (continued)

Setting & display item				Description	RC-EX series
2	Administrator settings [Administrator password]	Temp increment setting		The temperature increment setting can be changed by 0.5°C or 1.0°C.	A
		Set temp display		Ways of displaying setting temperatures can be selected.	A
		R/C display setting		Register [Room name] [Name of I/U] [Zone name] Display [Indoor temp display] or not. Display [Error code display] or not. Display [Heating stand-by display] [Defrost operation display] [Auto cooling/heating display] [Display temp of R/C, Room, Outdoor] or not	A
		Change administrator password		The administrator password can be changed. (Default setting is "0000") The administrator password can be reset.	A B
		F1/F2 function setting		Functions can be set for F1 and F2. Selectable functions: [Anti draft ON/OFF] [High power operation], [Energy-saving operation], [Silent mode cont.], [Home leave mode], [Favorite set 1], [Favorite set 2] and [Filter sign reset].	A
7.Service setting					
1	Installer settings [Service password]	Installation date		The [Installation date] can be registered. ▪ When registering the [Installation date], the [Next service date] is displayed automatically. (For changing the [Next service date], please refer the item of [Service & Maintenance])	B
		Company information		The [Company information] can be registered and can be displayed on the R/C. ▪ The [Company] can be registered within 26 characters. ▪ The [Phone No.] can be registered within 13 digits.	B
		Test run		On/Off operation of the test run can be done.	B
			Cooling test run	The [Cooling test run] can be done at 5°C of set temperature for 30 minutes.	
			Drain pump test run	Only drain pump can be operated.	
		Address setting of main IU		Main indoor unit address can be set. ▪ Only the main indoor unit can change operation mode and the sub indoor units dominated by the main indoor shall follow. ▪ The main indoor unit can domain 10 indoor units at a maximum.	B
		IU back-up function		When a pair of indoor units (2 groups) is connected to one unit of remote control, it can be set Enable or Disable for the [IU rotation], [IU capacity back-up] and [IU fault back-up]	B
		Motion sensor setting When the panel with the motion sensor is assembled.		Set Enable or Disable for the infrared sensor detectors of indoor units connected to the remote control. If Disable is selected, it cannot be control the motion sensor control for the energy-saving setting.	B
2	R/C function setting [Service password]	Main/Sub R/C		The R/C setting of [Main/Sub] can be changed.	B
		Return air temp		When two or more indoor units are connected to one unit of remote control, suction sensors, which are used for the judgement by thermostat, can be selected. ▪ It can be selected from [Individual], [Master IU] and [Average temp].	B
		R/C sensor		It can be set the mode to switch to the remote control sensor. It can be selected from cooling and heating.	B
		R/C sensor adjustment		The offset value of [R/C sensor] sensing temperature can be set respectively in heating and cooling.	B
		Operation mode		Enable or Disable can be set for each operation mode.	B
		ºC / ºF		Set the unit for setting temperatures. ▪ °C or °F can be selected.	B
		Fan speed		Fan speeds can be selected.	B
		External input		When two or more indoor units are connected to one unit of remote control, the range to apply CNT inputs can be set.	B
		Ventilation setting		Combination control for ventilator can be set.	B
		Auto-restart		The operation control method after recovery of power failure happened during operation can be set.	B
		Auto temp setting		[Enable] or [Disable] of [Auto temp setting] can be selected.	B
		Auto fan speed		[Enable] or [Disable] of [Auto fan speed] can be selected.	B

⑤ Operation and setting from remote control (continued)

Setting & display item				Description	RC-EX series
3	IU settings [Service password]	Fan speed setting		The fan speed for indoor units can be set.	B
		Filter sign		The setting of filter sign display timer can be done from following patterns.	B
		External input 1		The connect of control by external input 1 can be changed.	B
		External input 1 signal		The type of external input 1 signal can be changed.	B
		External input 2		The connect of control by external input 2 can be changed.	B
		External input 2 signal		The type of external input 2 signal can be changed.	B
		Heating thermo-OFF temp adjustment		The judgement temperature of heating thermo-off can be adjusted within the range from 0 to +3°C (1°C interval)	B
		Return temperature adjustment		The sensing temperature of return air temperature sensor built in the indoor unit can be adjusted within the range of ±2°C.	B
		Fan control in cooling thermo-OFF		Fan control, when the cooling thermostat is turned OFF, can be changed.	B
		Fan control in heating thermo-OFF		Fan control, when the heating thermostat is turned OFF, can be changed.	B
		Anti-frost temp		Judgment temperature for the anti-frost control during cooling can be changed.	B
		Anti-frost control		When the anti-frost control of indoor unit in cooling is activated, the fan speed can be changed.	B
		Keep fan operating after cooling is stopped		The time period residual fan operation after stopping or thermo-off in cooling mode can be set.	B
		Keep fan operating after heating is stopped		The time period residual fan operation after stopping or thermo-off in heating mode can be set.	B
		Intermittent fan operation in heating		The fan operation rule following the residual fan operation after stopping or thermo-off in heating mode can be set.	B
		Fan circulator operation		In case that the fan is operated as the circulator, the fan control rule can be set.	B
		Control pressure adjust		When only the OA processing units are operated, control pressure value can be changed.	B
		Auto operation mode		The [Auto rule selection] for switching the operation mode automatically can be selected from 3 patterns.	B
		Thermo. rule setting		When selecting [Outdoor air temp. control], the judgment temperature can be offset by outdoor temperature.	B
		Auto fan speed control		Auto switching range for the auto fan speed control can be set.	B
		IU overload alarm		If the difference between the setting temperature and the suction temperature becomes larger than the temperature difference set for the overload alarm, at 30 minutes after the start of operation, the overload alarm signal is transmitted from the external output (CNT-5).	B
		External output setting		Functions assigned to the external outputs 1 to 4 can be changed.	B
4	Service & Maintenance [Service password]	IU address		Max 16 indoor units can be connected to one remote control, and all address No. of the connected indoor units can be displayed. ▪ The indoor unit conforming to the address No. can be identified by selecting the address No. and tapping [Check] to operate the indoor fan.	B
		Next service date		The [Next service date] can be registered. ▪ The [Next service date] and [Company information] is displayed on the message screen.	A B
		Operation data		The [Operation data] for indoor unit and outdoor unit can be displayed.	B
		Error display			B
			Error history	The error history can be displayed.	
			Display anomaly data	The operation data just before the latest error stop can be displayed.	
			Erase anomaly data	Anomaly operation data can be erased.	
			Reset periodical check	The timer for the periodical check can be reset.	
		Saving IU settings		The I/U settings memorized in the indoor PCB connected to the remote control can be saved in the memory of the remote control.	B
		Special settings		[Erase IU address] [CPU reset] [Restore of default setting] [Touch panel calibration]	B
		Indoor unit capacity display		Address No. and capacities of indoor units connected to the remote control are displayed.	B
8.Contact company				Shows registered [Contact company] and [Contact phone].	
9.Inspection					
	Confirmation of Inspection			This is displayed when any error occurs.	A
10.PC connection					
	USB connection			Weekly timer setting and etc., can be set from PC.	C

◆ Listed items may not function depending on the specifications of indoor and outdoor units which are combined.

1.9.3 Installation of wired remote control (Option parts)
(1) Model RC-EX3A

PJZ012A171 A

1） Safety precautions

●Please read this manual carefully before starting installation work to install the unit properly.
Every one of the followings is important information to be observed strictly.

⚠WARNING	Failure to follow these instructions properly may result in serious consequences such as death, severe injury, etc.
⚠CAUTION	Failure to follow these instructions properly may cause injury or property damage.

It could have serious consequences depending on the circumstances.

●The following pictograms are used in the text.

⃠	Never do.	❗	Always follow the instructions given.

●Keep this manual at a safe place where you can consult with whenever necessary. Show this manual to installers when moving or repairing the unit. When the ownership of the unit is transferred, this manual should be given to a new owner.

⚠WARNING

❗ **Consult your dealer or a professional contractor to install the unit.**
Improper installation made on your own may cause electric shocks, fire or dropping of the unit.

❗ **Installation work should be performed properly according to this installation manual.**
Improper installation work may result in electric shocks, fire or break-down.

❗ **Be sure to use accessories and specified parts for installation work.**
Use of unspecified parts may result in drop, fire or electric shocks.

❗ **Install the unit properly to a place with sufficient strength to hold the weight.**
If the place is not strong enough, the unit may drop and cause injury.

❗ **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**
Power source with insufficient and improper work can cause electric shock and fire.

❗ **Shut OFF the main power source before starting electrical work.**
Otherwise, it could result in electric shocks, break-down or malfunction.

⃠ **Do not modify the unit.**
It could cause electric shocks, fire, or break-down.

❗ **Be sure to turn OFF the power circuit breaker before repairing/ inspecting the unit.**
Repairing/inspecting the unit with the power circuit breaker turned ON could cause electric shocks or injury.

⚠WARNING

Do not install the unit in appropriate environment or where inflammable gas could generate, flow in, accumulate or leak.

If the unit is used at places where air contains dense oil mist, steam, organic solvent vapor, corrosive gas (ammonium, sulfuric compound, acid, etc) or where acidic or alkaline solution, special spray, etc. are used, it could cause electric shocks, break-down, smoke or fire as a result of significant deterioration of its performance or corrosion.

Do not install the unit where water vapor is generated excessively or condensation occurs.

It could cause electric shocks, fire, or break-down.

Do not use the unit in a place where it gets wet, such as laundry room.

It could cause electric shocks, fire, or break-down.

Do not operate the unit with wet hands.

It could cause electric shocks.

Do not wash the unit with water.

It could cause electric shocks, fire, or break-down.

Use the specified cables for wiring, and connect them securely with care to protect electronic parts from external forces.

Improper connections or fixing could cause heat generation, fire, etc.

Seal the inlet hole for remote control cable with putty.

If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.

If dew or water enters the unit, it may cause screen display anomalies.

When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.

It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.

The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.

Do not leave the remote control with its upper case removed.

If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.

⚠CAUTION

Do not install the remote control at following places.

(1) It could cause break-down or deformation of remote control.
- Where it is exposed to direct sunlight
- Where the ambient temperature becomes 0 ˚C or below, or 40 ˚C or above
- Where the surface is not flat
- Where the strength of installation area is insufficient

(2) Moisture may be attached to internal parts of the remote control, resulting in a display failure.
- Place with high humidity where condensation occurs on the remote control
- Where the remote control gets wet

(3) Accurate room temperature may not be detected using the temperature sensor of the remote control.
- Where the average room temperature cannot be detected
- Place near the equipment to generate heat
- Place affected by outside air in opening/closing the door
- Place exposed to direct sunlight or wind from air-conditioner
- Where the difference between wall and room temperature is large

To connect to a personal computer via USB, use the dedicated software.
Do not connect other USB devices and the remote control at the same time.

It could cause malfunction or break-down of the remote control/personal computer.

2） Accessories & prepare on site

Following parts are provided.

Accessories	R/C main unit, wood screw (ϕ 3.5 x 16) 2 pcs., Quick reference

Following parts are arranged at site. Prepare them according to the respective installation procedures.

Item name	Q'ty	Remark
Switch box For 1 piece or 2 pieces (JIS C 8340 or equivalent)	1	These are not required when installing directly on a wall.
Thin wall steel pipe for electric appliance directly on a wall. (JIS C 8305 or equivalent)	As required	
Lock nut, bushing (JIS C 8330 or equivalent)	As required	
Lacing (JIS C 8425 or equivalent)	As required	Necessary to run R/C cable on the wall.
Putty	Suitably	For sealing gaps
Molly anchor	As required	
R/C cable (0.3 mm^2 x 2 pcs.)	As required	See right table when longer than 100m

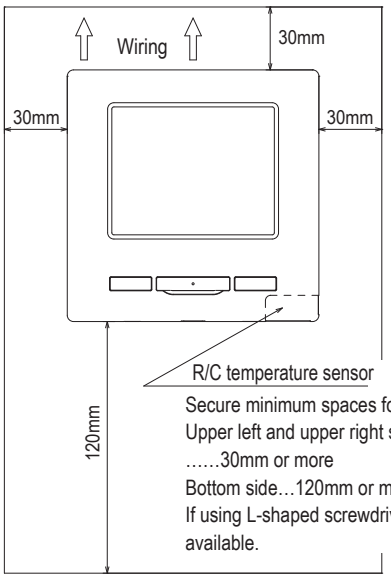
When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm^2 . Connect them to wires of larger size near the outside of R/C. When wires are connected, take measures to prevent water, etc. from entering inside.

≦ 200 m	0.5 mm^2 x 2 cores
≦ 300m	0.75 mm^2 x 2 cores
≦ 400m	1.25 mm^2 x 2 cores
≦ 600m	2.0 mm^2 x 2 cores

3） Installation place

Secure the installation space shown in the figure.
For the installation method, “embedding wiring” or “exposing wiring” can be selected.
For the wiring direction, “Backward”, “Upper center” or “Upper left” can be selected.
Determine the installation place in consideration of the installation method and wiring direction.

Installation space

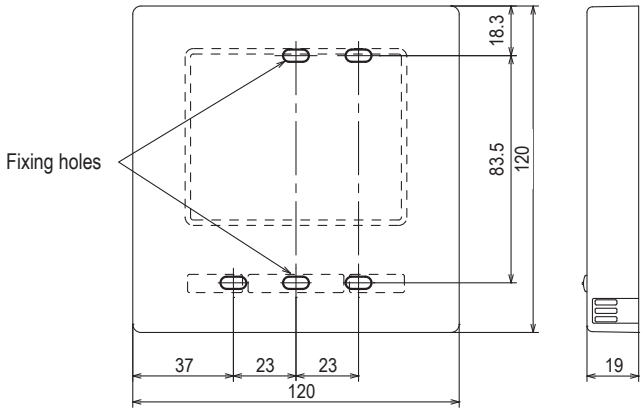


Secure minimum spaces for disassembling the case.
Upper left and upper right sides
……30mm or more
Bottom side…120mm or more
If using L-shaped screwdriver, 50mm or more is available.

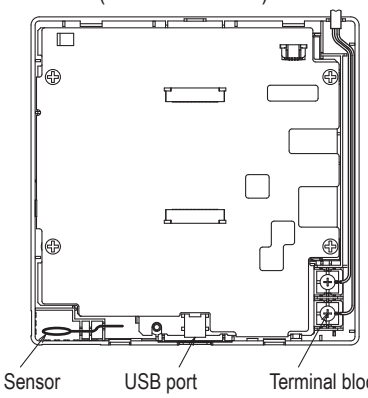
4) Installation procedure

Perform installation and wiring work for the remote control according to the following procedure.

Dimensions (Viewed from front)

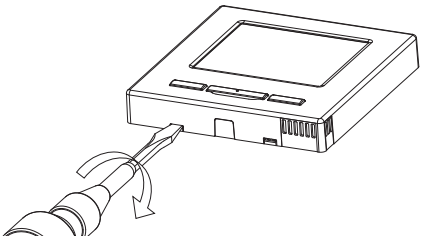


PCB side (Viewed from rear)



To disassemble the R/C case into the upper and lower pieces after assembling them once

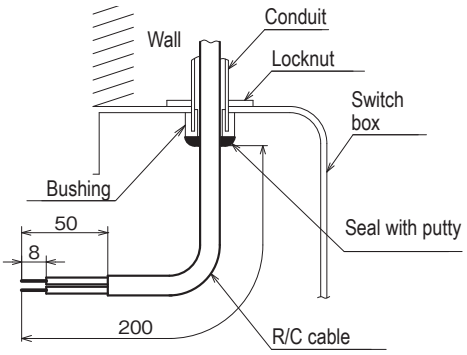
· Insert the tip of flat head screwdriver or the like in the recess at the lower part of R/C and twist it lightly to remove. It is recommended that the tip of the screwdriver be wrapped with tape to avoid damaging the case.
Take care to protect the removed upper case from moisture or dust.



In case of embedding wiring

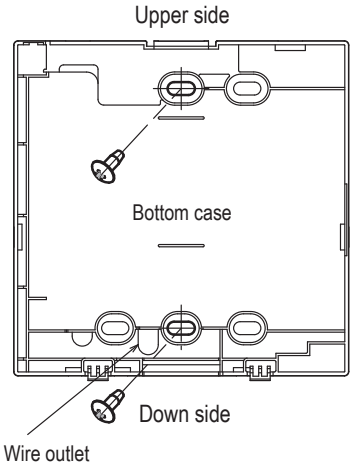
(When the wiring is retrieved "Backward")

① Embed the switch box and the R/C wires beforehand.
Seal the inlet hole for the R/C wiring with putty.

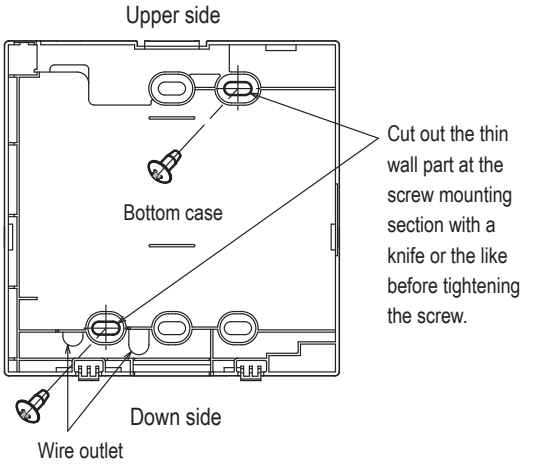


② When wires are passed through the bottom case, fix the bottom case at 2 places on the switch box.

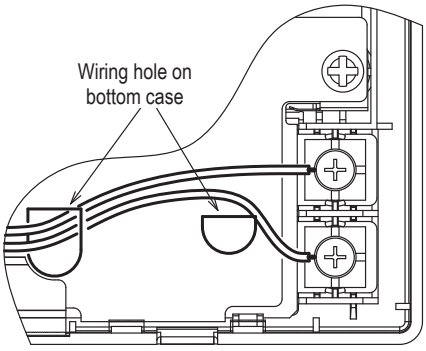
Switch box for 1 pc.



Switch box for 2 pcs.

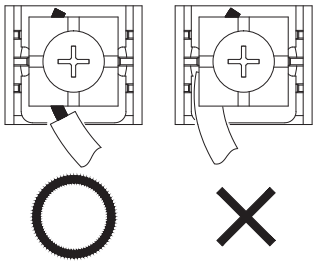


③ Connect wires from X and Y terminals of R/C to X and Y terminals of indoor unit. R/C wires (X, Y) have no polarity. Fix wires such that the wires will run around the terminal screws on the top case of R/C.
④ Install the upper case with care not to pinch wires of R/C.



Cautions for wire connection

Use wires of no larger than 0.5 mm^2 for wiring running through the remote control case. Take care not to pinch the sheath.
Tighten by hand (0.7 N·m or less) the wire connection. If the wire is connected using an electric driver, it may cause failure or deformation.

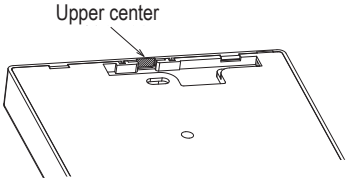


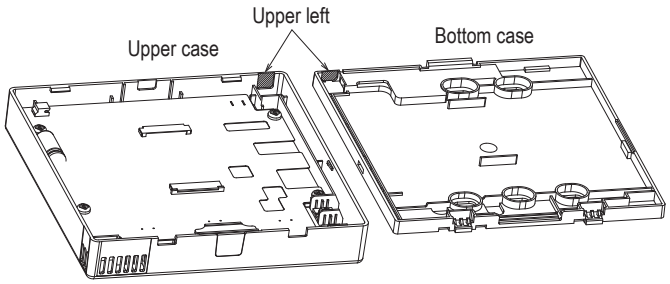
In case of exposing wiring

(When the wiring is taken out from the "upper center" or "upper left" of R/C)

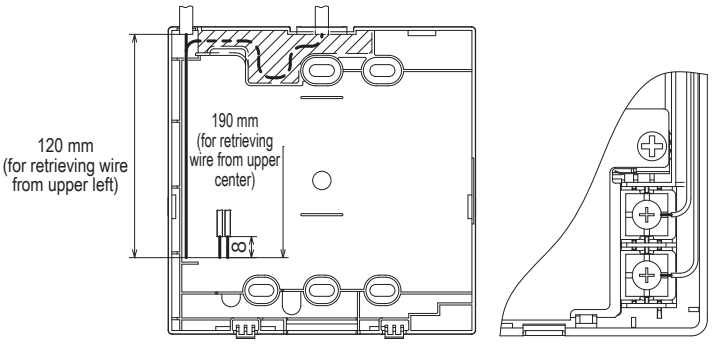
① Cut out the thin wall sections on the cases for the size of wire.

When taking the wiring out from the upper center, open a hole before separating the upper and bottom cases. This will reduce risk of damaging the PCB and facilitate subsequent work.
When taking the wiring out from the upper left, take care not to damage the PCB and not to leave any chips of cut thin wall inside.



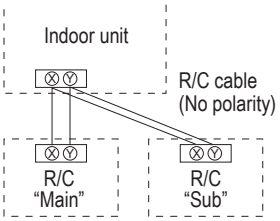


② Fix the bottom R/C case on a flat surface with two wood screws.
③ In case of the upper center, pass the wiring behind the bottom case. (Hatched section)
④ Connect wires from X and Y terminals of R/C to X and Y terminals of indoor unit. R/C wires (X, Y) have no polarity. Fix wires such that the wires will run around the terminal screws on the top case of R/C.
⑤ Install the top case with care not to pinch wires of R/C.
⑥ Seal the area cut in ① with putty.



5) Main/Sub setting when more than one remote control are used

Up to two units of R/C can be used at the maximum for 1 indoor unit or 1 group.
One is main R/C and the other is sub R/C.
Operating range is different depending on the main or sub R/C.



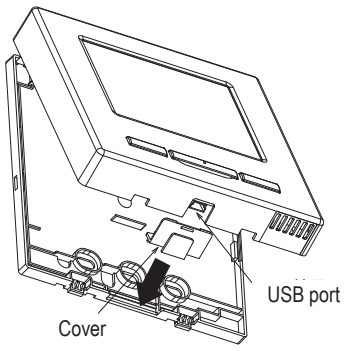
○ : operable ×: not operable

R/C operations			Main	Sub
Run/Stop, Change set temp., Change flap direction, Auto swing, Change fan speed operations			○	○
High power operation, Energy-saving operation			○	○
Silent mode control			○	×
Useful functions	Individual flap control		○	×
	Anti draft setting		○	×
	Timer		○	○
	Favorite setting		○	○
	Weekly timer		○	×
	Home leave mode		○	×
	External ventilation		○	○
	Select the language		○	○
	Silent mode control		○	×
Energy-saving setting			○	×
Filter	Filter sign reset		○	○
User setting	Initial settings		○	○
	Administrator settings	Permission/ Prohibition setting	○	×
		Outdoor unit silent mode timer	○	×
		Setting temp. range	○	×
		Temp increment setting	○	×
		Set temp. display	○	○
		R/C display setting	○	○
		Change administrator password	○	○
		F1/F2 function setting	○	○

R/C operations				Main	Sub
Service setting	Installation settings	Installation date		○	×
		Company information		○	○
		Test run		○	×
		Static pressure adjustment		○	×
		Change auto-address		○	×
		Address setting of main IU		○	×
		IU back-up function		○	×
		Motion sensor setting		○	×
	R/C function settings	Main/Sub of R/C		○	○
		Return air temp.		○	×
		R/C sensor		○	×
		R/C sensor adjustment		○	×
		Operation mode		○	×
		ºC / ºF		○	×
		Fan speed		○	×
		External input		○	×
		Upper/lower flap control		○	×
		Left/right flap control		○	×
		Ventilation setting		○	×
		Auto-restart		○	×
		Auto temp. setting		○	×
		Auto fan speed		○	×
	IU settings			○	×
	Service & Maintenance	IU address		○	○
		Next service date		○	×
		Operation data		○	×
		Error display	Error history	○	○
			Display/erase anomaly data	○	×
			Reset periodical check	○	○
		Saving IU settings		○	×
		Special settings	Erase IU address	○	×
			CPU reset	○	○
			Restore of default setting	○	×
			Touch panel calibration	○	○
		Indoor unit capacity display		○	×

Advice: Connection to personal computer

It can be set from a personal computer via the USB port (mini-B).
Connect after removing the cover for USB port of upper case.
Replace the cover after use.
Special software is necessary for the connection.
For details, view the web site.

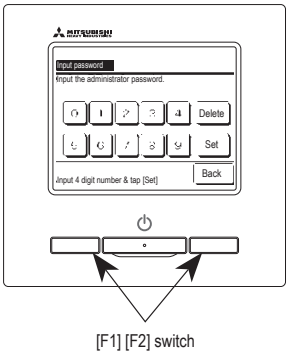


Advice: Initializing of password

Administrator password (for daily setting items) and
service password (for installation, test run and maintenance) are used.

○ The administrator password at factory default is "0000". This setting can be changed (Refer to User's Manual).
If the administrator password is forgotten, it can be initialized by holding down the [F1] and [F2] switches together for five seconds on the administrator password input screen.

○ Service password is "9999", which cannot be changed.
When the administrator password is input, the service password is also accepted.



PJA012D730B

(2) Model RC-E5

Read together with indoor unit's installation manual.

⚠WARNING

- Fasten the wiring to the terminal securely and hold the cable securely so as not to apply unexpected stress on the terminal.
  Loose connection or hold will cause abnormal heat generation or fire.
- Make sure the power source is turned off when electric wiring work.
  Otherwise, electric shock, malfunction and improper running may occur.

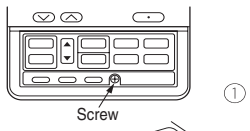
⚠CAUTION

- Do not install the remote control at the following places in order to avoid malfunction.
  (1) Places exposed to direct sunlight
  (2) Places near heat devices
  (3) High humidity places
  (4) Hot surface or cold surface enough to generate condensation
  (5) Places exposed to oil mist or steam directly
  (6) Uneven surface
- Do not leave the remote control without the upper case.
  In case the upper cace needs to be detached, protect the remote control with a packaging box or bag in order to keep it away from water and dust.

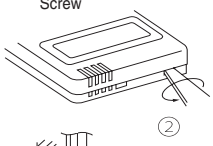
Accessories	Remote control, wood screw (ϕ 3.5×16) 2 pieces
Prepare on site	Remote control cord (2 cores) the insulated thickness in 1mm or more. [In case of embedding cord] Erectrical box, M4 screw (2 pieces) [In case of exposing cord] Cord clamp (if needed)

Installation procedure

① Open the cover of remote control, and remove the screw under the buttons without fail.

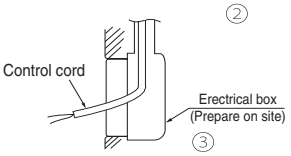


② Remove the upper case of remote control.
Insert a flat-blade screwdriver into the dented part of the upper part of the remote control, and wrench slightly.

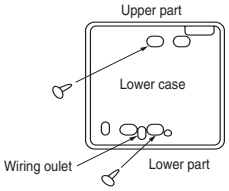


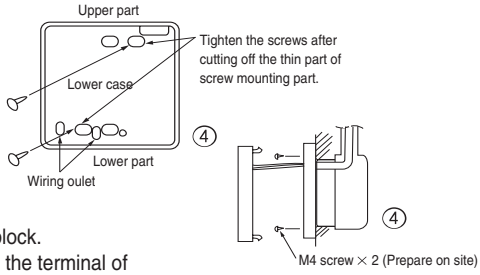
[In case of embedding cord]

③ Embed the erectrical box and remote control cord beforehand.



④ Prepare two M4 screws (recommended length is 12-16mm) on site, and install the lower case to erectrical box.
Choose either of the following two positions in fixing it with screws.



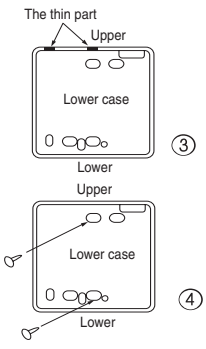


⑤ Connect the remote control cord to the terminal block.
Connect the terminal of remote control (X,Y) with the terminal of indoor unit (X,Y). (X and Y are no polarity)

⑥ Install the upper case as before so as not to catch up the remote control cord, and tighten with the screws.

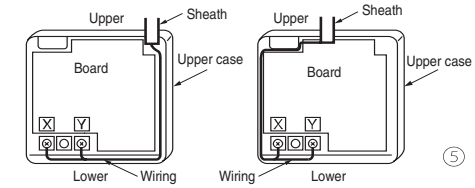
[In case of exposing cord]

③ You can pull out the remote control cord from left upper part or center upper part.
Cut off the upper thin part of remote control lower case with a nipper or knife, and grind burrs with a file etc.



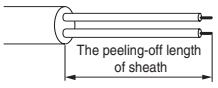
④ Install the lower case to the flat wall with attached two wooden screws.

⑤ Connect the remote control cord to the terminal block.
Connect the terminal of remote control (X,Y) with the terminal of indoor unit (X,Y).
(X and Y are no polarity)
Wiring route is as shown in the right diagram depending on the pulling out direction.



The wiring inside the remote control case should be within 0.3mm^2 (recommended) to 0.5mm^2.
The sheath should be peeled off inside the remote control case.
The peeling-off length of each wire is as below.

Pulling out from upper left	Pulling out from upper center
X wiring : 215mm Y wiring : 195mm	X wiring : 170mm Y wiring : 190mm



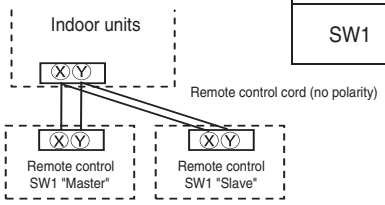
⑥ Install the upper case as before so as not to catch up the remote control cord, and tighten with the screws.
⑦ In case of exposing cord, fix the cord on the wall with cord clamp so as not to slack.

Installation and wiring of remote control

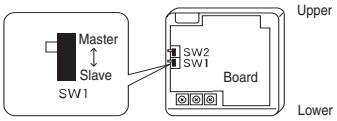
① Wiring of remote control should use 0.3mm^2 × 2 cores wires or cables. (on-site configuration)
② Maximum prolongation of remote control wiring is 600 m.
If the prolongation is over 100m, change to the size below.
But, wiring in the remote control case should be under 0.5mm^2 . Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.
100 - 200m·····0.5mm^2 × 2 cores
Under 300m·····0.75mm^2 × 2 cores
Under 400m·····1.25mm^2 × 2 cores
Under 500m·····2.0mm^2 × 2 cores

Master/ slave setting when more than one remote controls are used

A maximum of two remote controls can be connected to one indoor unit (or one group of indoor units.)



Switch	Setting	Contents
SW1	M	Master remote control
	S	Slave remote control

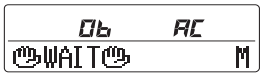


Set SW1 to "Slave" for the slave remote control. It was factory set to "Master" for shipment.
Note: The setting "Remote control sensor enabled" is only selectable with the master remote control in the position where you want to check room temperature.
The air-conditioner operation follows the last operation of the remote control regardless of the master/ slave setting of it.

The indication when power source is supplied

When power source is turned on, the following is displayed on the remote control until the communication between the remote control and indoor unit settled.
Master remote control : " WAIT M"
Slave remote control : " WAIT S"

At the same time, a mark or a number will be displayed for two seconds first.
This is the software's administration number of the remote control, not an error cord.



※ The left mark is only an example. Other marks may appear.

When remote control cannot communicate with the indoor unit for half an hour, the below indication will appear.
Check wiring of the indoor unit and the outdoor unit etc.

The range of temperature setting

When shipped, the range of set temperature differs depending on the operation mode as below.

Heating : 16-30˚C (55-86˚F)

Except heating (cooling, fan, dry, automatic) : 18-30˚C (62-86˚F)

●Upper limit and lower limit of set temperature can be changed with remote control.

Upper limit setting: valid during heating operation. Possible to set in the range of 20 to 30˚C (68 to 86˚F).

Lower limit setting: valid except heating (automatic, cooling, fan, dry) Possible to set in the range of 18 to 26˚C (62 to 79˚F).

When you set upper and lower limit by this function, control as below.

1. When ⑫TEMP RANGE SET, remote control function of function setting mode is "INDN CHANGE" (factory setting),
   【If upper limit value is set】
   During heating, you cannot set the value exceeding the upper limit.

   【If lower limit value is set 】
   During operation mode except heating, you cannot set the value below the lower limit.

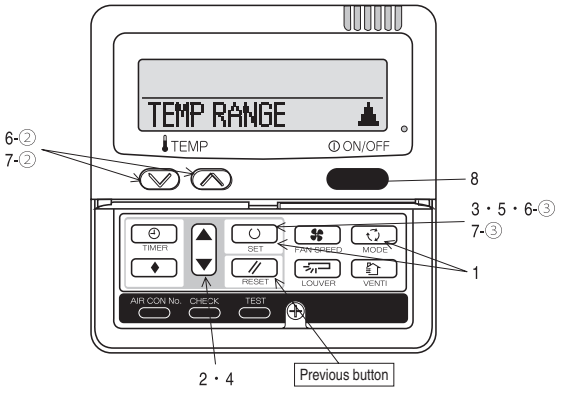
2. When ⑫TEMP RANGE SET, remote control function of function setting mode is "NO INDN CHANGE"
   【If upper limit value is set】
   During heating, even if the value exceeding the upper limit is set, upper limit value will be sent to the indoor unit. But, the indication is the same as the temperature set.

   【If lower limit value is set 】
   During except heating, even if the value lower than the lower limit is set, lower limit value will be sent to the indoor unit. But, the indication is the same as the temperature set.

●How to set upper and lower limit value

1. Stop the air-conditioner, and press (SET) and (MODE) button at the same time for over three seconds .
   The indication changes to "FUNCTION SET ▼".
2. Press ▼ button once, and change to the "TEMP RANGE ▲ " indication.
3. Press (SET) button, and enter the temperature range setting mode.
4. Select "UPPER LIMIT ▼" or "LOWER LIMIT ▲" by using ▲ ▼ button.
5. Press (SET) button to fix.
6. When "UPPER LIMIT ▼" is selected (valid during heating)
   ① Indication: "☝ ∨ ∧ SET UP" → "UPPER 30˚C ∨"
   ② Select the upper limit value with temperature setting button ▽ △. Indication example: "UPPER 26˚C ∨ ∧" (blinking)
   ③ Press (SET) button to fix. Indication example: "UPPER 26˚C" (Displayed for two seconds)
   After the fixed upper limit value displayed for two seconds, the indication will return to "UPPER LIMIT ▼".
7. When "LOWER LIMIT ▲" is selected (valid during cooling, dry, fan, automatic)
   ① Indication: "☝ ∨ ∧ SET UP" → "LOWER 18˚C ∧"
   ② Select the lower limit value with temperature setting button ▽ △. Indication example: "LOWER 24˚C ∨ ∧" (blinking)
   ③ Press (SET) button to fix. Indication for example: "LOWER 24˚C" (Displayed for two seconds)
   After the fixed lower limit value displayed for two seconds, the indication will return to "LOWER LIMIT ▼".
8. Press ON/OFF button to finish.

- It is possible to finish by pressing ON/OFF button on the way, but unfinished change of setting is unavailable.
- During setting, if you press (RESET) button, you return to the previous screen.



The functional setting

● The initial function setting for typical using is performed automatically by the indoor unit connected, when remote control and indoor unit are connected.
As long as they are used in a typical manner, there will be no need to change the initial settings.
If you would like to change the initial setting marked "○", set your desired setting as for the selected item.
The procedure of functional setting is shown as the following diagram.

Note 1: The initial setting marked "※" is decided by connected indoor and outdoor unit, and is automatically defined as following table.

Function No.	Item	Default	Model
Remote control function02	AUTO RUN SET	AUTO RUN ON	"Auto-RUN" mode selectable indoor unit.
		AUTO RUN OFF	Indoor unit without "Auto-RUN" mode
Remote control function06	FAN SPEED SW	VALID	Indoor unit with two or three step of air flow setting
		INVALID	Indoor unit with only one of air flow setting
Remote control function07	LOUVER SW	VALID	Indoor unit with automatically swing louver
		INVALID	Indoor unit without automatically swing louver
Remote control function13	I/U FAN	HI-MID-LO	Indoor unit with three step of air flow setting
		HI-LO	Indoor unit with two step of air flow setting
		HI-MID	
		1 FAN SPEED	Indoor unit with only one of air flow setting
Remote control function15	MODEL TYPE	HEAT PUMP	Heat pump unit
		COOLING ONLY	Exclusive cooling unit

Note 3: As for plural indoor unit, set indoor functions to each master and slave indoor unit.
But only master indoor unit is received the setting change of indoor unit function "05 EXTERNAL INPUT" and "06 PERMISSION / PROHIBISHION".

[Flow of function setting]

Start : Stop air-conditioner and press "(SET)" and "(MODE)" buttons at the same time for over three seconds.
Finalize : Press "(SET)" button.
Reset : Press "(RESET)" button.
Select : Press ▲ ▼ button.
End : Press ON/OFF button.
It is possible to finish above setting on the way, and unfinished change of setting is unavailable.
"○" : Initial settings
"※" : Automatic criterion

Record and keep the setting

Consult the technical data etc. for each control details

Stop air-conditioner and press (SET) + (MODE) buttons at the same time for over three seconds.

FUNCTION SET ▼

FUNCTION ▼ (Remote control function)

Function	setting		
01 ESP SET	ESP VALID	○	Validate setting of ESP:External Static Pressure
	ESP INVALID		Invalidate setting of ESP
02 AUTO RUN SET	AUTO RUN ON	※	
	AUTO RUN OFF	※	Automatical operation is impossible
03 TEMP SW	VALID	○	
	INVALID		Temperature setting button is not working
04 MODE SW	VALID	○	
	INVALID		Mode button is not working
05 ON/OFF SW	VALID	○	
	INVALID		On/Off button is not working
06 FAN SPEED SW	VALID	※	
	INVALID	※	Fan speed button is not working
07 LOUVER SW	VALID	※	
	INVALID	※	Louver button is not working
08 TIMER SW	VALID	○	
	INVALID		Timer button is not working
09 SENSOR SET	SENSOR OFF	○	Remote thermistor is not working.
	SENSOR ON		Remote thermistor is working.
	SENSOR +3.0℃		Remote thermistor is working, and to be set for producing +3.0˚C increase in temperature.
	SENSOR +2.0℃		Remote thermistor is working, and to be set for producing +2.0˚C increase in temperature.
	SENSOR +1.0℃		Remote thermistor is working, and to be set for producing +1.0˚C increase in temperature.
	SENSOR −1.0℃		Remote thermistor is working, and to be set for producing -1.0˚C increase in temperature.
	SENSOR −2.0℃		Remote thermistor is working, and to be set for producing -2.0˚C increase in temperature.
	SENSOR −3.0℃		Remote thermistor is working, and to be set for producing -3.0˚C increase in temperature.
10 AUTO RESTART	INVALID	○	
	VALID		
11 VENT LINK SET	NO VENT	○	
	VENT LINK		In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), the operation of ventilation device is linked with the operation of indoor unit.
	NO VENT LINK		In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), you can operate /stop the ventilation device independently by (VENT) button.
12 TEMP RANGE SET	INDN CHANGE	○	If you change the range of set temperature, the indication of set temperature will vary following the control.
	NO INDN CHANGE		If you change the range of set temperature, the indication of set temperature will not vary following the control, and keep the set temperature.
13 I/U FAN	HI-MID-LO	※	Air flow of fan becomes the three speed.
	HI-LO	※	Air flow of fan becomes the two speed.
	HI-MID		Air flow of fan becomes the two speed.
	1 FAN SPEED	※	Air flow of fan is fixed at one speed.
14 POSITION			If you change the remote control function "14 POSITION", you must change the indoor function "04 POSITION" accordingly.
	4POSITION STOP	○	You can select the louver stop position in the four.
	FREE STOP		The louver can stop at any position.
15 MODEL TYPE	HEAT PUMP	※	
	COOLING ONLY	※	
16 EXTERNAL CONTROL SET	INDIVIDUAL	○	If you input signal into CnT of the indoor printed circuit board from external, the indoor unit will be operated independently according to the input from external.
	FOR ALL UNITS		If you input into CNT of the indoor printed circuit board from external, all units which connect to the same remote control are operated according to the input from external.
17 ROOM TEMP INDICATION SET	INDICATION OFF	○	
	INDICATION ON		In normal working indication, indoor unit temperature is indicated instead of air flow. (Only the master remote control can be indicated.)
18 INDICATION	INDICATION ON	○	
	INDICATION OFF		Heating preparation indication should not be indicated.
19 ℃/℉ SET	℃	○	Temperature indication is by degree C.
	℉		Temperature indication is by degree F.

(Indoor unit function) I/U FUNCTION ▲

Indoor unit No. are indicated only when plural indoor units are connected.

I/U000 ▲
I/U001 ⇕
I/U002 ⇕
I/U003 ⇕
I/U004 ⇕

To set other indoor unit, press AIR CON No. button, which allows you to go back to the indoor unit selection screen (for example: I/U 000 ▲).

Function	setting		
02 FAN SPEED SET	STANDARD	※	
	HIGH SPEED 1	※	
	HIGH SPEED 2		
03 FILTER SIGN SET	INDICATION OFF		
	TYPE 1	○	The filter sign is indicated after running for 180 hours.
	TYPE 2		The filter sign is indicated after running for 600 hours.
	TYPE 3		The filter sign is indicated after running for 1000 hours.
	TYPE 4		The filter sign is indicated after running for 1000 hours, then the indoor unit will be stopped by compulsion after 24 hours.
04 POSITION			If you change the indoor function "04 POSITION", you must change the remote control function "14 POSITION" accordingly.
	4POSITION STOP	○	You can select the louver stop position in the four.
	FREE STOP		The louver can stop at any position.
05 EXTERNAL INPUT	LEVEL INPUT	○	
	PULSE INPUT		
06 OPERATION PERMISSION/PROHIBITION	INVALID	○	
	VALID		Permission/prohibition control of operation will be valid.
07 EMERGENCY STOP	INVALID	○	
	VALID		With the VRF series, it is used to stop all indoor units connected with the same outdoor unit immediately. When stop signal is inputed from remote on-off terminal "CNT-6", all indoor units are stopped immediately.
08 SP OFFSET	OFFSET +3.0℃		To be reset for producing +3.0˚C increase in temperature during heating.
	OFFSET +2.0℃		To be reset for producing +2.0˚C increase in temperature during heating.
	OFFSET +1.0℃		To be reset for producing +1.0˚C increase in temperature during heating.
	NO OFFSET	○	
09 RETURN AIR TEMP	OFFSET +2.0℃		To be reset producing +2.0˚C increase in return air temperature of indoor unit.
	OFFSET +1.5℃		To be reset producing +1.5˚C increase in return air temperature of indoor unit.
	OFFSET +1.0℃		To be reset producing +1.0˚C increase in return air temperature of indoor unit.
	NO OFFSET	○	
	OFFSET −1.0℃		To be reset producing -1.0˚C increase in return air temperature of indoor unit.
	OFFSET −1.5℃		To be reset producing -1.5˚C increase in return air temperature of indoor unit.
	OFFSET −2.0℃		To be reset producing -2.0˚C increase in return air temperature of indoor unit.
10 FAN CONTROL	LOW FAN SPEED	○	When heating thermostat is OFF, fan speed is low speed.
	SET FAN SPEED		When heating thermostat is OFF, fan speed is set speed.
	INTERMITTENCE		When heating thermostat is OFF, fan speed is operated intermittently.
	FAN OFF		When heating thermostat is OFF, the fan is stopped. When the remote thermistor is working, "FAN OFF" is set automatically. Do not set "FAN OFF" when the indoor unit's thermistor is working.
11 FROST PREVENTION TEMP			Change of indoor heat exchanger temperature to start frost prevention control.
	TEMP HIGH		
	TEMP LOW	○	
12 FROST PREVENTION CONTROL			Working only with the Single split series.
	FAN CONTROL ON	○	To control frost prevention, the indoor fan tap is raised.
	FAN CONTROL OFF		
13 DRAIN PUMP LINK	(cooling)(dry)	○	Drain pump is run during cooling and dry.
	(cooling)(dry) AND (heating)		Drain pump is run during cooling, dry and heating.
	(cooling)(dry) AND (heating) AND (fan)		Drain pump is run during cooling, dry, heating and fan.
	(cooling)(dry) AND (fan)		Drain pump is run during cooling, dry and fan.
14 FAN REMAINING (cooling)	NO REMAINING	○	After cooling is stopped is OFF, the fan does not perform extra operation.
	0.5 HOUR		After cooling is stopped is OFF, the fan perform extra operation for half an hour.
	1 HOUR		After cooling is stopped is OFF, the fan perform extra operation for an hour.
	6 HOUR		After cooling is stopped is OFF, the fan perform extra operation for six hours.
15 FAN REMAINING (heating)	NO REMAINING	○	After heating is stopped or heating thermostat is OFF, the fan does not perform extra operation.
	0.5 HOUR		After heating is stopped or heating thermostat is OFF,the fan perform extra operation for half an hour.
	2 HOUR		After heating is stopped or heating thermostat is OFF,the fan perform extra operation for two hours.
	6 HOUR		After heating is stopped or heating thermostat is OFF, the fan perform extra operation for six hours.
16 FAN INTERMITTENCE	NO REMAINING	○	
	20minOFF 5minON		During heating is stopped or heating thermostat is OFF, the fan perform intermittent operation for five minutes with low fan speed after twenty minutes' OFF.
	5minOFF 5minON		During heating is stopped or heating thermostat is OFF, the fan perform intermittent operation for five minutes with low fan speed after five minutes' OFF.
17 PRESSURE CONTROL	STANDARD	※	
	TYPE1	※	Connected "OA Processing" type indoor unit, and is automatically defined.

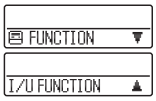
Note2: Fan setting of "HIGH SPEED"					
Fan tap		Indoor unit air flow setting			
		(4 step)	(3 step)	(2 step)	(2 step)
FAN SPEED SET	STANDARD	UH - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me
	HIGH SPEED1, 2	UH - UH - Hi - Me	UH - Hi - Me	UH - Me	UH - Hi
Initial function setting of some indoor unit is "HIGH SPEED".					

ON/OFF button (finished)

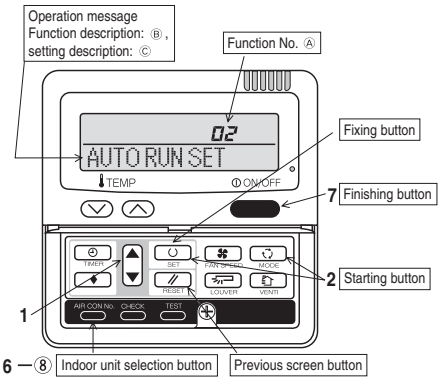
How to set function

1. **Stop air-conditioner and press (SET) (MODE) buttons at the same time for over three seconds, and the "FUNCTION SET ▼" will be displayed.**

2. **Press (SET) button.**
3. **Make sure which do you want to set, "FUNCTION ▼" (remote control function) or "I/U FUNCTION ▲" (indoor unit function).**
4. **Press ▲ or ▼ button.**
   Selecct "FUNCTION ▼" (remote control function) or "I/U FUNCTION ▲" (indoor unit function).



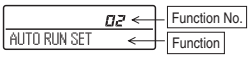
5. **Press (SET) button.**



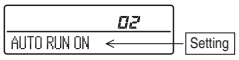
6. **【On the occasion of remote control function selection】**

① "DATA LOADING" (Indication with blinking)
↓
Display is changed to "01 ESP SET".

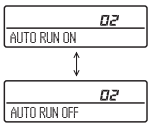
② Press ▲ or ▼ button.
"No. and function"are indicated by turns on the remote control function table, then you can select from them.
(For example)



③ Press (SET) button.
The current setting of selected function is indicated.
(for example) "AUTO RUN ON" ← If "02 AUTO RUN SET" is selected



④ Press ▲ or ▼ button.
Select the setting.



⑤ Press (SET)
"SET COMPLETE" will be indicated, and the setting will be completed.
Then after "No. and function" indication returns, Set as the same procedure if you want to set continuously ,and if to finish, go to 7.

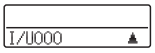
7. **Press ON/OFF button.**
   Setting is finished.

【On the occasion of indoor unit function selection】

① "DATA LOADING" (Blinking for 2 to 23 seconds to read the data)
↓
Indication is changed to "02 FAN SPEED SET".
Go to ②.

[Note]

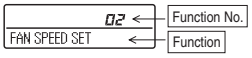
(1) If plural indoor units are connected to a remote control, the indication is "I/U 000" (blinking) ← The lowest number of the indoor unit connected is indicated.



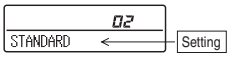
(2) Press ▲ or ▼ button.
Select the number of the indoor unit you are to set
If you select "ALL UNIT ▼", you can set the same setting with all unites.

(3) Press (SET) button.

② Press ▲ or ▼ button.
"No. and function" are indicated by turns on the indoor unit function table, then you can select from them.
(For example)



③ Press (SET) button.
The current setting of selected function is indicated.
(For example) "STANDARD" ← If "02 FAN SPEED SET" is selected.



④ Press ▲ or ▼ button.
Select the setting.

⑤ Press (SET) button.
"SET COMPLETE" will be indicated, and the setting will be completed.
Then after "No. and function" indication returns, set as the same procedure if you want to set continuously , and if to finish, go to 7.

※ When plural indoor units are connected to a remote control, press the AIR CON No. button, which allows you to go back to the indoor unit selection screen. (example "I/U 000 ▲")

- It is possible to finish by pressing ON/OFF button on the way, but unfinished change of setting is unavailable.
- During setting, if you press (RESET) button, you return to the previous screen.
- Setting is memorized in the control and it is saved independently of power failure.

【How to check the current setting】

When you select from "No. and funcion" and press set button by the previous operation, the "Setting" displayed first is the current setting.
(But, if you select "ALL UNIT ▼", the setting of the lowest number indoor unit is displayed.)

PSC012D127A B

Inverter driven split PAC
71VNX-W
Designed for R32 refrigerant

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to the page 42.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces.

SAFETY PRECAUTIONS

●We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
●The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
●The meaning of "Marks" used here are as shown below.

⃠	Never do it under any circumstance.	❗ ⏚	Always do it according to the instruction

●Units of single phase power source are equipment complying with IEC61000-3-12.
●Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
●Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.

Check before installation work

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

❗
- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, it may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substanard performance, contrl failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R32 and R410A.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.

❗
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant.
- **Only use prescribed optional parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition**
  The forced operation by short-circuiting protective device of pressure switch and temperature control or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit.
- **Be sure to wear protective goggles and gloves while at work.**
- **This unit is designed specifically for R32.**
  Using any other refrigerant can cause unit failure and personal injury.

⃠
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not run the unit with removed panels or protections**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.
- **Do not process or splice the power cord, or share the socket with other power plugs.**
  This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.
- **Do not bundle or wind or process the power cord. Do not deform the power cord by treading it.**
  This may cause fire or heating.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes andregulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **After maintenance, all wiring, wiring ties and the like, should be retumed to their original state and wiring route, and the necessary clearance from all metal parts should be secured.**
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.
- **Do not install the unit in the locations listed below**
  - Locations where carbon fiber, metal powder or any powder is floating.
  - Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  - Vehicles and ships
  - Locations where cosmetic or special sprays are often used.
  - Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  - Locations where any machines which generate high frequency harmonics are used.
  - Locations with salty atmospheres such as coastlines
  - Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  - Locations where the unit is exposed to chimney smoke
  - Locations at high altitude (more than 1000m high)
  - Locations with ammonic atmospheres (e.g. organic fertilizer)
  - Locations with calcium chloride (e.g. snow melting agent)
  - Locations where heat radiation from other heat source can affect the unit
  - Locations without good air circulation.
  - Locations with any obstacles which can prevent inlet and outlet air of the unit
  - Locations where short-circuit of air can occur (in case of multiple unist installation)
  - Locations where strong air blows against the air outlet of outdoor unit

  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  - Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  - Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  - Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  - Locations where vibration and operation sound generated by the outdoor unit can affect seriously, (on the wall or at the place near bed room)
  - Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  - Locations where drainage cannot run off safely.

  It can affect surrounding environment and cause a claim.
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands**
  It can cause electric shocks.
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water**
  It can cause electric shocks.
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur property damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.
- **Do not touch the suction or aluminum fin on the outdoor unit.**
  This may cause injury.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R32. R32 will rise to pressure about 1.6 times higher than that of a conventional refrigerant (R22 or R407C). A cylinder containing R32 has a light blue indication mark on the top.
- A unit designed for R32 has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R32 tools listed in the table on the right before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R32. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation.)

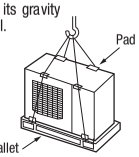
	Dedicated R32 and R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position. If not properly balanced, the unit can be thrown off-balance and fall.

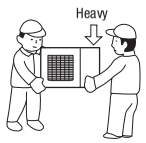
1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.



2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

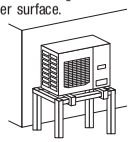
- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit.
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.

Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

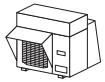
4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

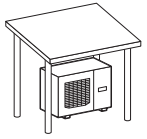
1. Install the unit on the base so that the bottom is higher than snow cover surface.



2. Provide a snow hood to the outdoor unit on site.
Regarding outline of a snow hood, refer to our technical manual.



3. Install the unit under eaves or provide the roof on site.

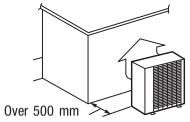


Since drain water generated by defrost control may freeze, following measures are required.

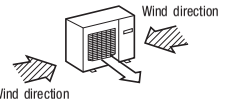
- ● Don't execute drain piping work by using a drain elbow and drain grommets (optional parts). [Refer to DRAIN PIPING WORK.]
- ● Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]
- ● Attach heater on a base plate on site, if there is possibility to freeze drain water.
  In case that the product has a corrective drainage system, the drainage paths should have suitable measure against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

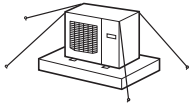
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.

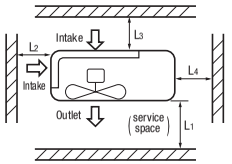


5) Installation space

- ● Walls surrounding the unit in the four sides are not acceptable.
- ● There must be a 1-meter or larger space in the above.
- ● When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space. In order to facilitate servicing of controls, please provide a sufficient space between units so that their top plates can be removed easily.
- ● Where a danger of short-circuiting exists, install guide louvers.
- ● When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- ● Where piling snow can bury the outdoor unit, provide proper snow guards.
- ● A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

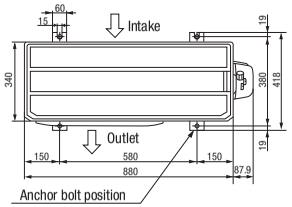
(mm)

Example installation / Size	71V		
	I	II	III
L1	Open	Open	500
L2	300	250	Open
L3	100	150	100
L4	250	250	250

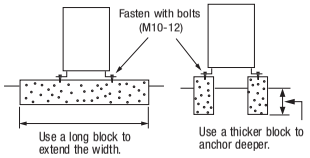


6) Installation

① Anchor bolt fixed position



② Notabilia for installation



- ● In installing the unit, fix the unit's legs with bolts specified on the above.
- ● The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- ● Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- ● Refer to the above illustrations for information regarding concrete foundations.
- ● Install the unit in a level area. (With a gradient of 5 mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

- ● When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site. So that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, refer to our technical manual.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

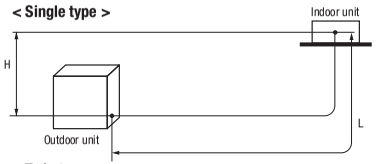
- ● Check the following points in light of the indoor unit specifications and the installation site.
- ● Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Descriptions		Dimensional limitations	Marks appearing in the drawing	
			Single type	Twin type
One-way pipe length of refrigerant piping		≦50m	L	L+L1+L2
Main pipe length		≦50m	—	L
One-way pipe length after the first branching point		≦20m	—	L1, L2
One-way pipe length difference from the first branching point to the indoor unit		≦10m	—	|L1—L2|
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher,	≦30m	H	H
	When the outdoor unit is positioned lower,	≦15m		
Elevation difference between indoor units		≦0.5m	—	h

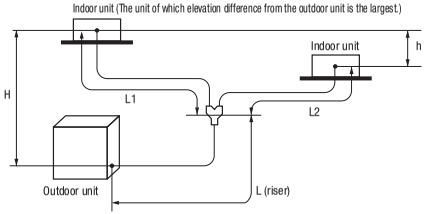
⚠CAUTION

- ● The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, please see " 6. UTILIZATION OF EXISTING PIPING."

< Single type >



< Twin type >



2) Determination of pipe size

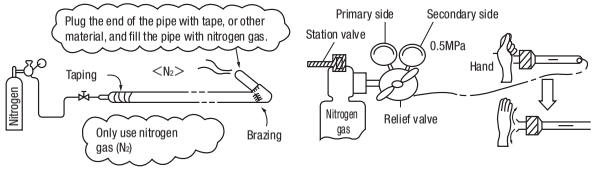
● Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

		Model 71V	
		Gas pipe	Liquid pipe
Outdoor unit connected		ϕ15.88	ϕ9.52
		Flare	Flare
Refrigerant piping (Main pipe L)		ϕ15.88	ϕ9.52
In the case a single type	Indoor unit connectied	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 71V	
In the case a twin type	Branching pipe set	DIS-WA1	
	Refrigerant piping (branch pipe L1,L2)	ϕ12.7	ϕ9.52
	Indoor unit connectied	ϕ12.7	ϕ6.35
	Capacity of indoor unit	Model 40V ×2	

About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



⚠CAUTION

- ●When the 40V model is connected as an indoor unit, always use a ϕ9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (ϕ6.35 on the liquid pipe side).
  If a ϕ6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- ●A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
  A branching part must be dressed with a heat-insulation material supplied as an accessory.
- ●For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.

3) Refrigerant pipe wall thickness and material

● Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.

Pipe diameter [mm]	6.35	9.52	12.7	15.88
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe

NOTE ● Select pipes having a wall thickness larger than the specified minimum pipe thickness.

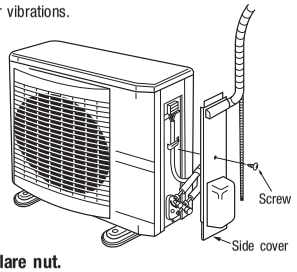
*Phosphorus deoxidized seamless copper pipe C1220T, JIS H3300

4) On-site piping work

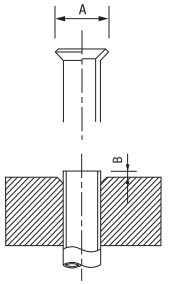
⚠IMPORTANT

- ●Take care so that installed pipes may not touch components within a unit.
  If touching with an internal component, it will generate abnormal sounds and/or vibrations.

How to remove the side cover Please remove the screw of a side cover and remove to the front.



- ●Carry out the on site piping work with the service valve fully closed.
- ●Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- ●Bend a pipe to a radius as large as practical.(R100 – R150) Do not bend a pipe repeatedly to correct its form.
- ●Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R32 are different from those for conventional R22 and R407C. Although we recommend the use of flaring tools designed specifically for R32, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- ●The pipe should be anchored every 1.5m or less to isolate the vibration.
- ●Tighten a flare joint securely with a double spanner.



Flared pipe end: A (mm)

Copper pipe outer diameter	A $^{0}_{-0.4}$
ϕ6.35	9.1
ϕ9.52	13.2
ϕ12.7	16.6
ϕ15.88	19.7

Copper pipe protrusion for flaring: B (mm)

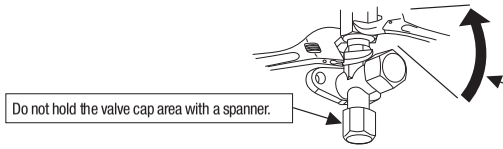
Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R32 tool	With a conventional tool
ϕ6.35	0 – 0.5	0.7 – 1.3
ϕ9.52		
ϕ12.7		
ϕ15.88		

⚠CAUTION

Do not apply force beyond proper fastening torque in tightening the flare nut.

Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.
Do not apply refrigerating machine oil to the flared surface. It can cause refrigerant leakage.

Service valve size (mm)	Tightening torque (N-m)	Tightening angle (°)	Recommended length of a tool handle (mm)
ϕ6.35 (1/4")	14 – 18	45 – 60	150
ϕ9.52 (3/8")	34 – 42	30 – 45	200
ϕ12.7 (1/2")	49 – 61	30 – 45	250
ϕ15.88(5/8")	68 – 82	15 – 20	300

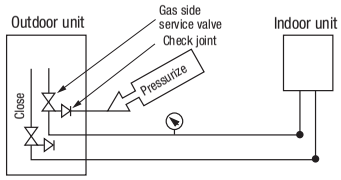


Use a torque wrench. If a torque wrench is not available, fasten the flare nut manually first and then tighten it further, using the left table as a guide.

5) Air tightness test

① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient temperature fall 1°C, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



6) Evacuation

<Work flow>

When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.

Run the vacuum pump for at least one hour after the vacuum gauge shows -101kPa or lower. (-755mmHg or lower)

Confirm that the vacuum gauge indicator does not rise even if the system is left for one hour or more.

Airtightness test completed
↓
Vacuuming begins
↓
Vacuuming completed
↓
Vacuum gauge check
↓
Fill refrigerant

Pay attention to the following points in addition to the above for the R32 and compatible machines.

○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

Item / Capacity	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
Model 71V	0.054	2.75	30

● This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping. When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.
● If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, please see "6. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = { Main pipe length (m) – Length covered without additional charge 30 (m) } x 0.054 (kg/m) + Total length of branch pipes (m) x 0.054 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

(2) Charging refrigerant

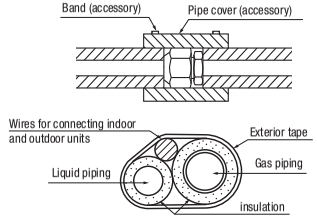
● Since R32 refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
● Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
● In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
● When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

8) Heating and condensation prevention

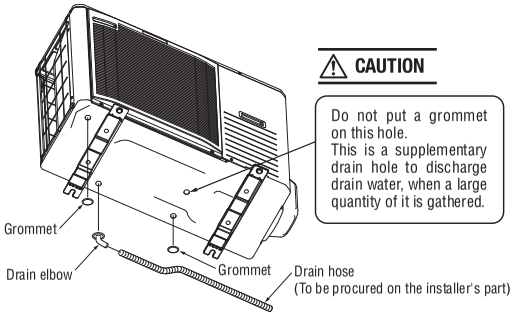
(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.

(2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- Although it is verified in a test that this air conditioning unit shows satisfactory performance under JIS condensation test conditions, **both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**



3. DRAIN PIPING WORK

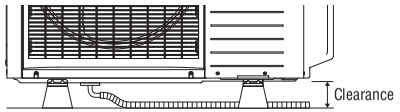
- Execute drain piping by using a drain elbow and drain grommets supplied separately as optional parts, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of service valve or connected pipes.
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)
- Do not use drain elbow and grommet made of plastic for drain piping when base heater for outdoor unit is used. Plastic grommet and elbow will be damaged and burnt in worst case.
- Prepare another drain tray made of metallic material for collecting drain when base heater is used.



⚠ CAUTION

Do not put a grommet on this hole.
This is a supplementary drain hole to discharge drain water, when a large quantity of it is gathered.

- When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an optional part) or concrete blocks.
  Then, please secure space for the drain elbow and the drain hose.



4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

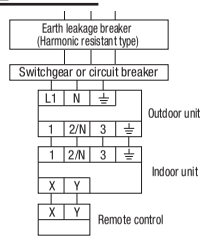
- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51),
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - flat twin tinsel cord (code designation 60227 IEC 41);

  Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire.
  If improgery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.
- Do not turn on the power until the electrical work is completeted .
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- For power supply cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.

Power cable, indoor-outdoor connecting wires

- Always perform grounding system installation work with the power cord unplugged.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.

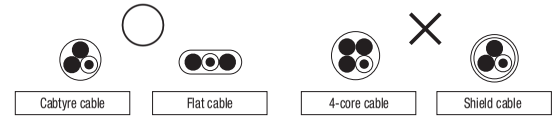
⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.



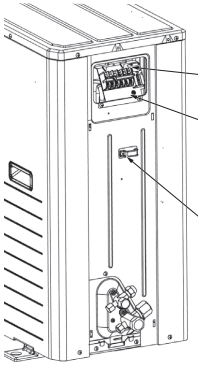
Model	Power source	Power cable thickness (mm^2)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness x number
71V	Single phase 3 wire 220-240V 50Hz 220V 60Hz	3.5	20	17	ϕ1.6mm	ϕ1.6mm x 3

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.

(a) Power source cable: Use the cable which is conformed with 60245 IEC57. When selecting the power source cable length, make sure that voltage drop is less than 2%. If the wire length gets longer, increase the wire diameter.
(b) Indoor-Outdoor connecting wires: Use the wires which is conformed with 60245 IEC57.



- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.



- Do not connect to the grounding wire from another unit, but install a dedicated wire up to the grounding wire from the distribution board.
- Fasten cables and protect the terminal connections from external force.
- It is attached on the back side of the service panel.

Main fuse specification

Model	Specification	Part No.
71V	250V 20A	SSA564A117

5. TEST RUN

⚠ WARNING

- Before conduct a test run, make sure that the service valves are open.
- Turn on power 6 hours prior to a test run to energize the crank case heater.
- Without this operation, refrigerant may accumulate in the compressor and earth leakage breaker may be activated.
- In case of the first operation after turning on power, even if the unit does not move for 30 minutes, it is not a breakdown.
- Always give a 3-minute or longer interval before you start the unit again whenever it is stopped.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠ CAUTION

- When you operate switches for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid service valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power source is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "E-5" (Communication error) may occur.

About insulation resistance

- An insulation resistance value may drop to several M ohms immediately after installation or when the unit is left for a long time without power, because refrigerant is gathered in the compressor. When the earth-leakage breaker is actuated due to low insulation resistance, please check the following:

(1) Check whether a normal insulation resistance value is restored about 6 hours after power is turned. Turning on power will energize the compressor and heat it to evaporate refrigerant gathered in it.
(2) Check whether the earth-leakage breaker is a harmonic resistant type.
This unit is equipped with an inverter and therefore, the use of a harmonic resistant type earth-leakage breaker is necessary to prevent a false actuation.

1) Test run method

Please remove a side cover.

(1) A test run can be initiated from an outdoor unit by using SW5-3 and SW5-4 for on-site setting.
(2) Switching SW5-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW5-4 is OFF, or a heating operation, when SW5-4 is ON.
(4) **Do not fail to switch SW5-3 to OFF when a test run is completed.**

※ **In case of the first operation after turning on the power source, when the unit runs in the cooling mode at outside temperature 5℃ or lower, it automatically changes into the cooling mode after it runs in the heating mode for 10 minutes.**

SW-5-3	SW-5-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	—	Normal or After the test operation

2) Checking the state of the unit in operation

Please remove a service panel.

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas service valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2, SW3-4, on-site.

Please remove a service panel.

(1) Defrost control switching (SW3-1)
- ·When this switch is turned ON, the unit will run in the defrost mode more frequently.
- ·Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.

(2) Snow guard fan control (SW3-2)
- ·When this switch is turned on, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
- ·When the unit is used in a very snowy country, set this switch to ON.

(3) Lower noise silent mode (SW3-4)
- ·Upper limit of compressor speed and fan speed becomes lower in silent mode.

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED(The cycles of 5 seconds)		Failure event	Action
	Red LED	Green LED		
E34	Blinking once	Blinking continuously	Open phase	Check power cables for loose contact or disconnection
E40	Blinking once	Blinking continuously	63H1 actuation or operation with service valves shut (occurs mainly during a heating operation)	1. Check whether the service valves are open. 2. If an error has been canceled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E49	Blinking once	Blinking continuously	Low pressure error or operation with service valves shut (occurs mainly during a cooling operation)	

- If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve.

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.

Items to check before a test run

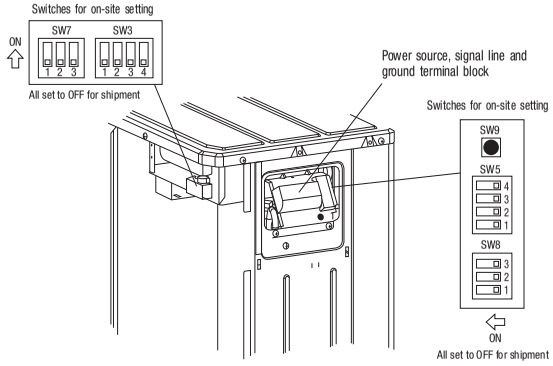
- When you leave the outdoor unit with power supplied to it, be sure to close the panel.

Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are service valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabtyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
—	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure

- Always carry out a test run and check the following in order as listed.

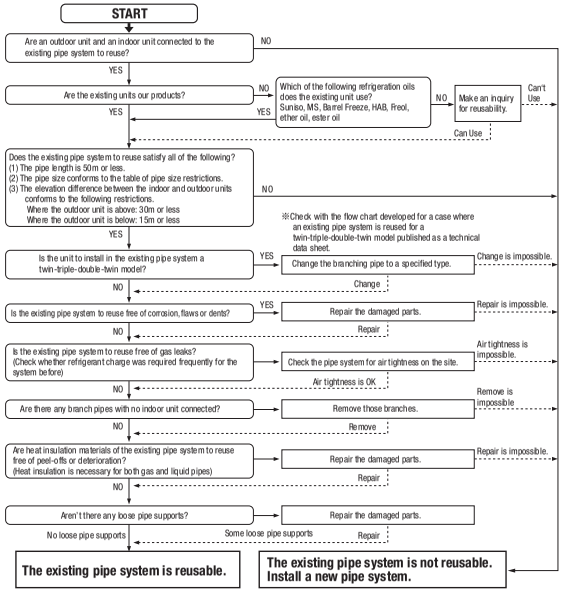
Turn	The contents of operation	Check
①	Open the gas side service valve fully.	
②	Open the liquid side service valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW5-3 / SW5-4 OFF: the unit will start a cooling operation.	
	SW5-3 / SW5-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, please turn on SW5-3 for 1 second and be sure to end a test run.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	



※1 Do not operate SW3-3, SW5-1, SW5-2, SW7, SW8-2, SW8-3.
※2 Refer to TECHNICAL MANUAL about SW9. (Pump down SW)

6. UTILIZATION OF EXISTING PIPING

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠ WARNING

<Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the existing unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.

- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R32.
- **Turn on-site setting switch SW8-1** to the ON position. (Where the gas pipe size is ϕ19.05)

<Table of pipe size restrictions>

◎:Standard pipe size ○:Usable △:Restricted to shorter pipe length limits Cool ↓ : Cooling capacity drop

Additional charge volume per meter of pipe		0.054kg/m		0.11kg/m
Pipe size	Liquid pipe	ϕ9.52	ϕ9.52	ϕ12.7
	Gas pipe	ϕ12.7	ϕ15.88	ϕ15.88
71V	Usability	Cool ↓	◎	△
	Maximum one-way pipe length	35	50	25
	Length covered without additional charge	30	30	15

- **The pipe length should be at least 5m. If the pipe length is shorter than 5m, the quantity of refrigerant needs to be reduced. Please consult with our distributor in the area, if you need to recover refrigerant and charge it again.**
- Any combinations of pipe sizes not listed in the table are not usable.

<Pipe system after the branching pipe>

◎:Standard pipe size ○:Usable

Additional charging amount of refrigerant per 1m			0.054kg/m	
Pipe size	Liquid pipe		ϕ9.52	
	Gas pipe		ϕ12.7	ϕ15.88
Model	Combination type	Combination of capacity		
71V	Twin	40+40	◎	○

- Any combinations of pipe sizes not listed in the tableare not usable.

<The model types of existing units of which branching pipes are reusable.>

In case of replacement of used branching pipes, please use our genuine branching pipes.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) − Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.
Example) When an 71V (single installation) is installed in a 30m long existing pipe system (liquid ϕ12.7, gas ϕ15.88), the quantity of refrigerant to charge additionally should be (30m-25m) x 0.11kg/m = 0.55 kg.

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.

- If you choose to wash the pipe system, contact our distributor in the area.

(2) Models FDC100-140VNX-W, 100-140VSX-W

PSC012D143C△

Inverter driven split PAC
100, 125, 140 VNX-W 100, 125, 140 VSX-W
Designed for R32 refrigerant

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 42.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces

SAFETY PRECAUTIONS

- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown below.

⃠	Never do it under any circumstance.	❗	Always do it according to the instruction

- For 3 phase power source outdoor unit, EN61000-3-2 is not applicable if consent by the utility company or nortification to the utility company is given before usage.
- 3 phase power source unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a house-hold appliance it could cause electromagnetic interference.
- In case of 125VNX and 140VNX, equipment complying with IEC 61000-3-12.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user

Check before installation work

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, It may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire,
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R32 and R410A.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant
- **Only use prescribed option parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition**
  The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit
- **Be sure to wear protective goggles and gloves while at work.**
- **This unit is designed specifically for R32.**
  Using any other refrigerant can cause unit failure and personal injury.
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not run the unit with removed panels or protections**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.
- **Do not process or splice the power cord, or share the socket with other power plugs.**
  This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.
- **Do not bundle or wind or process the power cord. Do not deform the power cord by treading it.**
  This may cause fire or heating.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.**
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.
- **Do not install the unit in the locations listed below**
  •Locations where carbon fiber, metal powder or any powder is floating.
  •Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  •Vehicles and ships
  •Locations where cosmetic or special sprays are often used.
  •Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  •Locations where any machines which generate high frequency harmonics are used.
  •Locations with salty atmospheres such as coastlines
  •Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  •Locations where the unit is exposed to chimney smoke
  •Locations at high altitude (more than 1000m high)
  •Locations with ammonic atmospheres (e.g. organic fertilizer).
  •Locations with calcium chloride (e.g. snow melting agent).
  •Locations where heat radiation from other heat source can affect the unit
  •Locations without good air circulation.
  •Locations with any obstacles which can prevent inlet and outlet air of the unit
  •Locations where short-circuit of air can occur (in case of multiple units installation)
  •Locations where strong air blows against the air outlet of outdoor unit
  •Locations where something located above the unit could fall.
  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  •Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  •Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  •Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  •Locations where vibration and operation sound generated by the outdoor unit can affect seriously. (on the wall or at the place near bed room)
  •Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  •Locations where drainage cannot run off safely.
  It can affect surrounding environment and cause a claim
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands.**
  It can cause electric shocks.
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water.**
  It can cause electric shocks.
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur properly damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.
- **Do not touch the suction or aluminum fin on the outdoor unit.**
  This may cause injury.

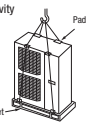
Notabilia as a unit designed for R32

- Do not use any refrigerant other than R32. R32 will rise to pressure about 1.6 times higher than that of a conventional refrigerant (R22 or R407C).
  A cylinder containing R32 has a light blue indication mark on the top.
- A unit designed for R32 has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R32 tools listed in the table on the right before installing or servicing this unit.
- All indoor units must be models designed exclusively for R32. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated R32 and R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position.
If not properly balanced, the unit can be thrown off-balance and fall.

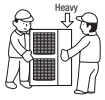


1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.

2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.
- ○ Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

1.Install the unit on the base so that the bottom is higher than snow cover surface.

2.Provide a snow hood to the outdoor unit on site. Regarding outline of a snow hood, consult a dealer.

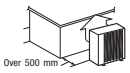
3.Install the unit under eaves or providen the roof on site.

Since drain water generated by defrost control may freeze, following measures are required.

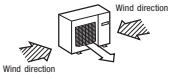
- Don't execute drain piping work by using a drain elbow and drain grommets (optional parts). [Refer to DRAIN PIPING WORK.]
- Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]
- Attach heater on a base plate on site, if there is possibility to freeze drain water.
  In case that the product has a corrective drainage system, the drainage paths should have suitable measure against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

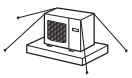
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.

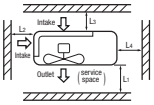


5) Installation space

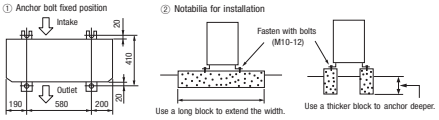
- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.
- A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

(mm)

Example installation / Size	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	5	5	5



6) Installation



- In installing the unit, fix the unit's legs with bolts specified on the left.
- The protrusion of an anchor bolt on the front side must be kept within 15mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the left illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

- When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site, so that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, consult a dealer.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

- Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

– : Not applicable combination

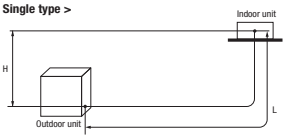
Restrictions	Model for outdoor units	Dimensional restrictions	Installation type: Single type	Twin type	Triple type A	Triple type B
One-way pipe length	100VNX,125VNX,100VSX,125VSX	3m ≦ ≦ 100m (3)	L	L+L1 L+L2	–	–
	140VNX, 140VSX				L+L1+L2+L3	L+L1+L2+L3
Main pipe length	100VNX,125VNX,100VSX,125VSX	≦ 100m (3)	–	L	–	–
	140VNX, 140VSX				L	L
One-way pipe length between the first branch from to the second branch	140VNX, 140VSX	≦ 5m	–	–	–	La
One-way pipe length after the first branch	100VNX,125VNX,100VSX,125VSX	≦ 30m	–	L1,L2	–	–
	140VNX, 140VSX				L1, L2, L3	L1 (1)
One-way pipe length from the first branch to indoor units through the second branch	140VNX, 140VSX	≦ 27m	–	–	–	La+L2, La+L3 (1)
One-way pipe length difference from the first branch to the indoor unit	100VNX,125VNX,100VSX,125VSX	≦ 10m	–	IL1-L2I	–	–
	140VNX, 140VSX	≦ 3m			I L1-L2 I , I L2-L3 I , I L3-L1 I	
		≦ 10m			–	L1-(La+L2),L1-(La+L3) (1)
One way pipe length difference from the second branch to the indoor unit	140VNX, 140VSX	≦ 10m	–	–	–	I L2-L3 I
Elevation difference between indoor and outdoor units	Outdoor unit is positioned higher,	≦ 50m (2)	H	H	H	H
	Outdoor unit is positioned lower,	≦ 15m				
Elevation difference between indoor units		≦ 0.5m	–	h	h1,h2,h3	h1,h2,h3

⚠CAUTION

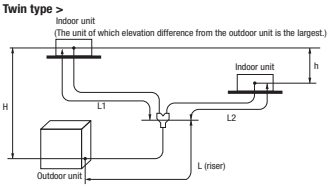
- The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, see " 6. UTILIZATION OF EXISTING PIPING."
- With the triple pipe connection, the way of use is different when the difference of one-way pipe length after the first branching point is 3m to 10m. For details, refer to the above table and right figure.

Notes (1) Install the indoor units so that L + L1 becomes the longest one-way pipe.
Keep the pipe length difference between L1 and (La + L2) or (La + L3) within 10m.
(2) When the outdoor unit is installed at a position higher than the indoor unit by 30m or more, set SW5-2 on the control PCB to ON.
(3) Maximum piping length is limited up to 65m for SRK50 triple type combination, and 85m for FDE50 triple type and FDE60, FDE71 twin type.

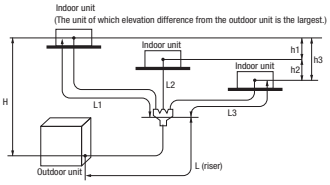
< Single type >



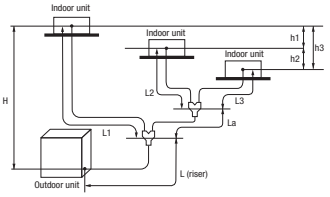
< Twin type >



< Triple type A > In case L1, L2, L3 difference < 3m



< Triple type B > In case L1, L2, L3 difference ≧ 3m



2) Determination of pipe size

- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

		Model 100V		Model 125V		Model 140V	
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
Outdoor unit connected		ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
		Flare	Flare	Flare	Flare	Flare	Flare
Refrigerant piping (Main pipe L)		ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
In the case of a single type	Indoor unit connected	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 100V		Model 125V		Model 140V	
In the case of a twin type	Branching pipe set	DIS-WA1G		DIS-WA1G		DIS-WA1G	
	Refrigerant piping (branch pipe L1,L2)	ϕ12.7	ϕ9.52	ϕ12.7	ϕ9.52	ϕ15.88	ϕ9.52
	Indoor unit connected	ϕ12.7	ϕ6.35	ϕ12.7	ϕ6.35	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 50V×2		Model 60V×2		Model 71V×2	
In the case of a triple type A	Branching pipe set	–		–		DIS-TA1G	
	Refrigerant piping (branch pipe L1,L2,L3)					ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50Vx3	
In the case of a triple type B	Branching pipe set	–		–		DIS-WA1G	
	Refrigerant piping (branch pipe La)					ϕ15.88	ϕ9.52
	Refrigerant piping (branch pipe L1)					ϕ12.7	ϕ9.52
	Branching pipe set (After branch pipe La)					DIS-WA1G	
	Refrigerant piping (branch pipe L2,L3)					ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50V×3	

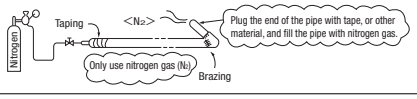
⚠CAUTION

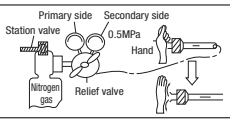
- When the 50V or 60V model is connected as an indoor unit, always use a ϕ9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (ϕ6.35 on the liquid pipe side).
  If a ϕ6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
  A branching part must be dressed with a heat-insulation material supplied as an accessory.
- For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.
- In the case of a triple type, branching pipe set shown in this table varies depending on the length difference of one way piping after the first branch. Please check the table above.

About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.





3) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.
- This unit uses R32. Always use 1/2H pipes having a 1.0mm or thicker wall for ϕ19.05 or larger pipes, because O-type pipes do not meet the pressure resistance requirement.

Pipe diameter [mm]	6.35	9.52	12.7	15.88	22.22	25.4	28.58
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0	1.0	1.0	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H 3300

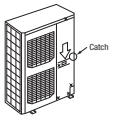
NOTE

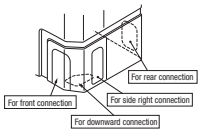
- Select pipes having a wall thickness larger than the specified minimum pipe thickness.

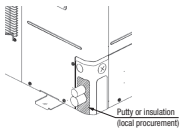
4) On-site piping work

⚠IMPORTANT ● Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

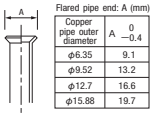
How to remove the service panel First remove the five screws (× mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.





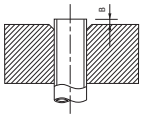


- ●The pipe can be laid in any of the following directions: side right, front, rear and downward.
- ●Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area.
  ※Please close the gap of piping connecting part with putty or insulation material (locally procured) after piping connection. Small animals or insects may intrude into the outdoor unit and it will cause electrical short.
- ●Carry out the on site piping work with the service valve fully closed.
- ●Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- ●Bend a pipe to a radius as large as practical.(R100–R150) Do not bend a pipe repeatedly to correct its form.
- ●Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R32 are different from those for conventional R22 and R407C. Although we recommend the use of flaring tools designed specifically for R32, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
  ※Do not reuse existing flare, make new flare.
- ●The pipe should be anchored every 1.5m or less to isolate the vibration.
- ●Tighten a flare joint securely with a double spanner.



Flared pipe end: A (mm)

Copper pipe outer diameter	A 0 −0.4
ϕ6.35	9.1
ϕ9.52	13.2
ϕ12.7	16.6
ϕ15.88	19.7



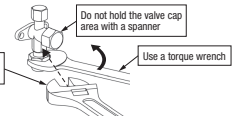
Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R32 tool	With a conventional tool
ϕ6.35	0–0.5	0.7–1.3
ϕ9.52		
ϕ12.7		
ϕ15.88		

⚠ CAUTION

- ●Do not apply force beyond proper fastening torque in tightening the flare nut.
- ●Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.
- ●Do not apply refrigerating machine oil to the flared surface. It can cause refrigerant leakage.

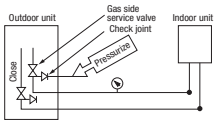
Service valve size (mm)	Tightening torque (N·m)
ϕ6.35 (1/4")	14–18
ϕ9.52 (3/8")	34–42
ϕ12.7 (1/2")	49–61
ϕ15.88 (5/8")	68–95



5) Air tightness test

① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient temperature fall 1℃, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



6) Evacuation

<Work flow> When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.

Airtightness test completed
↓
Vacuuming begins
↓
Run the vacuum pump for at least one hour after the vacuum gauge shows -101kPa or lower. (-755mmHg or lower)
↓
Vacuuming completed
↓
Confirm that the vacuum gauge indicator does not rise even if the system is left for one hour or more.
↓
Vacuum gauge check
↓
Fill refrigerant

Pay attention to the following points in addition to the above for the R32 and compatible machines.

- ○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- ○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

<Single type>

Item / Capacity	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
100VNX–140VNX 100VSX–140VSX	0.054	4.0	30

<Twin, triple type>

Item / Capacity	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)		Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
	Main pipe	Branch pipe		
100VNX–140VNX 100VSX–140VSX	0.054		4.0	30

- ●This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping. When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.
- ●If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, see "6. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = { Main pipe length (m) – Length covered without additional charge 30 (m) } x 0.054 (kg/m) + Total length of branch pipes (m) x 0.054 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

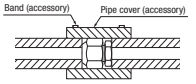
(2) Charging refrigerant

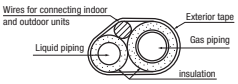
- ●Since R32 refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- ●Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- ●In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- ●When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

8) Heating and condensation prevention

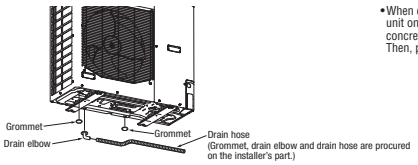
(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
(2) Use a heat insulating material that can withstand 120℃ or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- Although it is verified in a test that this air-conditioning unit shows satisfactory performance under JIS condensation test conditions, **both gas and liquid pipes need to be dressed with 20mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**



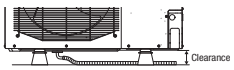


3. DRAIN PIPING WORK

- •Execute drain piping by using a drain elbow and drain grommets supplied separately as optional parts, where water drained from the outdoor unit is a problem.
- •Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- •Condensed water may flow out from vicinity of service valve or connected pipes.
- •Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)
- •Do not use drain elbow and grommet made of plastic for drain piping when base heater for outdoor unit is used. Plastic grommet and elbow will be damaged and burnt in worst case.
- •Prepare another drain tray made of metallic material for collecting drain when base heater is used.



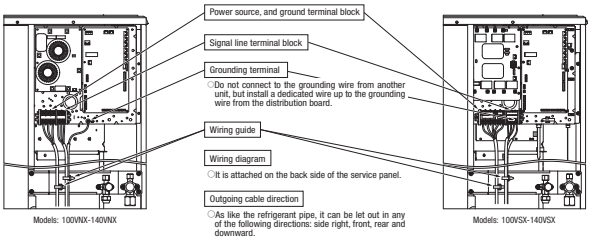
- •When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an optional part) or concrete blocks.
  Then, please secure space for the drain elbow and the drain hose.



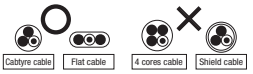
4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- •Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51),
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - flat twin tinsel cord (code designation 60227 IEC 41);
  Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- •Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If impropery grounded, an electric shock or malfunction may result.
- •A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- •The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire.



- •Do not turn on the power source until the electrical work is completeted .
- •Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident.)
- •For power source cables, use conduits.
- •Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- •Fasten cables so that may not touch the piping, etc.
- •When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- •Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.
- ● Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- ● In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- ● Grounding terminals are provided in the control box.



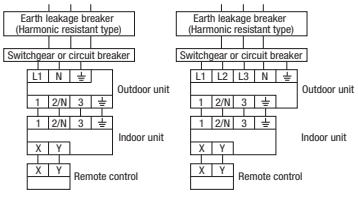
Main fuse specification

Model	Specification	Part No.
100VNX–140VNX	250V 30A	PCA006A091
100VSX–140VSX	—	—

Power cable, indoor-outdoor connecting wires

- ●Always perform grounding system installation work with the power cord unplugged.

⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.



Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VNX	Single phase 3 wires 220-240V 50Hz 220V 60Hz	5.5	25	21	ϕ1.6mm	ϕ1.6mm x 3
125VNX,140VNX			27	20		
100VSX-140VSX	3 phase 4 wires 380-415V 50Hz 380V 60Hz	3.5	14	49		

●The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
●Switchgear or circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.

※At the connection with the duct type indoor unit.

Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VNX	Single phase 3 wires 220-240V 50Hz 220V 60Hz	8	26	20	ϕ1.6mm	ϕ1.6mm x 3
125VNX			28	28		
140VNX			30	27		
100VSX	3 phase 4 wires 380-415V 50Hz 380V 60Hz	3.5	15	46		
125VSX			16	43		
140VSX			17	40		

(a) Power source cable: Use the cable which is conformed with 60245 IEC57. When selecting the power source cable length, make sure that voltage drop is less than 2%. If the wire length gets longer, increase the wire diameter.
(b) Indoor-outdoor connecting wires: Use the wires which is conformed with 60245 IEC57.

5. TEST RUN

⚠WARNING
- Before test run, make sure that the service valves are open.
- Before test run, turn ON power source for 6 hours in order to warm up the compressor. Without this operation, refrigerant may accumulate in the compressor and earth leakage breaker may be activated.
- In case of the first operation after turning on power supply, even if the unit does not move for 30 minutes, it is not a breakdown.
- After power is turned off, wait 3 minutes or more before power source is turned ON again.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠CAUTION
- When you operate switches (SW3, SW4, SW5) for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid service valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power source is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "Communication error between outdoor and indoor unit" may occur.

1) Test run method

(1) A test run can be initiated from an outdoor unit by using SW3-3 and SW3-4 for on-site setting.
(2) Switching SW3-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW3-4 is OFF, or a heating operation, when SW3-4 is ON.
(4) **Do not fail to switch SW3-3 to OFF when a test run is completed.**

SW-3-3	SW-3-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	—	Normal or after the test operation

2) Checking the state of the unit in operation

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas service valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2, SW5-2, SW4-1, on-site

(1) Defrost control switching (SW3-1)
・When this switch is turned ON, the unit will run in the defrost mode more frequently.
・Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.
(2) Snow guard fan control (SW3-2)
・When this switch is turned ON, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
・When the unit is used in a very snowy country, set this switch to ON.
(3) High height difference operation control (SW5-2)
・Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
(4) Lower noise silent mode (SW4-1)
・Upper limit of compressor speed and fan speed becomes lower in silent mode

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED(The cycles of 5 seconds) Red LED	Green LED	Failure event	Action
E34	Blinking once	Blinking continuously	Open phase	Check power cables for loose contact or disconnection
E40	Blinking once	Blinking continuously	63H1 actuation or operation with service valves shut (occurs mainly during a heating operation)	1. Check whether the service valves are open. 2. If an error has been canceled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E49	Blinking once	Blinking continuously	Low pressure error or operation with service valves shut (occurs mainly during a cooling operation)	
E57	Blinking once	Blinking continuously	Short of refrigerant error or operation with service valves shut (occurs mainly during a cooling operation)	

● If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve.

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

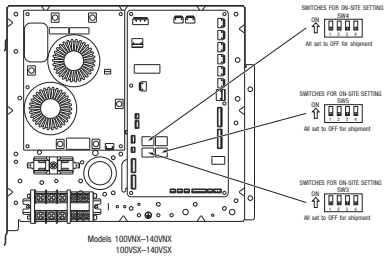
This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.

Items to check before a test run ● When you leave the outdoor unit with power supplied to it, be sure to close the panel.

Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are service valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabbyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
—	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure ● Always carry out a test run and check the following in order as listed.

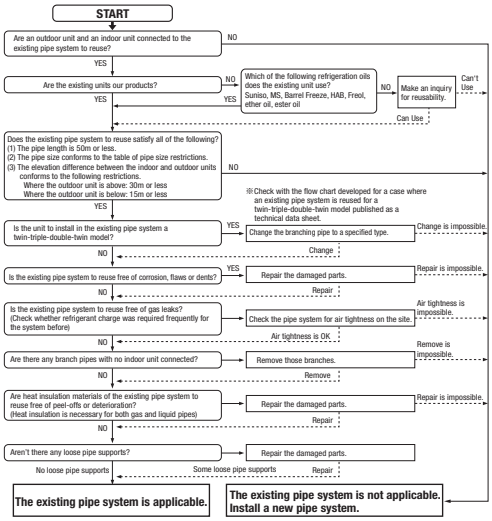
Turn	The contents of operation	Check
①	Open the gas side service valve fully.	
②	Open the liquid side service valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW3-3 ON / SW3-4 OFF: the unit will start a cooling operation. SW3-3 ON / SW3-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, do not forget to turn SW3-3 to the OFF position.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	



Models 100VNX–140VNX
100VSX–140VSX

6. UTILIZATION OF EXISTING PIPING

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the existing unit (in the order of (1), (2), (3) and (4))
(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
● For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R32.
● **Turn on-site setting switch SW5-1** to the ON position. (Where the gas pipe size is ϕ19.05)

<Where the existing unit cannot be run for a cooling operation.>
Wash the pipe system or install a new pipe system.
● If you choose to wash the pipe system, contact our distributor in the area.

<Table of pipe size restrictions>
◎:Standard pipe size ○:Applicable
△:Restricted to shorter pipe length limits ×:Not applicable

Additional charging amount of refrigerant per 1m		0.02kg/m	0.054kg/m		0.1kg/m	
Pipe size	Liquid pipe	ϕ6.35	ϕ9.52	ϕ9.52	ϕ12.7	ϕ12.7
	Gas pipe	ϕ15.88	ϕ15.88	ϕ19.05	ϕ15.88	ϕ19.05
100VNX 100VSX	Usability	△	◎	○※1	△	△※1
	Maximum one-way pipe length	20	100	100	50	50
	Length covered without additional charge	10	30	30	15	15
125VNX 125VSX	Usability	△	◎	○※1	△	△※1
	Maximum one-way pipe length	20	100	100	50	50
	Length covered without additional charge	10	30	30	15	15
140VNX 140VSX	Usability	△	◎	○※1	△	△※1
	Maximum one-way pipe length	20	100	100	50	50
	Length covered without additional charge	10	30	30	15	15

<Pipe system after the branching pipe>

Additional charging amount of refrigerant per 1m			After 1st branch ※4			After 2nd branch		
			0.054kg/m			0.054kg/m		
Pipe size	Liquid pipe		ϕ9.52			ϕ9.52		
	Gas pipe		ϕ12.7	ϕ15.88	ϕ19.05※1	ϕ12.7	ϕ15.88	ϕ19.05※1
Model	Combination type	Combination of capacity						
100V	Twin	50+50	◎	○	×	—	—	—
125V	Twin	60+60	◎	○	×	—	—	—
	Twin	71+71	×	◎	○	—	—	—
140V	Triple A	50+50+50	◎	○	×	—	—	—
	Triple B	50+50+50	×	◎※5	○※5	◎	○	×

※1 Because of its insufficient pressure resistance, **turn the DIP switch SW5-1** provided on the outdoor unit board to the ON position for ϕ19.05 × t1.0. (In the case of a twin-triple-double-twin model, this also applies to the case where ϕ19.05 × t1.0 is used in a pipe system after the first branching point.) However, you need not turn the DIP switch SW5-1 to the ON position, if 1/2H pipes or pipes having 1.2 or thicker walls are used.
※2 When the main pipe length exceeds 40m, a significant capacity drop may be experienced due to pressure loss in the liquid pipe system. Use ϕ12.7 for the liquid main.
※3 Keep the total pipe length, not one-way pipe length, below the specified maximum pipe length.
※4 Piping size after branch should be equal or smaller than main pipe size.
※5 Piping size from first branch to indoor unit should be ϕ9.52 (Liquid) / ϕ12.7 (Gas).
● Any combinations of pipe sizes not listed in the table or marked with × in the table are not usable.
● Do not reuse existing flare.

<The model types of existing units of which branching pipes are reusable.>
Models later than Type 8.
● F D C ＊ ＊ ＊ 8 □ □ □
● F D C P ＊ ＊ ＊ 8 □ □ □

The branching pipes used with models other than those listed above are not reusable because of their insufficient pressure resistance. Please use our genuine branching pipes for R32.

● ＊ ＊ ＊ are numbers representing horsepower. □□□ is an alphanumeric letter.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) – Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.
Example) When an 140V (single installation) is installed in a 20m long existing pipe system (liquid ϕ12.7, gas ϕ19.05), the quantity of refrigerant to charge additionally should be (20m-15m) x 0.11kg/m = 0.55 kg.

1.9.5 Instructions for branching pipe set (DIS-WA1G, WB1G, TA1G, TB1G)

PSB012D865

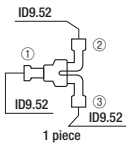
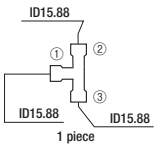
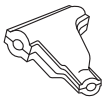
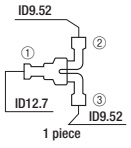
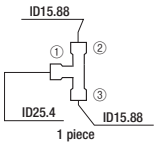
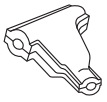
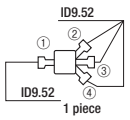
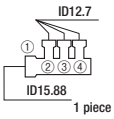
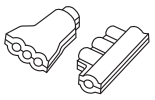
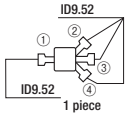
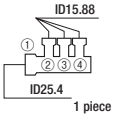
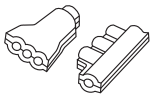
⚠ WARNING / CAUTION

- This set is for R410A and R32 refrigerant.
- Select a branching pipe set correctly rated for the combined total capacity of connected indoor units and install it according to this manual.
  An improperly installed branching pipe set can cause degraded performance or an abnormal unit stop.
- Provide good heat insulation to the pipes by following instructions contained in this manual.
  Improper heat insulation can result in degraded performance or a water leak accident from condensation.
- Please make sure that only parts supplied as accessories or the manufacturer's approved parts are used in installing the unit, because a leak of refrigerant can result in a lack-of-oxygen accident, if it reaches a concentration beyond the tolerable limit.

This manual explains how to use a branching pipe set that is indispensable in connecting pipes for a twin/triple/double-twin configuration installation (system). For the details of piping work, unit installation work and electrical installation work, please refer to the installation manuals and installation guides supplied with your outdoor and indoor units.

1. Branching pipe set specifications

(1) Please make sure that you have chosen the right branching pipe set and the specifications of the parts contained in it by checking with the table below.
(2) Connect pipes as illustrated in the table below. The pipe from an outdoor unit must be brazed to the pipe connection port "①" and the pipes from indoor units to "②," "③" and "④."

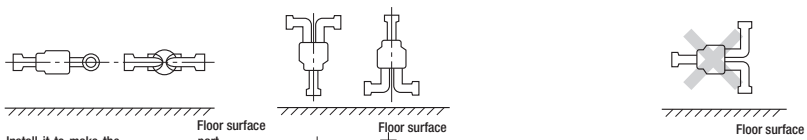
Branching pipe set type	Supported outdoor/indoor unit combinations		Part lists			
	Outdoor unit model	Indoor unit model	Branching pipe set for a liquid pipe	Branching pipe set for a gas pipe	Different diameter pipe joint	Heat insulation material
DIS-WA1G (Two-way branching set)	3HP	1.5HP＋1.5HP	 1 piece	 1 piece	Joint A ID9.52 2 pieces Flare joint (for indoor unit side connection) Joint B OD15.88 2 pieces ID12.7	 One each for liquid and gas
	4HP	2HP＋2HP				
		1.5HP＋2.5HP				
	5HP	2.5HP＋2.5HP				
		2HP＋3HP				
	6HP	3HP＋3HP				
		2HP＋4HP				
DIS-WB1G (Two-way branching set)	8HP	4HP＋4HP	 1 piece	 1 piece	Joint C OD12.7 1 piece ID9.52	 One each for liquid and gas
		3HP＋5HP				
	10HP 12HP	5HP＋5HP 6HP＋6HP				
DIS-TA1G (Three-way branching set)	6HP	2HP＋2HP＋2HP	 1 piece	 1 piece	Joint A ID9.52 3 pieces Flare joint (for indoor unit side connection)	 One each for liquid and gas
DIS-TB1G (Three-way branching set)	8HP	3HP＋3HP＋3HP	 1 piece	 1 piece	Joint A ID9.52 2 pieces Flare joint (for indoor unit side connection) Joint B OD15.88 1 piece ID12.7 Joint D ID12.7 1 piece OD9.52	 One each for liquid and gas

ID stands for inner diameter and OD, outer diameter.

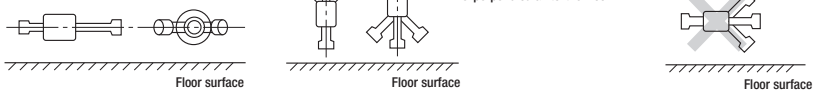
(3) To connect pipes for a Double Twin installation (involving 4 indoor units), please see 2-7. "Double Twin configuration."
(4) A branching pipe set must always be installed into the posture as illustrated in the drawing below.

＜Posture to install into＞

Two-way branching



Three-way branching

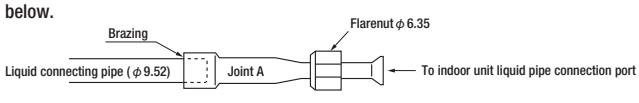


2. Pipe connecting procedure

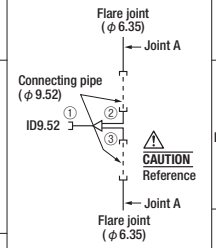
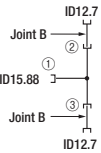
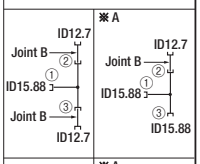
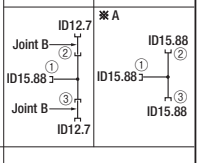
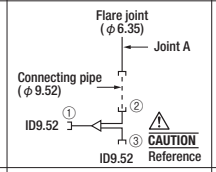
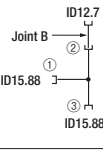
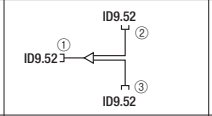
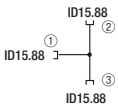
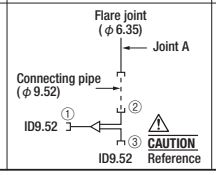
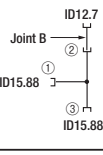
Braze the different diameter pipe joint found in the set matching the connected outdoor and indoor unit capacities according to the instructions set out below.

⚠ CAUTION

In connecting an indoor unit of which capacity is 1.5HP, 2HP or 2.5HP, always use a ϕ9.52 liquid pipe to connect to the branching pipe (branching pipe – indoor unit).
In connecting to an indoor unit (liquid pipe side: ϕ6.35), use the different diameter pipe joint A supplied with the set and follow the procedure set out below.

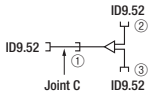
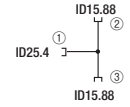
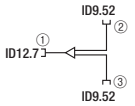
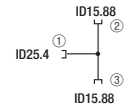


2-1 DIS-WA1G

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
3HP	1.5HP＋1.5HP		
4HP	2HP＋2HP		
	1.5HP＋2.5HP		※A 
5HP	2.5HP＋2.5HP		※A 
	2HP＋3HP		
6HP	3HP＋3HP		
	2HP＋4HP		

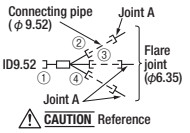
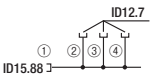
Note When connect the indoor unit of an old model that is shown in the model list, use the joint supplied with the branch piping set like ※A

2-2 DIS-WB1G

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
8HP	3HP＋5HP 4HP＋4HP		
10HP 12HP	5HP＋5HP 6HP＋6HP		

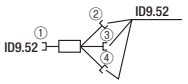
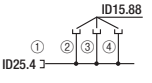
2-3 DIS-TA1G

Applicable to the difference in length of pipes after the branch being less than 3m
* Connection is not allowed when the difference in length of pipes is larger than 3m.

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
6HP	2HP＋2HP＋2HP		

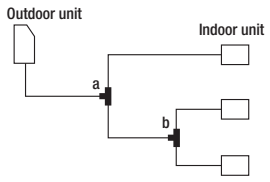
2-4 DIS-TB1G

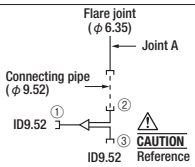
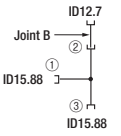
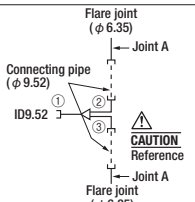
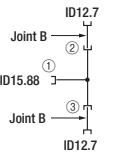
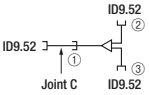
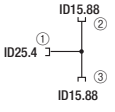
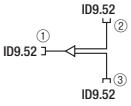
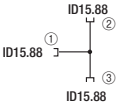
Applicable to the difference in length of pipes after the branch being less than 3m
* Connection is not allowed when the difference in length of pipes is larger than 3m.

Supported combinations		Liquid branching pipe	Gas branching pipe
Outdoor unit model	Indoor unit model		
8HP	3HP＋3HP＋3HP		

2-5. Triple type for same model/same capacity or different model/same capacity

When the difference in length of pipes after the branch is longer than 3m and shorter than 10m

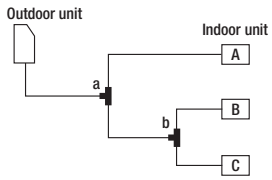


Outdoor unit model	Indoor unit model	Branching pipe	Branching pipe set type	Liquid branching pipe	Gas branching pipe
6HP	2HP＋2HP＋2HP	a	DIS-WA1G		
		b			
8HP	3HP＋3HP＋3HP	a	DIS-WB1G		
		b	DIS-WA1G		

2-6. Triple type for same model/different capacity or different model/different capacity

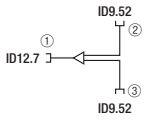
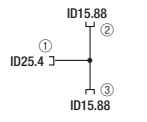
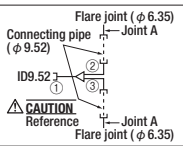
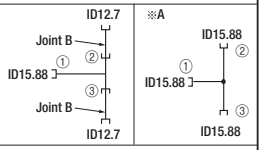
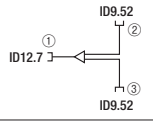
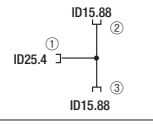
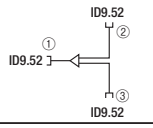
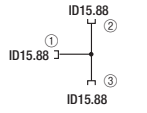
Applicable to the difference in length of pipes after the branch being less than 3m

* Connection is not allowed when the difference in length of pipes is larger than 3m.



Connecting position

Outdoor unit model	Indoor unit model	A	B	C
10HP	2.5HP+2.5HP+5HP	5HP	2.5HP	2.5HP
	3HP+3HP+4HP	4HP	3HP	3HP
12HP	3HP+3HP+6HP	6HP	3HP	3HP

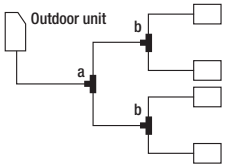
Outdoor unit model	Indoor unit model	Branching pipe	Branching pipe set type	Liquid branching pipe	Gas branching pipe
10HP 12HP	2.5HP+2.5HP+5HP 3HP+3HP+6HP	a	DIS-WB1G		
		b	DIS-WA1G		
10HP	3HP+3HP+4HP	a	DIS-WB1G		
		b	DIS-WA1G		

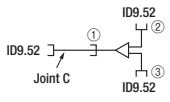
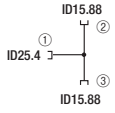
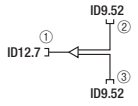
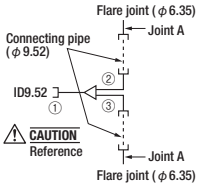
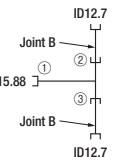
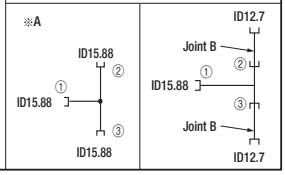
Note When connect the indoor unit of an old model that is shown in the model list, use the joint supplied with the branch piping set like※ A.

2-7. Double Twin type

Pipes should be connected as follows for a Double Twin installation (4 connected indoor units. The capacity of an outdoor unit available for this configuration is either 8HP or 10HP only):

Outdoor unit capacity	Indoor unit capacity
8HP	2HP×4 units
10HP	2.5HP×4 units
12HP	3HP×4 units



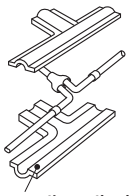
Branching pipe	Branching pipe set type	Outdoor unit model	Liquid branching pipe	Gas branching pipe
a	DIS-WB1G	8HP		
		10HP 12HP		
b	DIS-WA1G	8HP		
		10HP 12HP		

Note When connect the indoor unit of an old model that is shown in the model list, use the joint supplied with the branch piping set like※ A.

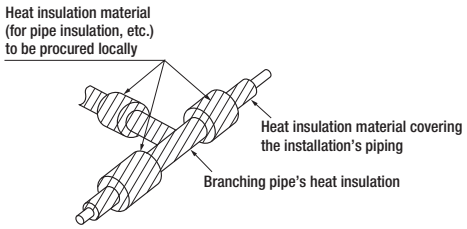
3. Heat insulation work

(1) Condensation can also occur on liquid pipes with this model. Please provide good heat insulation to both liquid and gas pipes.

(2) For the heat insulation of a branching pipe, always use the heat insulation material supplied with the set and provide heat insulation according to the instructions set out below.



1. It has an adhesive layer on the entire inner face. Remove a separator and wrap it around the branching pipe.



2. Apply a heat insulation material (to be procured locally) to the joint between the branching pipe's heat insulation and the heat insulation material covering the installation's piping as described above and wrap a tape over the gap shown as a hatched (///) area to complete dressing of the piping.

1.9.6 Safety precautions in handling air-conditioners with flammable refrigerant

R32 REFRIGERANT USED

PSA012B839K

	This equipment uses flammable refrigerants. If the refrigerant is leaked, together with an external ignition source, there is a possibility of ignition.		There is information included in the user's manual and/or installation manual.
	The user's manual should be read carefully.		A service personnel should be handing this equipment with reference to the installation manual.

- This safety precaution sheet is for R32 refrigerant. If you want to know the type of refrigerant in the unit, check the label attached to the outdoor unit.
- The precautionary items mentioned below are distinguished into two levels, ⚠ WARNING and ⚠ CAUTION.

⚠ WARNING : Wrong installation would cause serious consequences such as injuries or death.

⚠ CAUTION : Wrong installation might cause serious consequences depending on circumstances.

⚠ WARNING

- Strict compliance of the domestic laws must be observed when disposing the appliance.
- Do not use means to accelerate the defrost operation process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- The ducts connected to an appliance shall not contain a potential ignition source.

⚠ CAUTION

1. General

- The installation of pipe-work shall be kept to a minimum.
- Pipe-work shall be protected from physical damage.
- Compliance with national gas regulations shall be observed.
- Mechanical connections shall be accessible for maintenance purposes.
- Keep any required ventilation openings clear of obstruction.
- Servicing shall be performed only as recommended by the manufacturer.
- Equipment piping in the occupied space shall be installed in such a way to protect against accidental damage in operation and service.
- Precautions shall be taken to avoid excessive vibration or pulsation to refrigerating piping.
- Protection devices, piping and fitting shall be protected as far as possible against adverse effects for example, the danger of water collection and freezing in relief pipes or the accumulation of dirt and debris.
- Provision shall be made for expansion and contraction of long runs of piping.
- Piping in refrigerating systems shall be designed and installed to minimize the likelihood hydraulic shock damaging the system.
- The indoor equipment and pipes shall be securely mounted and guarded to avoid accidental rupture of equipment from moving furniture or reconstruction activities.
- Instructions for wiring to external zoning dampers and/or mechanical ventilation, to ensure that upon detection of a leak, the zoning dampers are driven fully open and additional mechanical ventilation is activated.
- For appliances using A2L refrigerants, connected via an air duct system to one or more rooms, the supply and return air shall be directly ducted to the space. Open areas such as false ceilings shall not be used as a return air duct.
- The following information requirements apply for enhanced tightness refrigerating systems using A2L refrigerants.
- Where safety shut off valves are specified, the minimum room area may be determined based on the maximum amount of refrigerant that can be leaked as determined in GG.12.2. (IEC 60335-2-40:2018)
- Where safety shut off valves are specified, the location of the valve in the refrigerating system relative to the occupied spaces shall be as described in GG.12.1.(IEC 60335-2-40:2018)

2. Unventilated areas

- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- If the refrigerant charge amount in the system is ≧1.84 kg, an unventilated area where the appliance is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.

3. Qualification of workers

- The staff in servicing operations must hold the national qualification or other relevant qualifications.

4. Information on servicing

4.1 Checks to the area
- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised.
- For repair to the refrigerating system, 4.2 to 4.6 shall be completed prior to conducting work on the system.

4.2 Work procedure
- Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

4.3 General work area
- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
- Work in confined spaces shall be avoided.

4.4 Checking for presence of refrigerant
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

4.5 Presence of fire extinguisher
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

4.6 No ignition sources
- No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition such a manner that it may lead to the risk of fire or explosion.
- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space.
- Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks.
- "No Smoking" signs shall be displayed.

4.7 Ventilated area
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
- A degree of ventilation shall continue during the period that the work is carried out.
- The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

4.8 Checks to the refrigerating equipment
- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification.
- At all times the manufacturer's maintenance and service guidelines shall be followed.
- If in doubt consult the manufacturer's technical department for assistance.

- The following checks shall be applied to installations using flammable refrigerants:
  – the actual refrigerant charge size is in accordance with the room size within which the refrigerant containing parts are installed.
  – the ventilation machinery and outlets are operating adequately and are not obstructed;
  – if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant,
  – marking to the equipment continues to the visible and legible. Markings and signs that are illegible shall be corrected,
  – refrigerating pipe or components are installed in a position where they are unlikely to e exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

⚠ CAUTION

4.9 Checks to electrical devices
- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures.
- If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with.
- It the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used.
- This shall be reported to the owner of the equipment so all parties are advised.
- Initial safety checks shall include:
  – that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
  – that no live electrical components and wiring are exposed while changing, recovering or purging the system.
  – that there is continuity of earth bonding.

5. Repairs to sealed components
- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc.
- If it is absolutely necessary to have an electrical supply to equipment during servicing then a permanently operating from of leak detection shall be located at the most critical point to warm of a potentially hazardous situation.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected.
  This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- Ensure that the apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
- Replacement parts shall be in accordance with the manufacturer's specifications.

6. Repair to intrinsically safe components
- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
- The test apparatus shall be at the correct rating.
- Replace components only with parts specified by the manufacturer.
- Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

NOTE
The use of silicone sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically sate components do not have to be insulated prior to working on them.

7. Cabling
- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

8. Detection of flammable refrigerants
- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.
- Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.
- Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are
– bubble method
– fluorescent method agents

- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.
- Removal of refrigerant shall be according to Item.9.

9. Removal and evacuation
- When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, for flammable refrigerants it is important that best practice is followed since flammability is a consideration.
- The following procedure shall be adhered to:
  – remove refrigerant;
  – purge the circuit with inert gas; (option for A2L)
  – evacuate;(option for A2L)
  – purge with inert gas ;(option for A2L)
  – open the circuit by cutting or brazing.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- For appliances containing flammable refrigerants, other than A2L refrigerants, the system shall be "flushed" with OFN to render the unit safe for flammable refrigerants.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for purging refrigerant systems.
- For appliances containing flammable refrigerants. other than A2L refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the to system with oxygen-free nitrogen and continuing fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is within the system.
- When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- This operation is absolutely vital if brazing operations on the pipe-work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and that ventilation is available.

10. Charging procedures
- In addition to conventional charging procedures, the following requirements shall be followed.
  – Ensure that contamination of different refrigerants dose not occur when using charging equipment. Hoses of lines shall be as short as possible to minimise the amount of refrigerant contained in them.
  – Cylinders shall be kept in an appropriate according to the instructions.
  – Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
  – Label the system when charging is complete (if not already).
  – Extreme care shall be taken not to overfill the refrigerating system.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas.
- The system shall be leak-tested on completion of charging but prior to commissioning.
- A follow up leak test shall be carried out prior to leaving the site.

11. Decommissioning
- Before carrying out this procedure, it is essential that the technician is' completely familiar with the equipment and all its detail.
- It is recommended good practice that all refrigerants are recovered safely.
- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant.
- It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.
b) Isolate system electrically.
c) Before attempting the procedure ensure that
  – mechanical handling equipment is available, if required, for handling refrigerant cylinders,
  – all personal protective equipment is available and being used correctly,
  – the recovery process is supervised at all times by a competent person,
  – recovery equipment and cylinders conform to the appropriate standards.
d) Pump down refrigerant system, if possible.
e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f) Make sure that cylinder is situated on the scales before recovery takes place.
g) Start the recovery machine and operate in accordance with instructions.
h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
i) Do not exceed the maximum working pressure of the cylinder, even temporarily .
j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k) Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

12. Labelling
- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed.
- For appliances containing flammable refrigerants. ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

⚠ CAUTION

13. Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge is available.
- All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.
- Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants.
- In addition, a set of calibrated weighing scales shall be available and in good working order.
- Hoses shall be complete with leak-free disconnect couplings and in good condition.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release.
  Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged.Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant dose not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.

14. Other safety precautions

- A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts.
- Flammable refrigerant used, refrigerant tubing protected or enclosed to avoid mechanical damage (IEC/EN 60335-2-40/A1).
- Tubing protected to extent that it will not be handled or used for carrying during moving of product (IEC/EN 60335-2-40/A1).
- Flammable refrigerant used, low temperature solder alloys, such as lead/tin alloys, not acceptable for pipe connections (IEC/EN 60335-2-40/A1).
- Do not use flare nut indoor which is locally procured.

Selection of installation location for the indoor unit

● Minimum installation area for indoor unit

⚠ CAUTION

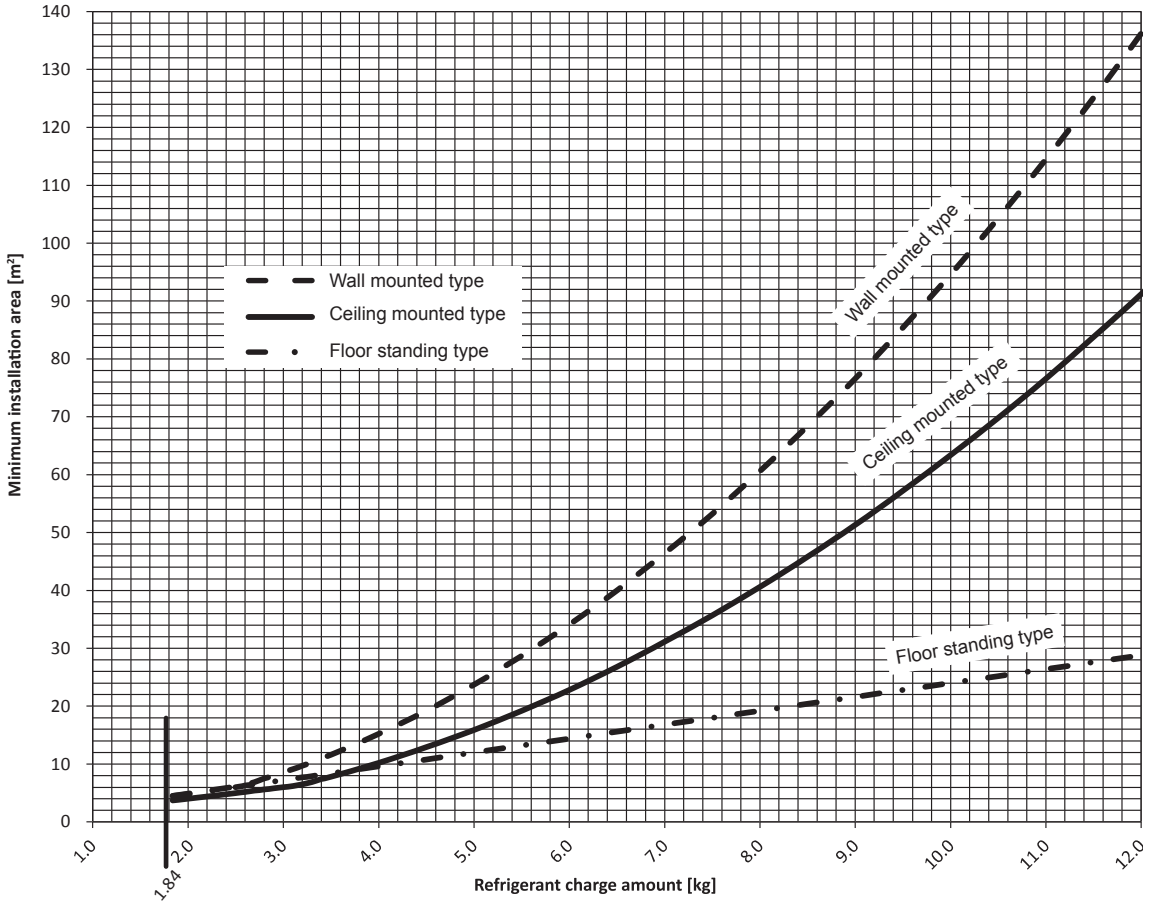
The indoor unit shall be installed in a room with minimum installation area or more according to the refrigerant charge amount (factory refrigerant charge +additional refrigerant charge).
For factory refrigerant charge, refer to the outdoor unit label model name or installation sheet.
For additional refrigerant charge, refer to the outdoor unit installation sheet.

• If the refrigerant charge amount in the system is < 1.84 kg, there are no additional minimum floor area requirements.
• If the refrigerant charge amount in the system is ≧ 1.84 kg, you need to comply with additional minimum floor area requirements as described in the following table.
• For further details regarding the installation location of indoor unit, refer to technical manual.

Refrigerant charge amount [kg]		1.00	1.50	1.84	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50
Minimum installation area [m²]	Ceiling mounted type H=2.2m	No requirements		3.7	4.0	4.5	5.0	5.5	6.0	6.7	7.8	9.0	10.2	11.5	12.9
	Wall mounted type H=1.8m			4.5	4.9	5.5	6.1	7.2	8.6	10.0	11.6	13.3	15.2	17.1	19.2
	Floor standing type*			4.5	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8

Refrigerant charge amount [kg]		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	12.0
Minimum installation area [m²]	Ceiling mounted type H=2.2m	15.9	19.2	22.8	26.8	31.1	35.7	40.6	45.8	51.3	57.2	63.4	69.8	76.6	91.2
	Wall mounted type H=1.8m	23.7	28.7	34.1	40.0	46.4	53.2	60.6	68.4	76.6	85.4	94.6	104.3	114.5	136.2
	Floor standing type*	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8	24.0	25.2	26.4	28.8

*For floor standing units with refrigerant leak sensor system, the minimum installation area is in accordance with IEC 60335-2-40:2018 Clause GG.2.2.



● Ceiling opening area

⚠ CAUTION

In case of installing the indoor unit in an enclosed ceiling space, ensure there is a sufficient ventilation opening around the unit.
In the event of refrigerant leakage, this countermeasure would prevent an increased concentration of refrigerant.

1.10 TECHNICAL INFORMATION

Model FDF71VNXWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDF71VH**
Outdoor unit model name	**FDC71VNX-W**

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Average(mandatory)	**Yes**
Warmer(if designated)	**No**
Colder(if designated)	**No**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**7.10**	kW
heating / Average	Pdesignh	**6.00**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**6.25**	A++
heating / Average	SCOP/A	**4.03**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**6.00**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**7.10**	kW
Tj=30℃	Pdc	**5.05**	kW
Tj=25℃	Pdc	**3.30**	kW
Tj=20℃	Pdc	**1.80**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.61**	-
Tj=30℃	EERd	**5.40**	-
Tj=25℃	EERd	**7.80**	-
Tj=20℃	EERd	**13.0**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**5.42**	kW
Tj=2℃	Pdh	**3.09**	kW
Tj=7℃	Pdh	**2.00**	kW
Tj=12℃	Pdh	**1.43**	kW
Tj=bivalent temperature	Pdh	**6.00**	kW
Tj=operating limit	Pdh	**4.59**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.87**	-
Tj=2℃	COPd	**3.95**	-
Tj=7℃	COPd	**4.90**	-
Tj=12℃	COPd	**6.00**	-
Tj=bivalent temperature	COPd	**2.60**	-
Tj=operating limit	COPd	**2.30**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**16**	W
standby mode	Psb	**16**	W
thermostat-off mode	Pto(cooling)	**18**	W
	Pto(heating)	**39**	W
crankcase heater mode	Pck	**7**	W

Annual electricity consumption			
cooling	Qce	**376**	kWh/a
heating / Average	Qhe	**2085**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**55**	dB(A)
Sound power level(outdoor)	Lwa	**66**	dB(A)
Global warming potential	GWP	**675**	kgCO_2eq.
Rated air flow(indoor)	-	**1080**	m^3/h
Rated air flow(outdoor)	-	**3600**	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

PGA000Z841 B

Model FDF100VNXWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDF100VH**
Outdoor unit model name	**FDC100VNX-W**

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Average(mandatory)	**Yes**
Warmer(if designated)	**No**
Colder(if designated)	**No**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**10.0**	kW
heating / Average	Pdesignh	**11.2**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**6.10**	A++
heating / Average	SCOP/A	**3.84**	A
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**11.2**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**10.0**	kW
Tj=30℃	Pdc	**7.33**	kW
Tj=25℃	Pdc	**4.66**	kW
Tj=20℃	Pdc	**3.35**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.76**	-
Tj=30℃	EERd	**5.33**	-
Tj=25℃	EERd	**7.33**	-
Tj=20℃	EERd	**10.9**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**9.91**	kW
Tj=2℃	Pdh	**5.99**	kW
Tj=7℃	Pdh	**3.85**	kW
Tj=12℃	Pdh	**2.93**	kW
Tj=bivalent temperature	Pdh	**11.2**	kW
Tj=operating limit	Pdh	**9.70**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.66**	-
Tj=2℃	COPd	**3.70**	-
Tj=7℃	COPd	**4.90**	-
Tj=12℃	COPd	**6.05**	-
Tj=bivalent temperature	COPd	**2.31**	-
Tj=operating limit	COPd	**2.00**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**15**	W
standby mode	Psb	**15**	W
thermostat-off mode	Pto(cooling)	**52**	W
	Pto(heating)	**87**	W
crankcase heater mode	Pck	**5**	W

Annual electricity consumption			
cooling	Qce	**574**	kWh/a
heating / Average	Qhe	**4084**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**65**	dB(A)
Sound power level(outdoor)	Lwa	**67**	dB(A)
Global warming potential	GWP	**675**	$kgCO_2eq.$
Rated air flow(indoor)	-	**1620**	m^3/h
Rated air flow(outdoor)	-	**6000**	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

PGA000Z841 B

Model FDF100VSXWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDF100VH**
Outdoor unit model name	**FDC100VSX-W**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**No**
Colder(if designated)	**No**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**10.0**	kW
heating / Average	Pdesignh	**11.2**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**6.10**	A++
heating / Average	SCOP/A	**3.84**	A
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**11.2**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**10.0**	kW
Tj=30℃	Pdc	**7.33**	kW
Tj=25℃	Pdc	**4.66**	kW
Tj=20℃	Pdc	**3.35**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.76**	-
Tj=30℃	EERd	**5.33**	-
Tj=25℃	EERd	**7.33**	-
Tj=20℃	EERd	**10.9**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**9.91**	kW
Tj=2℃	Pdh	**5.99**	kW
Tj=7℃	Pdh	**3.85**	kW
Tj=12℃	Pdh	**2.93**	kW
Tj=bivalent temperature	Pdh	**11.2**	kW
Tj=operating limit	Pdh	**9.70**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.66**	-
Tj=2℃	COPd	**3.70**	-
Tj=7℃	COPd	**4.90**	-
Tj=12℃	COPd	**6.05**	-
Tj=bivalent temperature	COPd	**2.31**	-
Tj=operating limit	COPd	**2.00**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**15**	W
standby mode	Psb	**15**	W
thermostat-off mode	Pto(cooling)	**52**	W
	Pto(heating)	**87**	W
crankcase heater mode	Pck	**5**	W

Annual electricity consumption			
cooling	Qce	**574**	kWh/a
heating / Average	Qhe	**4084**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**65**	dB(A)
Sound power level(outdoor)	Lwa	**67**	dB(A)
Global warming potential	GWP	**675**	$kgCO_2eq.$
Rated air flow(indoor)	-	**1620**	m^3/h
Rated air flow(outdoor)	-	**6000**	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

Model FDF125VNXWVH

Model(s) : FDC125VNX-W / FDF125VH							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency	η s,c	**238.0**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**334.0**	%
Tj=+30℃	Pdc	**9.25**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**490.0**	%
Tj=+25℃	Pdc	**5.94**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**684.0**	%
Tj=+20℃	Pdc	**3.35**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1100.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.015**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.067**	kW	Standby mode	P_{SB}	**0.015**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor	L_{WA}	**68.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PGA000Z841 B

Information to identify the model(s) to which the information relates :	FDC125VNX-W / FDF125VH						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW	Seasonal space heating energy efficiency	η s,h	**153.1**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**10.1**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**260.0**	%
T_j=+2℃	Pdh	**6.09**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**375.0**	%
T_j=+7℃	Pdh	**3.98**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**515.0**	%
T_j=+12℃	Pdh	**2.93**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**610.0**	%
T_{biv}=bivalent temperature	Pdh	**11.4**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**240.0**	%
T_{OL}=operation limit	Pdh	**10.0**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**200.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.015**	kW				
Thermostat-off mode	P_{TO}	**0.087**	kW	Type of energy input Standby mode	P_{SB}	**0.015**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor measured	L_{WA}	**70.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Model FDF125VSXWVH

Model(s) : FDC125VSX-W / FDF125VH							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency	η s,c	**238.0**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**334.0**	%
Tj=+30℃	Pdc	**9.25**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**490.0**	%
Tj=+25℃	Pdc	**5.94**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**684.0**	%
Tj=+20℃	Pdc	**3.35**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1100.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.015**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.067**	kW	Standby mode	P_{SB}	**0.015**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor	L_{WA}	**68.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Information to identify the model(s) to which the information relates :		FDC125VSX-W / FDF125VH					
Outdoor side heat exchanger of heat pump :		air					
Indoor side heat exchanger of heat pump :		air					
Indication if the heater is equipped with a supplementary heater :		No					
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW	Seasonal space heating energy efficiency	η s,h	**151.0**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**12.4**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**256.0**	%
T_j=+2℃	Pdh	**7.56**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**366.0**	%
T_j=+7℃	Pdh	**4.90**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**517.0**	%
T_j=+12℃	Pdh	**2.93**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**612.0**	%
T_{biv}=bivalent temperature	Pdh	**14.0**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**205.0**	%
T_{OL}=operation limit	Pdh	**10.9**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**200.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.015**	kW	Type of energy input Standby mode	P_{SB}	**0.015**	kW
Thermostat-off mode	P_{TO}	**0.087**	kW				
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor measured	L_{WA}	**70.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Model FDF140VNXWVH

Model(s) : FDC140VNX-W / FDF140VH							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**14.0**	kW	Seasonal space cooling energy efficiency	η s,c	**230.0**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**14.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**303.0**	%
Tj=+30℃	Pdc	**10.3**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**463.0**	%
Tj=+25℃	Pdc	**6.57**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**655.0**	%
Tj=+20℃	Pdc	**3.35**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1090.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.015**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.067**	kW	Standby mode	P_{SB}	**0.015**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor	L_{WA}	**69.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :	FDC140VNX-W / FDF140VH						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**16.0**	kW	Seasonal space heating energy efficiency	η s,h	**149.4**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**11.5**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**251.0**	%
T_j=+2℃	Pdh	**7.00**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**356.0**	%
T_j=+7℃	Pdh	**4.50**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**531.0**	%
T_j=+12℃	Pdh	**2.90**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**610.0**	%
T_{biv}=bivalent temperature	Pdh	**13.0**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**230.0**	%
T_{OL}=operation limit	Pdh	**10.9**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**200.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.015**	kW				
Thermostat-off mode	P_{TO}	**0.087**	kW	Type of energy input Standby mode	P_{SB}	**0.015**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor measured	L_{WA}	**71.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Model FDF140VSXWVH

Model(s) :	FDC140VSX-W / FDF140VH						
Outdoor side heat exchanger of air-conditioner :	air						
Indoor side heat exchanger of air-conditioner :	air						
Type :	vapour compression						
if applicable :	electric motor						
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**14.0**	kW	Seasonal space cooling energy efficiency	η s,c	**230.0**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**14.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**303.0**	%
Tj=+30℃	Pdc	**10.3**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**463.0**	%
Tj=+25℃	Pdc	**6.57**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**655.0**	%
Tj=+20℃	Pdc	**3.35**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1090.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.015**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.067**	kW	Standby mode	P_{SB}	**0.015**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor	L_{WA}	**69.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :	FDC140VSX-W / FDF140VH
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**16.0**	kW
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj			
T_j=-7℃	Pdh	**13.7**	kW
T_j=+2℃	Pdh	**8.4**	kW
T_j=+7℃	Pdh	**5.4**	kW
T_j=+12℃	Pdh	**2.9**	kW
T_{biv}=bivalent temperature	Pdh	**15.5**	kW
T_{OL}=operation limit	Pdh	**11.9**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-
Power consumption in modes other than 'active mode'			
Off mode	P_{OFF}	**0.015**	kW
Thermostat-off mode	P_{TO}	**0.087**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW
Other items			
Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**71.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV
GWP of the refrigerant		**675**	kg CO_2eq. (100years)

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η s,h	**146.0**	%
Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**240.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**350.0**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**517.0**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**610.0**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**200.0**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**180.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.015**	kW
For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m^3/h
For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h

Contact details	Mitsubishi heavy industries thermal systems,LTD.

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF140VNXWPVH

Model(s) :	FDC140VNX-W / FDF71VH (x2 units)						
Outdoor side heat exchanger of air-conditioner :	air						
Indoor side heat exchanger of air-conditioner :	air						
Type :	vapour compression						
if applicable :	electric motor						
Item		Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity		Prated,c	**14.0**	kW	Seasonal space cooling energy efficiency	η s,c	**325.0**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)					Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃		Pdc	**14.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**371.0**	%
Tj=+30℃		Pdc	**10.4**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**575.0**	%
Tj=+25℃		Pdc	**6.65**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**906.0**	%
Tj=+20℃		Pdc	**3.56**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1960.0**	%
Degradation coefficient for air conditioners**		Cdc	**0.25**	-				
Power consumption in other than 'active mode'								
Off mode		P_{OFF}	**0.015**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode		P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.015**	kW
Other items								
Capacity control			**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor		L_{WA}	**69.0**	dB				
If engine driven: Emissions of nitrogen oxides		NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant			**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.							

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Information to identify the model(s) to which the information relates :	FDC140VNX-W / FDF71VH (x2 units)						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**16.0**	kW	Seasonal space heating energy efficiency	η s,h	**181.0**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**11.5**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**281.0**	%
T_j=+2℃	Pdh	**7.02**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**420.0**	%
T_j=+7℃	Pdh	**4.45**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**686.0**	%
T_j=+12℃	Pdh	**2.83**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**870.0**	%
T_{biv}=bivalent temperature	Pdh	**13.0**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**240.0**	%
T_{OL}=operation limit	Pdh	**10.3**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**220.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.015**	kW				
Thermostat-off mode	P_{TO}	**0.015**	kW	Type of energy input Standby mode	P_{SB}	**0.015**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor measured	L_{WA}	**71.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF140VSXWPVH

Model(s) :	FDC140VSX-W / FDF71VH (x2 units)						
Outdoor side heat exchanger of air-conditioner :	air						
Indoor side heat exchanger of air-conditioner :	air						
Type :	vapour compression						
if applicable :	electric motor						
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**14.0**	kW	Seasonal space cooling energy efficiency	η s,c	**325.0**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**14.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**371.0**	%
Tj=+30℃	Pdc	**10.4**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**575.0**	%
Tj=+25℃	Pdc	**6.65**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**906.0**	%
Tj=+20℃	Pdc	**3.56**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1960.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.015**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.015**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor	L_{WA}	**69.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :		FDC140VSX-W / FDF71VH (x2 units)					
Outdoor side heat exchanger of heat pump :		air					
Indoor side heat exchanger of heat pump :		air					
Indication if the heater is equipped with a supplementary heater :		No					
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**16.0**	kW	Seasonal space heating energy efficiency	η s,h	**165.0**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**12.7**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**256.0**	%
T_j=+2℃	Pdh	**7.69**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**398.0**	%
T_j=+7℃	Pdh	**4.96**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**587.0**	%
T_j=+12℃	Pdh	**2.83**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**715.0**	%
T_{biv}=bivalent temperature	Pdh	**14.3**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**230.0**	%
T_{OL}=operation limit	Pdh	**11.9**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**210.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.015**	kW				
Thermostat-off mode	P_{TO}	**0.015**	kW	Type of energy input Standby mode	P_{SB}	**0.015**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**6000**	m^3/h
Sound power level, outdoor measured	L_{WA}	**71.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Model FDF71VH, 100VH, 125VH, 140VH

Model(s) : FDF71VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	5.1	kW	Total electric power input	P_{elec}	0.050	kW
Cooling capacity (latent)	$P_{rated,c}$	2.0	kW	Sound power level (per speed setting,if applicable)	L_{WA}	55.0	dB
Heating capacity	$P_{rated,h}$	8.0	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

Model(s) : FDF100VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	7.2	kW	Total electric power input	P_{elec}	0.160	kW
Cooling capacity (latent)	$P_{rated,c}$	2.8	kW	Sound power level (per speed setting,if applicable)	L_{WA}	65.0	dB
Heating capacity	$P_{rated,h}$	11.2	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

Model(s) : FDF125VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	8.5	kW	Total electric power input	P_{elec}	0.210	kW
Cooling capacity (latent)	$P_{rated,c}$	4.0	kW	Sound power level (per speed setting,if applicable)	L_{WA}	67.0	dB
Heating capacity	$P_{rated,h}$	14.0	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

Model(s) : FDF140VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	9.4	kW	Total electric power input	P_{elec}	0.210	kW
Cooling capacity (latent)	$P_{rated,c}$	4.6	kW	Sound power level (per speed setting,if applicable)	L_{WA}	67.0	dB
Heating capacity	$P_{rated,h}$	16.0	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

2. MICRO INVERTER PACKAGED AIR-CONDITIONERS

CONTENTS

■ How to read the model name

Example: FDF 140 VNAW P VH

- VH: Series code
- P: ◌ (blank) : Single type; P : Twin type
- VNAW: Applicable power source...See the specification
- 140: Product capacity
- FDF: Model name (FDF : Floor standing type; FDC : Outdoor unit)

2.1 SPECIFICATIONS

(1) Single type

Item				Model	FDF100VNAWVH	
					Indoor unit **FDF100VH**	Outdoor unit **FDC100VNA-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	10.0 [4.0(Min.) - 11.2(Max.)]	
	Nominal heating capacity (range)			kW	11.2 [4.0(Min.) - 12.5(Max.)]	
	Power consumption		Cooling	kW	3.08	
			Heating		2.94	
	Max power consumption				6.40	
	Running current		Cooling	A	14.9 / 15.6	
			Heating		14.4 / 15.0	
	Inrush current, max current				5 , 24	
	Power factor		Cooling	%	90	
			Heating		89	
	EER		Cooling		3.25	
	COP		Heating		3.81	
	Sound power level		Cooling	dB(A)	65	69
			Heating			70
	Sound pressure level		Cooling		P-Hi : 53 Hi : 51 Me : 49 Lo : 44	54
			Heating			55
	Silent mode sound pressure level				—	48 / 44 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	77
Compressor type & Q'ty					—	RMT5126SWP3 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 27 Hi : 26 Me : 23 Lo : 19	75
			Heating			73
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ 9.52 (3/8") Pipe ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
			Gas line		ϕ 15.88 (5/8") ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher)	Max.15 (Outdoor unit is lower)
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

Item				Model	FDF100VSAWVH	
					Indoor unit **FDF100VH**	Outdoor unit **FDC100VSA-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	10.0 [4.0(Min.) - 11.2(Max.)]	
	Nominal heating capacity (range)			kW	11.2 [4.0(Min.) - 12.5(Max.)]	
	Power consumption		Cooling	kW	3.09	
			Heating		2.94	
	Max power consumption				10.20	
	Running current		Cooling	A	4.8 / 5.0	
			Heating		4.6 / 4.8	
	Inrush current, max current				5 , 15	
	Power factor		Cooling	%	94	
			Heating		93	
	EER		Cooling		3.25	
	COP		Heating		3.81	
	Sound power level		Cooling	dB(A)	65	69
			Heating			70
	Sound pressure level		Cooling		P-Hi : 53 Hi : 51 Me : 49 Lo : 44	54
			Heating			55
	Silent mode sound pressure level				—	48 / 44 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	78
Compressor type & Q'ty					—	RMT5126SWP4 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 27 Hi : 26 Me : 23 Lo : 19	75
			Heating			73
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ 9.52 (3/8") Pipe ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
			Gas line		ϕ 15.88 (5/8") ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher)	Max.15 (Outdoor unit is lower)
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

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Item				Model	FDF125VNAWVH	
					Indoor unit **FDF125VH**	Outdoor unit **FDC125VNA-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	12.5 [5.0(Min.) - 14.0(Max.)]	
	Nominal heating capacity (range)			kW	14.0 [4.0(Min.) - 16.0(Max.)]	
	Power consumption		Cooling	kW	4.65	
			Heating		4.10	
	Max power consumption				6.40	
	Running current		Cooling	A	21.5 / 22.5	
			Heating		19.2 / 20.0	
	Inrush current, max current				5 , 24	
	Power factor		Cooling	%	94	
			Heating		93	
	EER		Cooling		2.69	
	COP		Heating		3.42	
	Sound power level		Cooling	dB(A)	67	71
			Heating			
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	54
			Heating			56
	Silent mode sound pressure level				—	48 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	77
Compressor type & Q'ty					—	RMT5126SWP3 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	75
			Heating			73
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ 9.52 (3/8") Pipe ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
			Gas line		ϕ 15.88 (5/8") ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher)	Max.15 (Outdoor unit is lower)
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C		7˚C	6˚C	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

PGA000Z841 B

Item				Model	FDF125VSAWVH	
					Indoor unit **FDF125VH**	Outdoor unit **FDC125VSA-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	12.5 [5.0(Min.) - 14.0(Max.)]	
	Nominal heating capacity (range)			kW	14.0 [4.0(Min.) - 16.0(Max.)]	
	Power consumption		Cooling	kW	4.65	
			Heating		4.09	
	Max power consumption				10.20	
	Running current		Cooling	A	7.2 / 7.5	
			Heating		6.3 / 6.6	
	Inrush current, max current				5 , 15	
	Power factor		Cooling	%	94	
			Heating		94	
	EER		Cooling		2.69	
	COP		Heating		3.42	
	Sound power level		Cooling	dB(A)	67	71
			Heating			
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	54
			Heating			56
	Silent mode sound pressure level				—	48 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	78
Compressor type & Q'ty					—	RMT5126SWP4 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	75
			Heating			73
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	Liquid line : I/U ϕ 9.52 (3/8") Pipe ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
			Gas line		Gas line : ϕ 15.88 (5/8") ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher)	Max.15 (Outdoor unit is lower)
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

PGA000Z841 B

Item				Model	FDF140VNAWVH	
					Indoor unit **FDF140VH**	Outdoor unit **FDC140VNA-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	13.6 [5.0(Min.) - 14.5(Max.)]	
	Nominal heating capacity (range)			kW	15.5 [4.0(Min.) - 16.5(Max.)]	
	Power consumption		Cooling	kW	5.35	
			Heating		4.98	
	Max power consumption				6.40	
	Running current		Cooling	A	24.0 / 25.1	
			Heating		22.1 / 23.1	
	Inrush current, max current				5 , 24	
	Power factor		Cooling	%	97	
			Heating		98	
	EER		Cooling		2.54	
	COP		Heating		3.11	
	Sound power level		Cooling	dB(A)	67	72
			Heating			73
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	56
			Heating			58
	Silent mode sound pressure level				—	49 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	77
Compressor type & Q'ty					—	RMT5126SWP3 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	75
			Heating			73
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	Liquid line : I/U ϕ 9.52 (3/8") Pipe ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
			Gas line		Gas line : ϕ 15.88 (5/8") ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher) Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C		7˚C	6˚C	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

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Item				Model	FDF140VSAWVH	
					Indoor unit **FDF140VH**	Outdoor unit **FDC140VSA-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	13.6 [5.0(Min.) - 14.5(Max.)]	
	Nominal heating capacity (range)			kW	15.5 [4.0(Min.) - 16.5(Max.)]	
	Power consumption		Cooling	kW	5.42	
			Heating		4.98	
	Max power consumption				10.20	
	Running current		Cooling	A	8.4 / 8.8	
			Heating		7.9 / 8.3	
	Inrush current, max current				5 , 15	
	Power factor		Cooling	%	94	
			Heating		91	
	EER		Cooling		2.51	
	COP		Heating		3.11	
	Sound power level		Cooling	dB(A)	67	72
			Heating			73
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	56
			Heating			58
	Silent mode sound pressure level				—	49 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	78
Compressor type & Q'ty					—	RMT5126SWP4 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	75
			Heating			73
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ 9.52 (3/8") Pipe ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
			Gas line		ϕ 15.88 (5/8") ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher)	Max.15 (Outdoor unit is lower)
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.

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(2) Twin type

Item				Model	FDF140VNAWPVH	
					Indoor unit **FDF71VH (2 units)**	Outdoor unit **FDC140VNA-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	13.6 [5.0(Min.) - 14.5(Max.)]	
	Nominal heating capacity (range)			kW	15.5 [4.0(Min.) - 16.5(Max.)]	
	Power consumption		Cooling	kW	4.46	
			Heating		4.49	
	Max power consumption				6.40	
	Running current		Cooling	A	19.6 / 20.5	
			Heating		19.7 / 20.6	
	Inrush current, max current				5 , 24	
	Power factor		Cooling	%	99	
			Heating		99	
	EER		Cooling		3.05	
	COP		Heating		3.46	
	Sound power level		Cooling	dB(A)	55	72
			Heating			73
	Sound pressure level		Cooling		P-Hi : 42 Hi : 39 Me : 35 Lo : 33	56
			Heating			58
	Silent mode sound pressure level				—	49 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	47	77
Compressor type & Q'ty					—	RMT5126SWP3 x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 18 Hi : 16 Me : 14 Lo : 12	75
			Heating			73
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ 9.52 (3/8") ②ϕ 9.52 (3/8")x0.8 ①ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
			Gas line		ϕ 15.88 (5/8") ②ϕ 15.88 (5/8")x1.0 ①ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.50	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher)	Max.15 (Outdoor unit is lower)
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	—
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 200V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G"×1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

Item			Model	FDF140VSAWPVH	
				Indoor unit **FDF71VH (2 units)**	Outdoor unit **FDC140VSA-W**
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	13.6 [5.0(Min.) - 14.5(Max.)]	
	Nominal heating capacity (range)		kW	15.5 [4.0(Min.) - 16.5(Max.)]	
	Power consumption	Cooling	kW	4.58	
		Heating		4.49	
	Max power consumption			10.20	
	Running current	Cooling	A	6.7 / 7.0	
		Heating		6.6 / 6.9	
	Inrush current, max current			5 , 15	
	Power factor	Cooling	%	99	
		Heating		99	
	EER	Cooling		3.05	
	COP	Heating		3.46	
	Sound power level	Cooling	dB(A)	55	72
		Heating			73
	Sound pressure level	Cooling		P-Hi : 42 Hi : 39 Me : 35 Lo : 33	56
		Heating			58
	Silent mode sound pressure level			—	49 / 45 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	1850 × 600 × 329	845×970×370
Exterior appearance (Munsell color) (RAL color)				Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight			kg	47	78
Compressor type & Q'ty				—	RMT5126SWP4 x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			L	—	0.9 (M-MB75)
Refrigerant (Type, amount, pre-charge length)			kg	R32 3.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Centrifugal fan ×1	Propeller fan ×1
Fan motor (Starting method)			W	157 < Direct line start >	86 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 18 Hi : 16 Me : 14 Lo : 12	75
		Heating			73
Available external static pressure			Pa	0	0
Outside air intake				Not possible	—
Air filter, Quality / Quantity				Plastic net ×1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)	Liquid line	mm	I/U ϕ 9.52 (3/8") ②ϕ 9.52 (3/8")x0.8 ①ϕ 9.52 (3/8")x0.8 O/U ϕ 9.52 (3/8")	
		Gas line		ϕ 15.88 (5/8") ②ϕ 15.88 (5/8")x1.0 ①ϕ 15.88 (5/8")x1.0 ϕ 15.88 (5/8")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.50	
	Vertical height diff. between O/U and I/U		m	Max.50 (Outdoor unit is higher)	Max.15 (Outdoor unit is lower)
	Drain hose			Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height			mm	—	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit	—
Option parts				Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WA1G"×1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U

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Item			Model	FDF200VSAWPVH	
				Indoor unit **FDF100VH (2 units)**	Outdoor unit **FDC200VSA-W**
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	20.0 [6.8(Min.) - 22.4(Max.)]	
	Nominal heating capacity (range)		kW	22.4 [6.6(Min.) - 25.0(Max.)]	
	Power consumption	Cooling	kW	6.71	
		Heating		6.06	
	Max power consumption			12.00	
	Running current	Cooling	A	10.7 / 11.2	
		Heating		9.6 / 10.0	
	Inrush current, max current			5 , 19	
	Power factor	Cooling	%	91	
		Heating		92	
	EER	Cooling		2.98	
	COP	Heating		3.69	
	Sound power level	Cooling	dB(A)	65	72
		Heating			74
	Sound pressure level	Cooling		P-Hi : 53 Hi : 51 Me : 49 Lo : 44	58
		Heating			59
	Silent mode sound pressure level	Cooling		—	55 / 53 (Normal / Silent)
		Heating		—	56 / 54 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	1850 × 600 × 329	1505×970×370
Exterior appearance (Munsell color) (RAL color)				Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight			kg	49	144
Compressor type & Q'ty				—	GTC5150SC40MF x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			L	—	1.55 (M-MB75R)
Refrigerant (Type, amount, pre-charge length)			kg	R32 4.3 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Centrifugal fan ×1	Propeller fan ×2
Fan motor (Starting method)			W	157 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 27 Hi : 26 Me : 23 Lo : 19	148
		Heating			134
Available external static pressure			Pa	0	0
Outside air intake				Not possible	—
Air filter, Quality / Quantity				Plastic net ×1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection.	
Installation data	Refrigerant piping size (O.D.)	Liquid line	mm	I/U ϕ 9.52 (3/8")	Pipe ②ϕ 9.52 (3/8")x0.8 ①ϕ 9.52 (3/8")x0.8 or ϕ 12.7 (1/2")x0.8 O/U ϕ 9.52 (3/8")
		Gas line		I/U ϕ 15.88 (5/8")	Pipe ②ϕ 15.88 (5/8")x1.0 ①ϕ 22.22 (7/8")x1.0 or ϕ 25.4 (1")x1.0 or ϕ 28.58 (1 1/8")x1.0 O/U ϕ 22.22 (7/8")
	Connecting method			Flare piping	Liquid : Flare piping / Gas : Brazing
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.70	
	Vertical height diff. between O/U and I/U		m	Max.50 (Outdoor unit is higher & Outdoor temperature ≦ 43°C)	
				Max.30 (Outdoor unit is higher & Outdoor temperature > 43°C)	
				Max.15 (Outdoor unit is lower)	
	Drain hose			Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height			mm	—	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores + earth cable / Terminal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit	Connecting pipe, Edging
Option parts				Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27˚C	19˚C	35˚C	24˚C	ISO5151-T1
Heating	20˚C		7˚C	6˚C	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WB1G"×1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U
(8) Use 1/2H pipes having a 1.0mm or thicker wall for ϕ 19.05 or larger pipes.

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Item			Model	FDF250VSAWPVH	
				Indoor unit **FDF125VH (2 units)**	Outdoor unit **FDC250VSA-W**
Power source				3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	25.0 [6.8(Min.) - 28.0(Max.)]	
	Nominal heating capacity (range)		kW	28.0 [5.7(Min.) - 31.5(Max.)]	
	Power consumption	Cooling	kW	9.54	
		Heating		8.37	
	Max power consumption			11.20	
	Running current	Cooling	A	14.9 / 15.6	
		Heating		13.4 / 14.0	
	Inrush current, max current			5 , 20	
	Power factor	Cooling	%	93	
		Heating		91	
	EER	Cooling		2.62	
	COP	Heating		3.35	
	Sound power level	Cooling	dB(A)	67	73
		Heating			75
	Sound pressure level	Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	58
		Heating			62
	Silent mode sound pressure level	Cooling		—	56 / 55 (Normal / Silent)
		Heating		—	59 / 58 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)			mm	1850 × 600 × 329	1505×970×370
Exterior appearance (Munsell color) (RAL color)				Ceramic white (N8.0)near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight			kg	49	145
Compressor type & Q'ty				—	GTC5150SC40MF x 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			L	—	1.55 (M-MB75R)
Refrigerant (Type, amount, pre-charge length)			kg	R32 5.1 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Centrifugal fan ×1	Propeller fan ×2
Fan motor (Starting method)			W	157 < Direct line start >	86 x 2 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	148
		Heating			153
Available external static pressure			Pa	0	0
Outside air intake				Not possible	—
Air filter, Quality / Quantity				Plastic net ×1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater			W	—	20 (Crank case heater)
Operation control	Remote control			(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)	Liquid line	mm	I/U ϕ 9.52 (3/8") Pipe ②ϕ 9.52 (3/8")x0.8 ①ϕ 12.7 (1/2")x0.8 O/U ϕ 12.7 (1/2")	
		Gas line		I/U ϕ 15.88 (5/8") Pipe ②ϕ 15.88 (5/8")x1.0 ①ϕ 22.22 (7/8")x1.0 or ϕ 25.4 (1")x1.0 or ϕ 28.58 (1 1/8")x1.0 O/U ϕ 22.22 (7/8")	
	Connecting method			Flare piping	Liquid : Flare piping / Gas : Brazing
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.70	
	Vertical height diff. between O/U and I/U		m	Max.50 (Outdoor unit is higher & Outdoor temperature ≦ 43°C)	
				Max.30 (Outdoor unit is higher & Outdoor temperature > 43°C)	
				Max.15 (Outdoor unit is lower)	
	Drain hose			Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height			mm	—	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5/5	
Interconnecting wires	Size x Core number			ϕ 1.6mm x 3 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number				IPX0	IP24
Standard accessories				Mounting kit	Connecting pipe, Edging
Option parts				Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WB1G"×1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U
(8) Use 1/2H pipes having a 1.0mm or thicker wall for ϕ 19.05 or larger pipes.

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Item				Model	FDF280VSAWPVH	
					Indoor unit **FDF140VH (2 units)**	Outdoor unit **FDC280VSA-W**
Power source					3 Phase, 380-415V 50Hz / 380V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	27.0 [7.5(Min.) - 31.5(Max.)]	
	Nominal heating capacity (range)			kW	30.0 [6.3(Min.) - 33.5(Max.)]	
	Power consumption		Cooling	kW	10.93	
			Heating		9.47	
	Max power consumption				11.40	
	Running current		Cooling	A	16.9 / 17.7	
			Heating		14.3 / 15.0	
	Inrush current, max current				5 , 20	
	Power factor		Cooling	%	94	
			Heating		96	
	EER		Cooling		2.47	
	COP		Heating		3.17	
	Sound power level		Cooling	dB(A)	67	75
			Heating			77
	Sound pressure level		Cooling		P-Hi : 55 Hi : 51 Me : 49 Lo : 44	61
			Heating			63
	Silent mode sound pressure level		Cooling		—	55 / 54 (Normal / Silent)
			Heating		—	56 / 55 (Normal / Silent)
Exterior dimensions (Height x Width x Depth)				mm	1850 × 600 × 329	1505×970×370
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0)near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5/1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	155
Compressor type & Q'ty					—	GTC5150SC40MF x 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	1.55 (M-MB75R)
Refrigerant (Type, amount, pre-charge length)				kg	R32 5.6 in outdoor unit (Incl. the amount for the piping of 30m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan ×1	Propeller fan ×2
Fan motor (Starting method)				W	157 < Direct line start >	86 x 2 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 29 Hi : 26 Me : 23 Lo : 19	136
			Heating			140
Available external static pressure				Pa	0	0
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net ×1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	20 (Crank case heater)
Operation control	Remote control				(Option) Wired : RC-EX3A , RC-E5 , RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Overload protection for fan motor. Frost protection thermostat. Refrigerant leak detection Internal thermostat for fan motor. Abnormal discharge temperature protection	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ 9.52 (3/8") Pipe ②ϕ 9.52 (3/8")x0.8 ①ϕ 12.7 (1/2")x0.8 O/U ϕ 12.7 (1/2")	
			Gas line		I/U ϕ 15.88 (5/8") Pipe ②ϕ 15.88 (5/8")x1.0 ①ϕ 22.22 (7/8")x1.0 or ϕ 25.4 (1")x1.0 or ϕ 28.58 (1 1/8")x1.0 O/U ϕ 22.22 (7/8")	
	Connecting method				Flare piping	Liquid : Flare piping / Gas : Brazing
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.60	
	Vertical height diff. between O/U and I/U			m	Max.50 (Outdoor unit is higher & Outdoor temperature ≦ 43°C)	
					Max.30 (Outdoor unit is higher & Outdoor temperature > 43°C)	
					Max.15 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ 20 x 3 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5/5	
Interconnecting wires	Size x Core number				ϕ 1.6mm x 3 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number					IPX0	IP24
Standard accessories					Mounting kit	Connecting pipe, Edging
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 400V 50Hz or 380V 60Hz.
(6) Indoor unit specifications for one unit. Capacity and operation data is two indoor units are combined and run together.
(7) Branching pipe set "DIS-WB1G"×1(Option). ① : Pipe of O/U-Branch, ② : Pipe of Branch-I/U
(8) Use 1/2H pipes having a 1.0mm or thicker wall for ϕ 19.05 or larger pipes.

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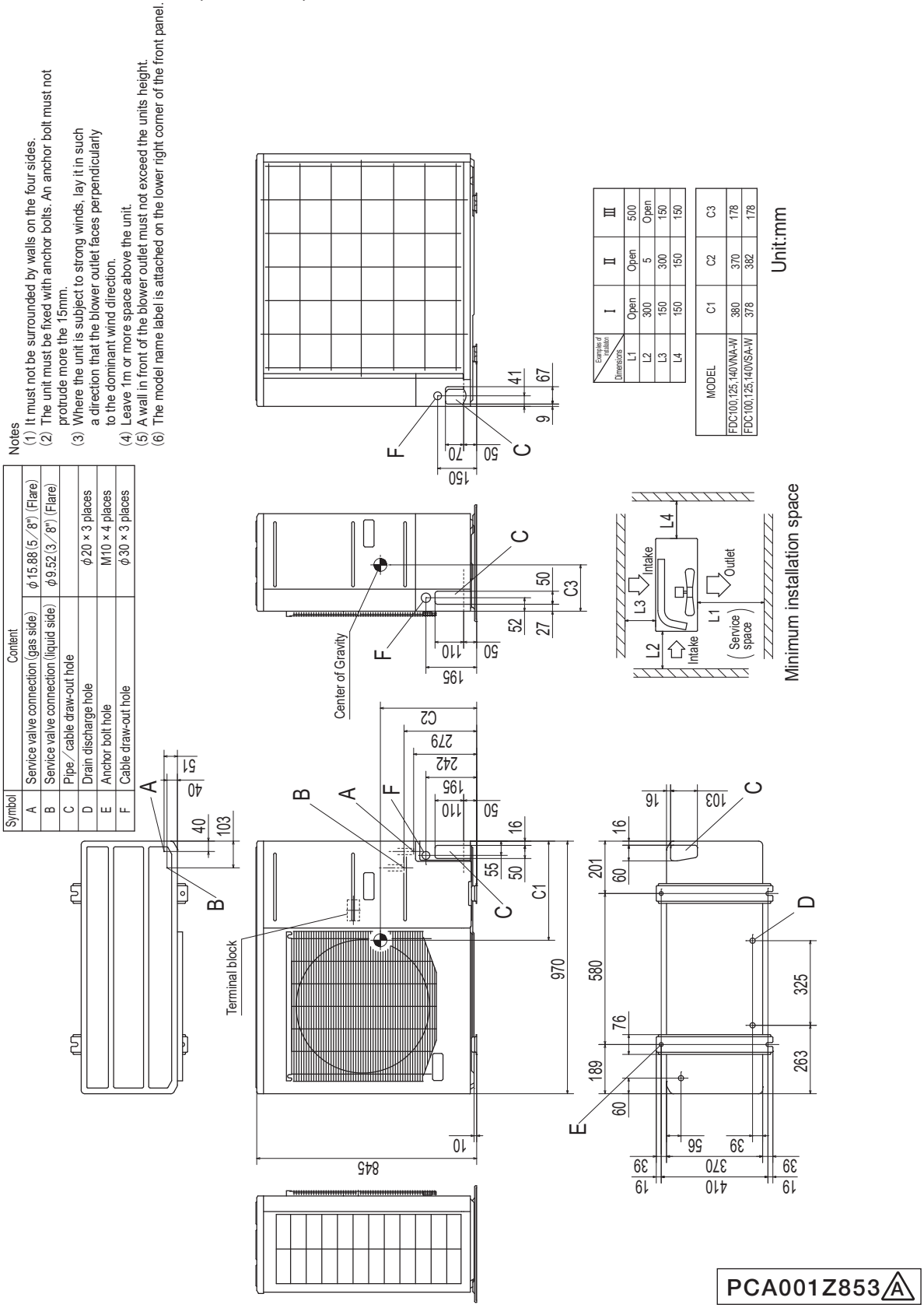
2.2 EXTERIOR DIMENSIONS

(1) Indoor units ..... See page 12.

(2) Outdoor units

Models FDC100VNA-W, 125VNA-W, 140VNA-W

100VSA-W, 125VSA-W, 140VSA-W

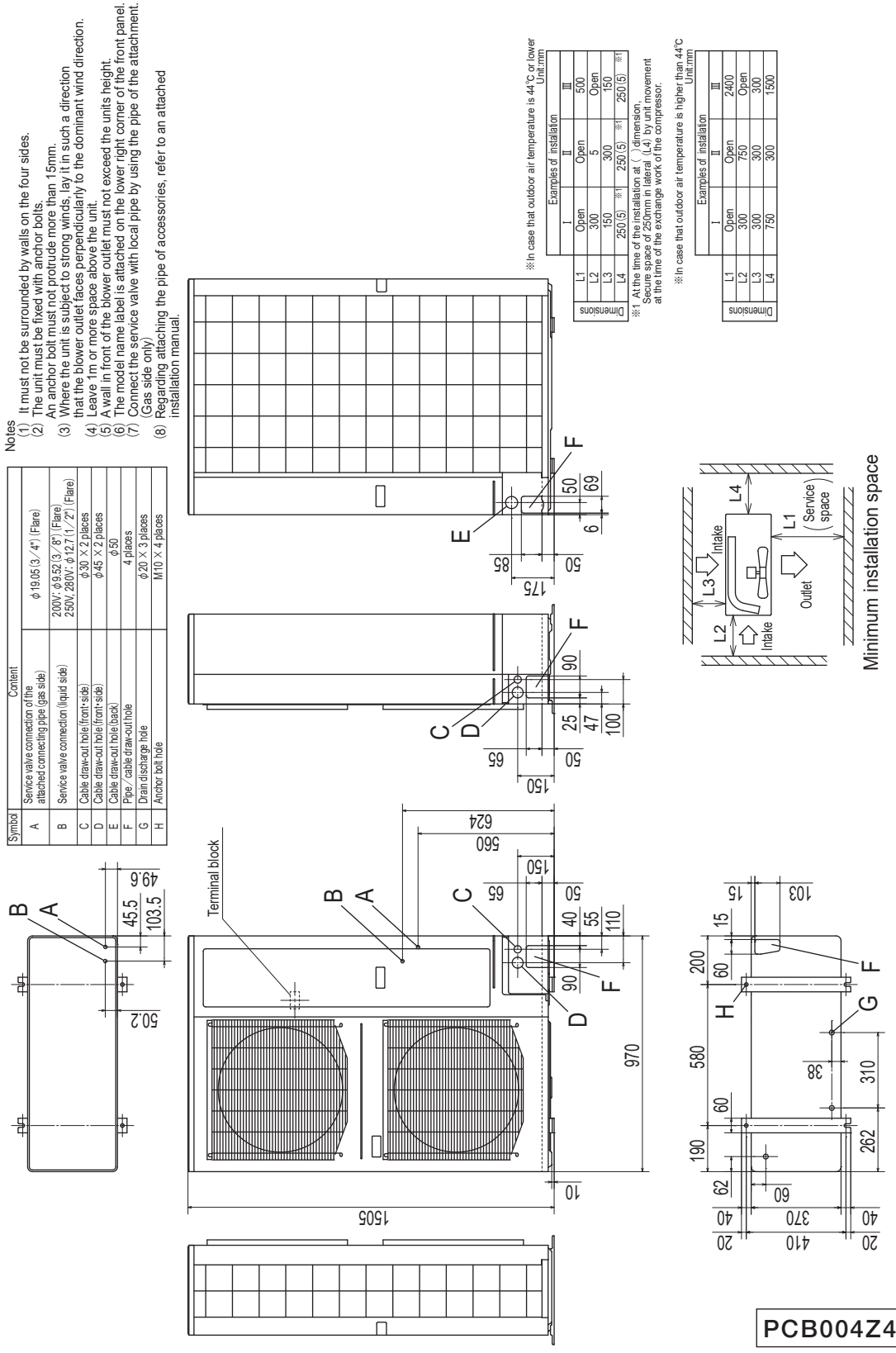


Symbol	Content	
A	Service valve connection (gas side)	φ15.88 (5/8") (Flare)
B	Service valve connection (liquid side)	φ9.52 (3/8") (Flare)
C	Pipe/cable draw-out hole	
D	Drain discharge hole	φ20 × 3 places
E	Anchor bolt hole	M10 × 4 places
F	Cable draw-out hole	φ30 × 3 places

Service of installation / Dimensions	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	150	150	150

MODEL	C1	C2	C3
FDC100,125,140VNA-W	380	370	178
FDC100,125,140VSA-W	378	382	178

Models FDC200VSA-W, 250VSA-W, 280VSA-W



(3) Remote control (Option parts) ..... See page 15.

2.3 ELECTRICAL WIRING

(1) **Indoor units** ..... **See page 18.**

(2) **Outdoor units**

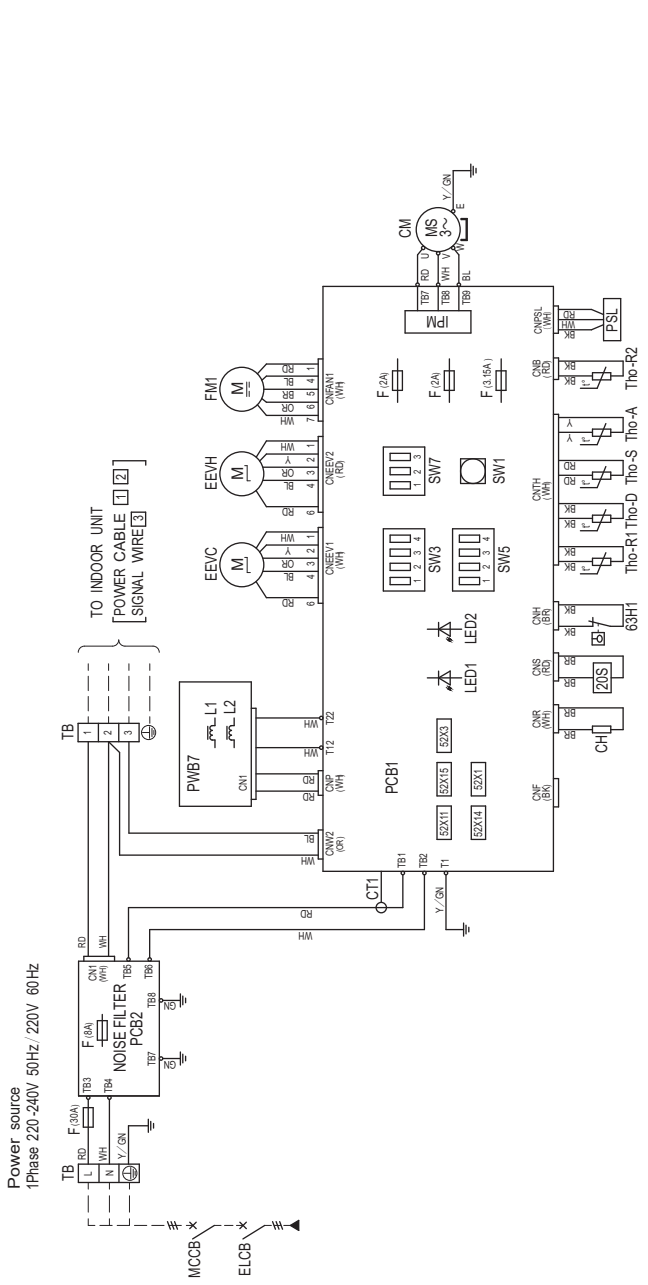
Model FDC100VNA-W, 125VNA-W, 140VNA-W

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
CT1	Current sensor
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1	Fan motor
IPM	Intelligent power module
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
L1,2	Reactor
PSL	Low pressure sensor
SW1	Switch
SW3,5,7	Local setting switch
TB	Terminal block
THo-A	Temperature sensor (Outdoor air)
THo-D	Temperature sesor (Discharge pipe)
THo-R1,R2	Temperature sensor (Heat exchanger)
THo-S	Temperature sensor (Suction pipe)
20S	Solenoid valve for 4-way valve
52X1	Auxiliary relay
52X3	Auxiliary relay
52X11	Auxiliary relay (for 20S)
52X14	Auxiliary relay (for CH)
52X15	Auxiliary relay
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green



Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	indoor-outdoor wire size x number	Earth wire size (mm)
100	24	5.5	22	ϕ 1.6mm x 3	ϕ 1.6
125					
140					

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

Local setting switch SW3,5,7 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ① Trial operation can be performed by using SW3-3,4. ② Compressor will be in the operation when SW3-3 is ON. ③ Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON ④ Be sure to turn OFF SW3-3 after the trial operation is finished.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
SW7-2	Defrost control change	Set this switch to ON when managing unit operation by remote control connected external equipment.
SW7-3	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.

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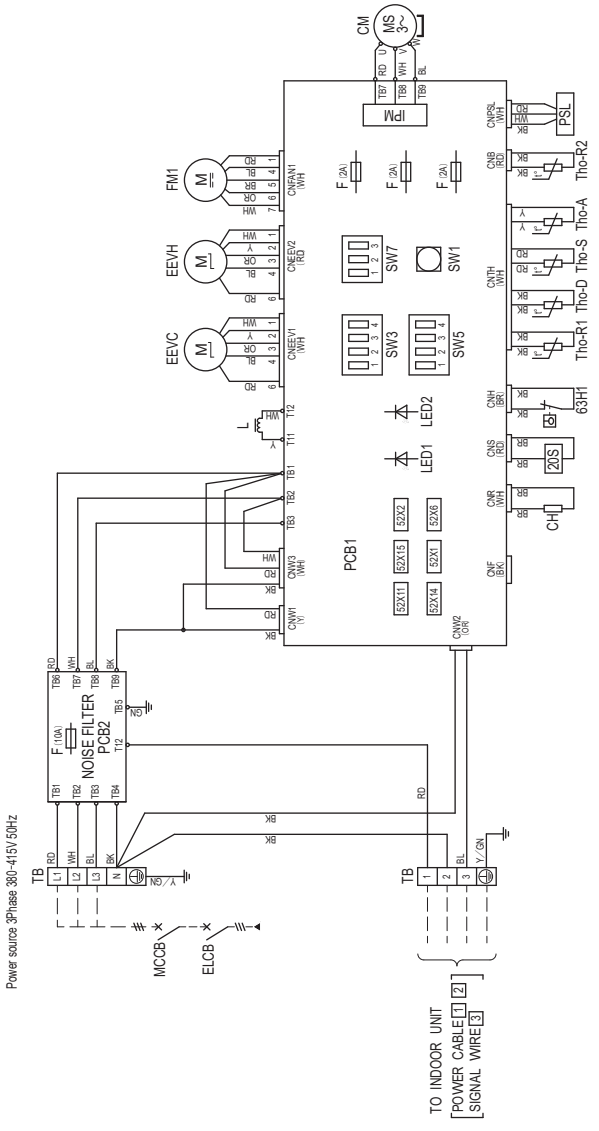
Models FDC100VSA-W, 125VSA-W, 140VSA-W

Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CN	Connector
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
F	Fuse
FM1	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
SW1	Switch
SW3,5,7	Local setting switch
TB	Terminal block
THo-A	Temperature sensor (Outdoor air)
THo-D	Temperature sensor (Discharge pipe)
THo-R1,R2	Temperature sensor (Heat exchanger)
THo-S	Temperature sensor (Suction pipe)
20S	Solenoid valve for 4-way valve
52X1	Auxiliary relay
52X2	Auxiliary relay
52X6	Auxiliary relay (for FM1)
52X11	Auxiliary relay (for 20S)
52X14	Auxiliary relay (for CH)
52X15	Auxiliary relay
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
Y	Yellow
Y/GN	Yellow/Green



Local setting switch SW3,5,7 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON ④Be sure to turn OFF SW3-3 after the trial operation is finished.
SW5-2	High height difference operation control	Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
SW7-2	Defrost control change	Set this switch to ON when managing unit operation by remote control connected external equipment.
SW7-3	Lower noise silent mode	Upper limit of compressor speed and fan speed becomes lower in silent mode.

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	indoor-outdoor wire size x number	Earth wire size (mm)
100 125 140	15	3.5	46	ϕ1.6mm x 3	ϕ1.6

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

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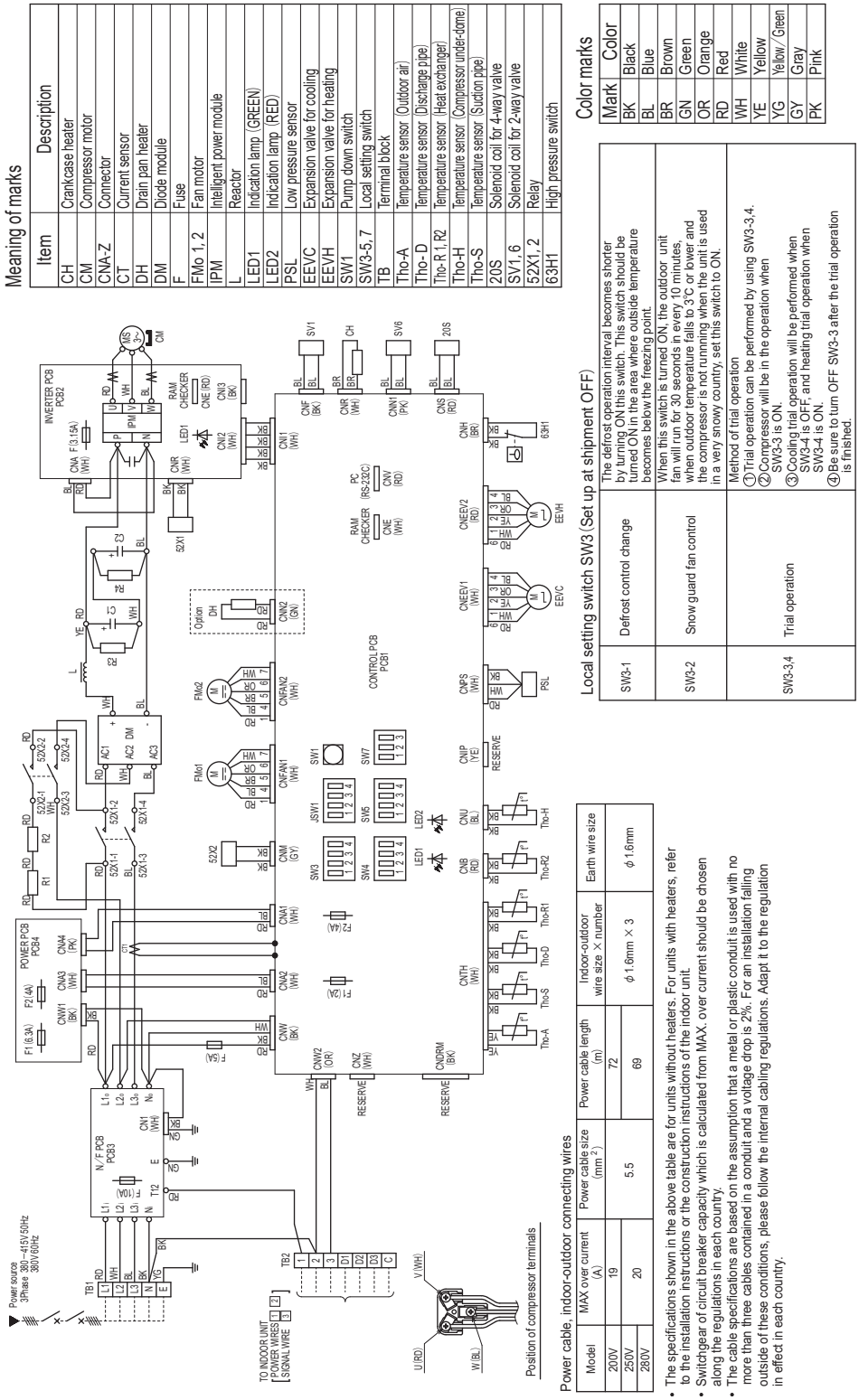
Models FDC200VSA-W, 250VSA-W, 280VSA-W



Meaning of marks

Item	Description
CH	Crankcase heater
CM	Compressor motor
CNA-Z	Connector
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FMo 1, 2	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
PSL	Low pressure sensor
EEVC	Expansion valve for cooling
EEVH	Expansion valve for heating
SW1	Pump down switch
SW3-5, 7	Local setting switch
TB	Terminal block
Tho-A	Temperature sensor (Outdoor air)
Tho-D	Temperature sensor (Discharge pipe)
Tho-R1, R2	Temperature sensor (Heat exchanger)
Tho-H	Temperature sensor (Compressor under-dome)
Tho-S	Temperature sensor (Suction pipe)
20S	Solenoid coil for 4-way valve
SV1, 6	Solenoid coil for 2-way valve
52X1, 2	Relay
63H1	High pressure switch

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
GN	Green
OR	Orange
RD	Red
WH	White
YE	Yellow
YG	Yellow / Green
GY	Gray
PK	Pink

Local setting switch SW3 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrost operation interval becomes shorter by turning ON this switch. This switch should be turned ON in the area where outside temperature becomes below the freezing point.
SW3-2	Snow guard fan control	When this switch is turned ON, the outdoor unit fan will run for 30 seconds in every 10 minutes, when outdoor temperature falls to 3°C or lower and the compressor is not running when the unit is used in a very snowy country, set this switch to ON.
SW3-3,4	Trial operation	Method of trial operation ①Trial operation can be performed by using SW3-3,4. ②Compressor will be in the operation when SW3-3 is ON. ③Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. ④Be sure to turn OFF SW3-3 after the trial operation is finished.

Power cable, indoor-outdoor connecting wires

Model	MAX over current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size × number	Earth wire size
200V	19	5.5	72	φ 1.6mm × 3	φ 1.6mm
250V	20		69		
280V					

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

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2.4 NOISE LEVEL

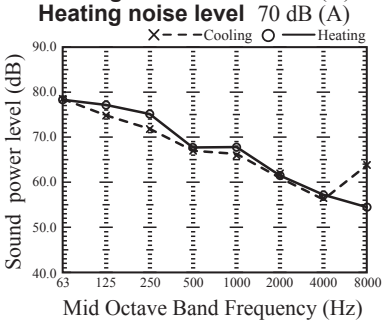
Notes(1) The data are based on the following conditions.
Ambient air temperature: Indoor unit 27℃WB. Outdoor unit 35℃DB.
(2) The data in the chart are measured in an anechoic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor units ..... See page 22.

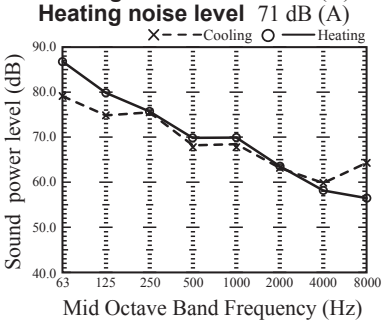
(2) Outdoor units

(a) Sound power level (Rated capacity value)

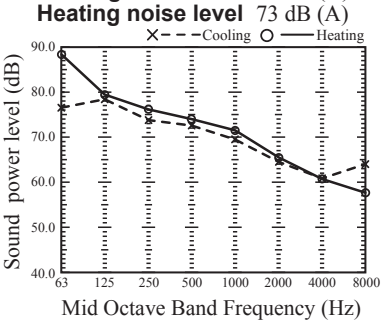
Models FDC100VNA-W,100VSA-W
Cooling noise level 69 dB (A)
Heating noise level 70 dB (A)



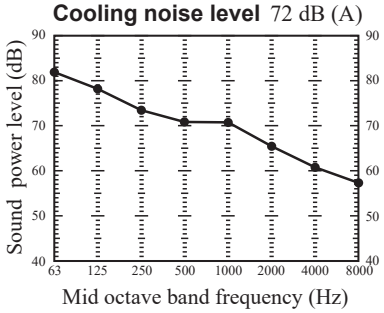
Models FDC125VNA-W,125VSA-W
Cooling noise level 71 dB (A)
Heating noise level 71 dB (A)



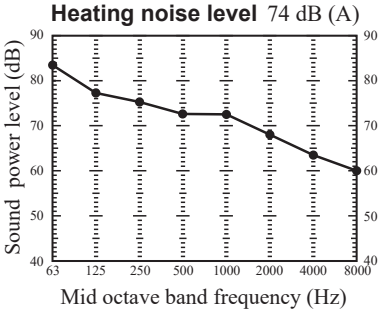
Models FDC140VNA-W,140VSA-W
Cooling noise level 72 dB (A)
Heating noise level 73 dB (A)



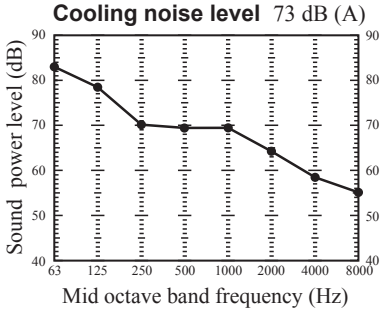
Model FDC200VSA-W
Cooling noise level 72 dB (A)



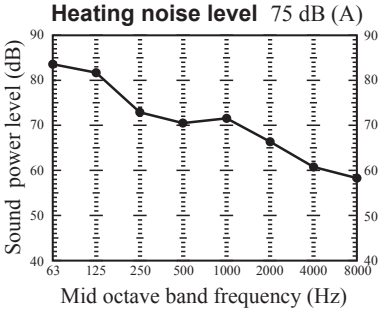
Heating noise level 74 dB (A)



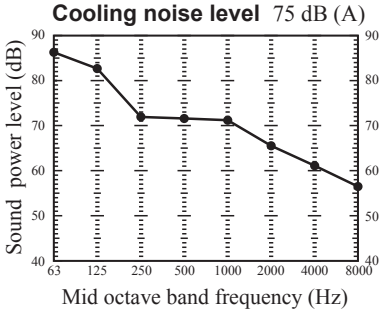
Model FDC250VSA-W
Cooling noise level 73 dB (A)



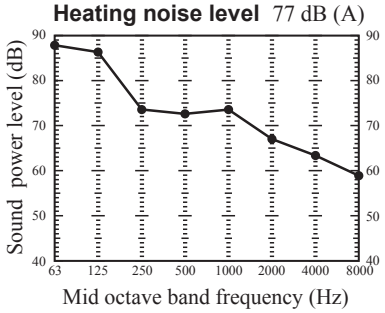
Heating noise level 75 dB (A)



Model FDC280VSA-W
Cooling noise level 75 dB (A)



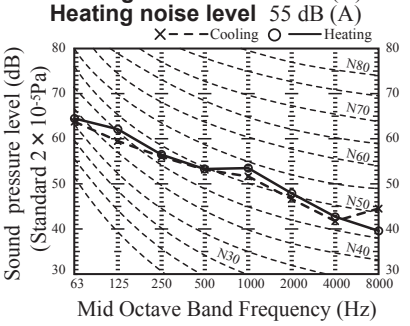
Heating noise level 77 dB (A)



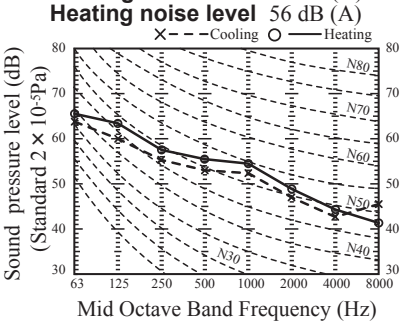
(b) Sound pressure level (Rated capacity value)

Measured based on JIS B 8616
Mike position: at highest noise level in position as mentioned below
Distance from front side 1m
Height 1m

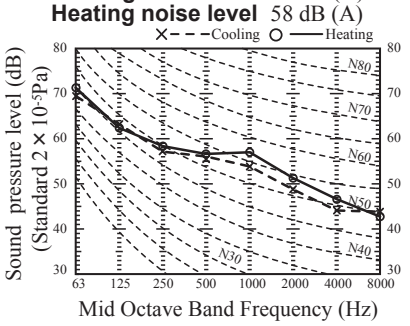
Models FDC100VNA-W,100VSA-W
Cooling noise level 54 dB (A)
Heating noise level 55 dB (A)



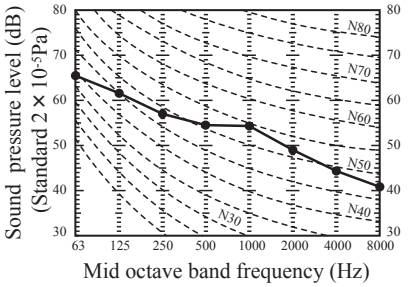
Models FDC125VNA-W,125VSA-W
Cooling noise level 54 dB (A)
Heating noise level 56 dB (A)



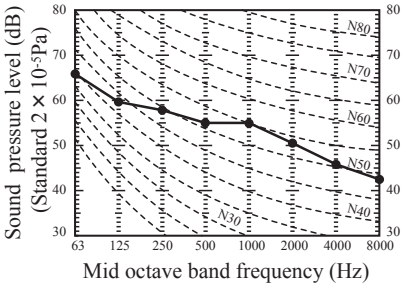
Models FDC140VNA-W,140VSA-W
Cooling noise level 56 dB (A)
Heating noise level 58 dB (A)



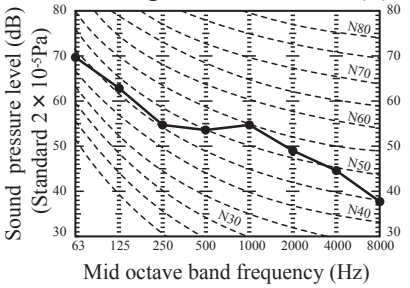
Model FDC200VSA-W
Cooling noise level 58 dB (A)



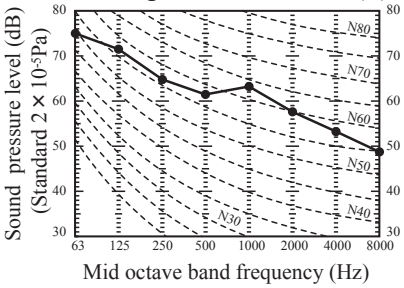
Heating noise level 59 dB (A)



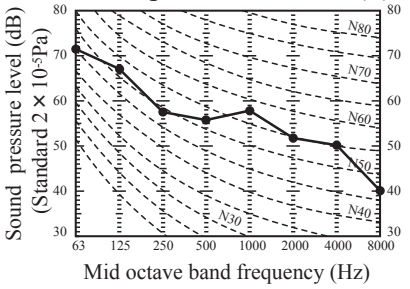
Model FDC250VSA-W
Cooling noise level 58 dB (A)



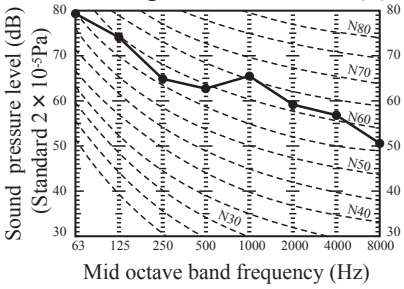
Heating noise level 62 dB (A)



Model FDC280VSA-W
Cooling noise level 61 dB (A)



Heating noise level 63 dB (A)



2.5 TEMPERATURE DISTRIBUTION

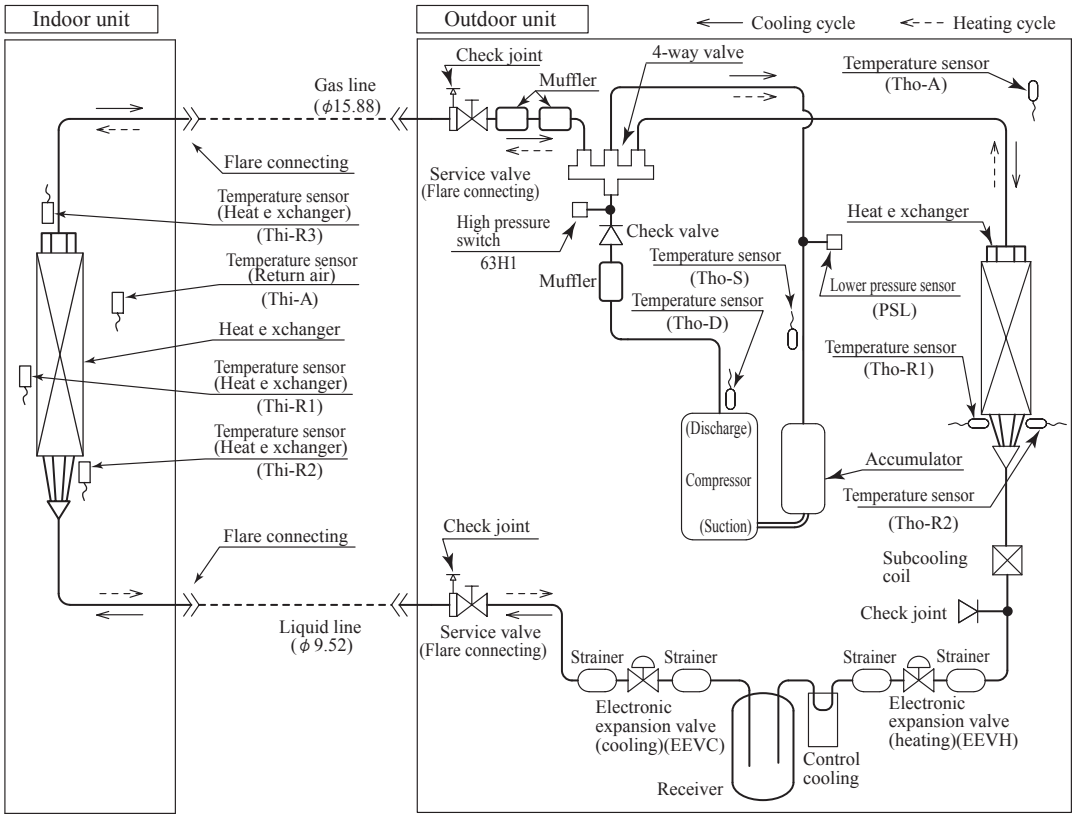
See page 27 of 1.5 chapter.

2.6 PIPING SYSTEM

(1) Models FDC100-140VNA-W, 100-140VSA-W

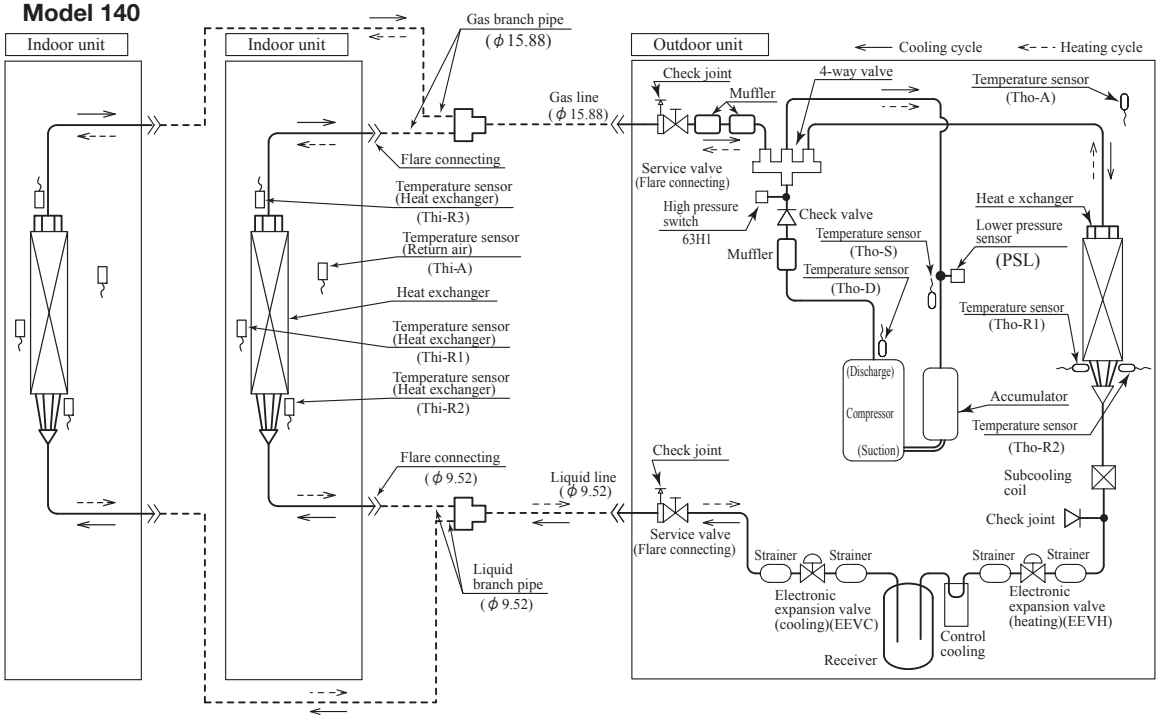
(a) Single type

Models 100, 125, 140



(b) Twin type

Model 140

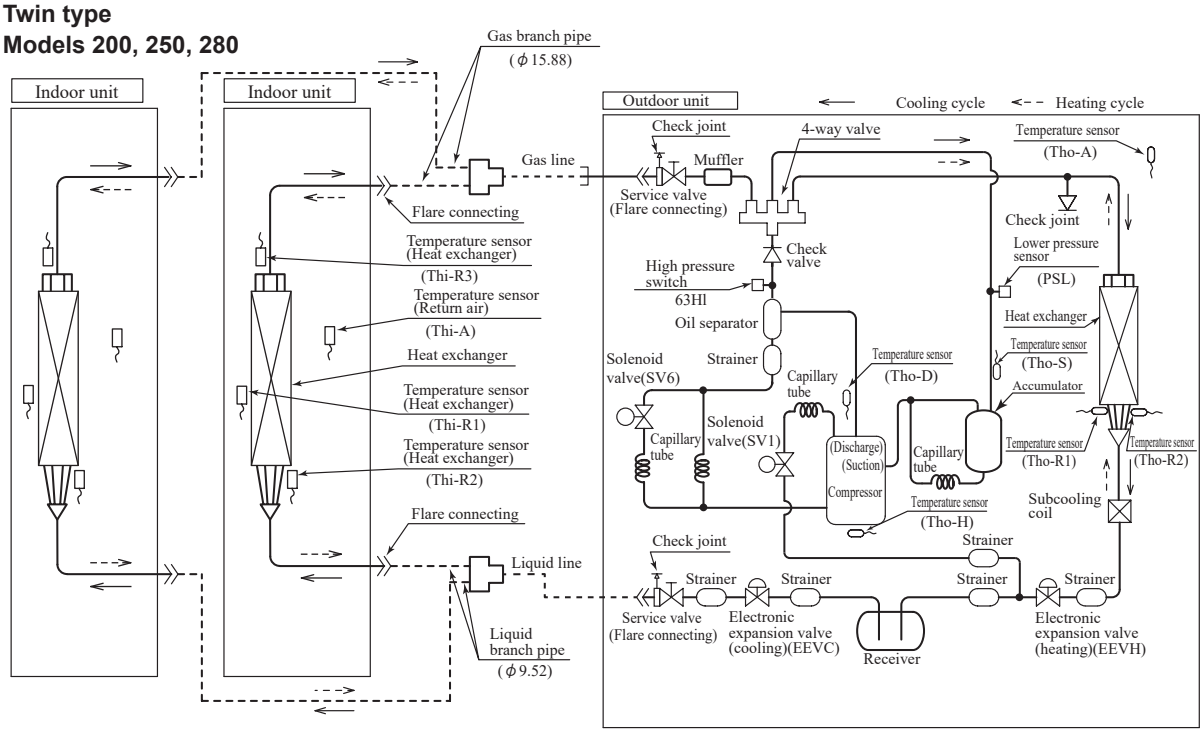


Preset point of the protective devices

Parts name	Mark	Equipped unit	100, 125, 140 model
Temperature sensor (for protection over-loading in heating)	**Thi-R**	Indoor unit	Active 63˚C Inactive 56˚C
Temperature sensor (for frost prevention)	**Thi-R**		Active 1.0˚C Inactive 10˚C
Temperature sensor (for protection high pressure in cooling)	**Tho-R**	Outdoor unit	Active 65˚C Inactive 51˚C
Temperature sensor (for detecting dis-charge pipe temperature)	**Tho-D**	Outdoor unit	Active 115˚C Inactive 85˚C
High pressure switch (for protection)	**63H1**	Outdoor unit	Active 4.15MPa Inactive 3.15MPa
Low pressure sensor (for protection)	**PSL**	Outdoor unit	Active 0.079MPa Inactive 0.227MPa

(2) Models FDC200-280VSA-W

Twin type
Models 200, 250, 280



●**Refrigerant line (one way) pipe size**

Model	Gas line	Liquid line
200	In case of ϕ22.22 : 35m	In case of ϕ9.52 : 40m (200)
250	In case of ϕ25.4 or ϕ28.58 : 70m (200, 250)	In case of ϕ12.7 : 70m (200, 250)
280	60m (280)	60m (280)

Preset point of the protective devices

Parts name	Mark	Equipped unit	200, 250, 280 model
Temperature sensor (for protection over-loading in heating)	**Thi-R**	Indoor unit	Active 63˚C Inactive 56˚C
Temperature sensor (for frost prevention)	**Thi-R**	Indoor unit	Active 1.0˚C Inactive 10˚C
Temperature sensor (for protection high pressure in cooling)	**Tho-R**	Outdoor unit	Active 64˚C Inactive 50˚C
Temperature sensor (for detecting discharge pipe temperature)	**Tho-D**	Outdoor unit	Active 135˚C Inactive 90˚C
High pressure switch (for protection)	**63H1**	Outdoor unit	Active 4.15MPa Inactive 3.15MPa
Low pressure sensor (for protection)	**PSL**	Outdoor unit	Active 0.079MPa Inactive 0.227MPa

2.7 RANGE OF USAGE & LIMITATIONS

(1) Models FDC100-140VNA-W, 100-140VSA-W

Operating temperature range		See next page.
		When used below -5˚C, install a snow hood (locally procured).
Recommendable area to install		Considering to get sufficient heating capacity, the area where the averaged lowest ambient air temperature in day time during winter is above 0˚C, and it has no accumulation of snow.
Installation site		The limitations of installation space are shown in the page for exterior dimensions. Install the indoor unit at least 2.5m higher than the floor surface.
Temperature and humidity conditions surrounding the indoor unit in the ceiling (Note 2)		Dew point temperature : 23˚C or less, relative hummdity : 80% or less
Limitations on unit and piping installation		See page 125.
Compressor ON-OFF cycling	Cycle Time	7 minutes or more (from OFF to OFF) or (from ON to ON)
	Stop Time	3 minutes or more
Power source	Voltage range	Rating ±10%
	Voltage drop at start-up	Min.85% of rating
	Phase-to-phase unbalance	3% or less

Note 1. Do not install the unit in places which :
1) Flammable gas may leak.
2) Carbon fiber, metal particles, powder, etc. are floating.
3) Cosmetic or special sprays are used frequently.
4) Exposed to oil splashes or steam (e.g. kitchen and machine plant).
5) Exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent).
6) Exposed to ammonia substance (e.g. organic fertilizer).
7) Matters affecting devices, such as sulfuric gas, chlorine gas, acid, alkali, etc. may generate or accumulate.
8) Chimney smoke is hanging.
9) Sucking the exhaust gas from heat exchanger.
10) Adjacent to equipment generating electromagnetic waves or high frequency waves.
11) There is light beams that affect the receiving device of indoor unit in case of the wireless specification.
12) Snow falls heavily.
13) At an elevation of 1000 meters or higher.
14) On mobile machine (e.g. vehicle, ship, etc.)
15) Splashed with water to indoor unit (e.g. laundry room).
16) Indoor units of twin and triple specifications separately in a room with partition.

Note 2. If ambient temperature and humidity exceed the above conditions, add polyurethane foam insulation (10mm or thicker) on the outer plate of indoor unit.

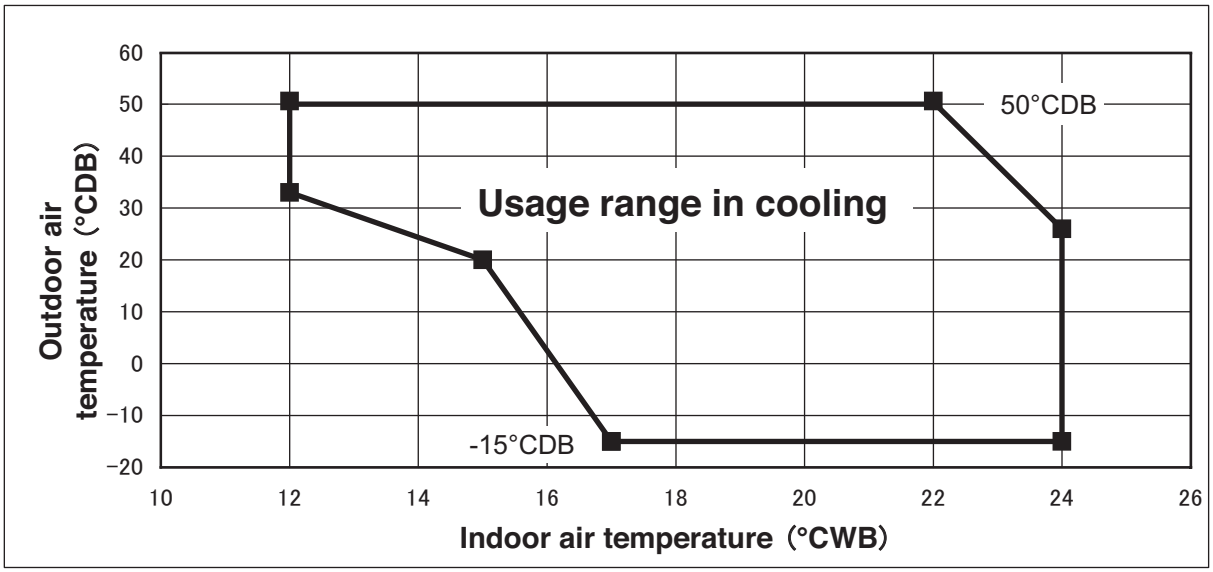
Note 3. Both gas and liquid pipes need to be coverd with 20mm or thicker heat insulation materials at the place where humidity exceeds 70%.

Note 4. When snow accumulate, install a snow hood on site.

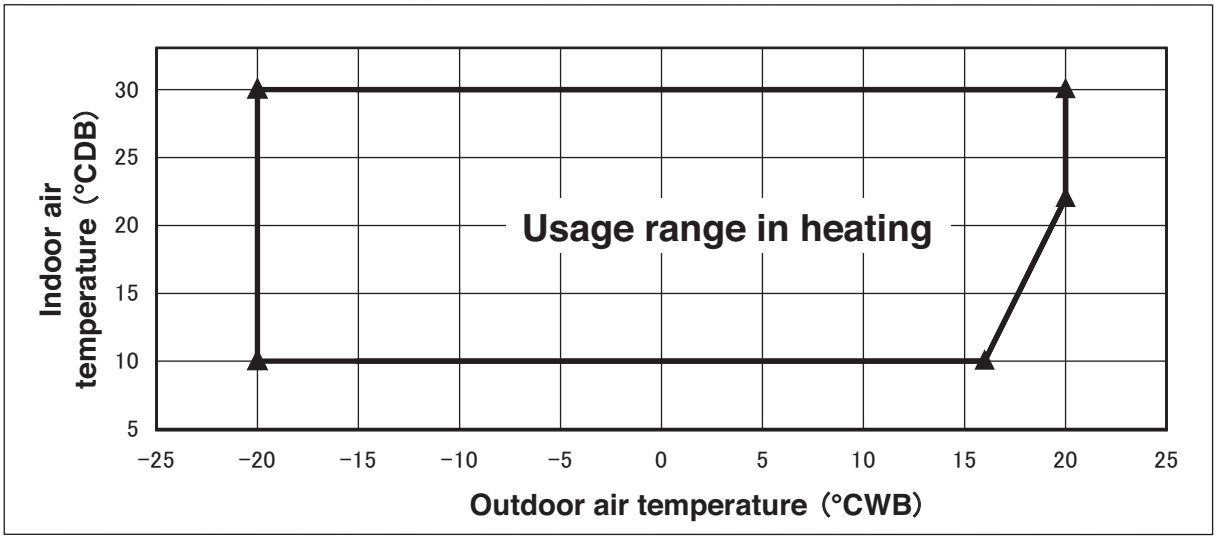
Note 5. The indoor unit shall be installed in a room with minimum installation area or more according to the refrigerant charge amount. (for details, refer to installation sheet)

Operating temperature range

■ **Cooling**



■ **Heating**



Decline in cooling and heating capacity or operation stop may occur when the outdoor unit is installed in places where natural wind can increase or decrease its design air flow rate.

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"CAUTION" Cooling operation under low outdoor air temperature conditions

PAC models can be operated in cooling mode at low outdoor air temperature condition within above temperature range. However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.

[Precaution]

In case of severely low temperature condition

1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, mount the flex flow adapter (prepared as option part) or like such devices onto the outdoor unit in order to divert the strong wind.

[Reason]

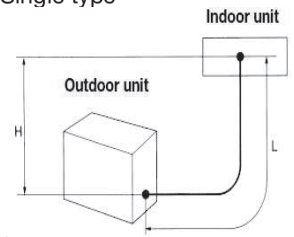
Under the low outdoor air temperature conditions of -5°C or lower, the outdoor fan is controlled at lower or lowest speed by outdoor fan control, but if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop more.

This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

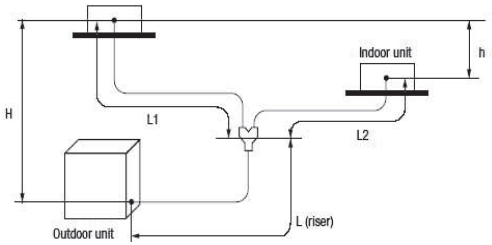
Limitation on unit and piping installation - single,twin.

Descriptions	Model for outdoor units		Dimensional limitations	Marks appearing in the drawing	
				Single type	Twin type
One-way pipe length	100V・125V・140V		≦ 50m	L	L＋L 1+L 2
Main pipe length	100V・125V・140V		≦ 50m		L
One-way pipe length after the first branching point	100V・125V・140V		≦ 30m		L 1, L 2
Difference of pipe length after the first branching point			≦ 10m		L 1-L 2 L 2-L 1
Total pipe length after the second branching point			≦ 15m		
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher	100V・125V・140V	≦ 30m (≦50m) ＊	H	H
	When the outdoor unit is positioned lower	100V・125V・140V	≦ 15m		
Elevation difference among indoor units			≦ 0.5m		h

Single type



Twin type



Twin type

Model for outdoor units	Branch piping set(option)
100V・125V・140V	DIS-WA1G

Notes
(1) A riser pipe must be part of the main.
A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
(2) In case of the outdoor unit is positioned higher, dimensional limitation change from 30m to 50m by changing SW5-2 of outdoor unit control PCB to ON. (＊ mark)

(2) Models FDC200-280VSA-W

Operating temperature range		See next page. When used below -5℃, install a snow hood (Option).
Recommendable area to install		Considering to get sufficient heating capacity, the area where the averaged lowest ambient air temperature in day time during winter is above 0℃, and it has no accumulation of snow.
Installation site		The limitations of installation space are shown in the page for exterior dimensions. Install the indoor unit at least 2.5m higher than the floor surface.
Temperature and humidity conditions surrounding the indoor unit in the ceiling (Note 2)		Dew point temperature : 23℃ or less, relative hummdity : 80% or less
Limitations on unit and piping installation		See pages 128-130.
Limitation of refrigerant		7.95kg See page 124.
Compressor ON-OFF cycling	Cycle time	7 minutes or more (from OFF to OFF) or (from ON to ON)
	Stop time	3 minutes or more
Power source	Voltage range	Rating ±10%
	Voltage drop at start-up	Min.85% of rating
	Phase-to-phase unbalance	3% or less

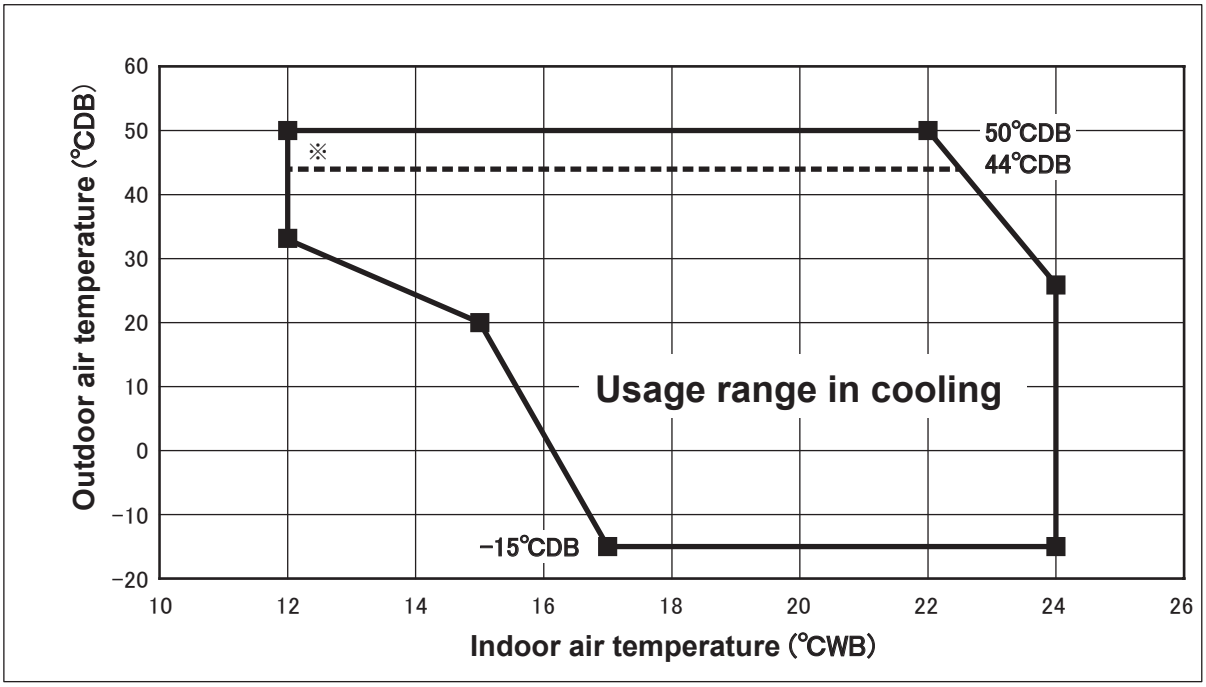
Note 1. Do not install the unit in places which :
1) Flammable gas may leak.
2) Carbon fiber, metal particles, powder, etc. are floating.
3) Cosmetic or special sprays are used frequently.
4) Exposed to oil splashes or steam (e.g. kitchen and machine plant).
5) Exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent).
6) Exposed to ammonia substance (e.g. organic fertilizer).
7) Matters affecting devices, such as sulfuric gas, chlorine gas, acid, alkali, etc. may generate or accumulate.
8) Chimney smoke is hanging.
9) Sucking the exhaust gas from heat exchanger.
10) Adjacent to equipment generating electromagnetic waves or high frequency waves.
11) There is light beams that affect the receiving device of indoor unit in case of the wireless specification.
12) Snow falls heavily.
13) At an elevation of 1000 meters or higher.
14) On mobile machine (e.g. vehicle, ship, etc.)
15) Splashed with water to indoor unit (e.g. laundry room).
16) Indoor units of twin, triple and double-twin specifications separately in a room with partition.
17) Location with receiving heat radiation from another heat source.

Note 2. If ambient temperature and humidity exceed the above conditions, add polyurethane foam insulation (10mm or thicker) on the outer plate of indoor unit.
Both gas and liquid pipes need to be coverd with 20mm or thicker heat insulation materials at the place where humidity exceeds 70%.

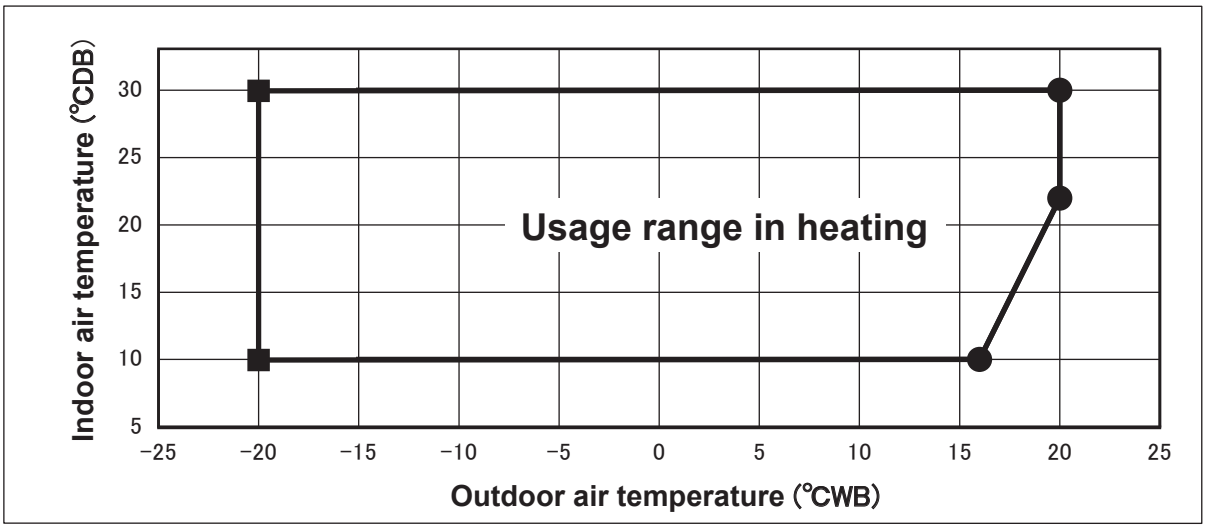
Note 3. When used below -5℃, install a snow hood on site.
Regarding outline of a snow hood, refer to our technical maunal.

Operating temperature range

■ Cooling



■ Heating



Decline in cooling and heating capacity or operation stop may occur when the outdoor unit is installed in places where natural wind can increase or decrease its design air flow rate.

"CAUTION" Cooling operation under low outdoor air temperature conditions

PAC models can be operated in cooling mode at low outdoor air temperature condition within above temperature range. However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.

[Precaution]

In case of severely low temperature condition

1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, mount the flex flow adapter (prepared as optional part) or like such devices onto the outdoor unit in order to divert the strong wind.

[Reason]

Under the low outdoor air temperature conditions of -5℃ or lower, the outdoor fan is controlled at lower or lowest speed by outdoor fan control, but if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop more.

This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

※Strict installation restrictions apply when outdoor temperature exceeds 44℃.
For details, refer to chapter 2.9.4(2) Installation of outdoor unit, 1. HAULAGE AND INSTALLATION, 5) Installation space.

Limitation on unit and piping installation - single,twin,triple,W-twin.

- Check the following points against the specification of the indoor unit and the installation site.
- Observe the following restrictions regarding unit installation and use. Improper installation can cause compressor failure or degradation of performance.
- The total liquid piping length of the system is restricted by the equivalent length (Le).
  The equivalent length (Le) is a virtual length corresponding to an equivalent length of liquid piping using a diameter of 12.7mm.

● FDC200V

Restriction		Dimensional restrictions	Marks appearing in the drawing				
			Single	Twin	Triple (A)	Triple(B)(2)	W–twin
Total equivalent length (Liquid piping)		≦ 70 m	Le	Le	Le	Le	Le
One–way pipe length of refrigerant piping	Liquid piping	≦ 40m (L : φ 9.52)	L	L+L1 L+L2	L+L1, L+L2, L+L3	L+L1 (1)	L+La+L1, L+La+L2 L+Lb+L3, L+Lb+L4
		40–70m(L : φ 12.7)					
	Gas piping	≦ 70m					
Main pipe length	Liquid piping	≦ 70m	L	L	L	L	L
	Gas piping	≦ 35m (L : φ 22.22)					
		35–70m (L : φ 25.4 or φ 28.58)					
One way pipe length from the first branching point to the second branching point		≦ 5m	–	–	–	La	–
One–way pipe length after the first branching point		≦ 30m	–	L1,L2	L1,L2,L3	L1	La+L1, La+L2 La+L3, La+L4
One–way pipe length from the first branching point to indoor units through the second branching point		≦ 27m	–	–	–	La+L2,La+L3	–
One–way pipe length difference from the first branching point to the indoor units	Twin Type, W–Twin	≦ 10m	–	|L1–L2|	–	–	|(L1+La)–(L3+Lb)|, |(L1+La)–(L4+Lb)|, |(L2+La)–(L3+Lb)|, |(L2+La)–(L4+Lb)|, |L1–L2|, |L3–L4|
	Triple Type(A)	≦ 3m	–	–	|L1–L2|,|L2–L3|,|L3–L1|	–	–
	Triple Type(B)	3m – 10m	–	–	–	L1–(La+L2), L1–(La+L3)(1)	–
One–way pipe length difference from the second branching point to the indoor unit		≦ 10m	–	–	–	|L2–L3|	|L1–L2|,|L3–L4|
Total pipe length after the second branching point		≦ 15m	–	–	–	–	L1+L2,L3+L4
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher	≦ 50m (3)	H	H	H	H	H
	When the outdoor unit is positioned lower	≦ 15m					
Elevation difference between indoor units		≦ 0.5m	–	h	h1,h2,h3	h1,h2,h3	h1,h2,h3,h4,h5,h6

[Formula to calculate equivalent length (Le)]

In case of new piping	Le = (length of φ 12.7) + 0.52 × (length of φ 9.52)
In case of existing piping	Le = (length of φ 12.7) + 0.52 × (length of φ 9.52) + 1.56 × (length of φ 15.88)

⚠CAUTION

● For model 200V, always use φ12.7mm liquid main pipe when one-way piping length exceeds 40m and φ9.52mm if it is 40m or less.
If φ9.52mm liquid pipe is used in an installation having one-way pipe longer than 40m, it may cause degradation of performance and/or water drops in the indoor unit.

● Always use φ25.4mm or φ28.58mm gas main pipe "L" when the length of "L" exceeds 35m.
If φ22.22mm gas pipe is used in an installation having one-way pipe longer than 35m, it may cause degradation of performance and/or water drops in the indoor unit.

Notes:

(1) Install the indoor units so that L + L1 becomes the longest one-way pipe.

(2) Connect the indoor unit with the maximum capacity to L1.

(3) If the outdoor temperature is above 43°C, the dimensional restriction is ≦ 30m.

Limitation on unit and piping installation - single,twin,W-twin.

- Check the following points against the specification of the indoor unit and the installation site.
- Observe the following restrictions regarding unit installation and use. Improper installation can cause compressor failure or degradation of performance.
- The total liquid piping length of the system is restricted by the equivalent length (Le).
  The equivalent length (Le) is a virtual length corresponding to an equivalent length of liquid piping using a diameter of 12.7mm.

● **FDC250/280V**

Restriction		Dimensional restrictions	Marks appearing in the drawing			
			Single	Twin	Triple	W-twin
Total equivalent length(Liquid piping)		[250V] ≦ 70m [280V] ≦ 60m	Le	Le		Le
One-way pipe length of refrigerant piping		[250V] ≦ 70m [280V] ≦ 60m	L	L+L1 L+L2		L+La+L1, L+La+L2 L+Lb+L3, L+Lb+L4
Main pipe length	Liquid piping	[250V] ≦ 70m [280V] ≦ 60m	L	L		L
	Gas piping	≦ 35m (L : φ 22.22)				
		[250V] 35-70m [280V] 35-60m (L : φ 25.4 or φ 28.58)				
One-way pipe length after the first branching point		≦ 30m	–	L1,L2		La+L1, La+L2 La+L3, La+L4
One-way pipe length difference from the first branching point to the indoor units		≦ 10m	–	|L1-L2|	–	|(L1+La)-(L3+Lb)|, |(L1+La)-(L4+Lb)|, |(L2+La)-(L3+Lb)|, |(L2+La)-(L4+Lb)|, |L1-L2|, |L3-L4|
One-way pipe length difference from the second branching point to the indoor unit		≦ 10m	–	–		|L1-L2|,|L3-L4|
Total pipe length after the second branching point		≦ 15m	–	–		L1+L2,L3+L4
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher	≦ 50m(3)	H	H		H
	When the outdoor unit is positioned lower	≦ 15m				
Elevation difference between indoor units		≦ 0.5m	–	h		h1,h2,h3,h4,h5,h6

[Formula to calculate equivalent length (Le)]

In case of new piping	Le = (length of φ 12.7) + 0.52 × (length of φ 9.52)
In case of existing piping	Le = (length of φ 12.7) + 0.52 × (length of φ 9.52) + 1.56 × (length of φ 15.88)

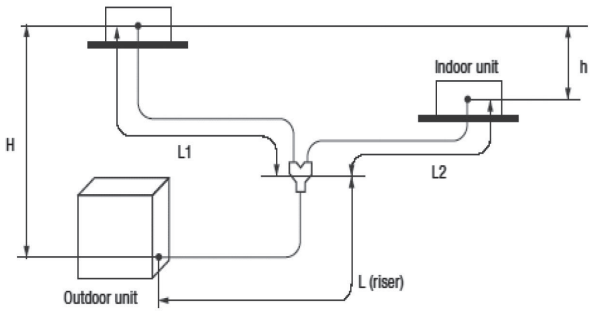
⚠CAUTION

● Always use φ25.4mm or φ28.58mm gas main pipe "L" when the length of "L" exceeds 35m.
If φ22.22mm gas pipe is used in an installation having one-way pipe longer than 35m, it may cause degradation of performance and/or water drops in the indoor unit.

Notes:

(1) If the outdoor temperature is above 43°C, the dimensional restriction is ≦ 30m.

Twin type



Twin type

Model for outdoor units	Branch piping set(Option)
200V・250V・280V	DIS-WB1G

(1) A riser pipe must be part of the main.
A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.

Limitation of refrigerant and additional refrigerant charge

(1) Determine if the factory refrigerant charge of the outdoor unit is sufficient to cover the total liquid piping length.

Item / Capacity	Factory refrigerant charge (kg)	Liquid piping length covered with factory refrigerant charge (m)
200V	4.3	30
250V	5.1	
280V	5.6	

(2) If the factory charge does not cover the total liquid piping length, an addition of refrigerant is necessary.

Step1 - Calculate the total equivalent length, Le:

[Formula to calculate equivalent length (Le)]

In case of new piping	Le = (length of ϕ12.7) + 0.52 × (length of ϕ9.52)
In case of existing piping	Le = (length of ϕ12.7) + 0.52 × (length of ϕ9.52) + 1.56 × (length of ϕ15.88)

Step2 - Determine from the table below the additional refrigerant charge:

Model FDC200 *	Equivalent length (Le)				
	≦30 m	30＜Le≦40 m	40＜Le≦50 m	50＜Le≦60 m	60＜Le≦70 m
Additional refrigerant charge (kg)	0kg	0.20kg	2.11kg	2.98kg	3.65kg

Model FDC250	Equivalent length (Le)				
	≦30 m	30＜Le≦40 m	40＜Le≦50 m	50＜Le≦60 m	60＜Le≦70 m
Additional refrigerant charge (kg)	0kg	0.44kg	1.31kg	2.18kg	2.85kg

Model FDC280	Equivalent length (Le)				
	≦30 m	30＜Le≦40 m	40＜Le≦50 m	50＜Le≦55 m	55＜Le≦60 m
Additional refrigerant charge (kg)	0kg	0.44kg	1.31kg	1.96kg	2.35kg

*For FDC200VSA-W only, even if the total liquid piping length > 30m, there may be cases where additional refrigerant charge is not required.

- It is not necessary to remove or add refrigerant charge even if the total liquid piping length is less than 3 m.
- If an existing pipe system is used, the refrigerant charge will vary according to the liquid pipe size. For further information, see "6. UTILIZATION OF EXISTING PIPING" in chapter 1.10.4 Installation of outdoor unit.

Examples:

FDC250VSA-W - W-twin system with L(ϕ12.7) = 35 m; La(ϕ9.52) = Lb(ϕ9.52) = 5 m;
L1(ϕ9.52) = L2(ϕ9.52) = L3(ϕ9.52) = L4(ϕ9.52) = 3 m
Total liquid piping length = 57 m, additional refrigerant charge is necessary
Step 1: Le = 35 + 0.52 x (5 + 5 + 3 + 3 + 3 + 3) = 46.44 m
Step 2: additional refrigerant charge = 1.31 kg

FDC200VSA-W - Twin system with L(ϕ9.52) = 30 m; L1(ϕ9.52) = L2(ϕ9.52) = 6 m
Total liquid piping length = 42 m, additional refrigerant charge might be necessary
Step 1: Le = 0 + 0.52 x (30 + 6 + 6) = 21.84 m
Step 2: additional refrigerant charge = 0 kg

FDC280VSA-W - Single system with L(ϕ12.7) = 25 m
Total liquid piping length = 25 m, no additional refrigerant charge needed

2.8 SELECTION CHART

Correct the cooling and heating capacity in accordance with the operating conditions. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown in the capacity tables (2.8.1) × Correction factors shown in the table (2.8.2) (2.8.3) (2.8.4)

Caution: In case that the cooling operation during low outdoor air temperature below -5°C is expected, install the outdoor unit where it is not influenced by natural wind. Otherwise protection control by low pressure will be activated much more frequently and it will cause insufficient capacity or breakdown of the compressor in worst case.

2.8.1 Capacity tables

(1) Single type

Model FDF100VNAWVH Indoor unit FDF100VH Outdoor unit FDC100VNA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.02	8.20	11.60	8.24	11.92	8.16	12.55	8.51	13.18	10.99
-10							10.67	8.06	11.23	8.09	11.53	8.02	12.13	8.36	12.73	10.61
-5							10.31	7.92	10.85	7.94	11.35	7.95	12.35	8.44	13.36	11.13
0					8.55	6.89	10.33	7.92	11.22	8.09	11.56	8.03	12.25	8.40	12.93	10.78
5					9.01	7.08	10.41	7.96	11.11	8.05	11.44	7.98	12.09	8.35	12.74	10.62
11					9.41	7.25	10.44	7.97	10.96	7.99	11.36	7.95	12.15	8.37	12.94	10.78
13					9.80	7.42	10.47	7.98	10.81	7.93	11.27	7.92	12.20	8.39	13.13	10.94
15					10.19	7.60	10.50	7.99	10.66	7.87	11.19	7.89	12.26	8.41	13.32	11.11
17					9.83	7.44	10.59	8.03	10.97	7.99	11.40	7.97	12.26	8.41	13.13	10.94
19					10.26	7.62	10.67	8.06	11.27	8.11	11.61	8.04	12.27	8.41	12.94	10.78
21					10.08	7.55	10.56	8.02	11.15	8.06	11.49	8.00	12.15	8.37	12.82	10.68
23					9.90	7.47	10.45	7.97	11.04	8.02	11.37	7.95	12.03	8.33	12.70	10.58
25			9.79	7.88	9.81	7.43	10.40	7.95	10.98	8.00	11.31	7.93	11.97	8.31	12.63	10.53
27			9.62	7.80	9.72	7.39	10.35	7.93	10.92	7.97	11.39	7.96	11.86	8.27		
29			9.42	7.71	9.49	7.29	10.11	7.83	10.69	7.88	11.16	7.88	11.63	8.19		
31			9.21	7.61	9.26	7.19	9.87	7.74	10.46	7.79	10.93	7.79	11.39	8.11		
33	7.82	6.72	8.42	7.24	9.03	7.09	9.64	7.65	10.23	7.71	10.70	7.70	11.16	8.03		
35	7.68	6.65	8.24	7.16	8.80	6.99	9.40	7.55	10.00	7.62	10.46	7.62	10.93	7.95		
37	7.59	6.61	8.11	7.10	8.63	6.92	9.18	7.47	9.72	7.51	10.15	7.50	10.57	7.84		
39	7.50	6.56	7.98	7.04	8.46	6.85	8.95	7.38	9.44	7.41	9.83	7.39	10.22	7.72		
41	7.40	6.52	7.85	6.98	8.29	6.78	8.72	7.29	9.16	7.30	9.51	7.27	9.86	7.60		
43	7.31	6.47	7.72	6.92	8.12	6.71	8.50	7.21	8.88	7.20	9.19	7.16	9.50	7.49		
46	7.17	6.40	7.52	6.84	7.87	6.60	8.16	7.08	8.46	7.05	8.71	6.99	8.97	7.32		
50	5.60	5.49	5.73	5.62	5.90	5.78	6.05	5.93	6.17	6.05	6.28	6.15	6.38	6.26		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	6.47	6.40	6.32	6.24	6.16
-17.7	-18	6.52	6.46	6.40	6.30	6.20
-15.7	-16	7.37	7.29	7.20	7.11	7.02
-13.5	-14	7.66	7.57	7.47	7.38	7.30
-11.5	-12	8.23	8.12	8.01	7.93	7.85
-9.5	-10	8.80	8.67	8.54	8.47	8.40
-7.5	-8	9.38	9.23	9.08	9.02	8.95
-5.5	-6	9.56	9.41	9.26	9.20	9.14
-3.0	-4	9.74	9.59	9.45	9.38	9.32
-1.0	-2	9.92	9.77	9.63	9.57	9.50
1.0	0	10.10	9.96	9.81	9.75	9.68
2.0	1	10.19	10.05	9.91	9.84	9.77
3.0	2	10.45	10.31	10.17	10.10	10.03
5.0	4	10.96	10.82	10.68	10.62	10.55
7.0	6	11.48	11.34	11.20	11.13	11.07
9.0	8	11.79	11.65	11.51	11.45	11.39
11.5	10	12.09	11.96	11.82	11.77	11.71
13.5	12	12.72	12.57	12.41	12.35	12.29
15.5	14	13.35	13.18	13.01	12.94	12.88
16.5	16	13.67	13.49	13.31	13.24	13.17

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Model FDF100VSAWVH Indoor unit FDF100VH Outdoor unit FDC100VSA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							11.02	8.20	11.60	8.24	11.92	8.16	12.55	8.51	13.18	10.99
-10							10.67	8.06	11.23	8.09	11.53	8.02	12.13	8.36	12.73	10.61
-5							10.31	7.92	10.85	7.94	11.35	7.95	12.35	8.44	13.36	11.13
0					8.55	6.89	10.33	7.92	11.22	8.09	11.56	8.03	12.25	8.40	12.93	10.78
5					9.01	7.08	10.41	7.96	11.11	8.05	11.44	7.98	12.09	8.35	12.74	10.62
11					9.41	7.25	10.44	7.97	10.96	7.99	11.36	7.95	12.15	8.37	12.94	10.78
13					9.80	7.42	10.47	7.98	10.81	7.93	11.27	7.92	12.20	8.39	13.13	10.94
15					10.19	7.60	10.50	7.99	10.66	7.87	11.19	7.89	12.26	8.41	13.32	11.11
17					9.83	7.44	10.59	8.03	10.97	7.99	11.40	7.97	12.26	8.41	13.13	10.94
19					10.26	7.62	10.67	8.06	11.27	8.11	11.61	8.04	12.27	8.41	12.94	10.78
21					10.08	7.55	10.56	8.02	11.15	8.06	11.49	8.00	12.15	8.37	12.82	10.68
23					9.90	7.47	10.45	7.97	11.04	8.02	11.37	7.95	12.03	8.33	12.70	10.58
25			9.79	7.88	9.81	7.43	10.40	7.95	10.98	8.00	11.31	7.93	11.97	8.31	12.63	10.53
27			9.62	7.80	9.72	7.39	10.35	7.93	10.92	7.97	11.39	7.96	11.86	8.27		
29			9.42	7.71	9.49	7.29	10.11	7.83	10.69	7.88	11.16	7.88	11.63	8.19		
31			9.21	7.61	9.26	7.19	9.87	7.74	10.46	7.79	10.93	7.79	11.39	8.11		
33	7.82	6.72	8.42	7.24	9.03	7.09	9.64	7.65	10.23	7.71	10.70	7.70	11.16	8.03		
35	7.68	6.65	8.24	7.16	8.80	6.99	9.40	7.55	10.00	7.62	10.46	7.62	10.93	7.95		
37	7.59	6.61	8.11	7.10	8.63	6.92	9.18	7.47	9.72	7.51	10.15	7.50	10.57	7.84		
39	7.50	6.56	7.98	7.04	8.46	6.85	8.95	7.38	9.44	7.41	9.83	7.39	10.22	7.72		
41	7.40	6.52	7.85	6.98	8.29	6.78	8.72	7.29	9.16	7.30	9.51	7.27	9.86	7.60		
43	7.31	6.47	7.72	6.92	8.12	6.71	8.50	7.21	8.88	7.20	9.19	7.16	9.50	7.49		
46	7.17	6.40	7.52	6.84	7.87	6.60	8.16	7.08	8.46	7.05	8.71	6.99	8.97	7.32		
50	5.60	5.49	5.73	5.62	5.90	5.78	6.05	5.93	6.17	6.05	6.28	6.15	6.38	6.26		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	6.47	6.40	6.32	6.24	6.16
-17.7	-18	6.52	6.46	6.40	6.30	6.20
-15.7	-16	7.37	7.29	7.20	7.11	7.02
-13.5	-14	7.66	7.57	7.47	7.38	7.30
-11.5	-12	8.23	8.12	8.01	7.93	7.85
-9.5	-10	8.80	8.67	8.54	8.47	8.40
-7.5	-8	9.38	9.23	9.08	9.02	8.95
-5.5	-6	9.56	9.41	9.26	9.20	9.14
-3.0	-4	9.74	9.59	9.45	9.38	9.32
-1.0	-2	9.92	9.77	9.63	9.57	9.50
1.0	0	10.10	9.96	9.81	9.75	9.68
2.0	1	10.19	10.05	9.91	9.84	9.77
3.0	2	10.45	10.31	10.17	10.10	10.03
5.0	4	10.96	10.82	10.68	10.62	10.55
7.0	6	11.48	11.34	11.20	11.13	11.07
9.0	8	11.79	11.65	11.51	11.45	11.39
11.5	10	12.09	11.96	11.82	11.77	11.71
13.5	12	12.72	12.57	12.41	12.35	12.29
15.5	14	13.35	13.18	13.01	12.94	12.88
16.5	16	13.67	13.49	13.31	13.24	13.17

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF125VNAWVH Indoor unit FDF125VH Outdoor unit FDC125VNA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							13.77	9.64	14.50	9.69	14.89	9.60	15.68	9.94	16.47	13.73
-10							13.34	9.45	14.04	9.50	14.41	9.40	15.16	9.75	15.92	13.27
-5							12.89	9.25	13.56	9.30	14.18	9.31	15.44	9.85	16.69	13.92
0					10.69	8.05	12.92	9.27	14.03	9.49	14.45	9.42	15.31	9.80	16.16	13.47
5					11.27	8.30	13.01	9.31	13.89	9.44	14.30	9.35	15.11	9.73	15.93	13.28
11					11.76	8.52	13.05	9.32	13.70	9.36	14.19	9.31	15.18	9.75	16.17	13.48
13					12.25	8.75	13.09	9.34	13.51	9.28	14.09	9.27	15.25	9.78	16.41	13.68
15					12.74	8.97	13.13	9.36	13.32	9.20	13.99	9.23	15.32	9.80	16.65	13.88
17					12.28	8.76	13.23	9.40	13.71	9.36	14.25	9.33	15.33	9.81	16.41	13.68
19					12.82	9.01	13.34	9.45	14.09	9.52	14.51	9.44	15.34	9.81	16.17	13.48
21					12.60	8.91	13.20	9.39	13.94	9.46	14.36	9.38	15.19	9.76	16.02	13.35
23					12.38	8.80	13.07	9.33	13.80	9.40	14.21	9.32	15.04	9.70	15.87	13.23
25			12.24	9.31	12.26	8.75	13.00	9.30	13.72	9.37	14.14	9.29	14.97	9.67	15.79	13.17
27			12.03	9.21	12.15	8.70	12.93	9.27	13.65	9.34	14.24	9.33	14.83	9.62		
29			11.77	9.08	11.87	8.57	12.64	9.15	13.36	9.22	13.95	9.22	14.53	9.52		
31			11.51	8.95	11.58	8.44	12.34	9.02	13.07	9.10	13.66	9.10	14.24	9.41		
33	9.77	7.90	10.52	8.47	11.29	8.31	12.05	8.90	12.79	8.98	13.37	8.99	13.95	9.31		
35	9.60	7.82	10.30	8.37	11.00	8.18	11.75	8.78	12.50	8.87	13.08	8.88	13.66	9.20		
37	9.49	7.76	10.14	8.29	10.79	8.09	11.47	8.66	12.15	8.73	12.68	8.72	13.21	9.05		
39	9.37	7.70	9.97	8.21	10.58	8.00	11.19	8.55	11.80	8.59	12.28	8.57	12.77	8.89		
41	9.25	7.64	9.81	8.13	10.36	7.90	10.91	8.43	11.45	8.45	11.89	8.42	12.32	8.74		
43	9.14	7.58	9.64	8.06	10.15	7.81	10.62	8.32	11.10	8.32	11.49	8.27	11.88	8.59		
46	8.96	7.49	9.40	7.94	9.83	7.67	10.20	8.15	10.57	8.12	10.89	8.06	11.21	8.37		
50	7.00	6.55	7.16	6.94	7.37	6.66	7.57	7.16	7.72	7.08	7.85	7.00	7.98	7.35		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	7.60	7.51	7.42	7.33	7.24
-17.7	-18	7.80	7.73	7.66	7.54	7.42
-15.7	-16	8.66	8.56	8.46	8.36	8.25
-13.5	-14	8.95	8.84	8.73	8.63	8.53
-11.5	-12	9.52	9.39	9.26	9.17	9.08
-9.5	-10	10.10	9.95	9.80	9.72	9.64
-7.5	-8	10.67	10.50	10.34	10.26	10.19
-5.5	-6	11.13	10.96	10.79	10.72	10.64
-3.0	-4	11.59	11.42	11.25	11.17	11.09
-1.0	-2	12.05	11.87	11.70	11.62	11.54
1.0	0	12.50	12.33	12.16	12.07	11.99
2.0	1	12.73	12.56	12.38	12.30	12.22
3.0	2	13.06	12.88	12.71	12.62	12.54
5.0	4	13.70	13.53	13.35	13.27	13.19
7.0	6	14.35	14.18	14.00	13.92	13.84
9.0	8	14.73	14.56	14.39	14.31	14.24
11.5	10	15.11	14.94	14.78	14.71	14.64
13.5	12	15.90	15.71	15.52	15.44	15.37
15.5	14	16.69	16.48	16.26	16.18	16.09
16.5	16	17.09	16.86	16.63	16.54	16.46

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Model FDF125VSAWVH Indoor unit FDF125VH Outdoor unit FDC125VSA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							13.77	9.64	14.50	9.69	14.89	9.60	15.68	9.94	16.47	13.73
-10							13.34	9.45	14.04	9.50	14.41	9.40	15.16	9.75	15.92	13.27
-5							12.89	9.25	13.56	9.30	14.18	9.31	15.44	9.85	16.69	13.92
0					10.69	8.05	12.92	9.27	14.03	9.49	14.45	9.42	15.31	9.80	16.16	13.47
5					11.27	8.30	13.01	9.31	13.89	9.44	14.30	9.35	15.11	9.73	15.93	13.28
11					11.76	8.52	13.05	9.32	13.70	9.36	14.19	9.31	15.18	9.75	16.17	13.48
13					12.25	8.75	13.09	9.34	13.51	9.28	14.09	9.27	15.25	9.78	16.41	13.68
15					12.74	8.97	13.13	9.36	13.32	9.20	13.99	9.23	15.32	9.80	16.65	13.88
17					12.28	8.76	13.23	9.40	13.71	9.36	14.25	9.33	15.33	9.81	16.41	13.68
19					12.82	9.01	13.34	9.45	14.09	9.52	14.51	9.44	15.34	9.81	16.17	13.48
21					12.60	8.91	13.20	9.39	13.94	9.46	14.36	9.38	15.19	9.76	16.02	13.35
23					12.38	8.80	13.07	9.33	13.80	9.40	14.21	9.32	15.04	9.70	15.87	13.23
25			12.24	9.31	12.26	8.75	13.00	9.30	13.72	9.37	14.14	9.29	14.97	9.67	15.79	13.17
27			12.03	9.21	12.15	8.70	12.93	9.27	13.65	9.34	14.24	9.33	14.83	9.62		
29			11.77	9.08	11.87	8.57	12.64	9.15	13.36	9.22	13.95	9.22	14.53	9.52		
31			11.51	8.95	11.58	8.44	12.34	9.02	13.07	9.10	13.66	9.10	14.24	9.41		
33	9.77	7.90	10.52	8.47	11.29	8.31	12.05	8.90	12.79	8.98	13.37	8.99	13.95	9.31		
35	9.60	7.82	10.30	8.37	11.00	8.18	11.75	8.78	12.50	8.87	13.08	8.88	13.66	9.20		
37	9.49	7.76	10.14	8.29	10.79	8.09	11.47	8.66	12.15	8.73	12.68	8.72	13.21	9.05		
39	9.37	7.70	9.97	8.21	10.58	8.00	11.19	8.55	11.80	8.59	12.28	8.57	12.77	8.89		
41	9.25	7.64	9.81	8.13	10.36	7.90	10.91	8.43	11.45	8.45	11.89	8.42	12.32	8.74		
43	9.14	7.58	9.64	8.06	10.15	7.81	10.62	8.32	11.10	8.32	11.49	8.27	11.88	8.59		
46	8.96	7.49	9.40	7.94	9.83	7.67	10.20	8.15	10.57	8.12	10.89	8.06	11.21	8.37		
50	7.00	6.55	7.16	6.94	7.37	6.66	7.57	7.16	7.72	7.08	7.85	7.00	7.98	7.35		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	7.60	7.51	7.42	7.33	7.24
-17.7	-18	7.80	7.73	7.66	7.54	7.42
-15.7	-16	8.66	8.56	8.46	8.36	8.25
-13.5	-14	8.95	8.84	8.73	8.63	8.53
-11.5	-12	9.52	9.39	9.26	9.17	9.08
-9.5	-10	10.10	9.95	9.80	9.72	9.64
-7.5	-8	10.67	10.50	10.34	10.26	10.19
-5.5	-6	11.13	10.96	10.79	10.72	10.64
-3.0	-4	11.59	11.42	11.25	11.17	11.09
-1.0	-2	12.05	11.87	11.70	11.62	11.54
1.0	0	12.50	12.33	12.16	12.07	11.99
2.0	1	12.73	12.56	12.38	12.30	12.22
3.0	2	13.06	12.88	12.71	12.62	12.54
5.0	4	13.70	13.53	13.35	13.27	13.19
7.0	6	14.35	14.18	14.00	13.92	13.84
9.0	8	14.73	14.56	14.39	14.31	14.24
11.5	10	15.11	14.94	14.78	14.71	14.64
13.5	12	15.90	15.71	15.52	15.44	15.37
15.5	14	16.69	16.48	16.26	16.18	16.09
16.5	16	17.09	16.86	16.63	16.54	16.46

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF140VNAWVH Indoor unit FDF125VH Outdoor unit FDC125VNA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							14.99	10.18	15.78	10.25	16.21	10.14	17.06	10.47	17.92	14.94
-10							14.51	9.96	15.27	10.02	15.68	9.92	16.50	10.25	17.32	14.43
-5							14.03	9.75	14.75	9.80	15.43	9.82	16.80	10.36	18.16	15.14
0					11.63	8.46	14.05	9.76	15.26	10.02	15.73	9.94	16.65	10.31	17.58	14.65
5					12.26	8.75	14.16	9.81	15.11	9.95	15.56	9.87	16.44	10.23	17.33	14.45
11					12.79	9.00	14.20	9.82	14.91	9.87	15.44	9.82	16.52	10.26	17.59	14.67
13					13.33	9.25	14.24	9.84	14.70	9.78	15.33	9.78	16.59	10.29	17.86	14.88
15					13.86	9.51	14.29	9.86	14.50	9.69	15.22	9.73	16.67	10.31	18.12	15.10
17					13.37	9.27	14.40	9.91	14.91	9.87	15.50	9.85	16.68	10.32	17.86	14.88
19					13.95	9.55	14.51	9.96	15.33	10.05	15.78	9.96	16.69	10.32	17.59	14.67
21					13.71	9.43	14.36	9.90	15.17	9.98	15.62	9.90	16.53	10.26	17.43	14.53
23					13.47	9.32	14.22	9.83	15.01	9.91	15.46	9.83	16.36	10.20	17.27	14.39
25			13.32	9.86	13.34	9.26	14.15	9.80	14.93	9.88	15.38	9.80	16.28	10.17	17.18	14.32
27			13.09	9.75	13.22	9.20	14.07	9.77	14.85	9.84	15.49	9.84	16.13	10.11		
29			12.81	9.60	12.91	9.05	13.75	9.63	14.54	9.71	15.18	9.71	15.81	9.99		
31			12.53	9.46	12.60	8.91	13.43	9.49	14.23	9.58	14.86	9.58	15.50	9.87		
33	10.63	8.34	11.45	8.92	12.28	8.76	13.11	9.35	13.91	9.45	14.55	9.45	15.18	9.75		
35	10.45	8.25	11.21	8.80	11.97	8.62	12.79	9.21	13.60	9.32	14.23	9.33	14.86	9.64		
37	10.32	8.18	11.03	8.72	11.74	8.51	12.48	9.08	13.22	9.16	13.80	9.16	14.38	9.46		
39	10.20	8.12	10.85	8.63	11.51	8.41	12.17	8.95	12.84	9.00	13.36	8.99	13.89	9.29		
41	10.07	8.05	10.67	8.54	11.28	8.30	11.87	8.82	12.45	8.85	12.93	8.82	13.41	9.12		
43	9.94	7.99	10.49	8.46	11.04	8.20	11.56	8.70	12.07	8.70	12.50	8.65	12.92	8.95		
46	9.75	7.89	10.22	8.33	10.70	8.05	11.10	8.51	11.50	8.47	11.85	8.41	12.20	8.70		
50	7.61	6.84	7.79	7.22	8.02	6.92	8.23	7.40	8.40	7.32	8.54	7.23	8.68	7.57		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	8.07	7.97	7.88	7.78	7.68
-17.7	-18	8.20	8.13	8.05	7.93	7.80
-15.7	-16	9.19	9.09	8.98	8.87	8.76
-13.5	-14	9.52	9.40	9.29	9.18	9.07
-11.5	-12	10.18	10.04	9.90	9.81	9.71
-9.5	-10	10.84	10.68	10.52	10.43	10.35
-7.5	-8	11.50	11.32	11.14	11.06	10.98
-5.5	-6	12.08	11.89	11.71	11.63	11.55
-3.0	-4	12.65	12.47	12.28	12.20	12.11
-1.0	-2	13.23	13.04	12.85	12.77	12.68
1.0	0	13.81	13.62	13.42	13.33	13.24
2.0	1	14.10	13.90	13.71	13.62	13.53
3.0	2	14.46	14.26	14.07	13.98	13.89
5.0	4	15.17	14.98	14.78	14.69	14.60
7.0	6	15.89	15.69	15.50	15.41	15.32
9.0	8	16.31	16.12	15.93	15.85	15.77
11.5	10	16.73	16.55	16.36	16.28	16.21
13.5	12	17.61	17.39	17.18	17.10	17.01
15.5	14	18.48	18.24	18.00	17.91	17.82
16.5	16	18.92	18.67	18.41	18.32	18.22

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Model FDF140VSAWVH Indoor unit FDF140VH Outdoor unit FDC140VSA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							14.99	10.18	15.78	10.25	16.21	10.14	17.06	10.47	17.92	14.94
-10							14.51	9.96	15.27	10.02	15.68	9.92	16.50	10.25	17.32	14.43
-5							14.03	9.75	14.75	9.80	15.43	9.82	16.80	10.36	18.16	15.14
0					11.63	8.46	14.05	9.76	15.26	10.02	15.73	9.94	16.65	10.31	17.58	14.65
5					12.26	8.75	14.16	9.81	15.11	9.95	15.56	9.87	16.44	10.23	17.33	14.45
11					12.79	9.00	14.20	9.82	14.91	9.87	15.44	9.82	16.52	10.26	17.59	14.67
13					13.33	9.25	14.24	9.84	14.70	9.78	15.33	9.78	16.59	10.29	17.86	14.88
15					13.86	9.51	14.29	9.86	14.50	9.69	15.22	9.73	16.67	10.31	18.12	15.10
17					13.37	9.27	14.40	9.91	14.91	9.87	15.50	9.85	16.68	10.32	17.86	14.88
19					13.95	9.55	14.51	9.96	15.33	10.05	15.78	9.96	16.69	10.32	17.59	14.67
21					13.71	9.43	14.36	9.90	15.17	9.98	15.62	9.90	16.53	10.26	17.43	14.53
23					13.47	9.32	14.22	9.83	15.01	9.91	15.46	9.83	16.36	10.20	17.27	14.39
25			13.32	9.86	13.34	9.26	14.15	9.80	14.93	9.88	15.38	9.80	16.28	10.17	17.18	14.32
27			13.09	9.75	13.22	9.20	14.07	9.77	14.85	9.84	15.49	9.84	16.13	10.11		
29			12.81	9.60	12.91	9.05	13.75	9.63	14.54	9.71	15.18	9.71	15.81	9.99		
31			12.53	9.46	12.60	8.91	13.43	9.49	14.23	9.58	14.86	9.58	15.50	9.87		
33	10.63	8.34	11.45	8.92	12.28	8.76	13.11	9.35	13.91	9.45	14.55	9.45	15.18	9.75		
35	10.45	8.25	11.21	8.80	11.97	8.62	12.79	9.21	13.60	9.32	14.23	9.33	14.86	9.64		
37	10.32	8.18	11.03	8.72	11.74	8.51	12.48	9.08	13.22	9.16	13.80	9.16	14.38	9.46		
39	10.20	8.12	10.85	8.63	11.51	8.41	12.17	8.95	12.84	9.00	13.36	8.99	13.89	9.29		
41	10.07	8.05	10.67	8.54	11.28	8.30	11.87	8.82	12.45	8.85	12.93	8.82	13.41	9.12		
43	9.94	7.99	10.49	8.46	11.04	8.20	11.56	8.70	12.07	8.70	12.50	8.65	12.92	8.95		
46	9.75	7.89	10.22	8.33	10.70	8.05	11.10	8.51	11.50	8.47	11.85	8.41	12.20	8.70		
50	7.61	6.84	7.79	7.22	8.02	6.92	8.23	7.40	8.40	7.32	8.54	7.23	8.68	7.57		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	8.07	7.97	7.88	7.78	7.68
-17.7	-18	8.20	8.13	8.05	7.93	7.80
-15.7	-16	9.19	9.09	8.98	8.87	8.76
-13.5	-14	9.52	9.40	9.29	9.18	9.07
-11.5	-12	10.18	10.04	9.90	9.81	9.71
-9.5	-10	10.84	10.68	10.52	10.43	10.35
-7.5	-8	11.50	11.32	11.14	11.06	10.98
-5.5	-6	12.08	11.89	11.71	11.63	11.55
-3.0	-4	12.65	12.47	12.28	12.20	12.11
-1.0	-2	13.23	13.04	12.85	12.77	12.68
1.0	0	13.81	13.62	13.42	13.33	13.24
2.0	1	14.10	13.90	13.71	13.62	13.53
3.0	2	14.46	14.26	14.07	13.98	13.89
5.0	4	15.17	14.98	14.78	14.69	14.60
7.0	6	15.89	15.69	15.50	15.41	15.32
9.0	8	16.31	16.12	15.93	15.85	15.77
11.5	10	16.73	16.55	16.36	16.28	16.21
13.5	12	17.61	17.39	17.18	17.10	17.01
15.5	14	18.48	18.24	18.00	17.91	17.82
16.5	16	18.92	18.67	18.41	18.32	18.22

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

(2) Twin type

Model FDF140VNAWPVH Indoor unit FDF71VH (2 units) Outdoor unit FDC140VNA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							14.99	10.93	15.78	10.97	16.21	10.86	17.06	11.30	17.92	14.94
-10							14.51	10.74	15.27	10.78	15.68	10.66	16.50	11.11	17.32	14.43
-5							14.03	10.54	14.75	10.57	15.43	10.57	16.80	11.21	18.16	15.14
0					11.63	9.18	14.05	10.55	15.26	10.77	15.73	10.68	16.65	11.16	17.58	14.65
5					12.26	9.45	14.16	10.60	15.11	10.71	15.56	10.61	16.44	11.09	17.33	14.45
11					12.79	9.67	14.20	10.61	14.91	10.63	15.44	10.57	16.52	11.11	17.59	14.67
13					13.33	9.90	14.24	10.63	14.70	10.55	15.33	10.53	16.59	11.14	17.86	14.88
15					13.86	10.14	14.29	10.65	14.50	10.48	15.22	10.49	16.67	11.16	18.12	15.10
17					13.37	9.92	14.40	10.69	14.91	10.64	15.50	10.59	16.68	11.17	17.86	14.88
19					13.95	10.17	14.51	10.74	15.33	10.80	15.78	10.70	16.69	11.17	17.59	14.67
21					13.71	10.07	14.36	10.68	15.17	10.74	15.62	10.64	16.53	11.12	17.43	14.53
23					13.47	9.96	14.22	10.62	15.01	10.67	15.46	10.58	16.36	11.06	17.27	14.39
25			13.32	10.53	13.34	9.91	14.15	10.59	14.93	10.64	15.38	10.55	16.28	11.03	17.18	14.32
27			13.09	10.43	13.22	9.86	14.07	10.56	14.85	10.61	15.49	10.59	16.13	10.98		
29			12.81	10.29	12.91	9.72	13.75	10.43	14.54	10.49	15.18	10.47	15.81	10.87		
31			12.53	10.16	12.60	9.59	13.43	10.31	14.23	10.37	14.86	10.36	15.50	10.77		
33	10.63	8.98	11.45	9.67	12.28	9.46	13.11	10.18	13.91	10.25	14.55	10.24	15.18	10.66		
35	10.45	8.89	11.21	9.56	11.97	9.32	12.79	10.06	13.60	10.14	14.23	10.13	14.86	10.56		
37	10.32	8.83	11.03	9.48	11.74	9.23	12.48	9.94	13.22	9.99	13.80	9.97	14.38	10.40		
39	10.20	8.77	10.85	9.40	11.51	9.13	12.17	9.82	12.84	9.85	13.36	9.82	13.89	10.24		
41	10.07	8.71	10.67	9.32	11.28	9.04	11.87	9.70	12.45	9.71	12.93	9.67	13.41	10.09		
43	9.94	8.65	10.49	9.24	11.04	8.94	11.56	9.59	12.07	9.57	12.50	9.52	12.92	9.94		
46	9.75	8.56	10.22	9.12	10.70	8.80	11.10	9.42	11.50	9.37	11.85	9.29	12.20	9.71		
50	7.61	7.46	7.79	7.64	8.02	7.75	8.23	8.07	8.40	8.23	8.54	8.21	8.68	8.51		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	8.07	7.97	7.88	7.78	7.68
-17.7	-18	8.20	8.13	8.05	7.93	7.80
-15.7	-16	9.19	9.09	8.98	8.87	8.76
-13.5	-14	9.52	9.40	9.29	9.18	9.07
-11.5	-12	10.18	10.04	9.90	9.81	9.71
-9.5	-10	10.84	10.68	10.52	10.43	10.35
-7.5	-8	11.50	11.32	11.14	11.06	10.98
-5.5	-6	12.08	11.89	11.71	11.63	11.55
-3.0	-4	12.65	12.47	12.28	12.20	12.11
-1.0	-2	13.23	13.04	12.85	12.77	12.68
1.0	0	13.81	13.62	13.42	13.33	13.24
2.0	1	14.10	13.90	13.71	13.62	13.53
3.0	2	14.46	14.26	14.07	13.98	13.89
5.0	4	15.17	14.98	14.78	14.69	14.60
7.0	6	15.89	15.69	15.50	15.41	15.32
9.0	8	16.31	16.12	15.93	15.85	15.77
11.5	10	16.73	16.55	16.36	16.28	16.21
13.5	12	17.61	17.39	17.18	17.10	17.01
15.5	14	18.48	18.24	18.00	17.91	17.82
16.5	16	18.92	18.67	18.41	18.32	18.22

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Model FDF140VSAWPVH Indoor unit FDF71VH (2 units) Outdoor unit FDC140VSA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
-15							14.99	10.93	15.78	10.97	16.21	10.86	17.06	11.30	17.92	14.94
-10							14.51	10.74	15.27	10.78	15.68	10.66	16.50	11.11	17.32	14.43
-5							14.03	10.54	14.75	10.57	15.43	10.57	16.80	11.21	18.16	15.14
0					11.63	9.18	14.05	10.55	15.26	10.77	15.73	10.68	16.65	11.16	17.58	14.65
5					12.26	9.45	14.16	10.60	15.11	10.71	15.56	10.61	16.44	11.09	17.33	14.45
11					12.79	9.67	14.20	10.61	14.91	10.63	15.44	10.57	16.52	11.11	17.59	14.67
13					13.33	9.90	14.24	10.63	14.70	10.55	15.33	10.53	16.59	11.14	17.86	14.88
15					13.86	10.14	14.29	10.65	14.50	10.48	15.22	10.49	16.67	11.16	18.12	15.10
17					13.37	9.92	14.40	10.69	14.91	10.64	15.50	10.59	16.68	11.17	17.86	14.88
19					13.95	10.17	14.51	10.74	15.33	10.80	15.78	10.70	16.69	11.17	17.59	14.67
21					13.71	10.07	14.36	10.68	15.17	10.74	15.62	10.64	16.53	11.12	17.43	14.53
23					13.47	9.96	14.22	10.62	15.01	10.67	15.46	10.58	16.36	11.06	17.27	14.39
25			13.32	10.53	13.34	9.91	14.15	10.59	14.93	10.64	15.38	10.55	16.28	11.03	17.18	14.32
27			13.09	10.43	13.22	9.86	14.07	10.56	14.85	10.61	15.49	10.59	16.13	10.98		
29			12.81	10.29	12.91	9.72	13.75	10.43	14.54	10.49	15.18	10.47	15.81	10.87		
31			12.53	10.16	12.60	9.59	13.43	10.31	14.23	10.37	14.86	10.36	15.50	10.77		
33	10.63	8.98	11.45	9.67	12.28	9.46	13.11	10.18	13.91	10.25	14.55	10.24	15.18	10.66		
35	10.45	8.89	11.21	9.56	11.97	9.32	12.79	10.06	13.60	10.14	14.23	10.13	14.86	10.56		
37	10.32	8.83	11.03	9.48	11.74	9.23	12.48	9.94	13.22	9.99	13.80	9.97	14.38	10.40		
39	10.20	8.77	10.85	9.40	11.51	9.13	12.17	9.82	12.84	9.85	13.36	9.82	13.89	10.24		
41	10.07	8.71	10.67	9.32	11.28	9.04	11.87	9.70	12.45	9.71	12.93	9.67	13.41	10.09		
43	9.94	8.65	10.49	9.24	11.04	8.94	11.56	9.59	12.07	9.57	12.50	9.52	12.92	9.94		
46	9.75	8.56	10.22	9.12	10.70	8.80	11.10	9.42	11.50	9.37	11.85	9.29	12.20	9.71		
50	7.61	7.46	7.79	7.64	8.02	7.75	8.23	8.07	8.40	8.23	8.54	8.21	8.68	8.51		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	8.07	7.97	7.88	7.78	7.68
-17.7	-18	8.20	8.13	8.05	7.93	7.80
-15.7	-16	9.19	9.09	8.98	8.87	8.76
-13.5	-14	9.52	9.40	9.29	9.18	9.07
-11.5	-12	10.18	10.04	9.90	9.81	9.71
-9.5	-10	10.84	10.68	10.52	10.43	10.35
-7.5	-8	11.50	11.32	11.14	11.06	10.98
-5.5	-6	12.08	11.89	11.71	11.63	11.55
-3.0	-4	12.65	12.47	12.28	12.20	12.11
-1.0	-2	13.23	13.04	12.85	12.77	12.68
1.0	0	13.81	13.62	13.42	13.33	13.24
2.0	1	14.10	13.90	13.71	13.62	13.53
3.0	2	14.46	14.26	14.07	13.98	13.89
5.0	4	15.17	14.98	14.78	14.69	14.60
7.0	6	15.89	15.69	15.50	15.41	15.32
9.0	8	16.31	16.12	15.93	15.85	15.77
11.5	10	16.73	16.55	16.36	16.28	16.21
13.5	12	17.61	17.39	17.18	17.10	17.01
15.5	14	18.48	18.24	18.00	17.91	17.82
16.5	16	18.92	18.67	18.41	18.32	18.22

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF200VSAWPVH Indoor unit FDF100VH (2 units) Outdoor unit FDC200VSA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					20.38	15.19	21.53	16.20	22.10	16.05	22.81	15.94	24.23	16.72	25.65	16.40
13					20.48	15.23	21.65	16.25	22.24	16.10	22.93	15.98	24.31	16.74	25.68	16.41
15					20.57	15.28	21.78	16.30	22.38	16.16	23.05	16.03	24.38	16.77	25.72	16.42
17					20.59	15.28	21.86	16.34	22.50	16.20	23.15	16.06	24.45	16.79	25.76	16.43
19					20.67	15.32	21.94	16.37	22.61	16.25	23.25	16.10	24.52	16.82	25.80	16.45
21					20.35	15.18	21.58	16.22	22.22	16.10	22.86	15.96	24.13	16.68	25.40	16.32
23					20.04	15.04	21.22	16.07	21.84	15.94	22.47	15.81	23.74	16.55	25.01	16.20
25			18.76	15.38	19.88	14.97	21.04	16.00	21.64	15.87	22.28	15.74	23.54	16.48	24.81	16.14
27			18.61	15.31	19.72	14.90	20.86	15.93	21.45	15.79	22.37	15.77	23.30	16.40		
29			18.31	15.17	19.39	14.76	20.51	15.79	21.09	15.65	22.03	15.64	22.97	16.29		
31			18.01	15.03	19.07	14.62	20.16	15.65	20.72	15.51	21.69	15.52	22.65	16.18		
33	16.68	13.95	17.45	14.77	18.74	14.47	19.81	15.51	20.36	15.37	21.35	15.39	22.33	16.07		
35	16.56	13.89	17.23	14.67	18.41	14.33	19.46	15.37	20.00	15.24	21.00	15.27	22.01	15.96		
37	16.34	13.78	16.98	14.55	18.04	14.18	19.00	15.19	19.54	15.06	20.50	15.08	21.46	15.78		
39	16.12	13.67	16.73	14.43	17.67	14.02	18.54	15.01	19.09	14.89	20.00	14.90	20.92	15.60		
41	15.90	13.56	16.47	14.32	17.29	13.86	18.08	14.83	18.63	14.72	19.50	14.72	20.37	15.42		
43	15.68	13.46	16.22	14.20	16.92	13.70	17.62	14.65	18.17	14.55	19.00	14.54	19.83	15.24		
46	15.34	13.29	15.84	14.03	16.36	13.47	16.93	14.39	17.49	14.30	18.25	14.28	19.01	14.98		
50	11.84	11.60	12.40	12.15	13.04	12.13	13.34	13.06	13.56	12.91	13.77	12.75	13.98	13.43		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	8.95	8.85	8.76	8.65	8.55
-17.7	-18	9.67	9.56	9.46	9.34	9.23
-15.7	-16	10.38	10.27	10.16	10.04	9.92
-13.5	-14	11.10	10.98	10.86	10.73	10.60
-11.5	-12	11.93	11.80	11.67	11.54	11.40
-9.5	-10	12.75	12.61	12.48	12.34	12.20
-7.5	-8	13.57	13.43	13.29	13.14	13.00
-5.5	-6	13.78	13.64	13.51	13.37	13.24
-3.0	-4	13.99	13.86	13.73	13.60	13.47
-1.0	-2	14.20	14.08	13.95	13.83	13.71
1.0	0	14.41	14.29	14.18	14.06	13.94
2.0	1	14.51	14.40	14.29	14.17	14.06
3.0	2	16.19	16.05	15.91	15.79	15.67
5.0	4	19.54	19.35	19.15	19.02	18.89
7.0	6	22.89	22.64	22.40	22.25	22.11
9.0	8	23.99	23.78	23.58	23.42	23.25
11.5	10	25.09	24.92	24.75	24.58	24.40
13.5	12	25.95	25.79	25.63	25.45	25.27
15.5	14	26.82	26.66	26.50	26.32	26.14
16.5	16	27.25	27.10	26.94	26.76	26.57

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Model FDF250VSAWPVH Indoor unit FDF125VH (2 units) Outdoor unit FDC250VSA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					25.67	18.03	27.17	19.11	27.92	18.93	28.75	18.77	30.42	19.53	32.08	19.09
13					25.70	18.05	27.20	19.12	27.95	18.94	28.78	18.78	30.45	19.54	32.11	19.10
15					25.72	18.06	27.23	19.13	27.98	18.96	28.81	18.80	30.48	19.55	32.15	19.12
17					25.73	18.06	27.32	19.17	28.11	19.01	28.94	18.85	30.56	19.58	32.20	19.13
19					25.84	18.12	27.43	19.22	28.26	19.07	29.06	18.90	30.66	19.61	32.25	19.15
21					25.45	17.93	26.98	19.02	27.78	18.87	28.57	18.70	30.17	19.43	31.75	18.98
23					25.05	17.75	26.53	18.83	27.29	18.67	28.08	18.50	29.68	19.25	31.26	18.82
25			23.45	18.11	24.85	17.66	26.30	18.73	27.05	18.57	27.84	18.41	29.43	19.16	31.01	18.74
27			23.26	18.02	24.66	17.56	26.08	18.64	26.81	18.47	27.97	18.46	29.13	19.05		
29			22.89	17.83	24.24	17.37	25.64	18.45	26.35	18.28	27.54	18.29	28.72	18.91		
31			22.51	17.65	23.83	17.19	25.20	18.26	25.91	18.10	27.11	18.12	28.31	18.76		
33	20.84	16.47	21.81	17.31	23.43	17.00	24.76	18.08	25.46	17.92	26.69	17.96	27.92	18.62		
35	20.70	16.39	21.54	17.18	23.02	16.82	24.32	17.89	25.00	17.74	26.26	17.79	27.51	18.48		
37	20.43	16.25	21.27	17.05	22.69	16.67	23.90	17.72	24.54	17.55	25.69	17.57	26.83	18.24		
39	20.32	16.20	21.18	17.00	22.55	16.61	23.67	17.62	24.27	17.45	25.31	17.43	26.35	18.07		
41	20.93	16.51	21.43	17.12	22.36	16.53	23.38	17.50	23.94	17.31	24.88	17.26	25.80	17.88		
43	19.81	15.94	20.68	16.77	21.93	16.33	22.83	17.28	23.34	17.08	24.16	16.99	24.96	17.59		
46	17.88	14.96	18.45	15.72	19.05	15.09	19.72	16.04	20.36	15.94	21.26	15.92	22.15	16.65		
50	11.78	11.55	12.33	12.09	12.97	12.62	13.27	13.01	13.48	13.21	13.69	13.34	13.91	13.63		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	11.35	11.22	11.10	10.97	10.84
-17.7	-18	12.14	12.00	11.87	11.73	11.59
-15.7	-16	12.92	12.78	12.64	12.49	12.35
-13.5	-14	13.71	13.55	13.41	13.25	13.10
-11.5	-12	14.39	14.24	14.08	13.93	13.77
-9.5	-10	15.09	14.92	14.77	14.60	14.45
-7.5	-8	15.77	15.61	15.44	15.28	15.12
-5.5	-6	16.05	15.89	15.73	15.58	15.42
-3.0	-4	16.32	16.17	16.02	15.87	15.72
-1.0	-2	16.59	16.46	16.31	16.17	16.02
1.0	0	16.87	16.74	16.60	16.46	16.32
2.0	1	17.01	16.87	16.74	16.60	16.47
3.0	2	19.33	19.16	19.00	18.85	18.71
5.0	4	23.97	23.74	23.50	23.33	23.17
7.0	6	28.61	28.30	28.00	27.81	27.64
9.0	8	29.99	29.73	29.47	29.27	29.07
11.5	10	31.36	31.15	30.95	30.73	30.50
13.5	12	32.44	32.24	32.03	31.82	31.59
15.5	14	33.52	33.33	33.13	32.91	32.68
16.5	16	34.07	33.87	33.67	33.44	33.22

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF280VSAWPVH Indoor unit FDF140VH (2 units) Outdoor unit FDC280VSA-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					27.72	19.01	29.34	20.07	30.15	19.88	31.05	19.71	32.85	20.44	34.65	19.98
13					27.75	19.03	29.37	20.08	30.18	19.89	31.08	19.72	32.88	20.45	34.68	19.99
15					27.78	19.04	29.41	20.10	30.22	19.91	31.12	19.74	32.92	20.47	34.72	20.00
17					27.79	19.04	29.51	20.14	30.36	19.97	31.25	19.80	33.01	20.50	34.77	20.02
19					27.91	19.10	29.62	20.19	30.52	20.04	31.39	19.85	33.11	20.54	34.83	20.04
21					27.48	18.90	29.14	19.98	30.00	19.82	30.86	19.63	32.58	20.34	34.29	19.85
23					27.06	18.69	28.65	19.76	29.48	19.59	30.33	19.41	32.05	20.14	33.76	19.67
25			25.32	19.06	26.84	18.59	28.41	19.65	29.22	19.48	30.07	19.31	31.78	20.03	33.49	19.57
27			25.12	18.95	26.63	18.49	28.17	19.54	28.96	19.37	30.21	19.36	31.46	19.91		
29			24.72	18.75	26.18	18.27	27.69	19.33	28.46	19.16	29.75	19.17	31.02	19.75		
31			24.31	18.54	25.74	18.07	27.21	19.13	27.98	18.96	29.28	18.99	30.58	19.59		
33	22.51	17.35	23.56	18.17	25.30	17.86	26.74	18.92	27.50	18.75	28.82	18.80	30.15	19.43		
35	22.35	17.26	23.27	18.02	24.86	17.66	26.27	18.72	27.00	18.55	28.36	18.62	29.71	19.27		
37	22.06	17.11	22.97	17.88	24.50	17.49	25.81	18.52	26.51	18.35	27.74	18.37	28.98	19.00		
39	21.95	17.05	22.87	17.83	24.36	17.43	25.56	18.41	26.21	18.23	27.34	18.21	28.46	18.81		
41	22.60	17.39	23.14	17.96	24.15	17.33	25.25	18.28	25.85	18.08	26.87	18.02	27.87	18.60		
43	21.40	16.76	22.33	17.56	23.68	17.12	24.66	18.04	25.21	17.82	26.09	17.72	26.96	18.28		
46	19.31	15.68	19.92	16.41	20.58	15.74	21.30	16.66	21.99	16.56	22.96	16.54	23.92	17.24		
50	12.72	12.47	13.32	13.05	14.01	13.03	14.33	14.03	14.56	13.86	14.78	13.70	15.02	14.42		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature				
		°CDB				
°CDB	°CWB	16	18	20	22	24
-19.8	-20	13.25	13.10	12.96	12.81	12.66
-17.7	-18	13.73	13.57	13.43	13.27	13.12
-15.7	-16	14.21	14.05	13.90	13.74	13.58
-13.5	-14	14.69	14.52	14.37	14.20	14.03
-11.5	-12	15.42	15.26	15.09	14.92	14.76
-9.5	-10	16.17	15.99	15.82	15.64	15.48
-7.5	-8	16.90	16.72	16.54	16.37	16.20
-5.5	-6	17.20	17.02	16.86	16.69	16.52
-3.0	-4	17.49	17.32	17.17	17.00	16.84
-1.0	-2	17.78	17.63	17.48	17.32	17.17
1.0	0	18.08	17.93	17.79	17.63	17.49
2.0	1	18.22	18.08	17.93	17.79	17.64
3.0	2	20.71	20.53	20.36	20.20	20.04
5.0	4	25.68	25.43	25.18	25.00	24.82
7.0	6	30.66	30.32	30.00	29.80	29.61
9.0	8	32.13	31.86	31.58	31.36	31.14
11.5	10	33.60	33.38	33.16	32.92	32.68
13.5	12	34.76	34.54	34.32	34.09	33.84
15.5	14	35.91	35.71	35.50	35.26	35.01
16.5	16	36.50	36.29	36.08	35.83	35.59

Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
In the heating mode in which the outside air temperature is 0°CDB or less, the compressor operates at maximum frequency.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

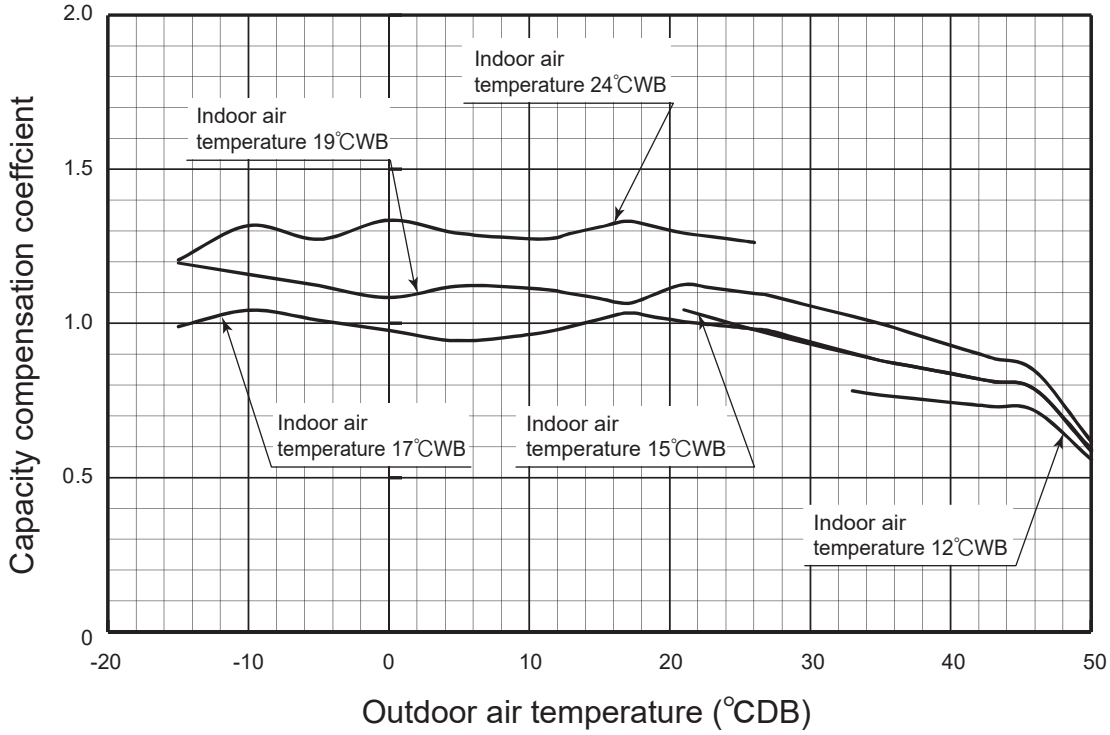
PGA000Z846

[References data]

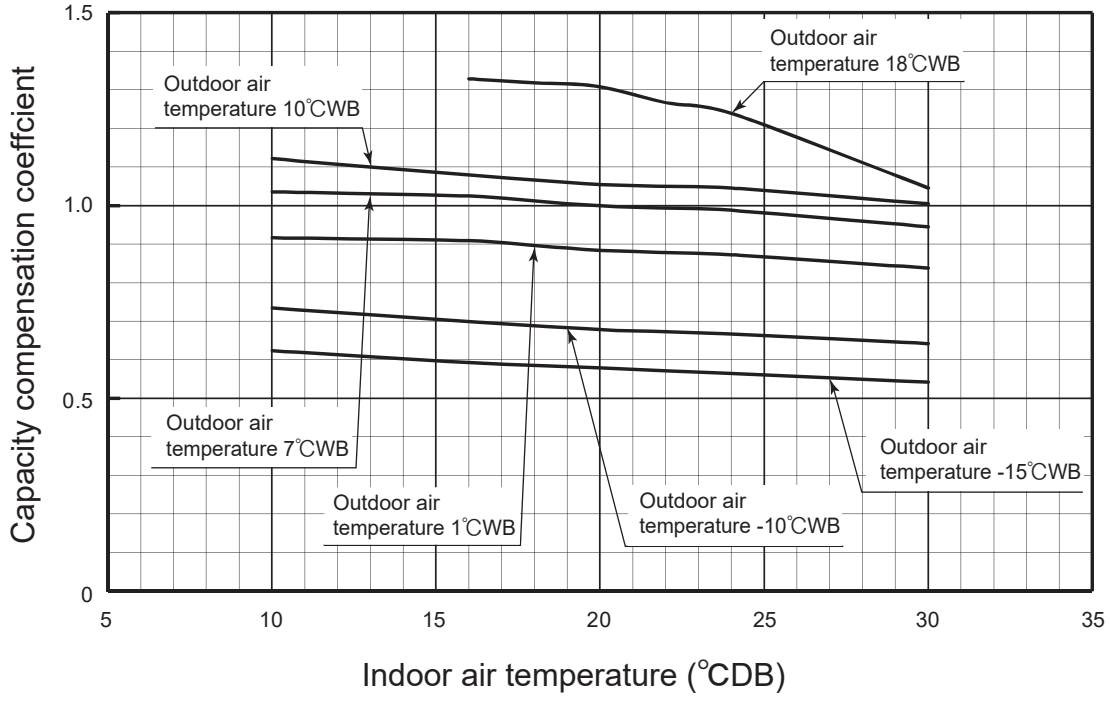
The following figures show capacity variation against outdoor and indoor temperature. Capacity compensation coefficient shows the ratio of maximum capacity at any temperature to nominal capacity.

(I) Models FDC100, 125, 140VNA-W, 100, 125, 140VSA-W

① Cooling

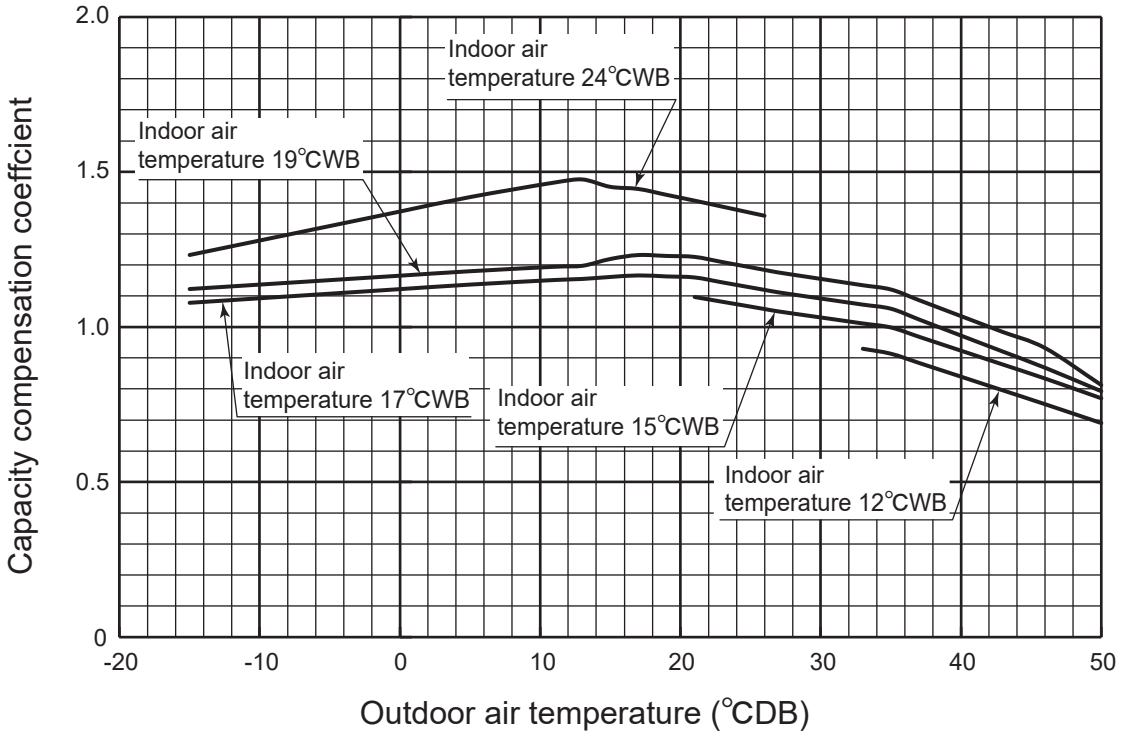


② Heating

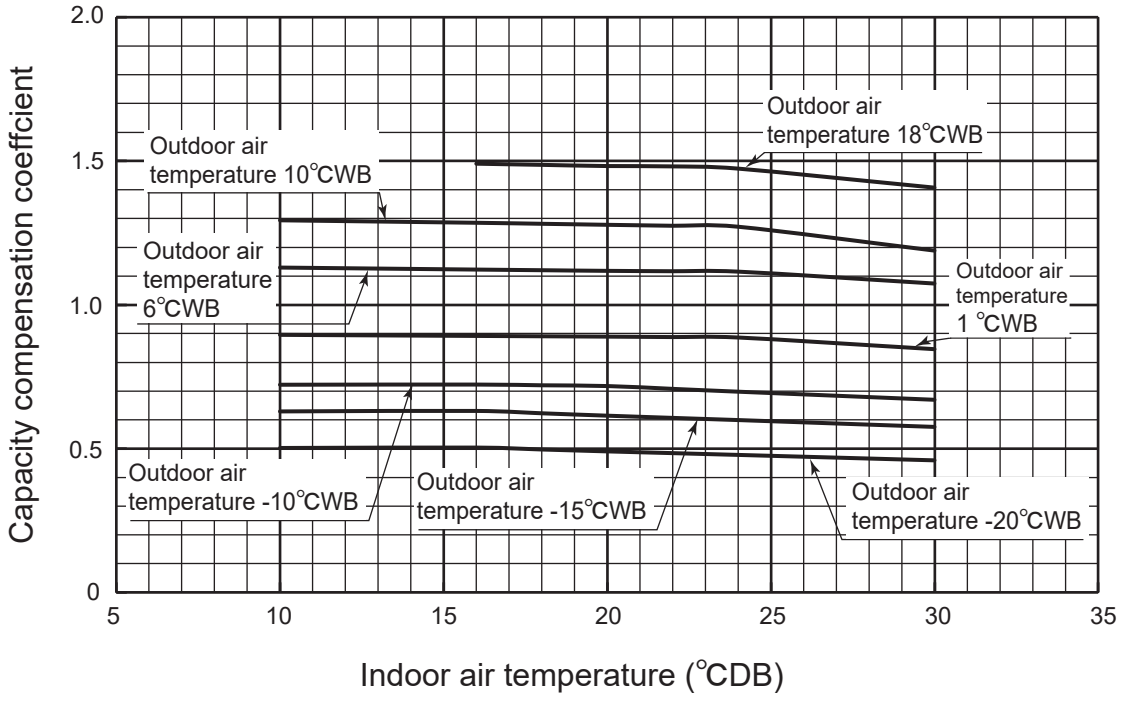


(Ⅱ) **Models FDC200VSA-W**

① **Cooling**



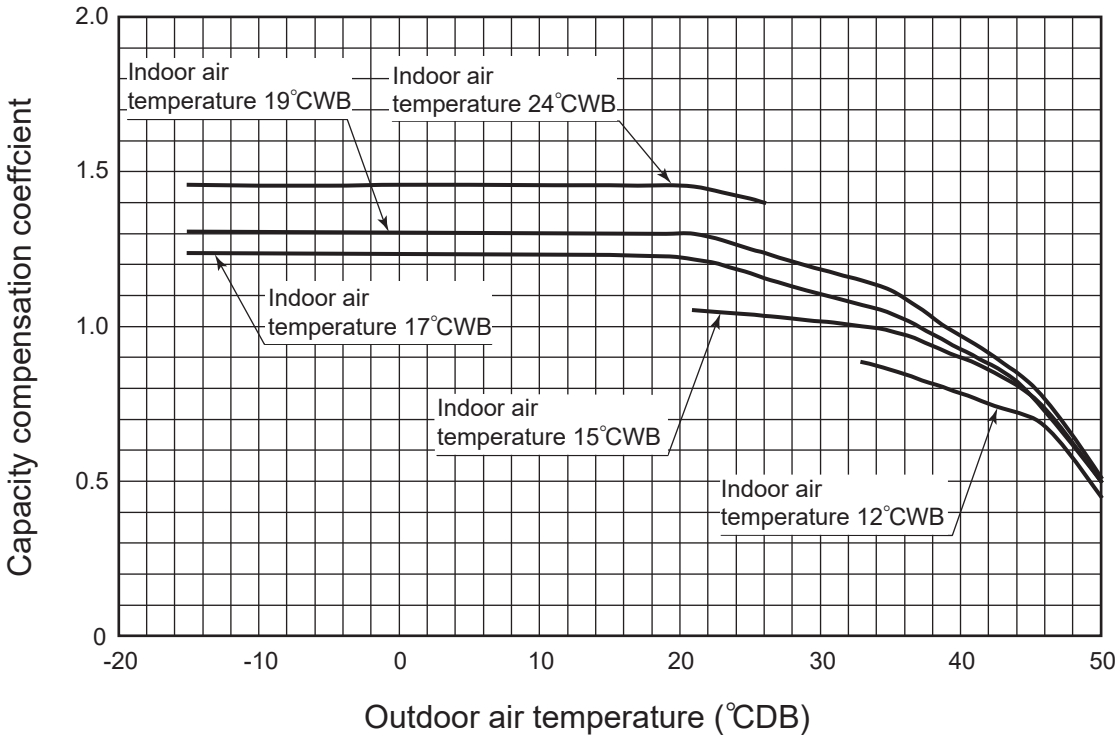
② **Heating**



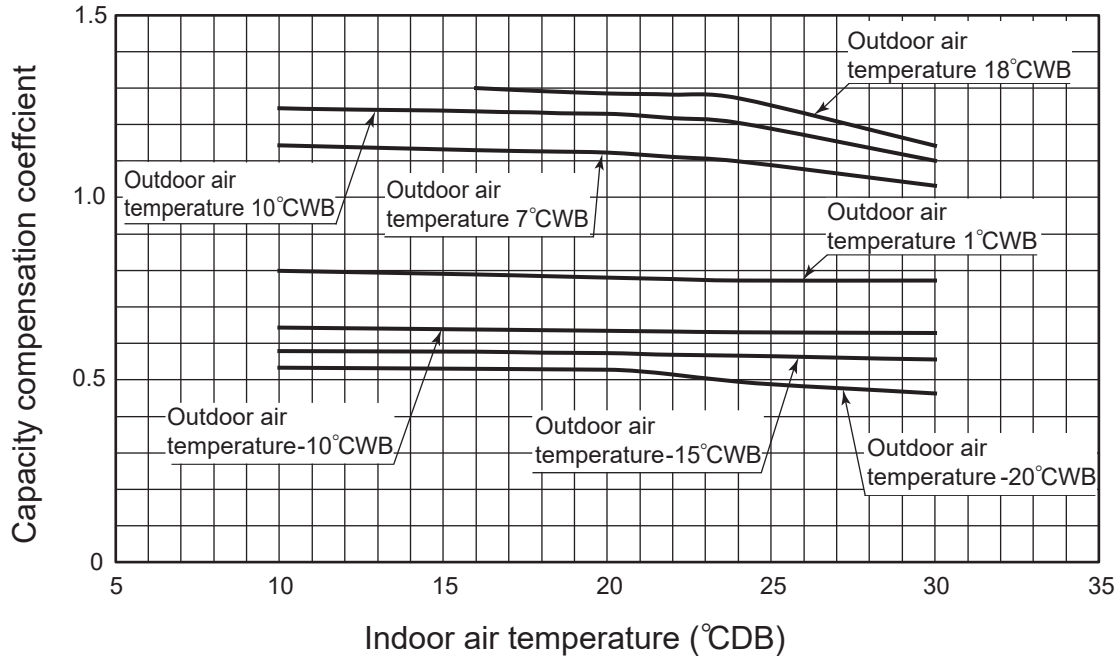
Note (1) These data show the case where the operation frequency of a compressor is maximum.

(Ⅲ) Model FDC250VSA-W

① Cooling

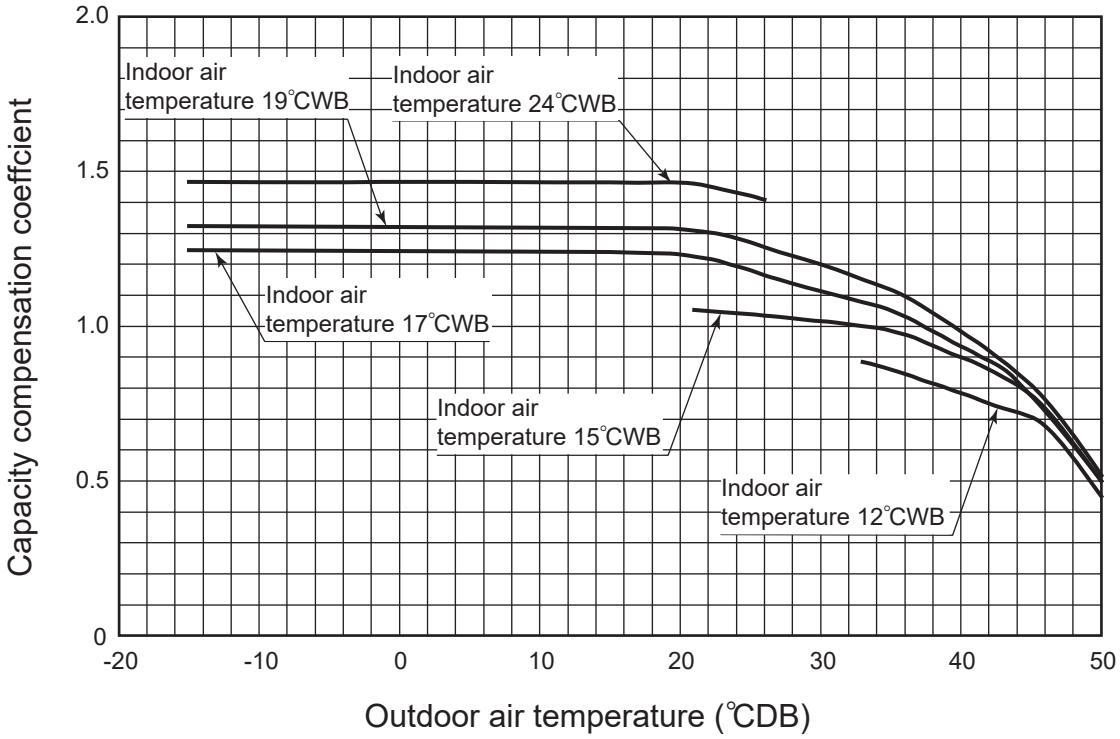


② Heating

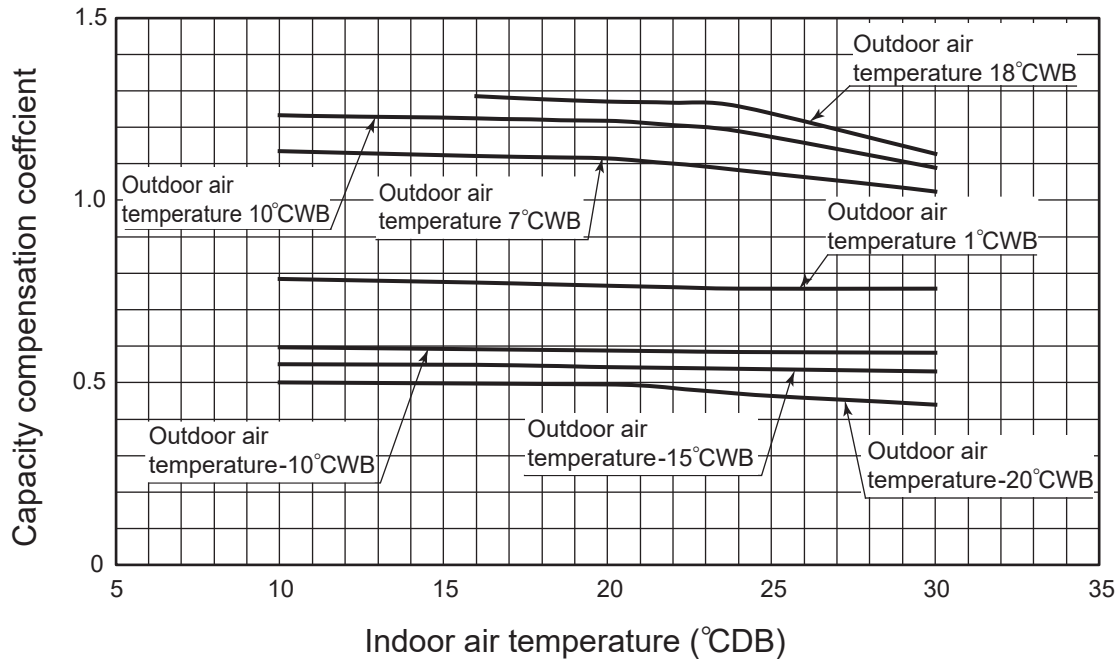


㈣ Models FDC280VSA-W

① Cooling



② Heating



2.8.2 Correction of cooling and heating capacity in relation to air flow rate control (Fan speed)

Fan speed	P-Hi or Hi	Me	Lo
Coefficient	1.00	0.97	0.95

2.8.3 Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

Models 100 - 140

Equivalent piping length (1)(m)			7.5	10	15	20	25	30	35	40	45	50	55
Heating			1	1	1	1	1	0.998	0.998	0.993	0.993	0.988	0.988
Cooling	100 model	ϕ15.88	1	0.991	0.978	0.964	0.951	0.937	0.924	0.910	0.897	0.883	0.870
	125 model		1	0.986	0.968	0.950	0.932	0.914	0.896	0.878	0.860	0.842	0.824
	140 model		1	0.985	0.966	0.946	0.927	0.907	0.888	0.868	0.849	0.829	0.810
	100 model	ϕ19.05	1.016	1.013	1.007	1.002	0.996	0.991	0.985	0.980	0.974	0.969	0.963
	125 model		1.022	1.018	1.009	1.001	0.992	0.984	0.975	0.967	0.958	0.950	0.941
	140 model		1.026	1.021	1.011	1.002	0.992	0.983	0.973	0.964	0.954	0.945	0.935

Models FDC200, 250, 280

Equivalet piping length (1) (m)			7.5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
Heating			1	0.998	0.995	0.991	0.988	0.984	0.981	0.977	0.974	0.970	0.967	0.963	0.960	0.956	0.953
Cooling	200model	ϕ22.22	1	0.997	0.991	0.984	0.978	0.971	0.965	-	-	-	-	-	-	-	-
	250model		1	0.995	0.985	0.975	0.965	0.954	0.944	-	-	-	-	-	-	-	-
	280model		1	0.993	0.979	0.966	0.952	0.937	0.923	-	-	-	-	-	-	-	-
	200model	ϕ25.4	-	-	-	-	-	-	0.988	0.984	0.981	0.977	0.974	0.970	0.967	0.963	0.960
	250model		-	-	-	-	-	-	0.978	0.972	0.966	0.960	0.953	0.947	0.941	0.935	0.929
	280model		-	-	-	-	-	-	0.968	0.960	0.951	0.943	0.932	0.925	0.916	-	-
	200model	ϕ28.58	-	-	-	-	-	-	0.999	0.997	0.995	0.993	0.991	0.989	0.987	0.985	0.983
	250model		-	-	-	-	-	-	0.997	0.994	0.990	0.987	0.983	0.980	0.976	0.973	0.969
	280model		-	-	-	-	-	-	0.995	0.991	0.985	0.981	0.975	0.971	0.965	-	-

Note (1) Calculate the equivalent length using the following formula.
However, install the piping so that the piping length is within +5 m of the limit length (actual length) for the respective types.

• Equivalent Length =Actual Length + (Equivalent bend length x number of bends in the piping.)
Equivalent length per bend.

Gas pipe diameter (mm)	ϕ12.7	ϕ15.88	ϕ19.05	ϕ22.22	ϕ25.4	ϕ28.58
Equivalent bend length	0.20	0.25	0.30	0.35	0.40	0.45

2.8.4 Height difference between the indoor unit and outdoor unit

When the outdoor unit is located below indoor units in cooling mode, or when the outdoor unit is located above indoor units in heating mode, the correction coefficient mentioned in the below table should be subtracted from the value in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	5m	10m	15m	20m	25m	30m	35m	40m	45m	50m
Adjustment coefficient	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.90

Piping length limitations

Item \ Model	FDC100, 125, 140	FDC200, 250	FDC280
Max. one way piping length	50m	70m	60m
Max. vertical height difference	Outdoor unit is higher 50m Outdoor unit is lower 15m	Outdoor unit is higher 50m（Outdoor air temperature≦43ºC） Outdoor unit is higher 30m（Outdoor air temperature＞43ºC） Outdoor unit is lower 15m	

Note (1) Values in the table indicate the one way piping length between the indoor and outdoor units.

How to obtain the cooling and heating capacity

Example : The net cooling capacity of the model FDF100VNAWVH with the air flow “P-High”, the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulb temperature at 19.0℃ and outdoor dry-bulb temperature 35℃ is

Net cooling capacity = 10.0 × 1.00 × 0.978 × 0.99 ≒ 9.7kW

- 10.0: Net cooling total capacity of FDF100VNAWVH (Outdoor temp. : 35℃DB Indoor temp. : 19℃WB) shown in table 2.8.1
- 1.00: Air flow : P-Hi shown in table 2.8.2
- 0.978: Piping length :15m (Gas pipe size is ϕ15.88) shown in table 2.8.3
- 0.99: Height diff. :5m (Outdoor unit : below) shown in table 2.8.4

2.9 APPLICATION DATA

2.9.4 Installation of outdoor unit

(1) Models FDC100-140VNA-W, 100-140VSA-W

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 42.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces

PSC012D120B F

Inverter driven split PAC
100, 125, 140 VNA-W 100, 125, 140 VSA-W
Designed for R32 refrigerant

SAFETY PRECAUTIONS

- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown below.

⃠	Never do it under any circumstance.	❗	Always do it according to the instruction

- For 3 phase power source outdoor unit, EN61000-3-2 is not applicable if consent by the utility company or nortification to the utility company is given before usage.
- 3phase power source unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a house-hold appliance it could cause electromagnetic interference.
- 5 and 6 HP units of single phase power source are equipment complying with IEC 61000-3-12.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user

Check before installation work

- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, It may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire,
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R32 and R410A.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant
- **Only use prescribed option parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition**
  The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit
- **Be sure to wear protective goggles and gloves while at work.**
- **This unit is designed specifically for R32.**
  Using any other refrigerant can cause unit failure and personal injury.
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not run the unit with removed panels or protections**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.
- **Do not process or splice the power cord, or share the socket with other power plugs.**
  This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.
- **Do not bundle or wind or process the power cord. Do not deform the power cord by treading it.**
  This may cause fire or heating.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.**
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.
- **Do not install the unit in the locations listed below**
  •Locations where carbon fiber, metal powder or any powder is floating.
  •Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  •Vehicles and ships
  •Locations where cosmetic or special sprays are often used.
  •Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  •Locations where any machines which generate high frequency harmonics are used.
  •Locations with salty atmospheres such as coastlines
  •Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  •Locations where the unit is exposed to chimney smoke
  •Locations at high altitude (more than 1000m high)
  •Locations with ammonic atmospheres (e.g. organic fertilizer).
  •Locations with calcium chloride (e.g. snow melting agent).
  •Locations where heat radiation from other heat source can affect the unit
  •Locations without good air circulation.
  •Locations with any obstacles which can prevent inlet and outlet air of the unit
  •Locations where short-circuit of air can occur (in case of multiple units installation)
  •Locations where strong air blows against the air outlet of outdoor unit
  •Locations where something located above the unit could fall.
  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  •Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  •Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  •Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  •Locations where vibration and operation sound generated by the outdoor unit can affect seriously (on the wall or at the place near bed room)
  •Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  •Locations where drainage cannot run off safely.
  It can affect surrounding environment and cause a claim
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands.**
  It can cause electric shocks.
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water.**
  It can cause electric shocks.
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur property damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.
- **Do not touch the suction or aluminum fin on the outdoor unit.**
  This may cause injury.

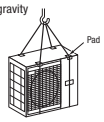
Notabilia as a unit designed for R32

- Do not use any refrigerant other than R32. R32 will rise to pressure about 1.6 times higher than that of a conventional refrigerant (R22 or R407C). A cylinder containing R32 has a light blue indication mark on the top.
- A unit designed for R32 has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R32 tools listed in the table on the right before installing or servicing this unit.
- All indoor units must be models designed exclusively for R32. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated R32 and R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position.
If not properly balanced, the unit can be thrown off-balance and fall.

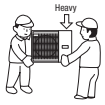


1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.

2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.
- ○ Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

1.Install the unit on the base so that the bottom is higher than snow cover surface.

2.Provide a snow hood to the outdoor unit on site.
Regarding outline of a snow hood, consult a dealer.

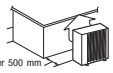
3.Install the unit under eaves or provided the roof on site.

Since drain water generated by defrost control may freeze, following measures are required.

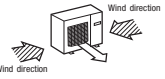
- Don't execute drain piping work by using a drain elbow and drain grommets (optional parts). [Refer to DRAIN PIPING WORK.]
- Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]
- Attach heater on a base plate on site, if there is possibility to freeze drain water.
  In case that the product has a corrective drainage system, the drainage paths should have suitable measure against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

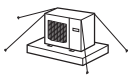
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.

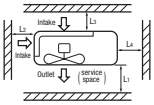


5) Installation space

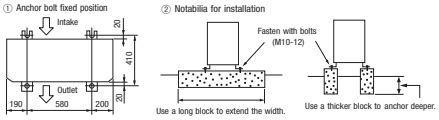
- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.
- A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

(mm)

Size / Example installation	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	150	150	150



6) Installation



- In installing the unit, fix the unit's legs with bolts specified on the left.
- The protrusion of an anchor bolt on the front side must be kept within 15mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the left illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

- When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site, so that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, consult a dealer.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

- Check the following points in light of the indoor unit specifications and the installation site.
- Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

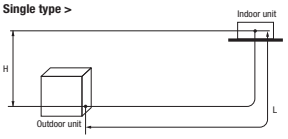
Restrictions			Marks appearing in the drawing			
	One-way pipe length difference from the first branching point to the indoor unit				< 3m	≧ 3m
	Model for outdoor units	Dimensional restrictions	Single type	Twin type	Triple type A	Triple type B
One-way pipe length of refrigerant piping	100VNA,125VNA,100VSA,125VSA	≦ 50m	L	L+L1+L2	L+L1+L2+L3	L+L1+L2+L3
	140VNA, 140VSA					
Main pipe length	100VNA,125VNA,100VSA,125VSA	≦ 50m	—	L	—	—
	140VNA, 140VSA				L	L
One-way pipe length between the first branching point from to the second branching point	140VNA, 140VSA	≦ 5m	—	—	—	La
One-way pipe length after the first branching point	All Models	≦ 30m	—	L1,L2	—	—
	140VNA, 140VSA				L1, L2, L3	L1 (1)
One-way pipe length from the first branching point to indoor units through the second branching point	140VNA, 140VSA	≦ 27m	—	—	—	La+L2, La+L3 (1)
One-way pipe length difference from the first branching point to the indoor unit	All Models	≦ 10m	—	(L1-L2)	—	—
	140VNA, 140VSA	≦ 3m			| L1-L2 | , | L2-L3 | , | L3-L1 |	
		≦ 10m			—	L1-(La+L2),(L1-(La+L3) (1)
One way pipe length difference from the second branching point to the indoor unit	140VNA, 140VSA	≦ 10m	—	—	—	| L2-L3 |
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher.	≦ 50m (2)	H	H	H	H
	When the outdoor unit is positioned lower.	≦ 15m				
Elevation difference between indoor units		≦ 0.5m	—	h	h1,h2,h3	h1,h2,h3

⚠CAUTION

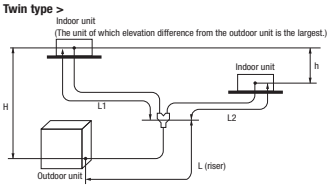
- The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, see " 6. UTILIZATION OF EXISTING PIPING."
- With the triple pipe connection, the way of use is different when the difference of one-way pipe length after the first branching point is 3m to 10m. For details, refer to the above table and right figure.

Notes (1) Install the indoor units so that L + L1 becomes the longest one-way pipe.
Keep the pipe length difference between L1 and (La + L2) or (La + L3) within 10m.
(2) When the outdoor unit is installed at a position higher than the indoor unit by 30m or more, set SW5-2 on the control PCB to ON.

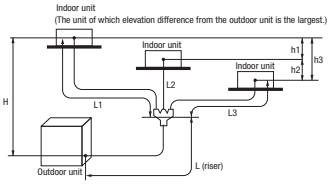
< Single type >



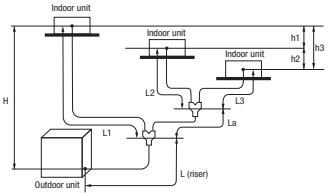
< Twin type >



< Triple type A >



< Triple type B >



2) Determination of pipe size

- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

		Model 100V		Model 125V		Model 140V	
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
Outdoor unit connected		ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
		Flare	Flare	Flare	Flare	Flare	Flare
Refrigerant piping (Main pipe L)		ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
In the case of a single type	Indoor unit connected	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 100V		Model 125V		Model 140V	
In the case of a twin type	Branching pipe set	DIS-WA1G		DIS-WA1G		DIS-WA1G	
	Refrigerant piping (branch pipe L1,L2)	ϕ12.7	ϕ9.52	ϕ12.7	ϕ9.52	ϕ15.88	ϕ9.52
	Indoor unit connected	ϕ12.7	ϕ6.35	ϕ12.7	ϕ6.35	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 50V×2		Model 60V×2		Model 71V×2	
In the case of a triple type A	Branching pipe set					DIS-TA1G	
	Refrigerant piping (branch pipe L1,L2,L3)	—		—		ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50Vx3	
In the case of a triple type B	Branching pipe set					DIS-WA1G	
	Refrigerant piping (branch pipe La)					ϕ15.88	ϕ9.52
	Refrigerant piping (branch pipe L1)	—		—		ϕ12.7	ϕ9.52
	Branching pipe set (After branch pipe La)					DIS-WA1G	
	Refrigerant piping (branch pipe L2,L3)					ϕ12.7	ϕ9.52
	Indoor unit connected					ϕ12.7	ϕ6.35
	Capacity of indoor unit					Model 50V×3	

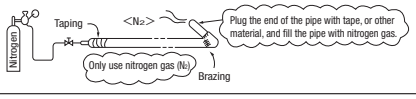
⚠CAUTION

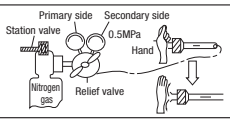
- When the 50V or 60V model is connected as an indoor unit, always use a ϕ9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (ϕ6.35 on the liquid pipe side).
  If a ϕ6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
  A branching part must be dressed with a heat-insulation material supplied as an accessory.
- For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.
- In the case of a triple type, branching pipe set shown in this table varies depending on the length difference of one way piping after the first branch. Please check the table above.

About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.





3) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.
- This unit uses R32. Always use 1/2H pipes having a 1.0mm or thicker wall for ϕ19.05 or larger pipes, because O-type pipes do not meet the pressure resistance requirement.

Pipe diameter [mm]	6.35	9.52	12.7	15.88	22.22	25.4	28.58
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0	1.0	1.0	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H 3300

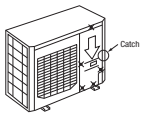
NOTE

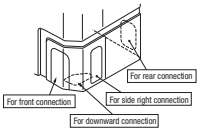
- Select pipes having a wall thickness larger than the specified minimum pipe thickness.

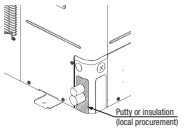
4) On-site piping work

⚠IMPORTANT ●Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

How to remove the service panel First remove the five screws (✕ mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.



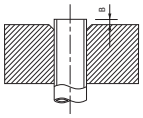




●The pipe can be laid in any of the following directions: side right, front, rear and downward.
●Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area.
※Please close the gap of piping connecting part with putty or insulation material (locally procured) after piping connection. Small animals or insects may intrude into the outdoor unit and it will cause electrical short.
●Carry out the on site piping work with the service valve fully closed.
●Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
●Bend a pipe to a radius as large as practical.(R100–R150) Do not bend a pipe repeatedly to correct its form.
●Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R32 are different from those for conventional R22 and R407C. Although we recommend the use of flaring tools designed specifically for R32, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
※Do not reuse existing flare, make new flare.
●The pipe should be anchored every 1.5m or less to isolate the vibration.
●Tighten a flare joint securely with a double spanner.

Flared pipe end: A (mm)

Copper pipe outer diameter	A 0 −0.4
ϕ6.35	9.1
ϕ9.52	13.2
ϕ12.7	16.6
ϕ15.88	19.7



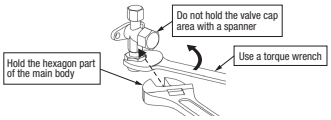
Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R32 tool	With a conventional tool
ϕ6.35	0–0.5	0.7–1.3
ϕ9.52		
ϕ12.7		
ϕ15.88		

⚠ CAUTION

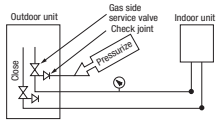
●Do not apply force beyond proper fastening torque in tightening the flare nut.
●Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.
●Do not apply refrigerating machine oil to the flared surface. It can cause refrigerant leakage.

Service valve size (mm)	Tightening torque (N·m)
ϕ6.35 (1/4")	14–18
ϕ9.52 (3/8")	34–42
ϕ12.7 (1/2")	49–61
ϕ15.88 (5/8")	68–95



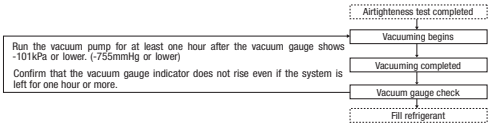
5) Air tightness test

① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient temperature fall 1 ℃, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.
② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



6) Evacuation

<Work flow> When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.



Pay attention to the following points in addition to the above for the R32 and compatible machines.
○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

<Single type>

Item / Capacity	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
100VNA–140VNA 100VSA–140VSA	0.054	3.3	30

<Twin, triple type>

Item / Capacity	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)		Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
	Main pipe	Branch pipe		
100VNA–140VNA 100VSA–140VSA	0.054		3.3	30

●This unit contains factory charged refrigerant covering 30m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 30m refrigerant piping. When refrigerant piping exceeds 30m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 30m.
●If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, see "6. UTILIZATION OF EXISTING PIPING."

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = { Main pipe length (m) – Length covered without additional charge 30 (m) } x 0.054 (kg/m) + Total length of branch pipes (m) x 0.054 (kg/m)

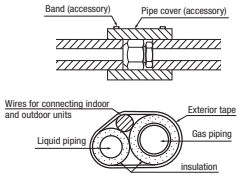
*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

(2) Charging refrigerant
●Since R32 refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
●Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
●In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
●When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

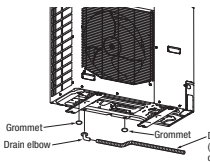
8) Heating and condensation prevention

(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
(2) Use a heat insulating material that can withstand 120℃ or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- Although it is verified in a test that this air-conditioning unit shows satisfactory performance under JIS condensation test conditions, **both gas and liquid pipes need to be dressed with 20mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**

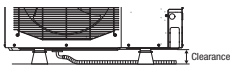


3. DRAIN PIPING WORK

•Execute drain piping by using a drain elbow and drain grommets supplied separately as optional parts, where water drained from the outdoor unit is a problem.
•Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
•Condensed water may flow out from vicinity of service valve or connected pipes.
•Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)
•Do not use drain elbow and grommet made of plastic for drain piping when base heater for outdoor unit is used. Plastic grommet and elbow will be damaged and burnt in worst case.
•Prepare another drain tray made of metallic material for collecting drain when base heater is used.

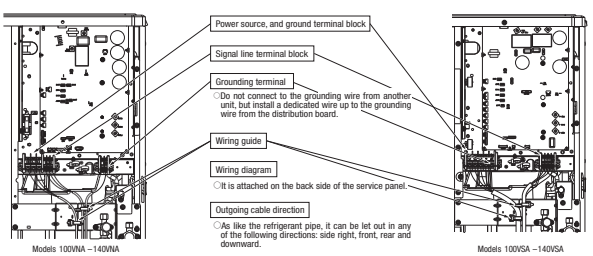


•When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an optional part) or concrete blocks.
Then, please secure space for the drain elbow and the drain hose.

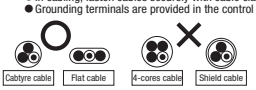


4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.
•Do not use any supply cord lighter than one specified in parentheses for each type below.
- braided cord (code designation 60245 IEC 51),
- ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
- flat twin tinsel cord (code designation 60227 IEC 41);
Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
•Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If impropery grounded, an electric shock or malfunction may result.
•A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
•The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.



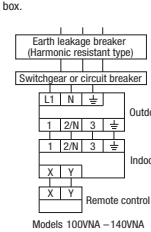
•Do not turn on the power source until the electrical work is completeted .
•Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident.)
•For power source cables, use conduits.
•Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
•Fasten cables so that may not touch the piping, etc.
•When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
•Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.
●Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
●In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
●Grounding terminals are provided in the control box.



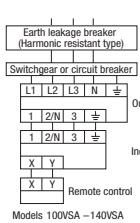
Main fuse specification

Model	Specification	Part No.
100VNA–140VNA	250V 30A	PCA006A092B
100VSA–140VSA	—	—

Power cable, indoor-outdoor connecting wires
●Always perform grounding system installation work with the power cord unplugged.
⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.



Models 100VNA –140VNA



Models 100VSA –140VSA

Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VNA–140VNA	Single phase 3 wires 220-240V 50Hz 220V 60Hz	5.5	24	22	φ1.6mm	φ1.6mm x 3
100VSA–140VSA	3 phase 4 wires 380-415V 50Hz 380V 60Hz	3.5	15	46		

●The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
●Switchgear or circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.

※At the connection with the duct type indoor unit.

Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
100VNA,125VNA	Single phase 3 wires 220-240V 50Hz 220V 60Hz	5.5	26	20	φ1.6mm	φ1.6mm x 3
140VNA			27			
100VSA,125VSA	3 phase 4 wires 380-415V 50Hz 380V 60Hz	3.5	17	40		
140VSA			18	38		

(a) Power source cable: Use the cable which is conformed with 60245 IEC57. When selecting the power source cable length, make sure that voltage drop is less than 2%. If the wire length gets longer, increase the wire diameter.
(b) Indoor-outdoor connecting wires: Use the wires which is conformed with 60245 IEC57.

5. TEST RUN

⚠ WARNING
- Before test run, make sure that the service valves are open.
- Before test run, turn ON power source for 6 hours in order to warm up the compressor. Without this operation, refrigerant may accumulate in the compressor and earth leakage breaker may be activated.
- In case of the first operation after turning on power supply, even if the unit does not move for 30 minutes, it is not a breakdown.
- After power is turned off, wait 3 minutes or more before power source is turned ON again.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠ CAUTION
- When you operate switches (SW3, SW5) for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid service valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power source is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "Communication error between outdoor and indoor unit" may occur.

1) Test run method

(1) A test run can be initiated from an outdoor unit by using SW3-3 and SW3-4 for on-site setting.
(2) Switching SW3-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW3-4 is OFF, or a heating operation, when SW3-4 is ON.
(4) **Do not fail to switch SW3-3 to OFF when a test run is completed.**

SW-3-3	SW-3-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	–	Normal or after the test operation

2) Checking the state of the unit in operation

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas service valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2, SW5-2, SW7-3, on-site

(1) Defrost control switching (SW3-1)
・When this switch is turned ON, the unit will run in the defrost mode more frequently.
・Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.
(2) Snow guard fan control (SW3-2)
・When this switch is turned ON, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
・When the unit is used in a very snowy country, set this switch to ON.
(3) High height difference operation control (SW5-2)
・Set this switch to ON when outdoor unit is installed at a position higher than indoor unit by 30m or more.
(4) Lower noise silent mode (SW7-3)
・Upper limit of compressor speed and fan speed becomes lower in silent mode

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED(The cycles of 5 seconds) Red LED	Green LED	Failure event	Action
E34	Blinking once	Blinking continuously	Open phase	Check power cables for loose contact or disconnection
E40	Blinking once	Blinking continuously	63H1 actuation or operation with service valves shut (occurs mainly during a heating operation)	1. Check whether the service valves are open. 2. If an error has been canceled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E49	Blinking once	Blinking continuously	Low pressure error or operation with service valves shut (occurs mainly during a cooling operation)	
E57	Blinking once	Blinking continuously	Short of refrigerant error or operation with service valves shut (occurs mainly during a cooling operation)	

● If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve.

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

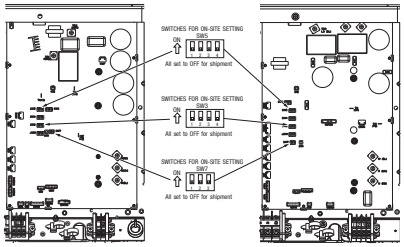
This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.

Items to check before a test run ● When you leave the outdoor unit with power supplied to it, be sure to close the panel.

Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are service valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabtyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
–	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure ● Always carry out a test run and check the following in order as listed.

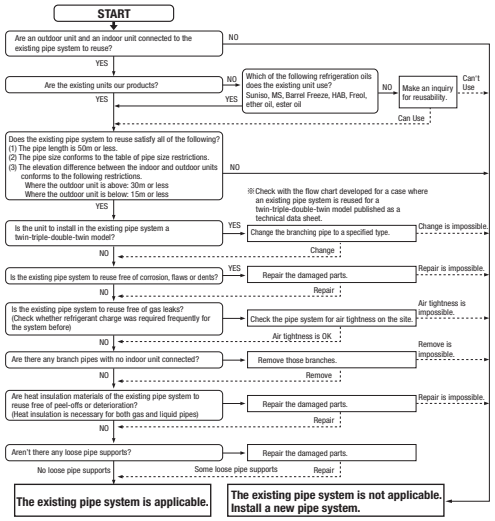
Turn	The contents of operation	Check
①	Open the gas side service valve fully.	
②	Open the liquid side service valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW3-3 ON / SW3-4 OFF: the unit will start a cooling operation. SW3-3 ON / SW3-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, do not forget to turn SW3-3 to the OFF position.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	



Models 100VNA – 140VNA　　Models 100VSA – 140VSA

6. UTILIZATION OF EXISTING PIPING

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the existing unit (in the order of (1), (2), (3) and (4))
(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
● For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R32.
● **Turn on-site setting switch SW5-1** to the ON position. (Where the gas pipe size is φ19.05)

<Where the existing unit cannot be run for a cooling operation.>
Wash the pipe system or install a new pipe system.
● If you choose to wash the pipe system, contact our distributor in the area.

<Table of pipe size restrictions>
◎:Standard pipe size ○:Applicable
△:Restricted to shorter pipe length limits ×:Not applicable

Additional charging amount of refrigerant per 1m		0.054kg/m		0.11kg/m	
Pipe size	Liquid pipe	φ9.52	φ9.52	φ12.7	φ12.7
	Gas pipe	φ15.88	φ19.05	φ15.88	φ19.05
100V	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15
125V	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15
140V	Usability	◎	○※1	△	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15

<Pipe system after the branching pipe>

			After 1st branch ※4			After 2nd branch		
Additional charging amount of refrigerant per 1m			0.054kg/m			0.054kg/m		
Pipe size	Liquid pipe		φ9.52			φ9.52		
	Gas pipe		φ12.7	φ15.88	φ19.05※1	φ12.7	φ15.88	φ19.05※1
Model	Combination type	Combination of capacity						
100V	Twin	50+50	◎	○	×	–	–	–
125V	Twin	60+60	◎	○	×	–	–	–
	Twin	71+71	×	◎	○	–	–	–
140V	Triple A	50+50+50	◎	○	×	–	–	–
	Triple B	50+50+50	×	◎※5	○※5	◎	○	×

※1 Because of its insufficient pressure resistance, **turn the DIP switch SW5-1** provided on the outdoor unit board to the ON position for φ19.05 × t1.0. (In the case of a twin-triple-double-twin model, this also applies to the case where φ19.05 × t1.0 is used in a pipe system after the first branching point.) However, you need not turn the DIP switch SW5-1 to the ON position, if 1/2H pipes or pipes having 1.2 or thicker walls are used.
※2 When the main pipe length exceeds 40m, a significant capacity drop may be experienced due to pressure loss in the liquid pipe system. Use φ12.7 for the liquid main.
※3 Keep the total pipe length, not one-way pipe length, below the specified maximum pipe length.
※4 Piping size after branch should be equal or smaller than main pipe size.
※5 Piping size from first branch to indoor unit should be φ9.52 (Liquid) / φ12.7 (Gas).
● Any combinations of pipe sizes not listed in the table or marked with × in the table are not usable.
● Do not reuse existing flare.

<The model types of existing units of which branching pipes are reusable.>
Models later than Type 8.
● F D C ＊ ＊ ＊ 8 □ □ □
● F D C P ＊ ＊ ＊ 8 □ □ □

The branching pipes used with models other than those listed above are not reusable because of their insufficient pressure resistance. Please use our genuine branching pipes for R32.

● ＊ ＊ ＊ are numbers representing horsepower. □□□ is an alphanumeric letter.

Formula to calculate additional charge volume

Additional charge volume (kg) = (Main pipe length (m) – Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.
Example) When an 140V (single installation) is installed in a 20m long existing pipe system (liquid φ12.7, gas φ19.05), the quantity of refrigerant to charge additionally should be (20m-15m) x 0.11kg/m = 0.55 kg.

(2) Models FDC200VSA-W, 250VSA-W, 280VSA-W

PSC012D154B Ⓓ

Inverter driven split PAC
FDC200VSA-W, FDC250VSA-W, FDC280VSA-W
Designed for R32 refrigerant

◎This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 42.
◎When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces

SAFETY PRECAUTIONS

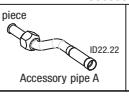
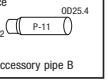
- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠ WARNING and ⚠ CAUTION. The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠ WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠ CAUTION. **These are very important precautions for safety. Be sure to observe all of them without fail.**
- The meaning of "Marks" used here are as shown below.

⃠	Never do it under any circumstance.	❗	Always do it according to the instruction

- For 3 phase power source outdoor unit,EN61000-3-2 is not applicable if consent by the utility company or nortification to the utility company is given before usage.
- 3phase power source unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a house-hold appliance it could cause electromagnetic interference.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.

Check before installation work

[Accessory]

Edging	Accessory pipe	
1 piece	1 piece	1 piece
 knock-out hole protection	 Accessory pipe A	 Accessory pipe B

- Model name and power supply
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

⚠ WARNING

- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- **Install the system in full accordance with the instruction manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, It may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.**
  Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
  In case of R32, the refrigerant could be ignited because of its flammability.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power supply with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire,
- **Be sure to shut off the power before starting electrical work.**
  Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.
- **Do not perform brazing work in the airtight room**
  It can cause lack of oxygen.
- **Use the prescribed pipes, flare nuts and tools for R32.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.**
  Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant
- **Only use prescribed optional parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Do not perform any change of protective device itself or its setup condition**
  The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.
- **Be sure to switch off the power supply in the event of installation, inspection or servicing.**
  If the power supply is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit
- **Be sure to wear protective goggles and gloves while at work.**
- **This unit is designed specifically for R32.**
  Using any other refrigerant can cause unit failure and personal injury.
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not run the unit with removed panels or protections**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.
- **Do not process or splice the power cord, or share the socket with other power plugs.**
  This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.
- **Do not bundle or wind or process the power cord. Do not deform the power cord by treading it.**
  This may cause fire or heating.

⚠ CAUTION

- **Carry out the electrical work for ground lead with care**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks,it could cause explosion or ignition.
- **Use the circuit breaker for all pole with correct capacity.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power supply wiring in accordance with the local codes and regulations.**
  The isolator should be locked in accordanced with EN60204-1.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.**
  If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage.To prevent such damage, keep the indoor unit in its packing or cover it.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- **Perform installation work properly according to this installation manual.**
  Improper installation can cause abnormal vibrations or increased noise generation.
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.**
  If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base flame can cause the unit falling down and cause personal injury.
- **Do not install the unit in the locations listed below**
  •Locations where carbon fiber, metal powder or any powder is floating.
  •Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  •Vehicles and ships
  •Locations where cosmetic or special sprays are often used.
  •Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  •Locations where any machines which generate high frequency harmonics are used.
  •Locations with salty atmospheres such as coastlines
  •Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual)
  •Locations where the unit is exposed to chimney smoke
  •Locations at high altitude (more than 1000m high)
  •Locations with ammonic atmospheres (e.g. organic fertilizer).
  •Locations with calcium chloride (e.g. snow melting agent).
  •Locations where heat radiation from other heat source can affect the unit
  •Locations without good air circulation.
  •Locations with any obstacles which can prevent inlet and outlet air of the unit
  •Locations where short circuit of air can occur (in case of multiple units installation)
  •Locations where strong air blows against the air outlet of outdoor unit
  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  •Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  •Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  •Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  •Locations where vibration and operation sound generated by the outdoor unit can affect seriously. (on the wall or at the place near bed room)
  •Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
  •Locations where drainage cannot run off safely.
  It can affect surrounding environment and cause a claim
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
  It can cause the damage of the items.
- **Do not touch any buttons with wet hands**
  It can cause electric shocks
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not clean up the unit with water**
  It can cause electric shocks
- **Do not operate the outdoor unit with any article placed on it.**
  You may incur property damage or personal injure from a fall of the article.
- **Do not step onto the outdoor unit.**
  You may incur injury from a drop or fall.
- **Do not touch the suction or aluminum fin on the outdoor unit.**
  This may cause injury.

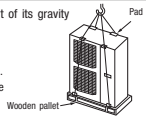
Notabilia as a unit designed for R32

- Do not use any refrigerant other than R32. R32 will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R32 has a light blue indication mark on the top.
- A unit designed for R32 has adopted a different size indoor unit operation valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R32 tools listed in the table on the right before installing or servicing this unit.
- All indoor units must be models designed exclusively for R32. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated R32 tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position.
If not properly balanced, the unit can be thrown off-balance and fall.

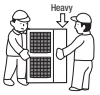


1) Delivery

- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When some compelling reason necessitates the unpacking of the unit before it is carried in, use nylon slings or protective wood pieces so as not to damage the unit by ropes lifting it.

2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.



3) Selection of installation location for the outdoor unit

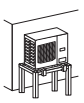
Be sure to select a suitable installation place in consideration of following conditions.

- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (including ammonia), which can harm the unit, will not be generated and not remain.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.
  Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

1.Install the unit on the base so that the bottom is higher than snow cover surface.



2.Provide a snow hood to the outdoor unit on site. Regarding outline of a snow hood, refer to our technical manual.

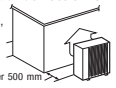
3.Install the unit under eaves or provided the roof on site.

Since drain water generated by defrost control may freeze, following measures are required.

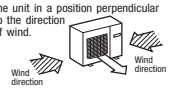
- Don't execute drain piping work by using a drain elbow and drain grommets (optional parts). [REFER TO DRAIN PIPING WORK.]
- Recommend setting Defrost Control (SW3-1) and Snow Guard Fan Control (SW3-2). [Refer to Setting SW3-1, SW3-2.]
- Attach heater on a base plate on site, if there is possibility to freeze drain water.
  In case that the product has a corrective drainage system, the drainage paths should have suitable measure against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.

5) Installation space

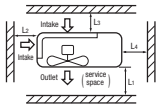
- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.
- A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

※In case that outdoor temperature is 44℃ or lower (mm)

Example installation / Size	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	250 (S)	250 (S)	250 (S)

※In case that outdoor temperature is higher than 44℃ (mm)

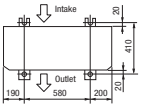
Example installation / Size	I	II	III
L1	Open	Open	2400
L2	300	750	Open
L3	300	300	300
L4	750	300	1500



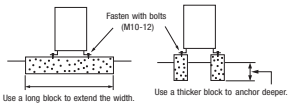
※ If unit is installed in L4 space with ( )'s condition, secure space of 250mm in lateral (L4) by unit movement at the time of exchange work of compressor.

6) Installation

① Anchor bolt fixed position



② Notabilia for installation



- In installing the unit, fix the unit's legs with bolts specified on the left.
- The protrusion of an anchor bolt on the front side must be kept within 15 mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the left illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5 mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

- When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site.
  So that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, refer to our technical manual.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

- Check the following points against the specification of the indoor unit and the installation site.
- Observe the following restrictions regarding unit installation and use. Improper installation can cause compressor failure or degradation of performance.
- The total liquid piping length of the system is restricted by the equivalent length (Le).
  The equivalent length (Le) is a virtual length corresponding to an equivalent length of liquid piping using a diameter of 12.7mm.

● FDC200V

Restriction		Dimensional restrictions	Marks appearing in the drawing				
			Single	Twin	Triple (A)	Triple(B)(2)	W-twin
Total equivalent length (Liquid piping)		≦ 70 m	Le	Le	Le	Le	Le
One-way pipe length of refrigerant piping	Liquid piping	≦ 40m (L : ϕ 9.52)	L	L+L1 L+L2	L+L1, L+L2, L+L3	L+L1 (1)	L+La+L1, L+La+L2 L+Lb+L3, L+Lb+L4
		40–70mL : ϕ 12.7)					
	Gas piping	≦ 70m					
Main pipe length	Liquid piping	≦ 70m					
	Gas piping	≦ 35m (L : ϕ 22.22)	L	L	L	L	L
		35–70m (L : ϕ 25.4 or ϕ 28.58)					
One way pipe length from the first branching point to the second branching point		≦ 5m	–	–	–	La	–
One–way pipe length after the first branching point		≦ 30m	–	L1,L2	L1,L2,L3	L1	La+L1, La+L2 La+L3, La+L4
One–way pipe length from the first branching point to indoor units through the second branching point		≦ 27m	–	–	–	La+L2,La+L3	–
One–way pipe length difference from the first branching point to the indoor units	Twin Type, W–Twin	≦ 10m	–	IL1–L2(	–	–	IL1+La)–(L3+Lb)(, IL1+La)–(L4+Lb)(, IL2+Lb)–(L3+Lb)(, IL2+Lb)–(L4+Lb)(, IL1–L2(IL3–L4(
	Triple Type(A)	≦ 3m	–	–	IL1–L2(IL2–L3(IL3–L1(	–	–
	Triple Type(B)	3m ～ 10m	–	–	–	L1–(La+L2), L1–(La+L3)(1)	–
One–way pipe length difference from the second branching point to the indoor unit		≦ 10m	–	–	–	IL2–L3(	IL1–L2(,IL3–L4(
Total pipe length after the second branching point		≦ 15m	–	–	–	–	L1+L2,L3+L4
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher	≦ 50m (3)	H	H	H	H	H
	When the outdoor unit is positioned lower	≦ 15m					
Elevation difference between indoor units		≦ 0.5m	–	h	h1,h2,h3	h1,h2,h3	h1,h2,h3,h4,h5,h6

⚠CAUTION

- **For model 200V, always use ϕ12.7mm liquid main pipe when one-way piping length exceeds 40m and ϕ9.52mm if it is 40m or less.**
  If ϕ9.52mm liquid pipe is used in an installation having one-way pipe longer than 40m, it may cause degradation of performance and/or water drops in the indoor unit.
- Always use ϕ25.4mm or ϕ28.58mm gas main pipe "L" when the length of "L" exceeds 35m.
  If ϕ22.22mm gas pipe is used in an installation having one-way pipe longer than 35m, it may cause degradation of performance and/or water drops in the indoor unit.

● FDC250/280V

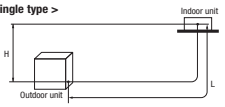
Restriction		Dimensional restrictions	Marks appearing in the drawing			
			Single	Twin	Triple	W-twin
Total equivalent length(Liquid piping)		[250V] ≦ 70m [280V] ≦ 60m	Le	Le		Le
One-way pipe length of refrigerant piping		[250V] ≦ 70m [280V] ≦ 60m	L	L+L1 L+L2		L+La+L1, L+La+L2 L+Lb+L3, L+Lb+L4
Main pipe length	Liquid piping	[250V] ≦ 70m [280V] ≦ 60m	L	L		L
	Gas piping	≦ 35m (L : ϕ 22.22) [250V] 35-70m [280V] 35-60m (L : ϕ 25.4 or ϕ 28.58)				
One-way pipe length after the first branching point		≦ 30m	–	L1,L2	–	La+L1, La+L2 La+L3, La+L4
One-way pipe length difference from the first branching point to the indoor units		≦ 10m	–	IL1-L2(		I(L1+La)–(L3+Lb)(, I(L1+La)–(L4+Lb)(, I(L2+La)–(L3+Lb)(, I(L2+La)–(L4+Lb)(, IL1–L2(, IL3–L4(
One-way pipe length difference from the second branching point to the indoor unit		≦ 10m	–	–		IL1-L2(,IL3-L4(
Total pipe length after the second branching point		≦ 15m	–	–		L1+L2,L3+L4
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher	≦ 50m(3)	H	H		H
	When the outdoor unit is positioned lower	≦ 15m				
Elevation difference between indoor units		≦ 0.5m	–	h		h1,h2,h3,h4,h5,h6

[Formula to calculate equivalent length (Le)]

In case of new piping	Le = (length of ϕ 12.7) + 0.52 × (length of ϕ 9.52)
In case of existing piping	Le = (length of ϕ 12.7) + 0.52 × (length of ϕ 9.52) + 1.56 × (length of ϕ 15.88)

Notes: (1) Install the indoor units so that L + L1 becomes the longest one-way pipe.
(2) Connect the indoor unit with the maximum capacity to L1.
(3) If the outdoor temperature is above 43°C, the dimensional restriction is ≦ 30m.

< Single type >



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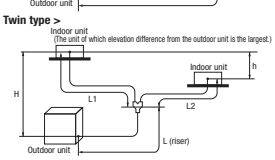

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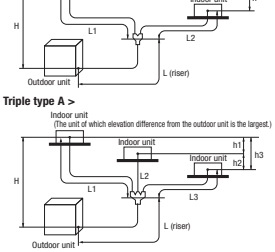

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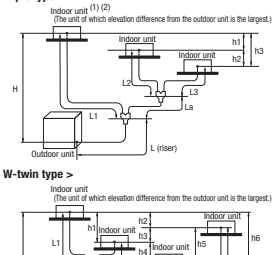
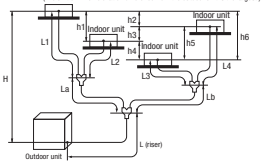


< W-twin type >



2) Determination of pipe size

- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

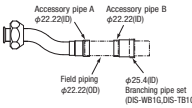
		Model 200V		Model 250V, 280V			
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
Outdoor unit connected		ϕ22.22	ϕ9.52	ϕ22.22	ϕ12.7	ϕ22.22	ϕ12.7
		Brazing	Flare	Brazing	Flare	Brazing	Flare
Refrigerant piping (main pipe L)		ϕ22.22 or ϕ25.4 or ϕ28.58	ϕ9.52 or ϕ12.7	ϕ22.22 or ϕ25.4 or ϕ28.58	ϕ12.7	ϕ22.22 or ϕ25.4 or ϕ28.58	ϕ12.7
In the case of a single type	Indoor unit connected	ϕ25.4	ϕ12.7	ϕ25.4	ϕ12.7	–	
	Capacity of indoor unit	Model 200V		Model 250V, 280V			
In the case of a twin type	Branching pipe set	DIS-WB1G		DIS-WB1G		–	
	Refrigerant piping (branch pipe L1,L2)	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52		
	Indoor unit connected	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52		
	Capacity of indoor unit	Model 100V×2		Model 125V×2, 140V×2			
In the case of a triple type A	Branching pipe set	DIS-TB1G		–		–	
	Refrigerant piping (branch pipe L1,L2,L3)	ϕ15.88	ϕ9.52				
	Indoor unit connected	ϕ15.88	ϕ9.52				
	Capacity of indoor unit	Model 71V×3					
In the case of a triple type B	Branching pipe set	DIS-WB1G		DIS-WB1G		DIS-WB1G	
	Refrigerant piping (branch pipe La,L1)	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
	Branching pipe set	DIS-WA1G		DIS-WA1G		DIS-WA1G	
	Refrigerant piping (branch pipe L2,L3)	ϕ15.88	ϕ9.52	ϕ12.7	ϕ9.52	ϕ15.88	ϕ9.52
	Indoor unit connected	ϕ15.88	ϕ9.52	ϕ12.7	ϕ6.35	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 71V×3		Model 60V×2+ Model 125V		Model 71V×2+ Model 100V, 71V×2+ 140V	
In the case of a W-twin type	Branching pipe set	DIS-WB1G		DIS-WB1G		DIS-WB1G	
	Refrigerant piping (branch pipe La,Lb)	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52	ϕ15.88	ϕ9.52
	Branching pipe set	DIS-WA1G		DIS-WA1G × 2		DIS-WA1G×2	
	Refrigerant piping (branch pipe L1,L2,L3,L4)	ϕ12.7	ϕ9.52	ϕ12.7	ϕ9.52	ϕ15.88	ϕ9.52
	Indoor unit connected	ϕ12.7	ϕ9.52	ϕ12.7	ϕ6.35	ϕ15.88	ϕ9.52
	Capacity of indoor unit	Model 50V×4		Model 60V×4, 71V×4		Model 71V×4	

⚠CAUTION

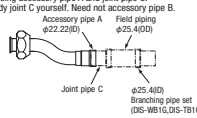
- When the model 50V or model 60V model is connected as an indoor unit, always use a ϕ9.52 liquid pipe for the branch (branching pipe – indoor unit) and a different diameter joint supplied with the branching pipe set for connection with the indoor unit (ϕ6.35 on the liquid pipe side).
  If a ϕ6.35 pipe is used for connection with a branching pipe, a refrigerant distribution disorder may occur, causing one of the indoor units to fall short of the rated capacity.
- A riser pipe must be a part of the main. A branching pipe set should be installed horizontally at a point as close to an indoor unit as possible.
  A branching part must be dressed with a heat-insulation material supplied as an accessory.
- For the details of installation work required at and near a branching area, see the installation manual supplied with your branching pipe set.

3) How to use pipe reducer

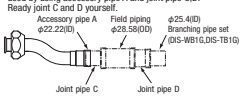
- ϕ22.22(OD) size of the refrigerant gas pipe can be used by using accessory pipe A,B.



- ϕ25.4(OD) size of the refrigerant gas pipe can be used by using accessory pipe A and joint pipe C.
  Ready joint C yourself. Need not accessory pipe B.



- ϕ28.58(OD) size of the refrigerant gas pipe can be used by using accessory pipe A and joint pipe C,D.
  Ready joint C and D yourself.



About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.

4) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.
- This unit uses R32. Always use 1/2H pipes having a 1.0mm or thicker wall for φ19.05 or larger pipes, because O-type pipes do not meet the pressure resistance requirement.

Pipe diameter [mm]	6.35	9.52	12.7	15.88	22.22	25.4	28.58
Minimum pipe wall thickness [mm]	0.8	0.8	0.8	1.0	1.0	1.0	1.0
Pipe material*	O-type pipe	O-type pipe	O-type pipe	O-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H 3300

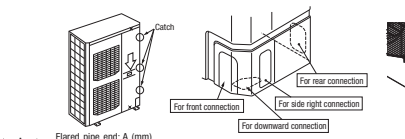
NOTE
- Select pipes having a wall thickness larger than the specified minimum pipe thickness.

5) On-site piping work

⚠IMPORTANT
- Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

How to remove the service panel
First remove screws (× mark) of the service panel and push it down into the direction of the arrow mark and then remove it by pulling it toward you.

- The pipe can be laid in any of the following directions: side right, front, rear and downward.
- Remove a knock-out plate provided on the pipe penetration to open a minimum necessary area and attach an edging material supplied as an accessory by cutting it to an appropriate length before laying a pipe.
  ※Please close the gap of piping connecting part with putty or insulation material (locally procured) after piping connection. Small animals or insects may intrude into the outdoor unit and it will cause electrical short.
- Carry out the on site piping work with the operation valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- Bend a pipe to a radius as large as practical.(R100—R150) Do not bend a pipe repeatedly to correct its form.
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R32 are different from those for conventional R22 and R407C. Although we recommend the use of flaring tools designed specifically for R32, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
  ※Do not reuse existing flare, make new flare.
- The pipe should be anchored every 1.5m or less to isolate the vibration.
- Tighten a flare joint securely with a double spanner.



Flared pipe end: A (mm)

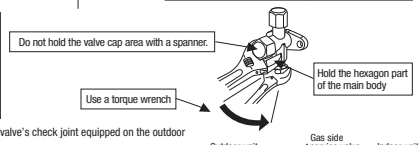
Copper pipe outer diameter	A 0 −0.4
φ6.35	9.1
φ9.52	13.2
φ12.7	16.6
φ15.88	19.7

Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R32 tool	With a conventional tool
φ6.35	0—0.5	0.7—1.3
φ9.52		
φ12.7		
φ15.88		

⚠CAUTION
- Do not apply force beyond proper fastening torque in tightening the flare nut.
- Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.
- Do not apply refrigerating machine oil to the flared surface. It can cause refrigerant leakage.

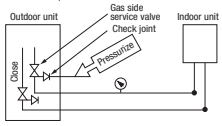
Service valve size (mm)	Tightening torque (N·m)
φ6.35 (1/4")	14—18
φ9.52 (3/8")	34—42
φ12.7 (1/2")	49—61
φ15.88 (5/8")	68—82
φ19.05 (3/4")	100—130



6) Air tightness test

① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient Temperature fall 1℃, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.



7) Evacuation

＜Work flow＞ When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.

Run the vacuum pump for at least one hour after the vacuum gauge shows -101kPa or lower. (-755mmHg or lower)
Confirm that the vacuum gauge indicator does not rise even if the system is left for one hour or more.

Airtightness test completed
↓
Vacuuming begins
↓
Vacuuming completed
↓
Vacuum gauge check
↓
Fill refrigerant

Pay attention to the following points in addition to the above for the R32 and compatible machines.
- ○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, R410A etc.).
- ○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

8) Additional refrigerant charge

(1) Determine if the factory refrigerant charge of the outdoor unit is sufficient to cover the total liquid piping length.

Item / Capacity	Factory refrigerant charge (kg)	Liquid piping length covered with factory refrigerant charge (m)
200V	4.3	30
250V	5.1	
280V	5.6	

(2) If the factory charge does not cover the total liquid piping length, an addition of refrigerant is necessary.

Step1 - Calculate the total equivalent length, Le:
[Formula to calculate equivalent length (Le)]

In case of new piping	Le = (length of φ12.7) + 0.52 × (length of φ9.52)
In case of existing piping	Le = (length of φ12.7) + 0.52 × (length of φ9.52) + 1.56 × (length of φ15.88)

Step2 - Determine from the table below the additional refrigerant charge:

Model FDC200 *	Equivalent length (Le)				
	≦30 m	30＜Le≦40 m	40＜Le≦50 m	50＜Le≦60 m	60＜Le≦70 m
Additional refrigerant charge (kg)	0kg	0.20kg	2.11kg	2.98kg	3.65kg

Model FDC250	Equivalent length (Le)				
	≦30 m	30＜Le≦40 m	40＜Le≦50 m	50＜Le≦60 m	60＜Le≦70 m
Additional refrigerant charge (kg)	0kg	0.44kg	1.31kg	2.18kg	2.85kg

Model FDC280	Equivalent length (Le)				
	≦30 m	30＜Le≦40 m	40＜Le≦50 m	50＜Le≦55 m	55＜Le≦60 m
Additional refrigerant charge (kg)	0kg	0.44kg	1.31kg	1.96kg	2.35kg

*For FDC200VSA-W only, even if the total liquid piping length > 30m, there may be cases where additional refrigerant charge is not required.

- It is not necessary to remove or add refrigerant charge even if the total liquid piping length is less than 3 m.
- If an existing pipe system is used, the refrigerant charge will vary according to the liquid pipe size. For further information, see "6. UTILIZATION OF EXISTING PIPING."

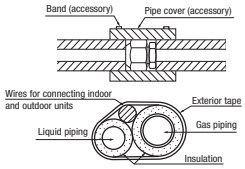
Examples:
FDC250VSA-W - W-twin system with L(φ12.7) = 35 m; La(φ9.52) = Lb(φ9.52) = 5 m; L1(φ9.52) = L2(φ9.52) = L3(φ9.52) = L4(φ9.52) = 3 m
Total liquid piping length = 57 m, additional refrigerant charge is necessary
Step 1: Le = 35 + 0.52 x (5 + 5 + 3 + 3 + 3 + 3) = 46.44 m Step 2: additional refrigerant charge = 1.31 kg

(3) Charging refrigerant
- Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

NOTE Put down the refrigerant volume calculated from the pipe length onto the label attached on the back side of the service panel.

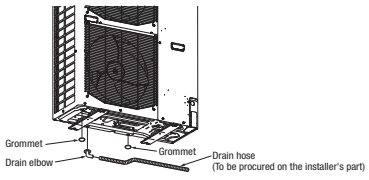
9) Heating and condensation prevention

(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
(2) Use a heat insulating material that can withstand 120℃ or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
- All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- **Both gas and liquid pipes need to be dressed with 20 mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**

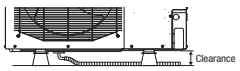


3. DRAIN PIPING WORK

- Execute drain piping by using a drain elbow and drain grommets supplied separately as optional parts, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of service valve or connected pipes.
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)
- Do not use drain elbow and grommet made of plastic for drain piping when base heater for outdoor unit is used. Plastic grommet and elbow will be damaged and burnt in worst case.
- Prepare another drain tray made of metallic material for collecting drain when base heater is used.

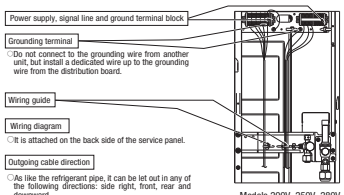


- When condensed water needs to be led to a drain, etc., install the unit on a flat base (supplied separately as an optional part) or concrete blocks.
  Then, please secure space for the drain elbow and the drain hose.



4. ELECTRICAL WIRING WORK For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.
- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51),
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - flat twin tinsel cord (code designation 60227 IEC 41);
  Do not use anything lighter than polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire.
  If impropery grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an acccident such as an electric shock or a fire.
- Do not turn on the power until the electrical work is completeted .

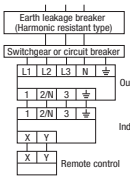


Models 200V, 250V, 280V

- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- For power supply cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable. Separate grounding wire from indoor - outdoor connecting wire.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.

Power cable, indoor-outdoor connecting wires
- Always perform grounding system installation work with the power cord unplugged.

⚠CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.



Models 200V, 250V, 280V

Model	Power supply	Power cable size (mm²)	MAX. over current (A)	Power cable length (m)	Earth wire size	Indoor-outdoor wire size × number
200V	3 phase 4 wire 380-415V 50Hz 380V 60Hz	5.5	19	72	φ1.6mm	φ1.6mm × 3
250V			20	69		
280V			20	69		

※In case of FDU indoor unit combination.

Model	Power supply	Power cable size (mm²)	MAX. over current (A)	Power cable length (m)	Earth wire size	Indoor-outdoor wire size × number
200V	3 phase 4 wire 380-415V 50Hz 380V 60Hz	5.5	23	60	φ1.6mm	φ1.6mm × 3
250V			25	55		
280V			25	55		

※In case of FDUM indoor unit combination.

Model	Power supply	Power cable size (mm²)	MAX. over current (A)	Power cable length (m)	Earth wire size	Indoor-outdoor wire size × number
200V	3 phase 4 wire 380-415V 50Hz 380V 60Hz	5.5	19	72	φ1.6mm	φ1.6mm × 3
250V			20	69		
280V			22	62		

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, follow the internal cabling regulations. Adapt it to the regulation in effect in each country.
- Use an all-pole disconnection type breaker with at 3mm or more gap between the contact points, that provide full disconnection under over-voltage category III.

5. COMMISSIONING

⚠ WARNING
- Before conduct a test run, make sure that the service valves are opened.
- Turn on power 6 hours prior to a test run to energize the crank case heater.
- In case of the first operation after turning on power, even if the unit does not move for 30 minutes, it is not a breakdown.
- Always give a 3-minute or longer interval before you start the unit again whenever it is stopped.
- Removing the service panel will expose high-voltage live parts and high-temperature parts, which are quite dangerous. Take utmost care not to incur an electric shock or burns. Do not leave the unit with the service panel open.

} A failure to observe these instructions can result in a compressor breakdown.

⚠ CAUTION
- When you operate switches (SW3, SW5) for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid service valve charge port.
- The 4-way valve (20S) is energized during a heating operation.
- When power supply is cut off to reset the unit, give 3 or more minutes before you turn on power again after power is cut off. If this procedure is not observed in turning on power again, "Communication error between outdoor and indoor unit" may occur.

1) Test run method

(1) A test run can be initiated from an outdoor unit by using SW3-3 and SW3-4 for on-site setting.
(2) Switching SW3-3 to ON will start the compressor.
(3) The unit will start a cooling operation, when SW3-4 is OFF, or a heating operation, when SW3-4 is ON.
(4) **Do not fail to switch SW3-3 to OFF when a test run is completed.**

SW-3-3	SW-3-4	
ON	OFF	Cooling during a test run
	ON	Heating during a test run
OFF	—	Normal or After the test operation

2) Checking the state of the unit in operation

Use check joints provided on the piping before and after the four-way valve installed inside the outdoor unit for checking discharge pressure and suction pressure.
As indicated in the table shown on the right, pressure detected at each point will vary depending on whether a cooling or heating operation has been selected.

	Check joint of the pipe	Charge port of the gas service valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating operation	Suction pressure (Low pressure)	Discharge pressure (High pressure)

3) Setting SW3-1, SW3-2, on-site

(1) Defrost control switching (SW3-1)
・When this switch is turned ON, the unit will run in the defrost mode more frequently.
・Set this switch to ON, when installed in a region where outdoor temperature falls below zero during the season the unit is run for a heating operation.
(2) Snow guard fan control (SW3-2)
・When this switch is turned on, the outdoor unit fan will run for 10 seconds in every 10 minutes, when outdoor temperature falls to 3℃ or lower and the compressor is not running.
・When the unit is used in a very snowy country, set this switch to ON.

4) Failure diagnosis in a test run

Error indicated on the remote control unit	Printed circuit board LED(The cycles of 5 seconds)		Failure event	Action
	Red LED	Green LED		
E40	Blinking once	Blinking continuously	63H1 actuation or operation with service valves shut (occurs mainly during a heating operation)	1. Check whether the service valves are open. 2. If an error has been cancelled when 3 minutes have elapsed since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.
E49	Blinking once	Blinking continuously	Low pressure error or operation with service valves shut (occurs mainly during a cooling operation)	

- If an error code other than those listed above is indicated, refer to the wiring diagram of the outdoor unit and the indoor unit.

5) The state of the electronic expansion valve

The following table illustrates the steady states of the electronic expansion valve.

	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
		During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut position	Full open position	Full open position	Full open position
Valve for a heating operation	Full open position	Full open position	Complete shut position	Full open position	Full open position

6) Heed the following on the first operation after turning on the circuit breaker.

・This outdoor unit may start in the standby mode (waiting for a compressor startup), which can continue up to 30 minutes, to prevent the oil level in the compressor from lowering on the first operation after turning on the circuit breaker. If that is the case, do not suspect a unit failure.
・At the first operation of heating mode after turning on the circuit breaker, the outdoor unit may start in cooling mode a while to prevent from liquid refrigerant back to compressor. If that is the case, do not suspect a unit failure.

Items to check before a test run

- When you leave the outdoor unit with power supplied to it, be sure to close the panel.

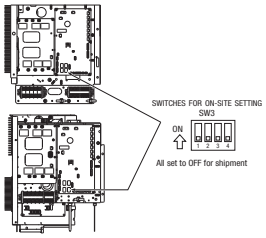
Item No.used in the installation manual	Item	Check item	Check
2	Refrigerant plumbing	If brazed, was it brazed under a nitrogen gas flow?	
		Were air-tightness test and vacuum extraction surely performed?	
		Are heat insulation materials installed on both liquid and gas pipes?	
		Are service valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
4	Electric wiring	Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
		Are properly rated electrical equipments used for circuit breakers and cables?	
		Doesn't cabling cross-connect between units, where more than one unit are installed?	
		Aren't indoor-outdoor signal wires connected to remote control wires?	
		Do indoor-outdoor connecting cables connect between the same terminal numbers?	
		Are either VCT cabtyre cables or WF flat cables used for indoor-outdoor connecting cables?	
		Does grounding satisfy the D type grounding (type III grounding) requirements?	
		Is the unit grounded with a dedicated grounding wire not connected to another unit's grounding wire?	
		Are cables free of loose screws at their connection points?	
		Are cables held down with cable clamps so that no external force works onto terminal connections?	
—	Indoor unit	Is indoor unit installation work completed?	
		Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedure

- Always carry out a test run and check the following in order as listed.

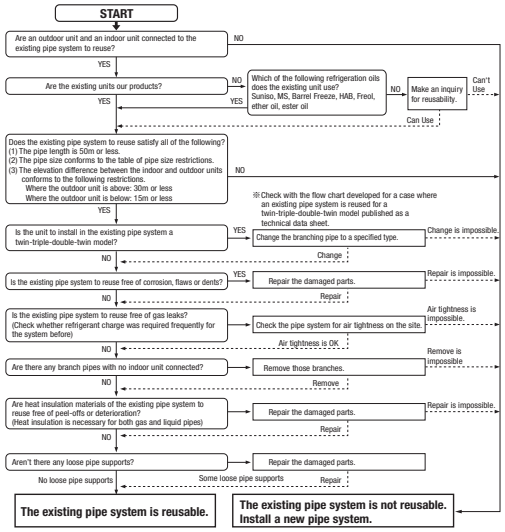
Turn	The contents of operation	Check
①	Open the gas side service valve fully.	
②	Open the liquid side service valve fully.	
③	Close the panel.	
④	Where a remote control unit is used for unit setup on the installation site, follow instructions for unit setup on the installation site with a remote control unit.	
⑤	SW3-3 ON / SW3-4 OFF: the unit will start a cooling operation.	
	SW3-3 ON / SW3-4 ON: the unit will start a heating operation.	
⑥	When the unit starts operation, press the wind direction button provided on the remote control unit to check its operation.	
⑦	Place your hand before the indoor unit's diffuser to check whether cold (warm) winds come out in a cooling (heating) operation.	
⑧	Make sure that a red LED is not blinking.	
⑨	When you complete the test run, do not forget to turn SW3-3 to the OFF position.	
⑩	Where options are used, check their operation according to the respective instruction manuals.	

<200V, 250V, 280V>



6. UTILIZATION OF EXISTING PIPING

Check whether an existing pipe system is reusable or not by using the following flow chart.



⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the excising unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R32.
- **Turn on-site setting switch SW5-1** to the ON position. (Where the gas pipe size is φ19.05)

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.
- If you choose to wash the pipe system, contact our distributor in the area.

<Table of pipe size restrictions>

Applicable pipe size combination is restricted by the following table.
Pipe length is limited according to the total refrigerant charge amount.
For additional charging amount of refrigerant, refer to 2.8) Additional refrigerant charge.
◎:Standard pipe size ○:Usable
△:Restricted to shorter pipe length limits ×:Not usable

Pipe size										
	Liquid pipe	φ9.52	φ9.52	φ9.52	φ12.7	φ12.7	φ12.7	φ15.88	φ15.88	φ15.88
	Gas pipe	φ22.22	φ25.4	φ28.58	φ22.22	φ25.4	φ28.58	φ22.22	φ25.4	φ28.58
200V	Usability	◎	○※2	○※2	△	◎	◎	△	△	×
250V 280V		×	×	×	◎	◎	◎	△	△	△

<Pipe system after the branching pipe>

Pipe size			After 1st branch ※3			After 2nd branch		
	Liquid pipe		φ9.52			φ9.52		
	Gas pipe		φ12.7	φ15.88	φ19.05※1	φ12.7	φ15.88	φ19.05※1
Model	Combination type	Combination of capacity						
200V	Twin	100+100	×	◎	○	—	—	—
	Triple A	71+71+71	×	◎	○	—	—	—
	Triple B	71+71+71	×	◎	○※4	×	◎	○
	Double twin	50+50+50+50	×	◎	○	◎	○	×
250V 280V	Twin	125+125, 140+140	×	◎	○	—	—	—
	Triple A	—	—	—	—	—	—	—
	Triple B	60+60+125, 71+71+140	×	◎	○※4	◎	×	×
	Triple B	71+71+100	×	◎	○※4	×	◎	×
	Double twin	60+60+60+60, 71+71+71+71	×	◎	○	◎	○	×

※1 Because of its insufficient pressure resistance, **turn the DIP switch SW5-1** provided on the outdoor unit board to the ON position for φ19.05 × t1.0. (In the case of a twin-triple-double-twin model, this also applies to the case where φ19.05 × t1.0 is used in a pipe system after the first branching point.) However, you need not turn the DIP switch SW5-1 to the ON position, if 1/2H pipes or pipes having 1.2 or thicker walls are used.
※2 When the main pipe length exceeds 40m, a significant capacity drop may be experienced due to pressure loss in the liquid pipe system. Use φ12.7 for the liquid main.
※3 Piping size after branch should be equal or smaller than main pipe size.
※4 Piping size from first branch to indoor unit should be φ9.52 (Liquid) / φ15.88 (Gas).
- Any combinations of pipe sizes not listed in the table or marked with × in the table are not usable.

<The model types of existing units of which branching pipes are reusable.>

Models later than Type 8.

- FDC＊＊＊8□□□ ●FDCP＊＊＊8□□□

The branching pipes used with models other than those listed above are not reusable because of their insufficient pressure resistance. Please use our genuine branching pipes for R32.

- ＊＊＊ are numbers representing horsepower. □□□ is an alphanumeric letter.

Formula to calculate additional charge volume

Refer to "2. REFRIGERANT PIPING WORK", "8) Additional refrigerant charge".

2.9.5 Method for connecting the accessory pipe

Models FDC200VSA-W, 250VSA-W, 280VSA-W

PSC012D028H F

- Be sure to use the accessory pipe to connect the service valve on the gas side with the field pipe.
- Be sure to use the straight pipe (Procured at the field) shown in the table 1 applicable to the model of outdoor unit.
- When tightening the flare, connect the pipe securely by pressing the flared face of pipe against the service valve.
- When brazing between the pipe in place and the attached pipe, confirm that no excessive force is applied to the flare joint. Otherwise gas could leak from the flare joint.
- Connect the attached pipe according to the following steps ① — ⑤.

① Referring to Table 2 and Table 3, prepare the straight pipe and the elbow in the field, which are used in the construction examples Ⓐ — Ⓓ applicable to the connecting direction.

② Firstly, use the accessory pipe to assemble the connecting pipe assembly outside the outdoor unit. (As shown in the figure of connecting examples Ⓐ — Ⓓ.)

③ After assembling the connecting pipe, connect it to the service valve on the gas side inside the outdoor unit. Tighten the flare nut with appropriate torque.

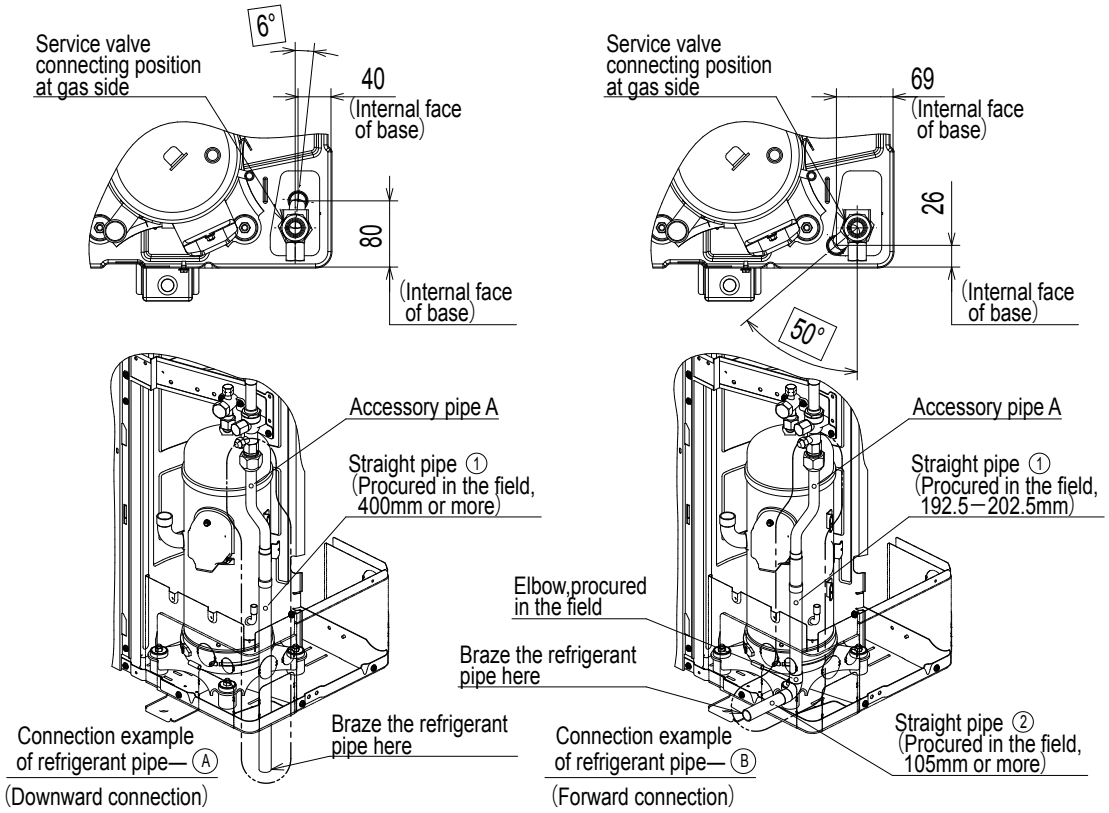
Proper torque	
ϕ 19.05	100−130N•m

④ After connection of the connecting pipe assembly to the service valve on the gas side, braze the connecting pipe assembly and the field pipe.

⑤ When connecting pipe contacts wiring, attach heat insulating material to the pipe in order to prevent from contacting of the pipe and wiring. (If the wiring is rubbed with the pipe and the cover of wiring is teared, there is a risk of a short circuit or an electtric shock.)

【Connection example Ⓐ — Ⓓ applicable to the connecting direction.】

- The piping angle shown below is an example in case of 15mm of heat insulating material. Adjust an angle, according to the thickness of heat insulating material. Pass the connecting pipe in a hole after angle adjustment.



About brazing

● Be sure to braze while supplying nitrogen gas.
If no nitrogen gas is supplied, a large amount of impurity (oxidized film) will be generated, which may clog the capillary tube and the expansion valve, resulting in fatal malfunction.

Table 1 Pipe specification

		Refrigerant line (one way) length (m)	
Single type	200V	≦35 (m)	φ22.22 x t1.0
	250V	≦70 (m)	φ25.4 x t1.0 or φ28.58 x t1.0
	280V	≦35 (m)	φ22.22 x t1.0
		≦60 (m)	φ25.4 x t1.0 or φ28.58 x t1.0

● Be sure to use pipes of 1／2H material, and wall thickness above 1mm. (Pressure resistance of O-type pipe is not enough.)

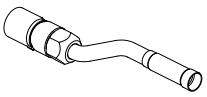
Table 2 Parts used for the connecting pipe assembly

No.	Name	Quantity	Remark
1	Accessory pipe A	1	Accessory
2	Straight pipe ①	1	Procured at the field
3	Straight pipe ②	1 or 0	Procured at the field (Not required for downward direction)
4	Elbow	1 or 0	Procured at the field (Not required for downward direction)

Table 3 Length and specification of straight pipe (Procured in the field)

	Ⓐ Downward	Ⓑ Forward	Ⓒ Rightward	Ⓓ Backward
Straight pipe ①	400mm or more	192.5－202.5mm	192.5－202.5mm	210mm
Straight pipe ②	－	105mm or more	155mm or more	370mm or more

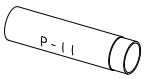
A



Accessory pipe A x 1 pc.

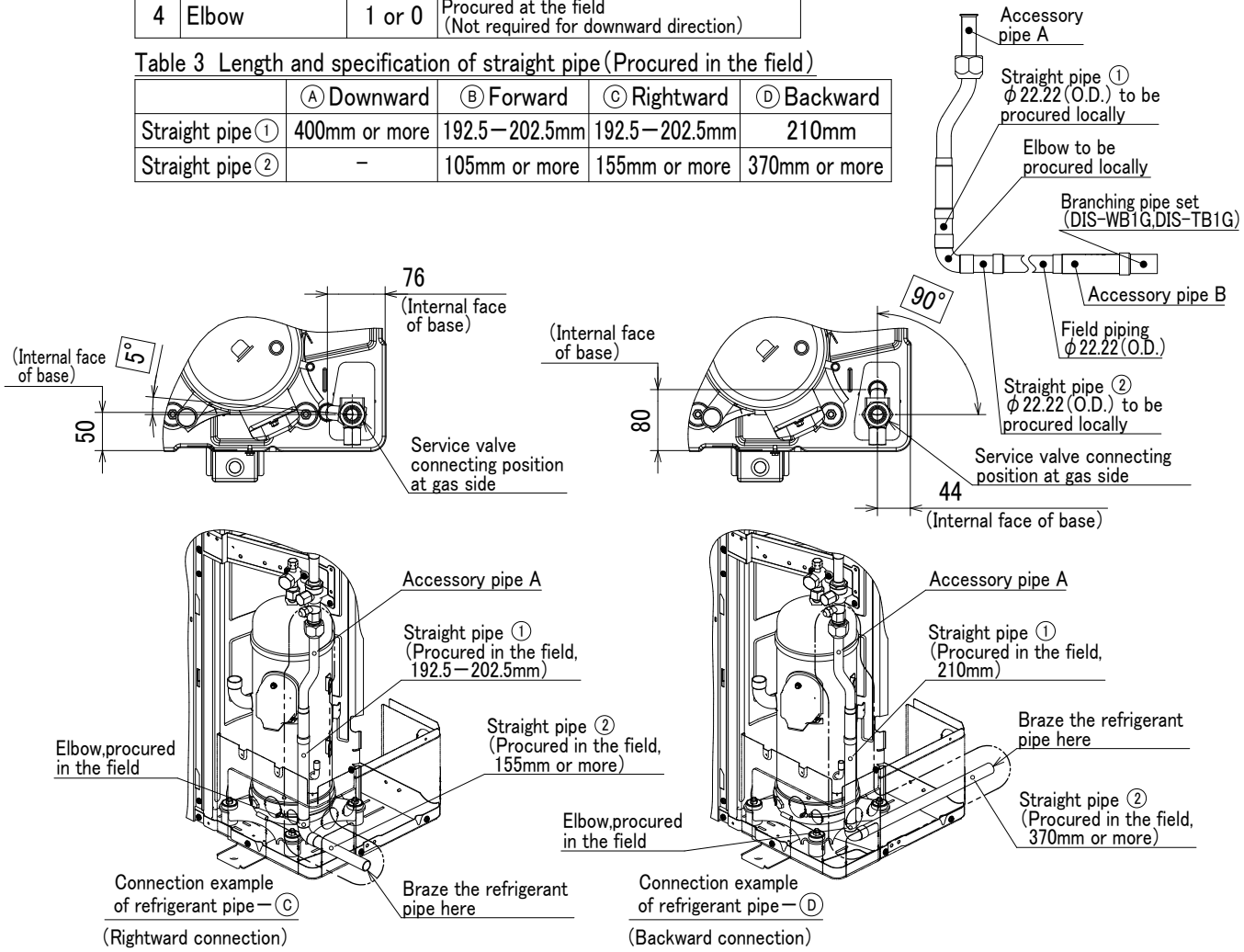
Heat insulating material is attached to the accessory pipe with band. When installing the heat insulating material, cut the band and retrieve it.

B



Accessory pipe B x 1 pc.

● Branching pipe set can be used by using the accessory pipe B. When φ22.22 (O.D.) size of the indoor unit gas pipe is used, the accessory pipe B is unnecessary.



2.9.6 Instructions for branching pipe set (DIS-WA1G, WB1G, TA1G, TB1G) ..... See page 78.

2.9.7 Safety precautions in handling air-conditioners with glammable refrigerant ..... See page 81.

2.10 TECHNICAL INFORMATION

Model FDF100VNAWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	FDF100VH
Outdoor unit model name	FDC100VNA-W

Function(indicate if present)	
cooling	Yes
heating	Yes

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Average(mandatory)	Yes
Warmer(if designated)	No
Colder(if designated)	No

Item	symbol	value	unit
Design load			
cooling	Pdesignc	10.0	kW
heating / Average	Pdesignh	8.50	kW
heating / Warmer	Pdesignh	-	kW
heating / Colder	Pdesignh	-	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	5.76	A+
heating / Average	SCOP/A	4.00	A+
heating / Warmer	SCOP/W	-	-
heating / Colder	SCOP/C	-	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	8.50	kW
heating / Warmer (2℃)	Pdh	-	kW
heating / Colder (-22℃)	Pdh	-	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	0	kW
heating / Warmer (2℃)	elbu	-	kW
heating / Colder (-22℃)	elbu	-	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	10.0	kW
Tj=30℃	Pdc	7.37	kW
Tj=25℃	Pdc	4.72	kW
Tj=20℃	Pdc	3.20	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	3.25	-
Tj=30℃	EERd	4.75	-
Tj=25℃	EERd	6.85	-
Tj=20℃	EERd	10.2	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	7.53	kW
Tj=2℃	Pdh	4.59	kW
Tj=7℃	Pdh	2.93	kW
Tj=12℃	Pdh	2.90	kW
Tj=bivalent temperature	Pdh	8.50	kW
Tj=operating limit	Pdh	6.30	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	2.70	-
Tj=2℃	COPd	3.99	-
Tj=7℃	COPd	5.00	-
Tj=12℃	COPd	6.00	-
Tj=bivalent temperature	COPd	2.45	-
Tj=operating limit	COPd	2.20	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	-	kW
Tj=7℃	Pdh	-	kW
Tj=12℃	Pdh	-	kW
Tj=bivalent temperature	Pdh	-	kW
Tj=operating limit	Pdh	-	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	-	-
Tj=7℃	COPd	-	-
Tj=12℃	COPd	-	-
Tj=bivalent temperature	COPd	-	-
Tj=operating limit	COPd	-	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	-	kW
Tj=2℃	Pdh	-	kW
Tj=7℃	Pdh	-	kW
Tj=12℃	Pdh	-	kW
Tj=bivalent temperature	Pdh	-	kW
Tj=operating limit	Pdh	-	kW
Tj=-15℃	Pdh	-	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	-	-
Tj=2℃	COPd	-	-
Tj=7℃	COPd	-	-
Tj=12℃	COPd	-	-
Tj=bivalent temperature	COPd	-	-
Tj=operating limit	COPd	-	-
Tj=-15℃	COPd	-	-

Bivalent temperature			
heating / Average	Tbiv	-10	℃
heating / Warmer	Tbiv	-	℃
heating / Colder	Tbiv	-	℃

Operating limit temperature			
heating / Average	Tol	-20	℃
heating / Warmer	Tol	-	℃
heating / Colder	Tol	-	℃

Cycling interval capacity			
for cooling	Pcycc	-	kW
for heating	Pcych	-	kW

Cycling interval efficiency			
for cooling	EERcyc	-	-
for heating	COPcyc	-	-

Degradation coefficient			
cooling	Cdc	0.25	-

Degradation coefficient			
heating	Cdh	0.25	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	7	W
standby mode	Psb	7	W
thermostat-off mode	Pto(cooling)	64	W
	Pto(heating)	76	W
crankcase heater mode	Pck	5	W

Annual electricity consumption			
cooling	Qce	608	kWh/a
heating / Average	Qhe	2973	kWh/a
heating / Warmer	Qhe	-	kWh/a
heating / colder	Qhe	-	kWh/a

Capacity control(indicate one of three options)	
fixed	No
staged	No
variable	Yes

Other items			
Sound power level(indoor)	Lwa	65	dB(A)
Sound power level(outdoor)	Lwa	69	dB(A)
Global warming potential	GWP	675	kgCO_2eq.
Rated air flow(indoor)	-	1620	m^3/h
Rated air flow(outdoor)	-	4500	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

PGA000Z841 B

Model FDF100VSAWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDF100VH**
Outdoor unit model name	**FDC100VSA-W**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**No**
Colder(if designated)	**No**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**10.0**	kW
heating / Average	Pdesignh	**8.50**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**5.76**	A+
heating / Average	SCOP/A	**4.00**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**8.50**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**10.0**	kW
Tj=30℃	Pdc	**7.37**	kW
Tj=25℃	Pdc	**4.72**	kW
Tj=20℃	Pdc	**3.20**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.25**	-
Tj=30℃	EERd	**4.75**	-
Tj=25℃	EERd	**6.85**	-
Tj=20℃	EERd	**10.2**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**7.53**	kW
Tj=2℃	Pdh	**4.59**	kW
Tj=7℃	Pdh	**2.93**	kW
Tj=12℃	Pdh	**2.90**	kW
Tj=bivalent temperature	Pdh	**8.50**	kW
Tj=operating limit	Pdh	**6.30**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.70**	-
Tj=2℃	COPd	**3.99**	-
Tj=7℃	COPd	**5.00**	-
Tj=12℃	COPd	**6.00**	-
Tj=bivalent temperature	COPd	**2.45**	-
Tj=operating limit	COPd	**2.20**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-20**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**7**	W
standby mode	Psb	**7**	W
thermostat-off mode	Pto(cooling)	**64**	W
	Pto(heating)	**76**	W
crankcase heater mode	Pck	**5**	W

Annual electricity consumption			
cooling	Qce	**608**	kWh/a
heating / Average	Qhe	**2973**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**65**	dB(A)
Sound power level(outdoor)	Lwa	**69**	dB(A)
Global warming potential	GWP	**675**	$kgCO_2eq.$
Rated air flow(indoor)	-	**1620**	m^3/h
Rated air flow(outdoor)	-	**4500**	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

PGA000Z841 B

Model FDF125VNAWVH

Model(s) : FDC125VNA-W / FDF125VH							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency	η s,c	**211.2**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**269.0**	%
Tj=+30℃	Pdc	**9.20**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**415.0**	%
Tj=+25℃	Pdc	**5.89**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**613.0**	%
Tj=+20℃	Pdc	**3.20**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1020.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.064**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m^3/h
Sound power level, outdoor	L_{WA}	**71.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :	FDC125VNA-W / FDF125VH						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW	Seasonal space heating energy efficiency	η s,h	**155.5**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**8.69**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**251.0**	%
T_j=+2℃	Pdh	**5.30**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**394.0**	%
T_j=+7℃	Pdh	**3.39**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**510.0**	%
T_j=+12℃	Pdh	**2.90**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**610.0**	%
T_{biv}=bivalent temperature	Pdh	**9.80**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**250.0**	%
T_{OL}=operation limit	Pdh	**7.40**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**220.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.010**	kW				
Thermostat-off mode	P_{TO}	**0.079**	kW	Type of energy input Standby mode	P_{SB}	**0.010**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m^3/h
Sound power level, outdoor measured	L_{WA}	**71.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PGA000Z841 B

Model FDF125VSAWVH

Model(s) :	FDC125VSA-W / FDF125VH						
Outdoor side heat exchanger of air-conditioner :	air						
Indoor side heat exchanger of air-conditioner :	air						
Type :	vapour compression						
if applicable :	electric motor						
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**12.5**	kW	Seasonal space cooling energy efficiency	η s,c	**211.2**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**12.5**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**269.0**	%
Tj=+30℃	Pdc	**9.20**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**415.0**	%
Tj=+25℃	Pdc	**5.89**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**613.0**	%
Tj=+20℃	Pdc	**3.20**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1020.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.064**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m^3/h
Sound power level, outdoor	L_{WA}	**71.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :	FDC125VSA-W / FDF125VH						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**14.0**	kW	Seasonal space heating energy efficiency	η s,h	**155.5**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**8.69**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**251.0**	%
T_j=+2℃	Pdh	**5.30**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**394.0**	%
T_j=+7℃	Pdh	**3.39**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**510.0**	%
T_j=+12℃	Pdh	**2.90**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**610.0**	%
T_{biv}=bivalent temperature	Pdh	**9.80**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**250.0**	%
T_{OL}=operation limit	Pdh	**7.40**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**220.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.010**	kW				
Thermostat-off mode	P_{TO}	**0.079**	kW	Type of energy input Standby mode	P_{SB}	**0.010**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m^3/h
Sound power level, outdoor measured	L_{WA}	**71.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF140VNAWVH

Model(s) : FDC140VNA-W / FDF140VH							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**13.6**	kW	Seasonal space cooling energy efficiency	η s,c	**205.1**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**13.6**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**254.0**	%
Tj=+30℃	Pdc	**10.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**393.0**	%
Tj=+25℃	Pdc	**6.44**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**596.0**	%
Tj=+20℃	Pdc	**3.20**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1005.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.064**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items				For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m^3/h
Capacity control		**variable**					
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :	FDC140VNA-W / FDF140VH
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**15.5**	kW
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj			
T_j=-7℃	Pdh	**9.00**	kW
T_j=+2℃	Pdh	**5.60**	kW
T_j=+7℃	Pdh	**3.70**	kW
T_j=+12℃	Pdh	**2.90**	kW
T_{biv}=bivalent temperature	Pdh	**10.5**	kW
T_{OL}=operation limit	Pdh	**7.95**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-
Power consumption in modes other than 'active mode'			
Off mode	P_{OFF}	**0.010**	kW
Thermostat-off mode	P_{TO}	**0.079**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW
Other items			
Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**73.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV
GWP of the refrigerant		**675**	kg CO_2eq. (100years)

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η s,h	**156.6**	%
Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**248.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**396.5**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**520.7**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**616.2**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**245.2**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**216.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.010**	kW
For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m^3/h
For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger		**-**	m^3/h

Contact details	Mitsubishi heavy industries thermal systems,LTD.

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF140VSAWVH

Model(s) : FDC140VSA-W / FDF140VH							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**13.6**	kW	Seasonal space cooling energy efficiency	η s,c	**205.1**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**13.6**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**254.0**	%
Tj=+30℃	Pdc	**10.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**393.0**	%
Tj=+25℃	Pdc	**6.44**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**596.0**	%
Tj=+20℃	Pdc	**3.20**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1005.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.064**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m^3/h
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :				FDC140VSA-W / FDF140VH			
Outdoor side heat exchanger of heat pump :				air			
Indoor side heat exchanger of heat pump :				air			
Indication if the heater is equipped with a supplementary heater :				No			
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**15.5**	kW	Seasonal space heating energy efficiency	η s,h	**156.6**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**9.00**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**248.0**	%
T_j=+2℃	Pdh	**5.60**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**396.5**	%
T_j=+7℃	Pdh	**3.70**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**520.7**	%
T_j=+12℃	Pdh	**2.90**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**616.2**	%
T_{biv}=bivalent temperature	Pdh	**10.5**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**245.2**	%
T_{OL}=operation limit	Pdh	**7.95**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**216.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.010**	kW				
Thermostat-off mode	P_{TO}	**0.079**	kW	Type of energy input Standby mode	P_{SB}	**0.010**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m^3/h
Sound power level, outdoor measured	L_{WA}	**73.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF140VNAWPVH

Model(s) : FDC140VNA-W / FDF71VH (x2 units)							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**13.6**	kW	Seasonal space cooling energy efficiency	η s,c	**286.2**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**13.6**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**305.0**	%
Tj=+30℃	Pdc	**10.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**491.0**	%
Tj=+25℃	Pdc	**6.44**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**820.0**	%
Tj=+20℃	Pdc	**3.40**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1740.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m^3/h
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Information to identify the model(s) to which the information relates :	FDC140VNA-W / FDF71VH (x2 units)						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**15.5**	kW	Seasonal space heating energy efficiency	η s,h	**196.1**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**9.30**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**307.0**	%
T_j=+2℃	Pdh	**5.67**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**476.0**	%
T_j=+7℃	Pdh	**3.67**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**674.0**	%
T_j=+12℃	Pdh	**2.86**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**907.0**	%
T_{biv}=bivalent temperature	Pdh	**10.5**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**265.0**	%
T_{OL}=operation limit	Pdh	**7.90**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**220.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.010**	kW				
Thermostat-off mode	P_{TO}	**0.010**	kW	Type of energy input Standby mode	P_{SB}	**0.010**	kW
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m^3/h
Sound power level, outdoor measured	L_{WA}	**73.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

PGA000Z841 B

Model FDF140VSAWPVH

Model(s) : FDC140VSA-W / FDF71VH (x2 units)							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**13.6**	kW	Seasonal space cooling energy efficiency	η s,c	**286.2**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**13.6**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**305.0**	%
Tj=+30℃	Pdc	**10.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**491.0**	%
Tj=+25℃	Pdc	**6.44**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**820.0**	%
Tj=+20℃	Pdc	**3.40**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**1740.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.010**	kW	Crankcase heater mode	P_{CK}	**0.005**	kW
Thermostat-off mode	P_{TO}	**0.000**	kW	Standby mode	P_{SB}	**0.010**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**4500**	m^3/h
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	-	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :		FDC140VSA-W / FDF71VH (x2 units)					
Outdoor side heat exchanger of heat pump :		air					
Indoor side heat exchanger of heat pump :		air					
Indication if the heater is equipped with a supplementary heater :		No					
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**15.5**	kW	Seasonal space heating energy efficiency	η s,h	**196.1**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**9.30**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**307.0**	%
T_j=+2℃	Pdh	**5.67**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**476.0**	%
T_j=+7℃	Pdh	**3.67**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**674.0**	%
T_j=+12℃	Pdh	**2.86**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**907.0**	%
T_{biv}=bivalent temperature	Pdh	**10.5**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**265.0**	%
T_{OL}=operation limit	Pdh	**7.90**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**220.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.010**	kW	Type of energy input Standby mode	P_{SB}	**0.010**	kW
Thermostat-off mode	P_{TO}	**0.010**	kW				
Crankcase heater mode	P_{CK}	**0.005**	kW				
Other items				For air-to-air heat pumps: air flow-rate,outdoor measured		**4380**	m^3/h
Capacity control		**variable**		For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Sound power level, outdoor measured	L_{WA}	**73.0**	dB				
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF200VSAWPVH

Model(s) : FDC200VSA-W / FDF100VH (x2 units)							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**20.0**	kW	Seasonal space cooling energy efficiency	η s,c	**246.0**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**20.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**320.0**	%
Tj=+30℃	Pdc	**14.7**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**498.0**	%
Tj=+25℃	Pdc	**9.4**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**737.0**	%
Tj=+20℃	Pdc	**6.8**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**992.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.008**	kW	Crankcase heater mode	P_{CK}	**0.012**	kW
Thermostat-off mode	P_{TO}	**0.024**	kW	Standby mode	P_{SB}	**0.008**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**8880**	m^3/h
Sound power level, outdoor	L_{WA}	**72.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Information to identify the model(s) to which the information relates :	FDC200VSA-W / FDF100VH (x2 units)
Outdoor side heat exchanger of heat pump :	air
Indoor side heat exchanger of heat pump :	air
Indication if the heater is equipped with a supplementary heater :	No
if applicable :	electric motor

Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.

Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**22.4**	kW
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj			
T_j=-7℃	Pdh	**11.1**	kW
T_j=+2℃	Pdh	**6.8**	kW
T_j=+7℃	Pdh	**6.6**	kW
T_j=+12℃	Pdh	**6.9**	kW
T_{biv}=bivalent temperature	Pdh	**12.5**	kW
T_{OL}=operation limit	Pdh	**12.5**	kW
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW
Bivalent temperature	T_{biv}	**-10.0**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-
Power consumption in modes other than 'active mode'			
Off mode	P_{OFF}	**0.008**	kW
Thermostat-off mode	P_{TO}	**0.032**	kW
Crankcase heater mode	P_{CK}	**0.012**	kW
Other items			
Capacity control		**variable**	
Sound power level, outdoor measured	L_{WA}	**74.0**	dB
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV
GWP of the refrigerant		**675**	kg CO_2eq. (100years)

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η s,h	**186.0**	%
Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**330.0**	%
T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**508.0**	%
T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**550.0**	%
T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**686.0**	%
T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**300.0**	%
T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**300.0**	%
For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Supplementary heater back-up heating capacity	elbu	**-**	kW
Type of energy input Standby mode	P_{SB}	**0.008**	kW
For air-to-air heat pumps: air flow-rate,outdoor measured		**8040**	m^3/h
For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger		**-**	m^3/h

Contact details	Mitsubishi heavy industries thermal systems,LTD.

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF250VSAWPVH

Model(s) : FDC250VSA-W / FDF125VH (x2 units)							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**24.0**	kW	Seasonal space cooling energy efficiency	η s,c	**228.1**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**24.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**262.0**	%
Tj=+30℃	Pdc	**17.8**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**485.0**	%
Tj=+25℃	Pdc	**11.5**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**645.0**	%
Tj=+20℃	Pdc	**7.1**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**985.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.009**	kW	Crankcase heater mode	P_{CK}	**0.012**	kW
Thermostat-off mode	P_{TO}	**0.027**	kW	Standby mode	P_{SB}	**0.009**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**8880**	m^3/h
Sound power level, outdoor	L_{WA}	**73.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :	FDC250VSA-W / FDF125VH (x2 units)						
Outdoor side heat exchanger of heat pump :	air						
Indoor side heat exchanger of heat pump :	air						
Indication if the heater is equipped with a supplementary heater :	No						
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**28.0**	kW	Seasonal space heating energy efficiency	η s,h	**167.0**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**12.6**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**305.0**	%
T_j=+2℃	Pdh	**7.6**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**410.0**	%
T_j=+7℃	Pdh	**5.6**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**546.0**	%
T_j=+12℃	Pdh	**6.2**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**676.0**	%
T_{biv}=bivalent temperature	Pdh	**14.2**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**275.0**	%
T_{OL}=operation limit	Pdh	**15.1**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**200.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.008**	kW				
Thermostat-off mode	P_{TO}	**0.035**	kW	Type of energy input Standby mode	P_{SB}	**0.008**	kW
Crankcase heater mode	P_{CK}	**0.012**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**9180**	m^3/h
Sound power level, outdoor measured	L_{WA}	**75.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water fiow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

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Model FDF280VSAWPVH

Model(s) : FDC280VSA-W / FDF140VH (x2 units)							
Outdoor side heat exchanger of air-conditioner : air							
Indoor side heat exchanger of air-conditioner : air							
Type : vapour compression							
if applicable : electric motor							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated cooling capacity	Prated,c	**27.0**	kW	Seasonal space cooling energy efficiency	η s,c	**213.1**	%
Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27℃/19℃(dry/wet bulb)				Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
Tj=+35℃	Pdc	**27.0**	kW	Tj=+35℃	EERd or GUEc,bin / AEFc,bin	**247.0**	%
Tj=+30℃	Pdc	**20.0**	kW	Tj=+30℃	EERd or GUEc,bin / AEFc,bin	**444.0**	%
Tj=+25℃	Pdc	**12.8**	kW	Tj=+25℃	EERd or GUEc,bin / AEFc,bin	**584.0**	%
Tj=+20℃	Pdc	**7.3**	kW	Tj=+20℃	EERd or GUEc,bin / AEFc,bin	**972.0**	%
Degradation coefficient for air conditioners**	Cdc	**0.25**	-				
Power consumption in other than 'active mode'							
Off mode	P_{OFF}	**0.009**	kW	Crankcase heater mode	P_{CK}	**0.012**	kW
Thermostat-off mode	P_{TO}	**0.032**	kW	Standby mode	P_{SB}	**0.009**	kW
Other items							
Capacity control		**variable**		For air-to-air air conditioner: air flow-rate,outdoor measured		**8160**	m^3/h
Sound power level, outdoor	L_{WA}	**75.0**	dB				
If engine driven: Emissions of nitrogen oxides	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdc is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Information to identify the model(s) to which the information relates :		FDC280VSA-W / FDF140VH (x2 units)					
Outdoor side heat exchanger of heat pump :		air					
Indoor side heat exchanger of heat pump :		air					
Indication if the heater is equipped with a supplementary heater :		No					
if applicable :	electric motor						
Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heating capacity	Prated,h	**30.0**	kW	Seasonal space heating energy efficiency	η s,h	**162.2**	%
Declared heating capacity for part load at indoor temperature 20℃ and outdoor temperature Tj				Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj			
T_j=-7℃	Pdh	**15.7**	kW	T_j=-7℃	COPd or GUEh,bin / AEFh,bin	**270.0**	%
T_j=+2℃	Pdh	**9.5**	kW	T_j=+2℃	COPd or GUEh,bin / AEFh,bin	**416.0**	%
T_j=+7℃	Pdh	**6.2**	kW	T_j=+7℃	COPd or GUEh,bin / AEFh,bin	**501.0**	%
T_j=+12℃	Pdh	**7.0**	kW	T_j=+12℃	COPd or GUEh,bin / AEFh,bin	**673.0**	%
T_{biv}=bivalent temperature	Pdh	**17.8**	kW	T_{biv}=bivalent temperature	COPd or GUEh,bin / AEFh,bin	**235.0**	%
T_{OL}=operation limit	Pdh	**17.8**	kW	T_{OL}=operation limit	COPd or GUEh,bin / AEFh,bin	**235.0**	%
For air-to-water heat pumps : T_j=-15℃ (if T_{OL}＜-20℃)	Pdh	**-**	kW	For air-to-water heat pumps:T_j=-15℃ (if T_{OL}＜-20℃)	COPd or GUEh,bin / AEFh,bin	**-**	%
Bivalent temperature	T_{biv}	**-10.0**	℃	For water-to-air heat pumps:Operation limit T_{ol} temperature		**-**	℃
Degradation coefficient heat pumps**	C_{dh}	**0.25**	-				
Power consumption in modes other than 'active mode'				Supplementary heater back-up heating capacity	elbu	**-**	kW
Off mode	P_{OFF}	**0.008**	kW				
Thermostat-off mode	P_{TO}	**0.035**	kW	Type of energy input Standby mode	P_{SB}	**0.008**	kW
Crankcase heater mode	P_{CK}	**0.012**	kW				
Other items							
Capacity control		**variable**		For air-to-air heat pumps: air flow-rate,outdoor measured		**8400**	m^3/h
Sound power level, outdoor measured	L_{WA}	**77.0**	dB	For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger		**-**	m^3/h
Emissions of nitrogen oxides(if applicable)	NOx ***	**-**	mg/kWh fuel input GCV				
GWP of the refrigerant		**675**	kg CO_2eq. (100years)				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

** If Cdh is not determined by measurement then the default degradation coefficient air conditioners shall be 0,25.

*** from 26 September 2018

Where information relates to multi-spilt air conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer.

Models FDF71VH, 100VH, 125VH, 140VH

Model(s) : FDF71VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	5.1	kW	Total electric power input	P_{elec}	0.050	kW
Cooling capacity (latent)	$P_{rated,c}$	2.0	kW	Sound power level (per speed setting,if applicable)	L_{WA}	55.0	dB
Heating capacity	$P_{rated,h}$	8.0	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

Model(s) : FDF100VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	7.2	kW	Total electric power input	P_{elec}	0.160	kW
Cooling capacity (latent)	$P_{rated,c}$	2.8	kW	Sound power level (per speed setting,if applicable)	L_{WA}	65.0	dB
Heating capacity	$P_{rated,h}$	11.2	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

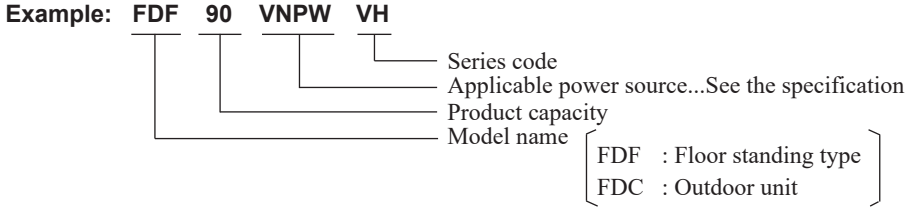
Model(s) : FDF125VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	8.5	kW	Total electric power input	P_{elec}	0.210	kW
Cooling capacity (latent)	$P_{rated,c}$	4.0	kW	Sound power level (per speed setting,if applicable)	L_{WA}	67.0	dB
Heating capacity	$P_{rated,h}$	14.0	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

Model(s) : FDF140VH							
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Cooling capacity (sensible)	$P_{rated,c}$	9.4	kW	Total electric power input	P_{elec}	0.210	kW
Cooling capacity (latent)	$P_{rated,c}$	4.6	kW	Sound power level (per speed setting,if applicable)	L_{WA}	67.0	dB
Heating capacity	$P_{rated,h}$	16.0	kW				
Contact details	Mitsubishi heavy industries thermal systems,LTD.						

3. STANDARD INVERTER PACKAGED AIR-CONDITIONERS

CONTENTS

■ How to read the model name



3.1 SPECIFICATIONS

Item			Model	FDF71VNPWVH	
				Indoor unit **FDF71VH**	Outdoor unit **FDC71VNP-W**
Power source				1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)		kW	7.1 [1.5 (Min.) - 7.3 (Max.)]	
	Nominal heating capacity (range)		kW	7.1 [1.1 (Min.) - 7.3 (Max.)]	
	Power consumption	Cooling	kW	2.51	
		Heating		2.02	
	Max power consumption			3.58	
	Running current	Cooling	A	11.1/11.6	
		Heating		9.1/9.5	
	Inrush current, max current			5 , 15.8	
	Power factor	Cooling	%	98	
		Heating		97	
	EER	Cooling		2.82	
	COP	Heating		3.51	
	Sound power level	Cooling	dB(A)	55	67
		Heating			
	Sound pressure level	Cooling		P-Hi : 42 Hi : 39 Me : 35 Lo : 33	54
		Heating			
	Silent mode sound pressure level			—	49
Exterior dimensions (Height × Width × Depth)			mm	1850 × 600 × 329	640 × 880 (+71) × 290
Exterior appearance (Munsell color) (RAL color)				Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight			kg	47	45
Compressor type & Q'ty				—	RMT5113SWE11 (Twin rotary type) × 1
Compressor motor (Starting method)			kW	—	Direct line start
Refrigerant oil (Amount, type)			L	—	0.45 (DIAMOND FREEZE MB75)
Refrigerant (Type, amount, pre-charge length)			kg	R32 1.3 in outdoor unit (Incl. the amount for the piping of 11m)	
Heat exchanger				Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control				Electronic expansion valve	
Fan type & Q'ty				Centrifugal fan × 1	Propeller fan × 1
Fan motor (Starting method)			W	157 < Direct line start >	34 < Direct line start >
Air flow		Cooling	m^3/min	P-Hi : 18 Hi : 16 Me : 14 Lo : 12	42
		Heating			
Available external static pressure			Pa	0	—
Outside air intake				Not possible	—
Air filter, Quality / Quantity				Plastic net × 1 (Washable)	—
Shock & vibration absorber				Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater			W	—	—
Operation control	Remote control			(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control			Thermostat by electronics	
	Operation display			—	
Safety equipments				Compressor overheat protection, Overcurrent protection, Frost protection, Serial signal error protection, Indoor fan motor error protection, Heating overload protection (High pressure control), Cooling overload protection Refrigerant leak detection	
Installation data	Refrigerant piping size (O.D.)	Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ6.35 (1/4") × 0.8 O/U ϕ6.35 (1/4")	
		Gas line		ϕ15.88 (5/8") ϕ12.7 (1/2") × 0.8 ϕ12.7 (1/2")	
	Connecting method			Flare piping	Flare piping
	Attached length of piping		m	—	—
	Insulation for piping			Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length		m	Max.26	
	Vertical height diff. between O/U and I/U		m	Max.20 (Outdoor unit is higher) Max.20 (Outdoor unit is lower)	
	Drain hose			Hose connectable with VP20	Hole size ϕ20 × 5 pcs.
Drain pump, max lift height			mm	—	—
Recommended breaker size			A	—	
L.R.A. (Locked rotor ampere)			A	5.0	
Interconnecting wires	Size × Core number			1.5mm² × 4 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number				IPX0	IPX4
Standard accessories				Mounting kit	Drain elbow, Drain hole grommet
Option parts				Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

Item				Model	FDF90VNPWVH	
					Indoor unit **FDF100VH**	Outdoor unit **FDC90VNP-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	9.0 [2.1 (Min.) - 9.5 (Max.)]	
	Nominal heating capacity (range)			kW	9.0 [1.7 (Min.) - 9.5 (Max.)]	
	Power consumption		Cooling	kW	2.50	
			Heating		2.24	
	Max power consumption				4.46	
	Running current		Cooling	A	11.1 / 11.6	
			Heating		9.9 / 10.4	
	Inrush current, max current				5 , 19	
	Power factor		Cooling	%	98	
			Heating		98	
	EER		Cooling		3.60	
	COP		Heating		4.02	
	Sound power level		Cooling	dB(A)	65	67
			Heating			66
	Sound pressure level		Cooling		P-Hi : 53 Hi : 51 Me : 49 Lo : 44	55
			Heating			53
	Silent mode sound pressure level		Cooling		—	52
			Heating			50
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	750 × 880 (+88) × 340
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	57
Compressor type & Q'ty					—	RMT5118SWP1 (Twin rotary type) × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.675 (DIAMOND FREEZE MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 1.7 in outdoor unit (Incl. the amount for the piping of 10m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 27 Hi : 26 Me : 23 Lo : 19	59
			Heating			55
Available external static pressure				Pa	0	—
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	—
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Compressor overheat protection, Overcurrent protection, Frost protection, Serial signal error protection, Indoor fan motor error protection, Heating overload protection (High pressure control), Cooling overload protection Refrigerant leak detection	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ6.35 (1/4") × 0.8 O/U ϕ6.35 (1/4")	
			Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 0.8 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.25	
	Vertical height diff. between O/U and I/U			m	Max.20 (Outdoor unit is higher) Max.20 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 4 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size × Core number				1.5mm^2 × 4 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number					IPX0	IPX4
Standard accessories					Mounting kit	Drain elbow, Drain hole grommet
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

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Item				Model	FDF100VNPWVH	
					Indoor unit **FDF100VH**	Outdoor unit **FDC100VNP-W**
Power source					1 Phase, 220-240V 50Hz / 220V 60Hz	
Operation data	Nominal cooling capacity (range)			kW	10.0 [2.1 (Min.) - 10.2 (Max.)]	
	Nominal heating capacity (range)			kW	10.0 [1.7 (Min.) - 10.4 (Max.)]	
	Power consumption		Cooling	kW	3.39	
			Heating		2.71	
	Max power consumption				4.46	
	Running current		Cooling	A	15.0 / 15.7	
			Heating		12.0 / 12.6	
	Inrush current, max current				5 , 19	
	Power factor		Cooling	%	98	
			Heating		98	
	EER		Cooling		2.95	
	COP		Heating		3.69	
	Sound power level		Cooling	dB(A)	65	68
			Heating			67
	Sound pressure level		Cooling		P-Hi : 53 Hi : 51 Me : 49 Lo : 44	56
			Heating			54
	Silent mode sound pressure level		Cooling		—	52
			Heating			50
Exterior dimensions (Height × Width × Depth)				mm	1850 × 600 × 329	750 × 880 (+88) × 340
Exterior appearance (Munsell color) (RAL color)					Ceramic white (N8.0) near equivalent (RAL 7047) near equivalent	Stucco white (4.2Y7.5 / 1.1) near equivalent (RAL 7044) near equivalent
Net weight				kg	49	57
Compressor type & Q'ty					—	RMT5118SWP1 (Twin rotary type) × 1
Compressor motor (Starting method)				kW	—	Direct line start
Refrigerant oil (Amount, type)				L	—	0.675 (DIAMOND FREEZE MB75)
Refrigerant (Type, amount, pre-charge length)				kg	R32 1.7 in outdoor unit (Incl. the amount for the piping of 10m)	
Heat exchanger					Louver fin & inner grooved tubing	M shape fin & inner grooved tubing
Refrigerant control					Electronic expansion valve	
Fan type & Q'ty					Centrifugal fan × 1	Propeller fan × 1
Fan motor (Starting method)				W	157 < Direct line start >	86 < Direct line start >
Air flow			Cooling	m^3/min	P-Hi : 27 Hi : 26 Me : 23 Lo : 19	63
			Heating			55
Available external static pressure				Pa	0	—
Outside air intake					Not possible	—
Air filter, Quality / Quantity					Plastic net × 1 (Washable)	—
Shock & vibration absorber					Rubber sleeve (for fan motor)	Rubber sleeve (for fan motor & compressor)
Electric heater				W	—	—
Operation control	Remote control				(Option) Wired : RC-EX3A, RC-E5, RCH-E3 Wireless : RCN-KIT4-E2	
	Room temperature control				Thermostat by electronics	
	Operation display				—	
Safety equipments					Compressor overheat protection, Overcurrent protection, Frost protection, Serial signal error protection, Indoor fan motor error protection, Heating overload protection (High pressure control), Cooling overload protection Refrigerant leak detection	
Installation data	Refrigerant piping size (O.D.)		Liquid line	mm	I/U ϕ9.52 (3/8") Pipe ϕ6.35 (1/4") × 0.8 O/U ϕ6.35 (1/4")	
			Gas line		ϕ15.88 (5/8") ϕ15.88 (5/8") × 0.8 ϕ15.88 (5/8")	
	Connecting method				Flare piping	Flare piping
	Attached length of piping			m	—	—
	Insulation for piping				Necessary (both Liquid & Gas lines)	
	Refrigerant line (one way) length			m	Max.25	
	Vertical height diff. between O/U and I/U			m	Max.20 (Outdoor unit is higher) Max.20 (Outdoor unit is lower)	
	Drain hose				Hose connectable with VP20	Hole size ϕ20 × 4 pcs.
Drain pump, max lift height				mm	—	—
Recommended breaker size				A	—	
L.R.A. (Locked rotor ampere)				A	5.0	
Interconnecting wires	Size x Core number				1.5mm^2 × 4 cores (Including earth cable) / Terminal block (Screw fixing type)	
IP number					IPX0	IPX4
Standard accessories					Mounting kit	Drain elbow, Drain hole grommet
Option parts					Motion sensor : LB-KIT2	

Notes (1) The data are measured at the following conditions. The pipe length is 7.5m.

Item / Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling	27℃	19℃	35℃	24℃	ISO5151-T1
Heating	20℃		7℃	6℃	ISO5151-H1

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
(3) Sound level indicates the value in an anechoic chamber. During operation these values are somewhat higher due to ambient conditions.
(4) Select the breaker size according to the own national standard.
(5) The operation data indicate when the air-conditioner is operated at 230V 50Hz or 220V 60Hz.

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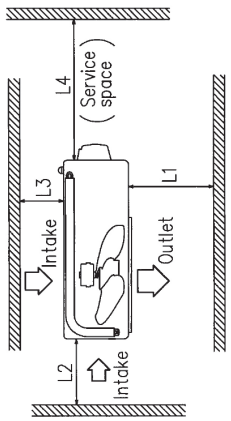
3.2 EXTERIOR DIMENSIONS

(1) **Indoor units** ..... **See page 12.**

(2) **Outdoor units**

Model FDC71VNP-W

Notes
(1) It must not be surrounded by walls on the four sides.
(2) The unit must be fixed with anchor bolts. An anchor bolt must not protrude more than 15mm.
(3) Where the unit is subject to strong winds, lay it in such a direction that the blower outlet faces perpendicularly to the dominant wind direction.
(4) Leave 1m or more space above the unit.
(5) A wall in front of the blower outlet must not exceed the units height.
(6) The model name label is attached on the lower right corner of the front panel.

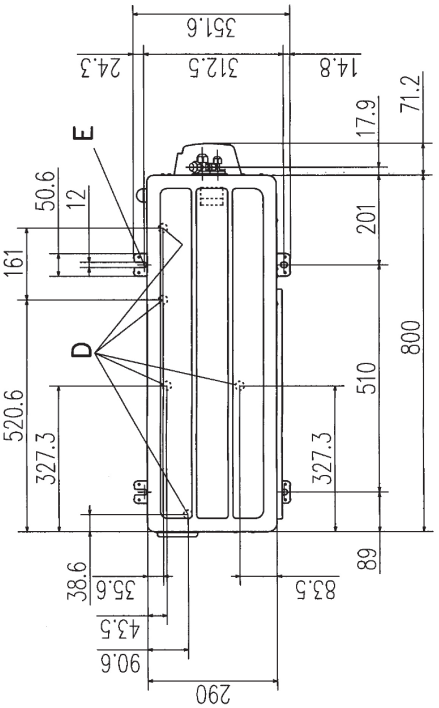


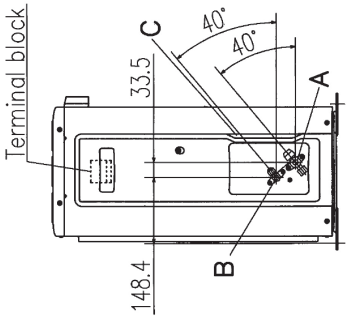
Minimum installation space

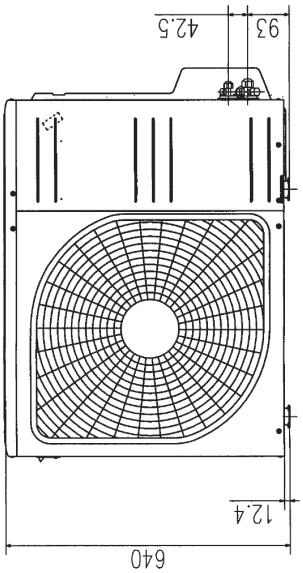
Examples of installation / Dimensions	I	II	III	IV
L1	Open	280	280	180
L2	100	75	Open	Open
L3	100	80	80	80
L4	250	Open	250	Open

Unit:mm

Symbol	Content	
A	Service valve connection (gas side)	ϕ12.7 (1/2") (Flare)
B	Service valve connection (liquid side)	ϕ6.35 (1/4") (Flare)
C	Pipe/cable draw-out hole	ϕ20 × 5 places
D	Drain discharge hole	M10 × 4 places
E	Anchor bolt hole	







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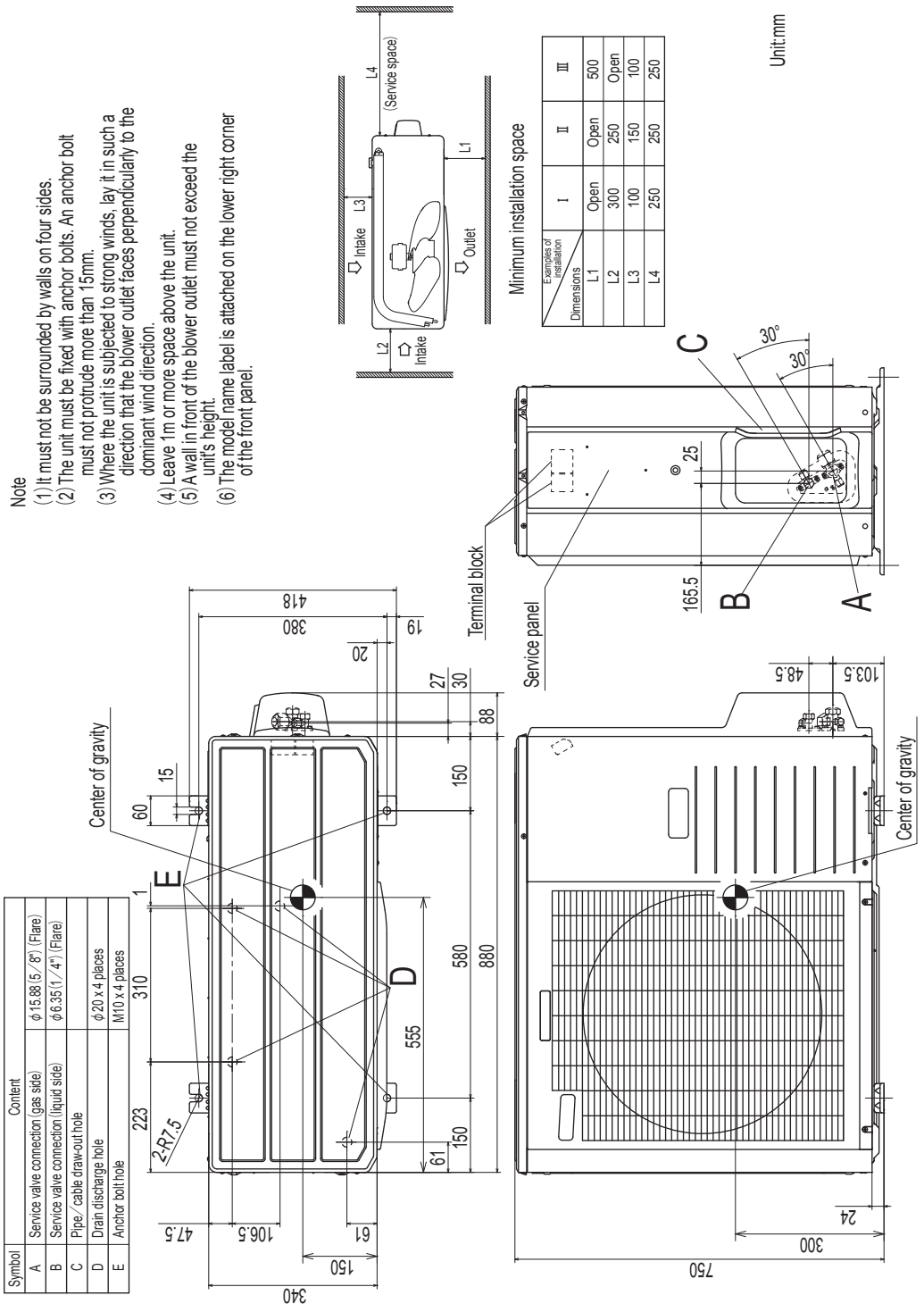
Models FDC90VNP-W, 100VNP-W



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(3) Remote control (Option parts) .....See page 15.

3.3 ELECTRICAL WIRING

(1) Indoor units ..... **See page 18.**

(2) Outdoor units

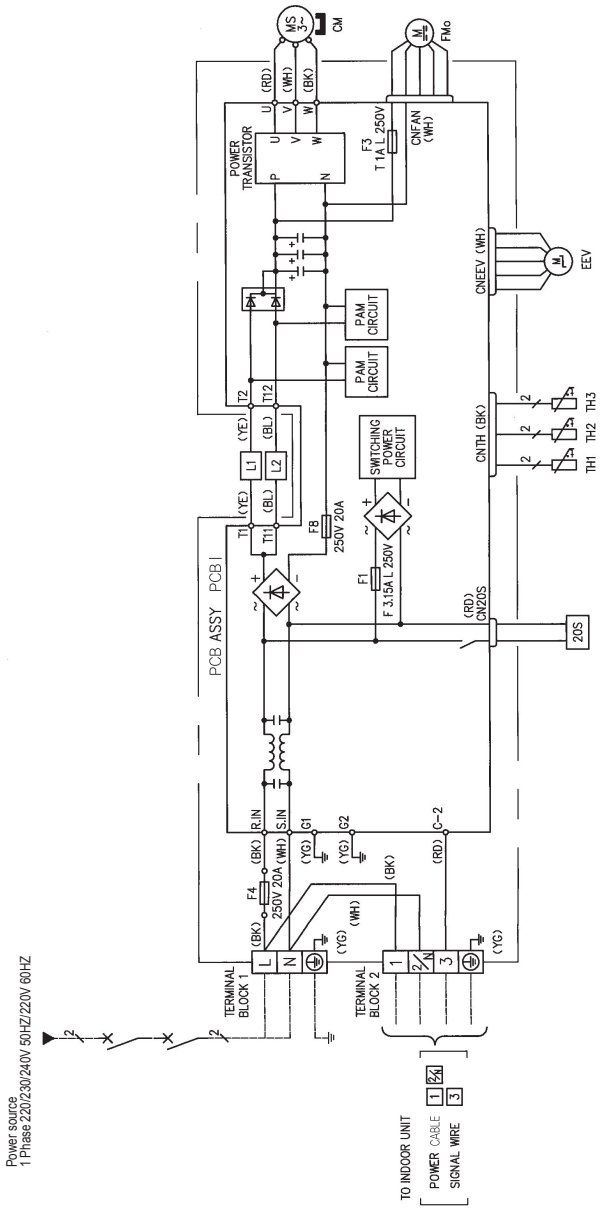
Model FDC71VNP-W

Meaning of marks

Item	Description
CM	Compressor motor
CN20S CNTH CNEEV CNFAN	Connector
EEV	Electric expansion valve (coil)
FMo	Fan motor
L1,2	Reactor
TH1	Heat exchanger temperature sensor (outdoor unit)
TH2	Outdoor air temperature sensor
TH3	Discharge pipe temperature sensor
20S	Solenoid coil for 4-way valve

Color marks

Mark	Color
BK	BLACK
BR	BROWN
OR	ORANGE
RD	RED
WH	WHITE
YE	YELLOW
YG	YELLOW/GREEN



Power cable, indoor-outdoor connecting wires

Model	MAX running current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor-outdoor wire size x number	Earth wire size (mm^2)
71	15.8	2.0	13	$1.5mm^2$ x 4	1.5

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

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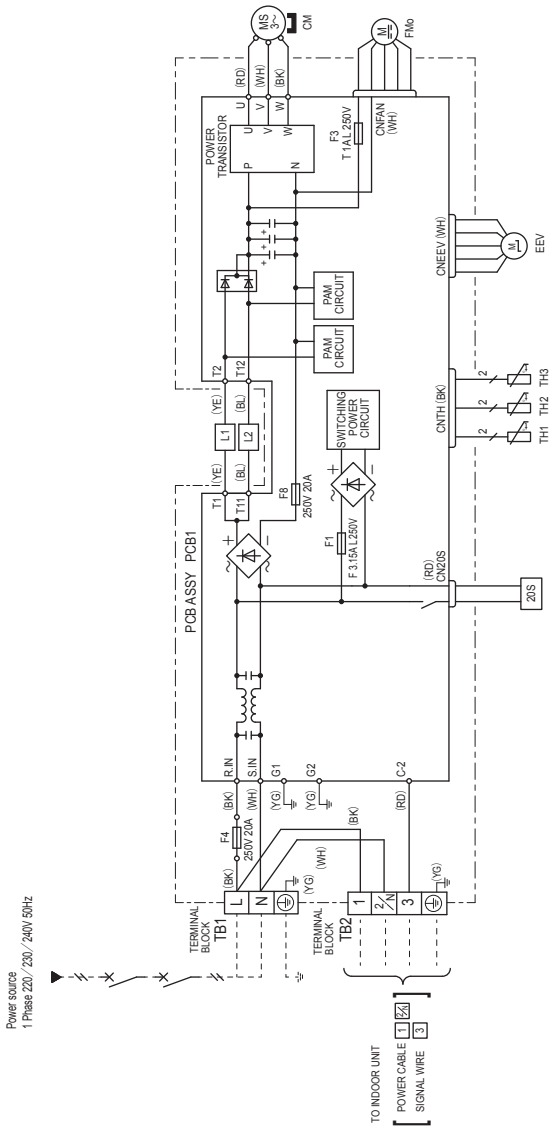
Models FDC90VNP-W, 100VNP-W

Meaning of marks

Item	Description
CM	Compressor motor
CN20S CNTH CNEEV CNFAN	Connector
EEV	Electric expansion valve (coil)
FMo	Fan motor
L1,2	Reactor
TB1,2	Terminal block
TH1	Heat exchanger temperature sensor (outdoor unit)
TH2	Outdoor air temperature sensor
TH3	Discharge pipe temperature sensor
20S	Solenoid coil for 4-way valve

Color marks

Mark	Color
BK	Black
BL	Blue
RD	Red
WH	White
YE	Yellow
YG	Yellow Green



Power cable, indoor-outdoor connecting wires

Model	MAX running current (A)	Power cable size (mm^2)	Power cable length (m)	Indoor–outdoor wire size × number	Earth wire size (mm^2)
90, 100	19	2.5	14	1.5mm² × 4	1.5

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

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3.4 NOISE LEVEL

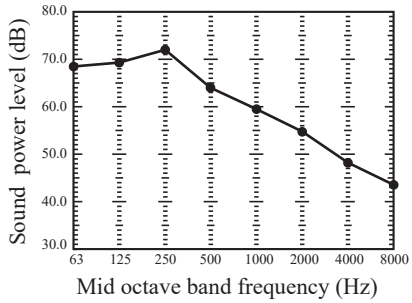
Notes(1) The data are based on the following conditions.
Ambient air temperature: Indoor unit 27℃WB. Outdoor unit 35℃DB.
(2) The data in the chart are measured in an anechoic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

(1) Indoor units ..... **See page 22.**

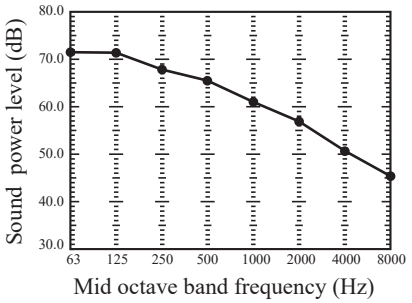
(2) Outdoor units

(a) Sound power level

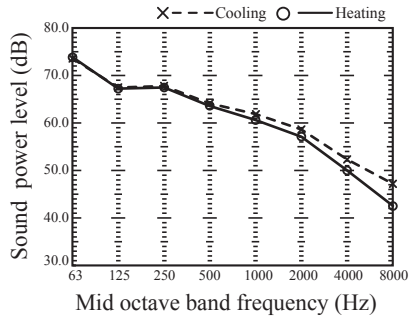
Model FDC71VNP-W
Cooling noise level 67 dB (A)



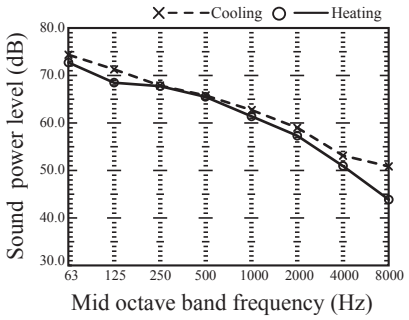
Heating noise level 67 dB (A)



Model FDC90VNP-W
Cooling noise level 67 dB (A)
Heating noise level 66 dB (A)



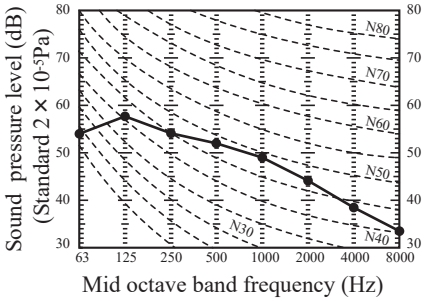
Model FDC100VNP-W
Cooling noise level 68 dB (A)
Heating noise level 67 dB (A)



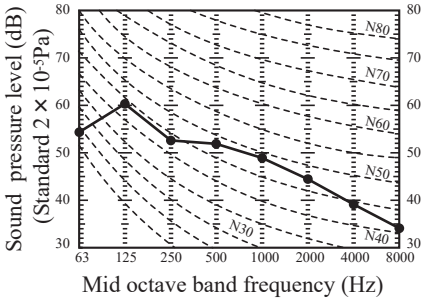
(b) Sound pressure level

Measured based on ISO-T1, JIS B 8616
Mike position: at highest noise level in position as mentined below
Distance from front side 1m
Height 1m

Model FDC71VNP-W
Cooling noise level 54 dB (A)



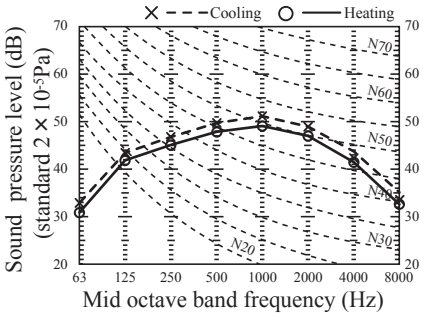
Heating noise level 54 dB (A)



Model FDC90VNP-W

Cooling noise level 55 dB (A)

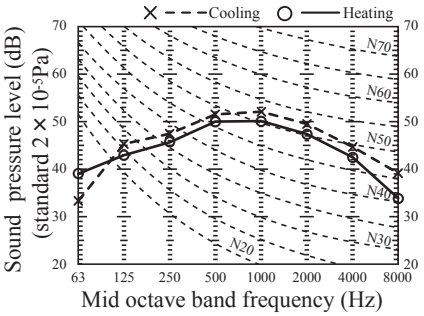
Heating noise level 53 dB (A)



Model FDC100VNP-W

Cooling noise level 56 dB (A)

Heating noise level 54 dB (A)

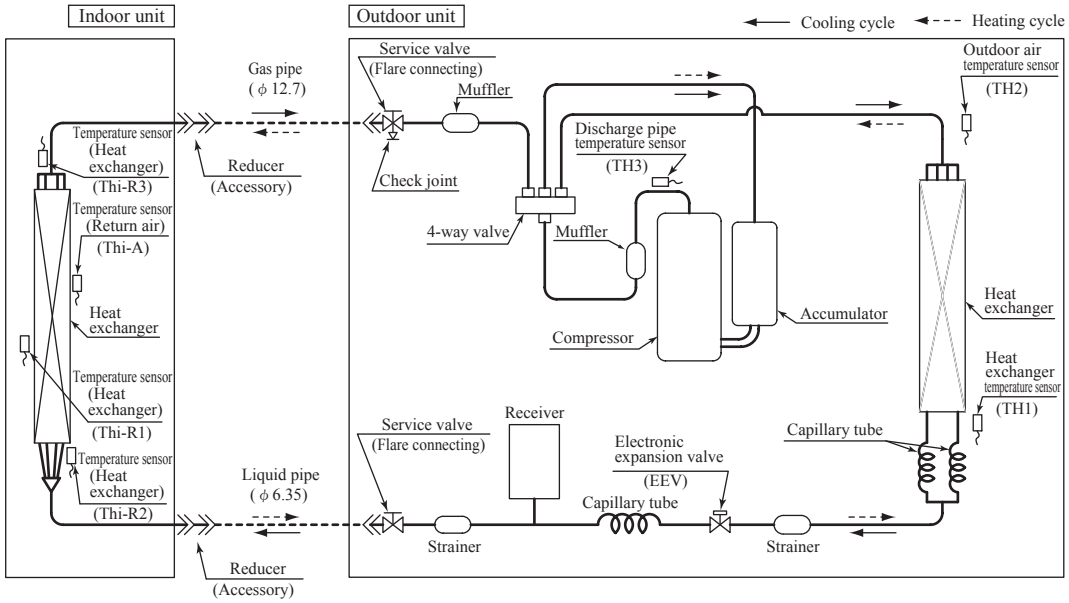


3.5 TEMPERATURE DISTRIBUTION

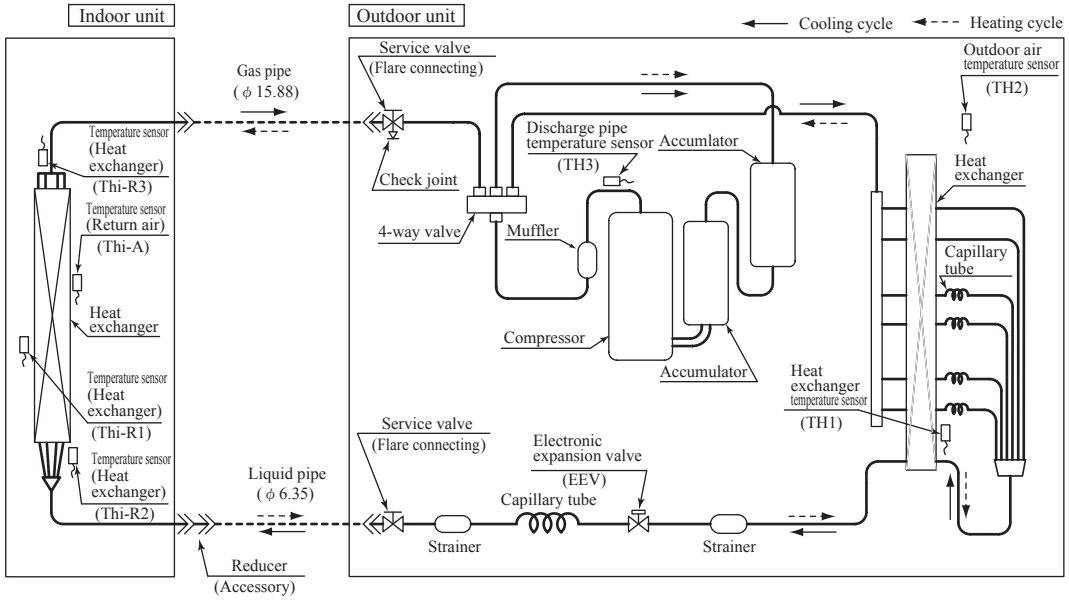
See page 27 of 1.5 chapter.

3.6 PIPING SYSTEM

Model 71



Models 90,100



Preset point of the protective devices

Parts name	Mark	Equipped unit	71 model	90,100 model
Temperature sensor (for protection overloading in heating)	Thi-R1 or Thi-R2	Indoor unit	Active 63℃, Inactive 56℃	
Temperature sensor (for frost prevention)			Active 1.0℃, Inactive 10℃	
Temperature sensor (for protection high pressure in cooling)	TH1	Outdoor unit	Active 62℃ Inactive 45-50℃	Active 60℃ Inactive 50℃
Temperature sensor (for detecting discharge pipe temperature)	TH3		Active 115℃, Inactive 95℃	

3.7 RANGE OF USAGE & LIMITATIONS

Operating temperature range		See next page.
		When used below -5℃, install a snow hood (prepared on site).
Recommendable area to install		Considering to get sufficient heating capacity, the area where the averaged lowest ambient air temperature in day time during winter is above 0℃, and it has no accumulation of snow.
Installation site		The limitations of installation space are shown in the page for exterior dimensions. Install the indoor unit at least 2.5m higher than the floor surface.
Temperature and humidity conditions surrounding the indoor unit (Note 2)		Dew point temperature : 23℃ or less, relative hummdity : 80% or less
Limitations on unit and piping installation		See page 188.
Compressor ON-OFF cycling	Cycle Time	13 minutes or more (from OFF to OFF) or (from ON to ON)
	Stop Time	3 minutes or more
Power source	Voltage range	Rating ±10%
	Voltage drop at start-up	Min.85% of rating
	Phase-to-phase unbalance	3% or less

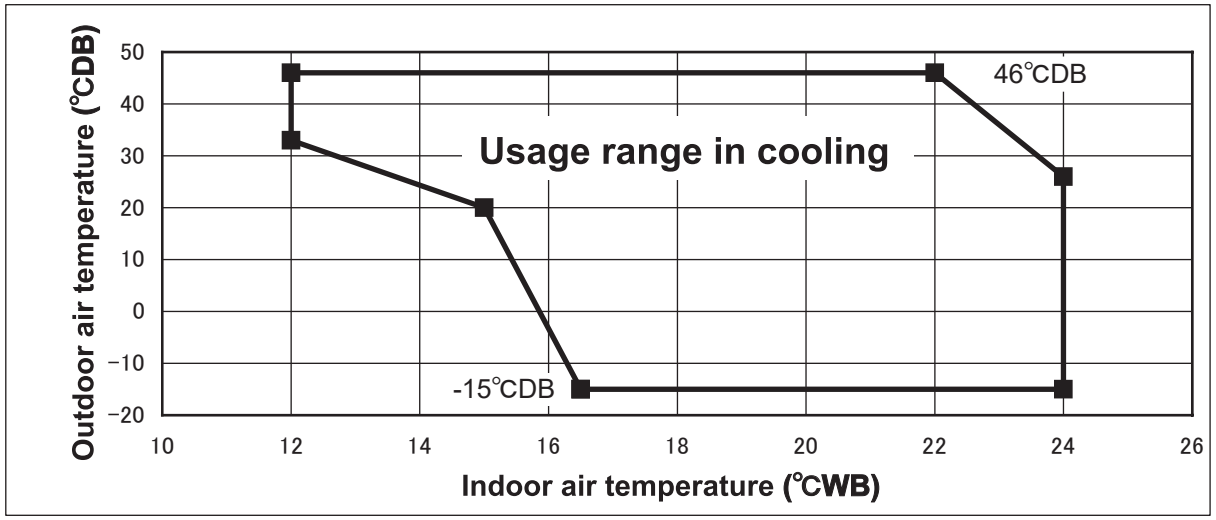
Note 1. Do not install the unit in places which :
1) Flammable gas may leak.
2) Carbon fiber, metal particles, powder, etc. are floating.
3) Cosmetic or special sprays are used frequently.
4) Exposed to oil splashes or steam (e.g. kitchen and machine plant).
5) Exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent).
6) Exposed to ammonia substance (e.g. organic fertilizer).
7) Matters affecting devices, such as sulfuric gas, chlorine gas, acid, alkali, etc. may generate or accumulate.
8) Chimney smoke is hanging.
9) Sucking the exhaust gas from heat exchanger.
10) Adjacent to equipment generating electromagnetic waves or high frequency waves.
11) There is light beams that affect the receiving device of indoor unit in case of the wireless specification.
12) Snow falls heavily.
13) At an elevation of 1000 meters or higher.
14) On mobile machine (e.g. vehicle, ship, etc.)
15) Splashed with water to indoor unit (e.g. laundry room).

Note 2. If ambient temperature and humidity exceed the above conditions, add polyurethane foam insulation on the outer plate (10mm or thicker) of indoor unit.

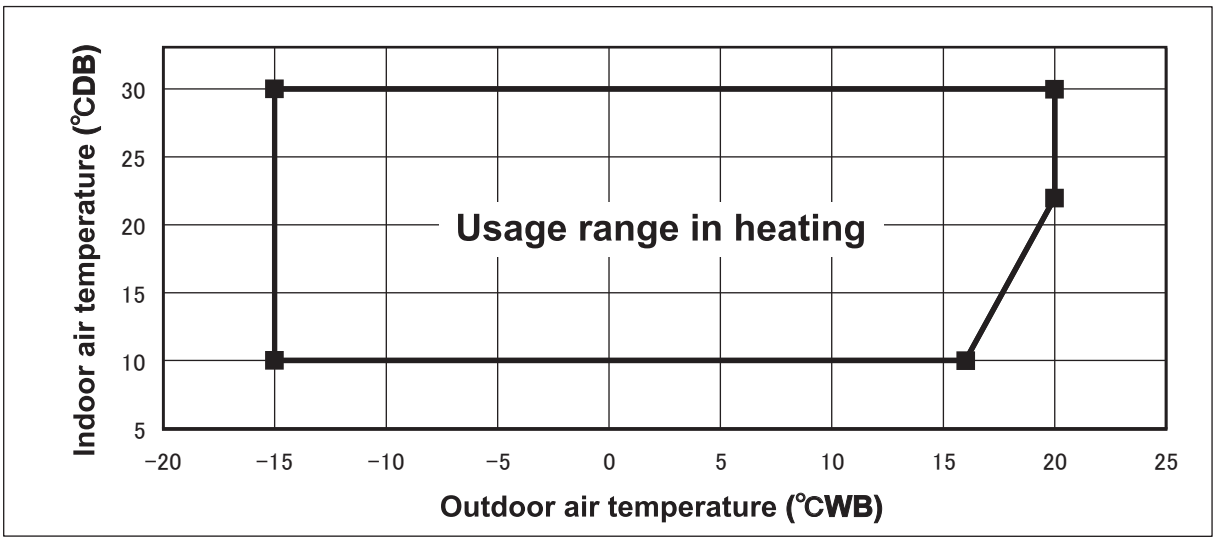
Note 3. Both gas and liquid pipes need to be coverd with 20mm or thicker heat insulation materials at the place where humidity exceeds 70%.

Operating temperature range

■ Cooling



■ Heating



Decline in cooling and heating capacity or operation stop may occur when the outdoor unit is installed in places where natural wind can increase or decrease its design air flow rate.

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"CAUTION" Cooling operation under low outdoor air temperature conditions

PAC models can be operated in cooling mode at low outdoor air temperature condition within above temperature range. However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.

[Precaution]

In case of severely low temperature condition

1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, mount the flex flow adapter (prepared as optional part) or like such devices onto the outdoor unit in order to divert the strong wind.

[Reason]

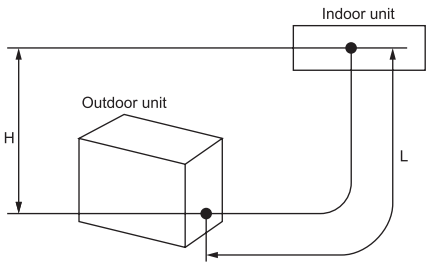
Under the low outdoor air temperature conditions of -5℃ or lower, the outdoor fan is controlled at lower or lowest speed by outdoor fan control, but if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop more.

This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

Limitation on unit and piping installation

Descriptions		Model for outdoor unit	Dimensional limitations	Marks appearing in the drawing
One-way pipe length		FDC71VNP-W	≦ 26m	L
		FDC90, 100VNP-W	≦ 25m	
Elevation difference between indoor and outdoor unit	When the outdoor unit is positioned higher	FDC71−100VNP-W	≦ 20m	H
	When the outdoor unit is positioned lower		≦ 20m	

Note FDC71−100VNP-W can be used for only single type.



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3.8 SELECTION CHART

Correct the cooling and heating capacity in accordance with the operating conditions. The net cooling and heating capacity can be obtained in the following way.

Net capacity = Capacity shown in the capacity tables (3.8.1) × Correction factors shown in the table (3.8.2) (3.8.3) (3.8.4)

Caution: In case that the cooling operation during low outdoor air temperature below -5°C is expected, install the outdoor unit where it is not influenced by natural wind. Otherwise protection control by low pressure will be activated much more frequently and it will cause insufficient capacity or breakdown of the compressor in worst case.

3.8.1 Capacity tables

Model FDF71VNPWVH Indoor unit FDF71VH Outdoor unit FDC71VNP-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					5.91	4.63	6.25	4.97	6.42	4.93	6.60	4.88	6.95	5.12	7.30	5.01
13					5.86	4.61	6.20	4.95	6.37	4.91	6.56	4.87	6.94	5.12	7.31	5.01
15					5.81	4.59	6.15	4.93	6.32	4.89	6.52	4.85	6.92	5.11	7.32	5.01
17					5.75	4.56	6.09	4.91	6.27	4.87	6.48	4.84	6.90	5.11	7.33	5.02
19					5.79	4.58	6.14	4.93	6.31	4.89	6.52	4.85	6.92	5.11	7.33	5.02
21					6.00	4.67	6.18	4.95	6.36	4.90	6.55	4.86	6.94	5.12	7.34	5.02
23					6.29	4.79	6.55	5.09	6.74	5.05	6.93	5.00	7.31	5.24	7.70	5.12
25			6.33	5.11	6.59	4.92	6.92	5.23	7.11	5.18	7.30	5.13	7.68	5.36	8.06	5.23
27			6.50	5.19	6.89	5.05	7.29	5.38	7.49	5.33	7.70	5.28	8.11	5.51		
29			6.42	5.15	6.80	5.01	7.19	5.34	7.40	5.30	7.60	5.24	8.01	5.47		
31			6.33	5.11	6.71	4.97	7.10	5.31	7.30	5.26	7.50	5.20	7.90	5.43		
33	5.90	4.78	6.30	5.10	6.62	4.93	7.00	5.27	7.20	5.22	7.40	5.17	7.79	5.40		
35	5.80	4.73	6.17	5.04	6.53	4.89	6.91	5.23	7.10	5.18	7.29	5.13	7.68	5.36		
37	5.52	4.59	5.88	4.90	6.22	4.76	6.58	5.10	6.77	5.06	6.97	5.01	7.35	5.25		
39	5.25	4.46	5.59	4.77	5.92	4.63	6.26	4.98	6.45	4.94	6.64	4.89	7.01	5.14		
41	4.98	4.33	5.30	4.64	5.61	4.51	5.94	4.85	6.12	4.82	6.31	4.78	6.68	5.04		
43	4.70	4.20	5.01	4.52	5.30	4.38	5.62	4.73	5.80	4.70	5.98	4.67	6.34	4.93		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-14.5	-15	3.93	3.88	3.83	3.78	3.74
-13.5	-14	4.07	4.02	3.98	3.93	3.88
-11.5	-12	4.36	4.31	4.27	4.22	4.17
-9.5	-10	4.65	4.61	4.56	4.51	4.46
-7.5	-8	4.94	4.90	4.85	4.80	4.75
-5.5	-6	5.25	5.20	5.14	5.09	5.03
-3.0	-4	5.55	5.50	5.44	5.38	5.32
-1.0	-2	5.85	5.80	5.74	5.67	5.61
1.0	0	6.16	6.10	6.03	5.97	5.90
2.0	1	6.31	6.25	6.18	6.11	6.04
3.0	2	6.47	6.42	6.36	6.30	6.23
5.0	4	6.80	6.77	6.73	6.66	6.59
7.0	6	7.12	7.11	7.10	7.03	6.96
9.0	8	7.49	7.48	7.47	7.41	7.36
11.5	10	7.85	7.84	7.83	7.80	7.76
13.5	12	7.29	7.29	7.28	7.26	7.23
15.5	14	6.73	6.73	6.74	6.72	6.71
16.5	16	6.17	6.18	6.19	6.19	6.18

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Model FDF90VNPWVH Indoor unit FDF100VH Outdoor unit FDC90VNP-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					8.51	6.97	9.11	7.44	9.42	7.40	9.70	7.34	10.26	7.73	10.82	7.58
13					8.42	6.94	9.09	7.43	9.42	7.40	9.70	7.34	10.26	7.73	10.82	7.58
15					8.32	6.90	9.06	7.42	9.43	7.40	9.71	7.35	10.27	7.74	10.83	7.59
17					8.23	6.86	9.04	7.41	9.44	7.41	9.72	7.35	10.27	7.74	10.83	7.59
19					8.36	6.91	9.05	7.42	9.39	7.39	9.67	7.33	10.22	7.72	10.77	7.57
21					8.76	7.08	9.06	7.42	9.34	7.37	9.61	7.31	10.16	7.70	10.71	7.55
23					8.75	7.08	9.12	7.44	9.40	7.39	9.67	7.33	10.21	7.72	10.75	7.56
25			8.38	7.22	8.74	7.07	9.19	7.47	9.46	7.41	9.73	7.35	10.26	7.73	10.79	7.58
27			8.21	7.15	8.73	7.07	9.25	7.50	9.52	7.44	9.79	7.37	10.33	7.76		
29			8.15	7.12	8.62	7.02	9.13	7.45	9.39	7.39	9.66	7.33	10.19	7.71		
31			8.09	7.09	8.52	6.98	9.00	7.40	9.26	7.34	9.52	7.28	10.05	7.67		
33	7.54	6.58	8.05	7.07	8.41	6.93	8.87	7.35	9.13	7.29	9.39	7.23	9.91	7.62		
35	7.40	6.52	7.89	7.00	8.31	6.89	8.74	7.30	9.00	7.24	9.26	7.19	9.77	7.57		
37	7.11	6.38	7.59	6.87	8.00	6.76	8.41	7.17	8.65	7.12	8.89	7.06	9.37	7.45		
39	6.82	6.24	7.29	6.74	7.68	6.63	8.07	7.04	8.29	6.99	8.52	6.93	8.97	7.32		
41	6.54	6.11	6.99	6.60	7.37	6.51	7.73	6.92	7.94	6.86	8.15	6.80	8.56	7.19		
43	6.25	5.97	6.69	6.47	7.05	6.38	7.40	6.79	7.59	6.74	7.78	6.68	8.16	7.07		
46	5.82	5.70	6.23	6.11	6.58	6.19	6.89	6.61	7.06	6.55	7.22	6.49	7.56	6.88		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature °CDB				
°CDB	°CWB	16	18	20	22	24
-14.5	-15	4.92	4.85	4.78	4.72	4.65
-13.5	-14	5.11	5.04	4.97	4.90	4.84
-11.5	-12	5.48	5.41	5.35	5.28	5.21
-9.5	-10	5.86	5.79	5.72	5.65	5.58
-7.5	-8	6.23	6.16	6.09	6.02	5.94
-5.5	-6	6.64	6.57	6.49	6.41	6.33
-3.0	-4	7.05	6.97	6.89	6.80	6.72
-1.0	-2	7.45	7.37	7.29	7.20	7.10
1.0	0	7.86	7.77	7.68	7.59	7.49
2.0	1	8.06	7.97	7.88	7.78	7.68
3.0	2	8.26	8.18	8.11	8.01	7.91
5.0	4	8.64	8.60	8.55	8.46	8.37
7.0	6	9.03	9.02	9.00	8.91	8.82
9.0	8	9.50	9.46	9.41	9.37	9.32
11.5	10	9.97	9.90	9.82	9.82	9.82
13.5	12	10.39	10.38	10.36	10.35	10.35
15.5	14	10.82	10.86	10.89	10.88	10.87
16.5	16	11.24	11.34	11.43	11.41	11.39

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Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

Model FDF100VNPWVH Indoor unit FDF100VH Outdoor unit FDC100VNP-W

Cooling mode (kW)

Outdoor air temperature	Indoor air temperature															
	18°CDB		21°CDB		23°CDB		26°CDB		27°CDB		28°CDB		31°CDB		33°CDB	
	12°CWB		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					9.12	7.23	9.67	7.66	9.94	7.60	10.23	7.53	10.82	7.92	11.41	7.76
13					9.40	7.35	9.76	7.70	9.94	7.60	10.24	7.54	10.82	7.92	11.41	7.76
15					9.67	7.47	9.85	7.73	9.95	7.60	10.24	7.54	10.83	7.92	11.41	7.76
17					9.94	7.59	9.95	7.77	9.95	7.60	10.24	7.54	10.83	7.92	11.41	7.76
19					9.66	7.47	9.82	7.72	9.89	7.58	10.18	7.52	10.76	7.90	11.33	7.74
21					9.42	7.36	9.68	7.66	9.83	7.55	10.12	7.49	10.69	7.88	11.26	7.72
23					9.51	7.40	9.88	7.74	10.07	7.64	10.37	7.58	10.97	7.97	11.56	7.81
25			9.15	7.58	9.60	7.44	10.07	7.82	10.32	7.74	10.63	7.68	11.25	8.06	11.87	7.90
27			9.12	7.57	9.69	7.48	10.26	7.90	10.56	7.83	10.86	7.76	11.45	8.13		
29			9.00	7.51	9.55	7.42	10.13	7.84	10.42	7.78	10.71	7.71	11.30	8.08		
31			8.87	7.45	9.42	7.36	9.99	7.79	10.28	7.73	10.57	7.66	11.15	8.03		
33	8.24	6.93	8.82	7.43	9.29	7.31	9.85	7.73	10.14	7.67	10.43	7.61	11.00	7.98		
35	8.04	6.83	8.61	7.33	9.16	7.25	9.72	7.68	10.00	7.62	10.28	7.55	10.85	7.93		
37	7.62	6.62	8.15	7.12	8.67	7.04	9.20	7.48	9.48	7.42	9.75	7.36	10.30	7.75		
39	7.19	6.41	7.70	6.92	8.19	6.84	8.69	7.28	8.96	7.23	9.22	7.17	9.75	7.57		
41	6.77	6.22	7.24	6.71	7.70	6.64	8.18	7.08	8.44	7.04	8.69	6.99	9.20	7.39		
43	6.34	6.01	6.79	6.52	7.22	6.45	7.67	6.89	7.91	6.85	8.16	6.80	8.66	7.22		
46	5.71	5.60	6.11	5.99	6.49	6.16	6.90	6.61	7.13	6.57	7.37	6.54	7.83	6.97		

Heating mode : HC (kW)

Outdoor air temperature		Indoor air temperature				
		°CDB				
°CDB	°CWB	16	18	20	22	24
-14.5	-15	5.46	5.40	5.33	5.26	5.18
-13.5	-14	5.68	5.61	5.54	5.47	5.39
-11.5	-12	6.10	6.03	5.96	5.88	5.81
-9.5	-10	6.52	6.45	6.38	6.30	6.22
-7.5	-8	6.95	6.87	6.79	6.71	6.63
-5.5	-6	7.39	7.32	7.25	7.16	7.07
-3.0	-4	7.84	7.77	7.70	7.61	7.51
-1.0	-2	8.29	8.22	8.15	8.05	7.95
1.0	0	8.74	8.67	8.60	8.50	8.39
2.0	1	8.96	8.90	8.83	8.72	8.61
3.0	2	9.18	9.12	9.06	8.96	8.86
5.0	4	9.60	9.57	9.53	9.44	9.35
7.0	6	10.03	10.01	10.00	9.92	9.85
9.0	8	10.51	10.51	10.51	10.46	10.41
11.5	10	10.99	11.00	11.02	10.99	10.97
13.5	12	11.24	11.28	11.31	11.29	11.27
15.5	14	11.50	11.55	11.60	11.58	11.56
16.5	16	11.75	11.82	11.89	11.87	11.85

PGA000Z846

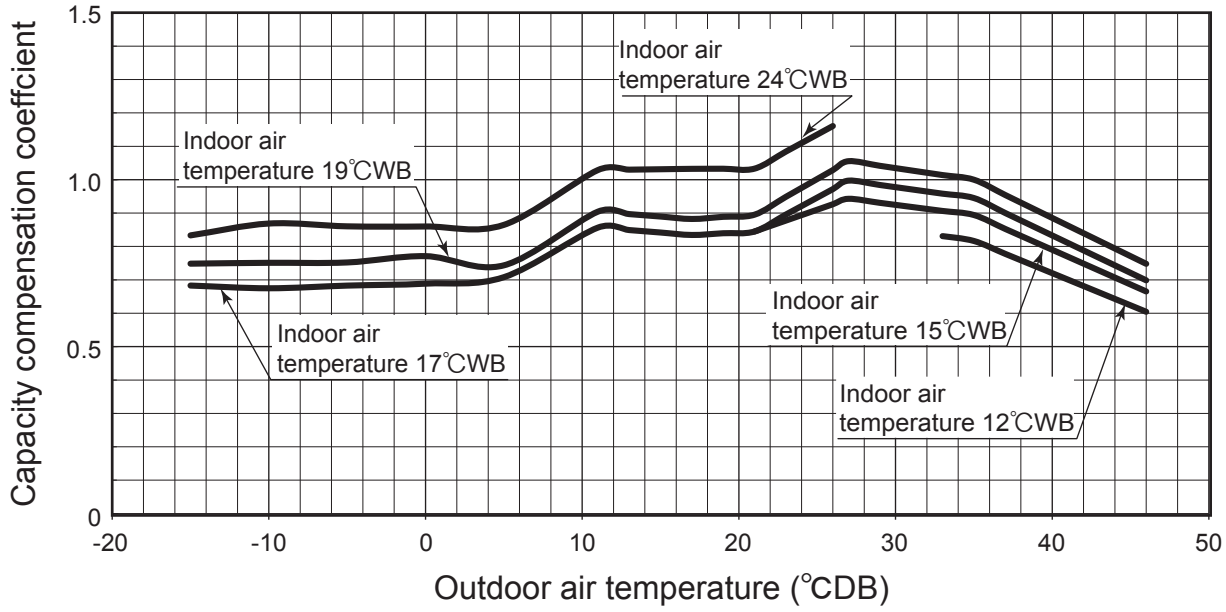
Notes(1) These data show average status.
Depending on the system control, there may be ranges where the operation is not conducted continuously.
These data show the case where the operation frequency of a compressor is fixed.
(2) Capacities are based on the following conditions.
Corresponding refrigerant piping length :7.5m
Level difference of Zero.
(3) Symbols are as follows
TC :Total cooling capacity (kW)
SHC :Sensible heat capacity (kW)
HC :Heating capacity (kW)

[References data]

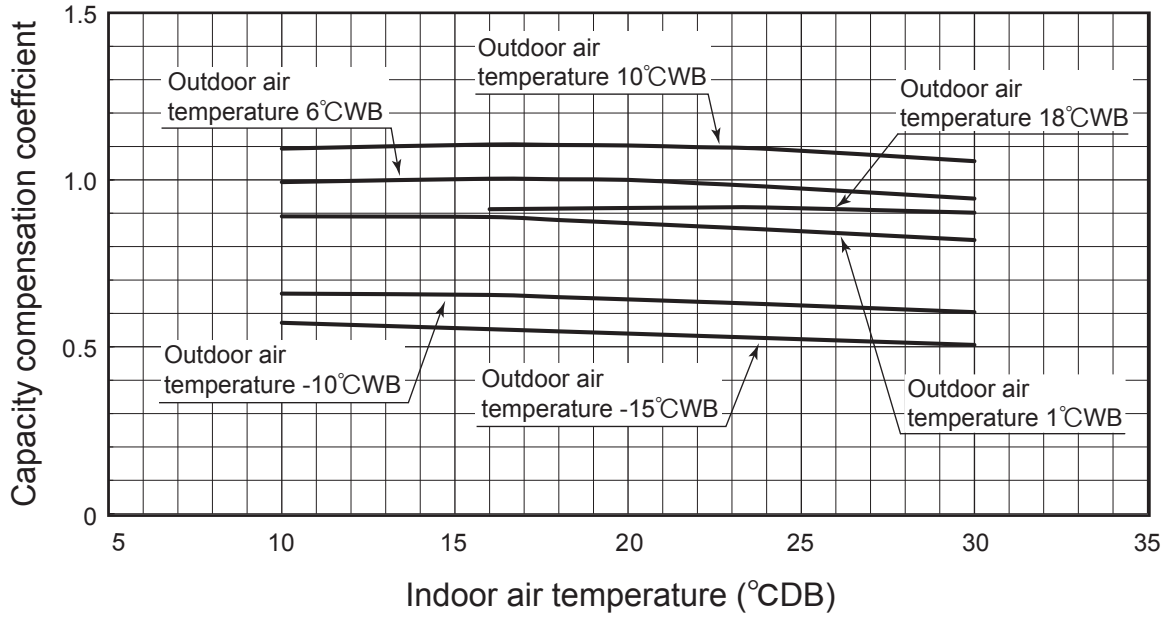
The following figures show capacity variation against outdoor and indoor temperature. Capacity compensation coefficient shows the ratio of maximum capacity at any temperature to nominal capacity.

(I) Model FDC71VNP-W

① Cooling

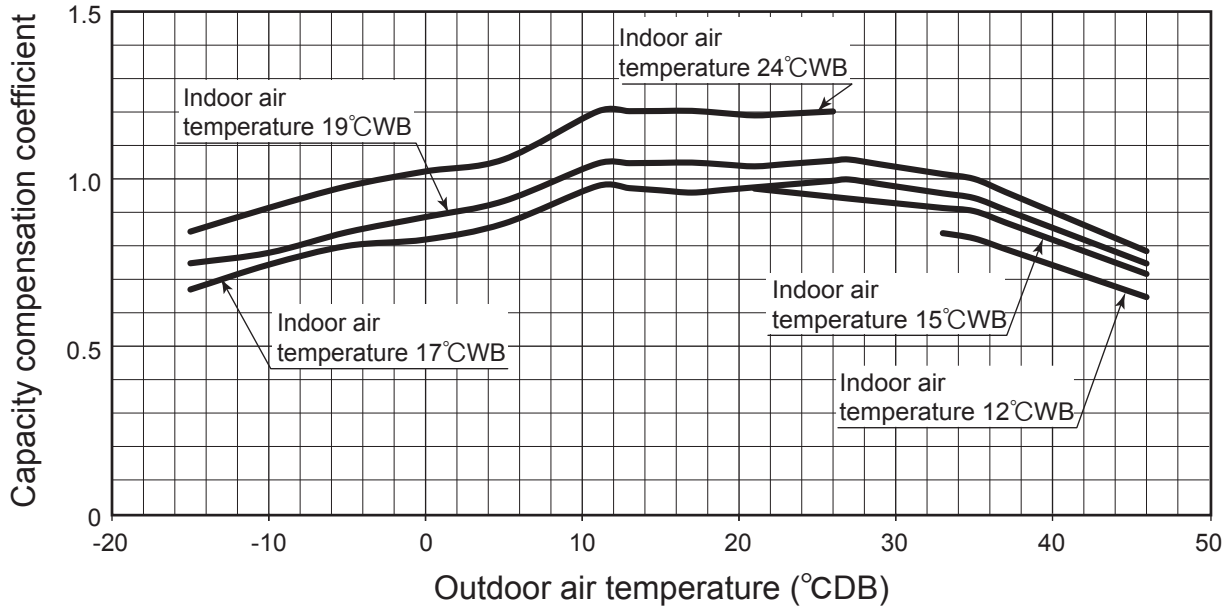


② Heating

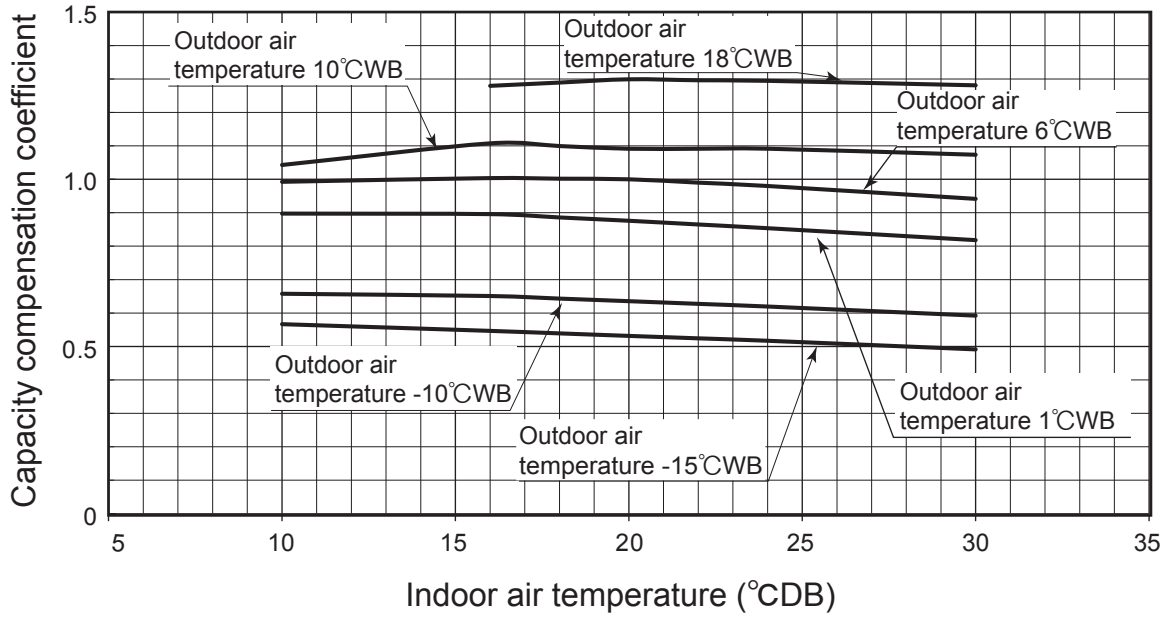


(Ⅱ) Model FDC90VNP-W

① Cooling

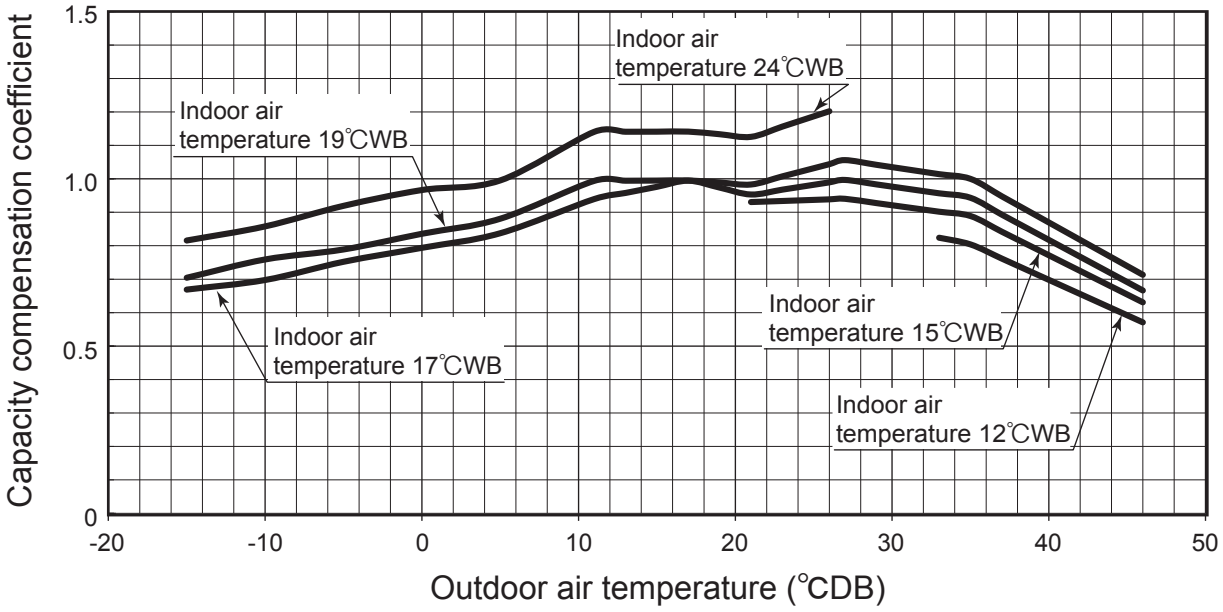


② Heating

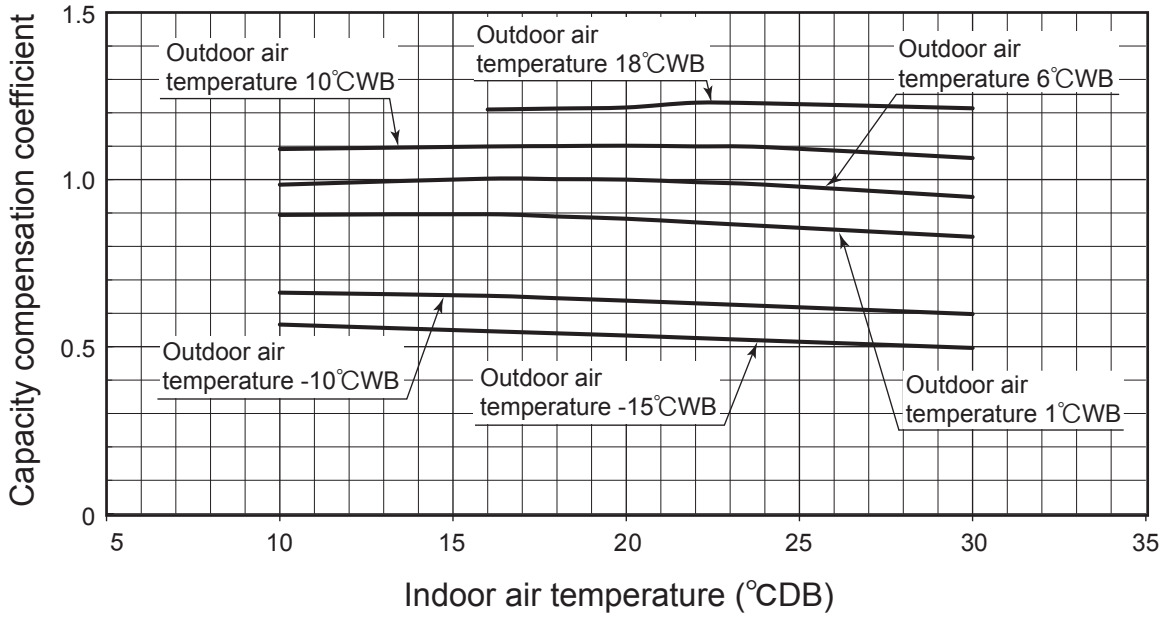


(Ⅲ) Model FDC100VNP-W

① Cooling



② Heating



3.8.2 Correction of cooling and heating capacity in relation to air flow rate control (Fan speed)

Fan speed		P-Hi	Hi	Me	Lo
Coefficient	Cooling	1.00	0.95	0.93	0.90
	Heating	1.00	0.97	0.96	0.94

3.8.3 Correction of cooling and heating capacity in relation to one way length of refrigerant piping

It is necessary to correct the cooling and heating capacity in relation to the one way equivalent piping length between the indoor and outdoor units.

Equivalent piping length (m)	7.5	10	15	20	25	30
Cooling	1	0.99	0.97	0.96	0.94	0.92
Heating	1	1	1	1	1	1

3.8.4 Height difference between the indoor unit and outdoor unit

When the outdoor unit is located below indoor units in cooling mode, or when the outdoor unit is located above indoor units in heating mode, the correction coefficient mentioned in the below table should be subtracted from the value in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	5m	10m	15m	20m
Adjustment coefficient	0.99	0.98	0.97	0.96

Piping length limitations

Item \ Model	FDC71VNP-W	FDC90, 100VNP-W
Max. one way piping length	26m	25m
Max. vertical height difference	Outdoor unit is higher 20m Outdoor unit is lower 20m	

Note (1) Values in the table indicate the one way piping length between the indoor and outdoor units.

How to obtain the cooling and heating capacity

Example : The net cooling capacity of the model FDF90VNPWVH with the air flow "P-Hi", the piping length of 15m, the outdoor unit located 5m lower than the indoor unit, indoor wet-bulb temperature at 19.0℃ and outdoor dry-bulb temperature 35℃ is

Net cooling capacity = 9.0 × 1.00 × 0.97 × 0.99 ≒ 8.6 kW

- 9.0 : Net cooling total capacity of FDF90VNPWVH (Outdoor temp. : 35℃DB Indoor temp. : 19℃WB) shown in table 3.8.1
- 1.00 : Air flow : P-Hi shown in table 3.8.2
- 0.97 : Piping length : 15m (Gas pipe size is ϕ15.88) shown in table 3.8.3
- 0.99 : Height difference : 5m (Outdoor unit : below) shown in table 3.8.4

3.9 APPLICATION DATA

3.9.4 Installation of outdoor unit

(1) Model FDC71VNP-W

PSC012D133C

Inverter driven split PAC
71VNP
Designed for R32 refrigerant

- **This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 42.**
- **When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces.**

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ⚠CAUTION.
  ⚠WARNING : Wrong installation would cause serious consequences such as injuries or death.
  ⚠CAUTION : Wrong installation might cause serious consequences depending on circumstances.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.
- For installing qualified personnel, take precautions in respect to themselves by using suitable protective clothing, groves, etc., and then perform the installation works.
- Please pay attention not to fall down the tools, etc. when installing the unit at the high position.
- If unusual noise can be heard during operation, consult the dealer.
- The meanings of "Marks" used here are shown as follows:

⃠	Never do it under any circumstances.	❗⏚	Always do it according to the instruction.

⚠ WARNING

❗
- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction. Do not carry out the installation and maintenance work except by the qualified installer.
- **Install the system in full accordance with the installation manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Be sure to use only for household and residence.**
  If this appliance is installed in inferior environment such as machine shop and etc., it can cause malfunction.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage, referred by the formula (accordance with ISO5149).**
  If the density of refrigerant exceeds the limit, please consult the dealer and install the ventilation system, otherwise lack of oxygen can occur, which can cause serious accident.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, It may cause water leaks, electric shocks, fire and personal injury.
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **Use the prescribed pipes, flare nuts and tools for R32.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by torque wrench with specified method.**
  If the flare nut were tightened with excess torque, this may cause burst and refrigerant leakage after a long period.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, air can be sucked into refrigerant circuit, which can cause bust or personal injury due to anomalously high pressure in the refrigerant.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.
- **Be sure to shut off the power source before starting electrical work.**
  Failure to shut off the power source can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power source distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **This appliance must be connected to main power source by means of a circuit breaker or switch (fuse:20A) with a contact separation of at least 3mm.**
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Stop the compressor before removing the pipe after shutting the service valve on pump down work.**
  If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.
- **Only use prescribed option parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Be sure to wear protective goggles and gloves while at work.**
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause electric shocks.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Do not perform brazing work in the airtight room.**
  It can cause lack of oxygen.
- **This unit is designed specifically for R32.**
  Using any other refrigerant can cause unit failure and personal injury.

⃠
- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not processing, splice the power cord, or share a socket with other power plugs.**
  This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.
- **Do not bundling, winding or processing for the power cord. Or, do not deforming the power plug due to tread it.**
  This may cause fire or heating.
- **Do not run the unit with removed panels or protections.**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Do not perform any change of protective device itself or its setup condition.**
  The forced operation by short-circuiting protective device of pressure switch and temperature control or the use of non specified component can cause fire or burst.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.

⚠ CAUTION

⏚
- **Carry out the electrical work for ground lead with care.**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.

❗
- **Use the circuit breaker for all pole correct capacity. Circuit breaker should be the one that disconnect all poles under over current.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in OFF state in accordance with EN60204-1.
- **After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.**
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury. To avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.

⃠
- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not install the unit in the locations listed below.**
  - Locations where carbon fiber, metal powder or any powder is floating.
  - Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  - Vehicles and ships.
  - Locations where cosmetic or special sprays are often used.
  - Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  - Locations where any machines which generate high frequency harmonics are used.
  - Locations with salty atmospheres such as coastlines.
  - Locations with heavy snow (If installed, be sure to provide base frame and snow hood mentioned in the manual).
  - Locations where the unit is exposed to chimney smoke.
  - Locations at high altitude (more than 1000m high).
  - Locations with ammonic atmospheres. (e.g. organic fertilizer)
  - Locations with calcium chloride (e.g. snow melting agent).
  - Locations where heat radiation from other heat source can affect the unit.
  - Locations without good air circulation.
  - Locations with any obstacles which can prevent inlet and outlet air of the unit.
  - Locations where short-circuit of air can occur (in case of multiple units installation).
  - Locations where strong air blows against the air outlet of outdoor unit.
  - Locations where something located above the unit could fall.

  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  - Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  - Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  - Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  - Locations where vibration and operation sound generated by the outdoor unit can affect seriously (on the wall or at the place near bed room).
  - Locations where an equipment affected by high harmonics is placed (TV set or radio receiver is placed within 5m).
  - Locations where drainage cannot run off safely.

  It can affect surrounding environment and cause a claim.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics.**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base frame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base frame can cause the unit falling down and cause personal injury.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not touch any buttons with wet hands.**
  It can cause electric shocks.
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not touch the suction or aluminum fin on the outdoor unit.**
  This may cause injury.
- **Do not put anything on the outdoor unit and operating unit.**
  This may cause damage the objects or injury due to falling to the object.
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
- **Do not clean up the unit with water.**
- **Do not step onto the outdoor unit.**
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences handrails around the outdoor unit.**

Notabilia as a unit designed for R32

- Do not use any refrigerant other than R32. R32 will rise to pressure about 1.6 times higher than that of a conventional refrigerant (R22 or R407C).
  A cylinder containing R32 has a lightblue indication mark on the top.
- A unit designed for R32 has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake.
  The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure.
  Accordingly, you are required to arrange dedicated R32 tools listed in the table on the next page before installing or servicing this unit.
- All indoor units must be models designed exclusively for R32. Check connectable indoor unit models in a catalog, etc. (A wrong in door unit, if connected into the system, will impair proper system operation)

	Dedicated R32 tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

Check before installation work

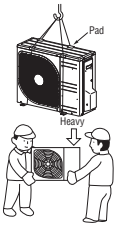
- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

Accessories for outdoor unit		Q'ty
①	Grommet (Heat pump type only)	4
②	Drain elbow (Heat pump type only)	1
③	Reducer set φ9.52→φ6.35	1
④	Reducer set φ15.88→φ12.7	1

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position. If not properly balanced, the unit can be thrown off-balance and fall.

1) Delivery



- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When you have to unpack the unit for a compelling reason before you haul it to the installation point, hoist the unit with nylon slings or ropes and protection pads so that you may not damage the unit.

2) Portage

- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.

3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

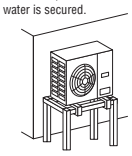
- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit.
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (includingammonia), which can harm the unit, will not be generated and not remain.
- ○ If a operation is conducted when the outdoor air temperature is -5℃ lower, the outdoor unit should be installed at a place where it is not influenced by natural wind.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.

Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

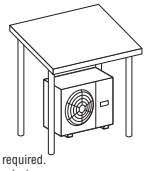
(1) If the unit is installed in the area where the snow will accumulate, following measures are required.
The bottom plate of unit and intake, outlet may be blocked by snow.

1 Install the unit on the base so that the bottom is higher than snow cover surface, and draining water is secured.



2 Provide a snow hood to the outdoor unit on site.

3 Install the unit under eaves or provide the roof on site.

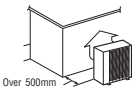


Since drain water generated by defrost control may freeze, following measures are required.

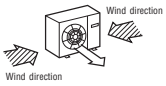
- Don't execute drain piping work by using a drain elbow and drain grommets (accessories). [Refer to DRAIN PIPING WORK.]
- Attached heater on a base plate on site, if there is possibility to freeze drain water. In case that the product has a corrective drainage system, the drainage paths should have suitable threatment against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



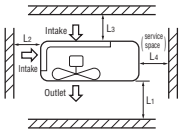
3.The unit should be installed on the stable and level foundation. If the foundation is not level, the down the unit with wires.

5) Installation space

- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space. In order to facilitate servicing of controls, please provide a sufficient space between units so that their top plates can be removed easily.
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.
- A barrier wall placed in front of the exhaust diffuser must not be higher than the unit.

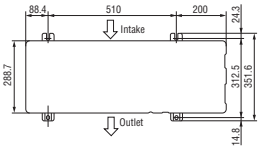
(mm)

Size \ Example installation	Ⅰ	Ⅱ	Ⅲ	Ⅳ
L1	Open	280	280	180
L2	100	75	Open	Open
L3	100	80	80	80
L4	250	Open	250	Open

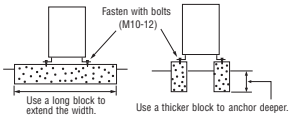


6) Installation

① Anchor bolt fixed position



② Notabilia for installation



- In installing the unit, fix the unit's legs with bolts specified on the above.
- The protrusion of an anchor bolt on the front side must be kept within 15mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the above illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

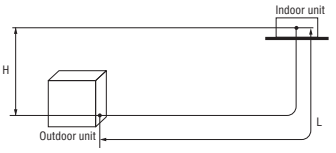
- When the outdoor air temperature is –5°C or lower, provide a snow hood to the outdoor unit on site. So that strong wind will not blow against the outdoor heat exchanger directly.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

- Check the following points in light of the indoor unit specifications and the installation site.
- Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Restrictions			Dimensional restrictions	Marks appearing in the drawing on the right
Indoor unit	FDT, FDE, FDU, FDUM, SRK	Main pipe length	30m or less	L
	FDF		26m or less	L
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher		20m or less	H
	When the outdoor unit is positioned lower		20m or less	H



⚠CAUTION ● The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, please see " 5. UTILIZATION OF EXISTING PIPING."

2) Determination of pipe size

- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

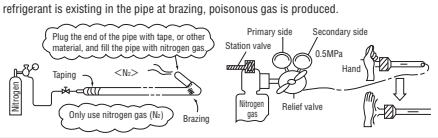
		Gas pipe	Liquid pipe
Outdoor unit connected		φ12.7 Flare	φ6.35 Flare
Refrigerant piping (branch pipeL)		φ12.7	φ6.35
Indoor unit connected	FDT, FDE, FDU, FDUM, FDF	φ15.88	φ9.52
	SRK	φ15.88	φ6.35

About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.

If the refrigerant is existing in the pipe at brazing, poisonous gas is produced.



3) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.

NOTE ● Select pipes having a wall thickness larger than the specified minimum pipe thickness.

Pipe diameter [mm]	φ6.35	φ12.7
Minimum pipe wall thickness [mm]	0.8	0.8
Pipe material*	O-type pipe	O-type pipe

*Phosphorus deoxidized seamless copper pipe ICS 23.040.15, ICS 77.150.30

4) On-site piping work

⚠ IMPORTANT Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

- [Except SRK] Regarding the change in the size of liquid/gas pipe; Use the reducer at indoor unit side. Reducer set is available in the outdoor unit as accessory.
- [SRK] Regarding the change in the size of gas pipe; Use the reducer at indoor unit side. Reducer set is available in the outdoor unit as accessory.

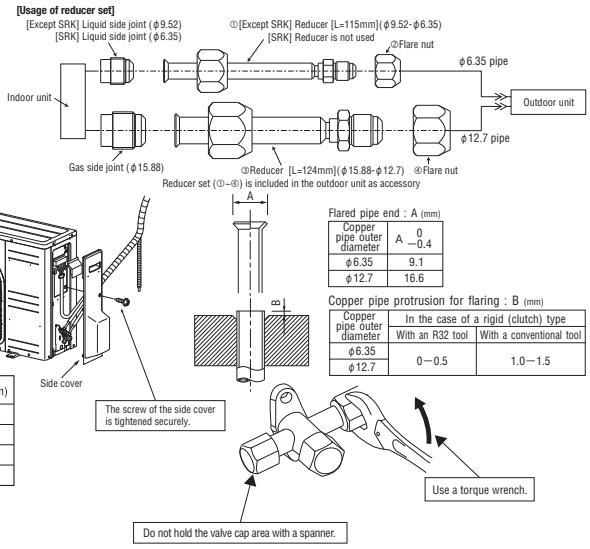
How to remove the side cover Please remove the screw of a side cover and remove to the front.

- Carry out the on site piping work with the service valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- Bend a pipe to a radius as large as practical.(R100–R150) Do not bend a pipe repeatedly to correct its form.
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R32 are different from those for conventional R22 and R407C. Although we recommend the use of flaring tools designed specifically for R32, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
  ※Do not reuse existing flare, make new flare.
- The pipe should be anchored every 1.5m or less to isolate the vibration.

⚠ CAUTION

- Do not apply force beyond proper fastening torque in tightening the flare nut.
- Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.
- Do not apply refrigerating machine oil to the flared surface. It can cause refrigerant leakage.

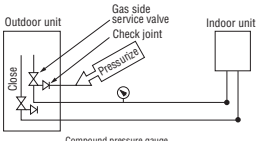
Service valve size (mm)	Tightening torque (N·m)
ϕ6.35	14—18
ϕ9.52	34—42
ϕ12.7	49—61
ϕ15.88	68—82



5) Air tightness test

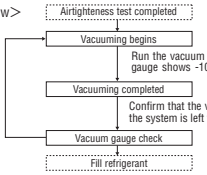
① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient temperature fall 1℃, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.

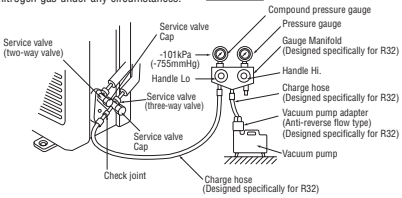


6) Evacuation

<Work flow>



When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.



Pay attention to the following points in addition to the above for the R32 and compatible machines.

○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

Securely tighten the service valve cap and the check joint blind nut after adjustment.

Service valve size (mm)	Service valve cap tightening torque (N·m)	Check joint blind nut tightening torque (N·m)
ϕ6.35 (1/4")	20—30	10—12
ϕ12.7 (1/2")	25—35	

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

Indoor unit	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe ϕ6.35)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
FDT, FDE FDU, FDUM, SRK	0.02	1.3	15
FDF	0.02	1.3	11

- This unit contains factory charged refrigerant covering 15m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 15m refrigerant piping. When refrigerant piping exceeds 15m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 15m.
- If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, please see "5. UTILIZATION OF EXISTING PIPING."
- For an installation measuring 15m or shorter in pipe length, please charge the refrigerant volume charged for shipment at the factory, when you recharge refrigerant after servicing etc.

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = (Main length (m) – Factory charged volume) x 0.02 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

(2) Charging refrigerant

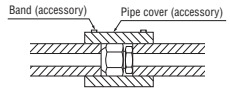
- Since R32 refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- Charge refrigerant always from the liquid side service port with the service valve shut. When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

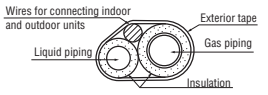
NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

8) Heating and condensation prevention

(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
· Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.

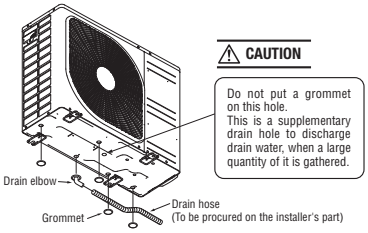
(2) Use a heat insulating material that can withstand 120℃ or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
· All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
· Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
· Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
· **Both gas and liquid pipes need to be dressed with 20mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**





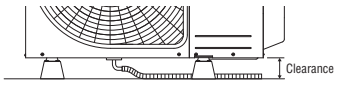
3. DRAIN PIPING WORK

- Execute drain piping by using a drain elbow and drain grommets supplied separately as accessories, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of service valve or connected pipes.
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)



⚠ CAUTION

Do not put a grommet on this hole.
This is a supplementary drain hole to discharge drain water, when a large quantity of it is gathered.



- When condensed water needs to be led to a drain, etc., install the unit on a flat base or concrete blocks.
  (prepared on site)
  Then, please secure space for the drain elbow and the drain hose.

4. ELECTRICAL WIRING WORK

For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - · braided cord (code designation 60245 IEC 51),
  - · ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - · flat twin tinsel cord (code designation 60227 IEC 41);

  Use polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If improperly grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power source cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire.
- Do not turn on the power source until the electrical work is completeted.
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- For power source cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.

⚠ CAUTION

In case of faulty wiring connection, the indoor unit stops, and then the run lamp turns on and the timer lamp blinks.

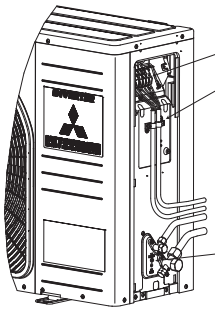
Use cables for interconnection wiring to avoid loosening of the wires.
CENELEC code for cables Required field cables.

H05RNR4G1.5 (Example) or 245IEC57

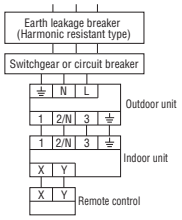
H	Harmonized cable type
05	300/500 volts
R	Natural-and/or synth. rubber wire insulation
N	Polychloroprene rubber conductors insulation
R	Stranded core
4or5	Number of conductors
G	One conductor of the cable is the earth conductor (yellow/green)
1.5	Section of copper wire (mm^2)

Main fuse specification

Specification	Part No.
250V 20A	SSA564A136A



Power source cable, indoor-outdoor connecting wires



- Always perform grounding system installation work with the power cord unplugged.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.

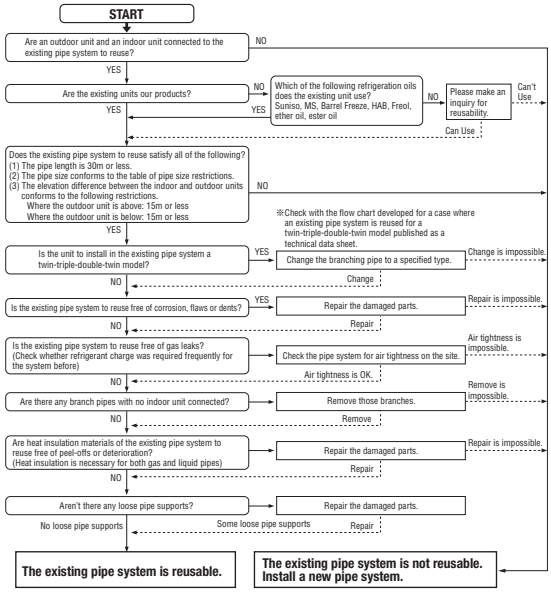
⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.

Phase	Earth leakage breaker	Switchgear or circuit breaker		Power souce (minimum)	Interconnecting and grounding wires (minimum)
		Switch breaker	Over current protector rated capacity		
Single-phase	20A,30mA, 0.1sec or less	30A	20A	2.0mm²	1.5mm×4

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

5. UTILIZATION OF EXISTING PIPING

Check whether an existing pipe system is reusable or not by using the following flow chart.



<Table of pipe size restrictions>

◎:Standard pipe size ○:Usable △:Restricted to shorter pipe length limits

Additional charge volume per meter of pipe			0.02kg/m	0.025kg/m	0.06kg/m	
Indoor unit	Pipe size	Liquid pipe	φ6.35	φ6.35	φ9.52	φ9.52
		Gas pipe	φ12.7	φ15.88	φ12.7	φ15.88
FDT, FDE FDU, FDUM, SRK	Usability		◎	○	△	△
	Maximum one-way pipe length		30	24	10	10
	Length covered without additional charge		15	12	5	5
FDF	Usability		◎	○	△	△
	Maximum one-way pipe length		26	20	8	8
	Length covered without additional charge		11	8	3	3

- **Please consult with our distributor in the area, if you need to recover refrigerant and charge it again.**
- Any combinations of pipe sizes not listed in the table are not usable.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) − Length covered without additional charge shown in the table (m)} × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.

Example) When FDT is installed in a 10m long existing pipe system (liquid φ9.52, gas φ12.7), the quantity of refrigerant to charge additionally should be (10m-5m) x 0.06kg/m = 0.3kg.

⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the excising unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R32.

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.
- If you choose to wash the pipe system, please contact our distributor in the area.

INSTALLATION TEST CHECK POINTS

Check the following points again after completion of the installation, and before turning on the power. Conduct a test run again and ensure that the unit operates properly.
Explain to the customer how to use the unit and how to take care of the unit following the instruction manual.

After installation

- ☐ Power cables and connecting wires are securely fixed to the terminal block.
- ☐ The power source voltage is correct as the rating.
- ☐ The drain hose is fixed securely.
- ☐ Service valve is fully open.
- ☐ No gas leaks from the joints of the service valve and joint.
- ☐ The pipe joints for indoor and outdoor pipes have been insulated.
- ☐ The reverse flow check cap is attached.
- ☐ The cover of the pipe cover (A) faces downward to prevent rain from entering.
- ☐ Gaps are properly sealed between the pipe covers (A) (B) and the wall surface / pipes.
- ☐ The screw of the side cover is tightened securely.

PSC012D137F F

(2) Model FDC90VNP-W, 100VNP-W

Inverter driven split PAC
90, 100VNP
Designed for R32 refrigerant

• This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 42.
• When install the unit, be sure to check whether the selection of installation place, power source specifications, usage limitation (piping length, height differences between indoor and outdoor units, power source voltage and etc.) and installation spaces.

SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, ⚠ WARNING and ⚠ CAUTION.
  ⚠ WARNING : Wrong installation would cause serious consequences such as injuries or death.
  ⚠ CAUTION : Wrong installation might cause serious consequences depending on circumstances.
  Both mentions the important items to protect your health and safety so strictly follow them by any means.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner's manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user.
- For installing qualified personnel, take precautions in respect to themselves by using suitable protective clothing, groves, etc., and then perform the installation works.
- Please pay attention not to fall down the tools, etc. when installing the unit at the high position.
- If unusual noise can be heard during operation, consult the dealer.
- The meanings of "Marks" used here are shown as follows:

⃠	Never do it under any circumstances.	❗ ⏚	Always do it according to the instruction.

⚠ WARNING

❗

- **Installation must be carried out by the qualified installer.**
  If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction. Do not carry out the installation and maintenance work except by the qualified installer.
- **Install the system in full accordance with the installation manual.**
  Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- **Be sure to use only for household and residence.**
  If this appliance is installed in inferior environment such as machine shop and etc., it can cause malfunction.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage, referred by the formula (accordance with ISO5149).**
  If the density of refrigerant exceeds the limit, please consult the dealer and install the ventilation system, otherwise lack of oxygen can occur, which can cause serious accident.
- **Use the original accessories and the specified components for installation.**
  If parts other than those prescribed by us are used, It may cause water leaks, electric shocks, fire and personal injury.
- **Install the unit in a location with good support.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.**
  Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- **Ventilate the working area well in the event of refrigerant leakage during installation.**
  If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- **Use the prescribed pipes, flare nuts and tools for R32.**
  Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- **Tighten the flare nut by torque wrench with specified method.**
  If the flare nut were tightened with excess torque, this may cause burst and refrigerant leakage after a long period.
- **Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.**
  If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant.
- **The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.**
  Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.
- **Be sure to shut off the power source before starting electrical work.**
  Failure to shut off the power source can cause electric shocks, unit failure or incorrect function of equipment.
- **Be sure to use the cables conformed to safety standard and cable ampacity for power source distribution work.**
  Unconformable cables can cause electric leak, anomalous heat production or fire.
- **This appliance must be connected to main power source by means of a circuit breaker or switch (fuse:20A) with a contact separation of at least 3mm.**
- **Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.**
  Incorrect installation may result in overheating and fire.
- **Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.**
  Loose connections or cable mountings can cause anomalous heat production or fire.
- **Be sure to fix up the service panels.**
  Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
- **Be sure to switch off the power source in the event of installation, inspection or servicing.**
  If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- **Stop the compressor before removing the pipe after shutting the service valve on pump down work.**
  If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.
- **Only use prescribed option parts. The installation must be carried out by the qualified installer.**
  If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- **Be sure to wear protective goggles and gloves while at work.**
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause electric shocks.
- **After completed installation, check that no refrigerant leaks from the system.**
  If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- **Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting out of alignment, be sure to hang up the unit at 4-point support.**
  An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit.
- **Consult the dealer or an expert regarding removal of the unit.**
  Incorrect installation can cause water leaks, electric shocks or fire.
- **Do not perform brazing work in the airtight room.**
  It can cause lack of oxygen.
- **This unit is designed specifically for R32.**
  Using any other refrigerant can cause unit failure and personal injury.

⃠

- **Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.**
  If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
- **Do not processing, splice the power cord, or share a socket with other power plugs.**
  This may cause fire or electric shock due to defecting contact, defecting insulation and over-current etc.
- **Do not bundling, winding or processing for the power cord. Or, do not deforming the power plug due to tread it.**
  This may cause fire or heating.
- **Do not run the unit with removed panels or protections.**
  Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
- **Do not perform any change of protective device itself or its setup condition.**
  The forced operation by short-circuiting protective device of pressure switch and temperature control or the use of non specified component can cause fire or burst.
- **Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.**
  If you repair or modify the unit, it can cause water leaks, electric shocks or fire.

⚠ CAUTION

⏚

- **Carry out the electrical work for ground lead with care.**
  Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.

❗

- **Use the circuit breaker for all pole correct capacity. Circuit breaker should be the one that disconnect all poles under over current.**
  Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- **Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations.**
  The isolator should be locked in OFF state in accordance with EN60204-1.
- **After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.**
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **Take care when carrying the unit by hand.**
  If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- **Dispose of any packing materials correctly.**
  Any remaining packing materials can cause personal injury. To avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- **Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.**
  Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- **Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.**
  If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.

⃠

- **Earth leakage breaker must be installed**
  If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- **Do not install the unit in the locations listed below.**
  - Locations where carbon fiber, metal powder or any powder is floating.
  - Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
  - Vehicles and ships.
  - Locations where cosmetic or special sprays are often used.
  - Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
  - Locations where any machines which generate high frequency harmonics are used.
  - Locations with salty atmospheres such as coastlines.
  - Locations with heavy snow (If installed, be sure to provide base frame and snow hood mentioned in the manual).
  - Locations where the unit is exposed to chimney smoke.
  - Locations at high altitude (more than 1000m high).
  - Locations with ammonic atmospheres. (e.g. organic fertilizer)
  - Locations with calcium chloride (e.g. snow melting agent).
  - Locations where heat radiation from other heat source can affect the unit.
  - Locations without good air circulation.
  - Locations with any obstacles which can prevent inlet and outlet air of the unit.
  - Locations where short-circuit of air can occur (in case of multiple units installation).
  - Locations where strong air blows against the air outlet of outdoor unit.
  - Locations where something located above the unit could fall.

  It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
- **Do not install the outdoor unit in the locations listed below.**
  - Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
  - Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
  - Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
  - Locations where vibration and operation sound generated by the outdoor unit can affect seriously (on the wall or at the place near bed room).
  - Locations where an equipment affected by high harmonics is placed (TV set or radio receiver is placed within 5m).
  - Locations where drainage cannot run off safely.

  It can affect surrounding environment and cause a claim.
- **Do not install the unit near the location where leakage of combustible gases can occur.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.**
  Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- **Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics.**
  Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- **Secure a space for installation, inspection and maintenance specified in the manual.**
  Insufficient space can result in accident such as personal injury due to falling from the installation place.
- **Do not install the outdoor unit in a location where insects and small animals can inhabit.**
  Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- **Do not use the base frame for outdoor unit which is corroded or damaged due to long periods of operation.**
  Using an old and damage base frame can cause the unit falling down and cause personal injury.
- **Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.**
  Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- **Do not touch any buttons with wet hands.**
  It can cause electric shocks.
- **Do not touch any refrigerant pipes with your hands when the system is in operation.**
  During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Do not touch the suction or aluminum fin on the outdoor unit.**
  This may cause injury.
- **Do not put anything on the outdoor unit and operating unit.**
  This may cause damage the objects or injury due to falling to the object.
- **Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art.**
- **Do not clean up the unit with water.**
- **Do not step onto the outdoor unit.**
- **When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences handrails around the outdoor unit.**

Notabilia as a unit designed for R32

- Do not use any refrigerant other than R32. R32 will rise to pressure about 1.6 times higher than that of a conventional refrigerant (R22 or R407C).
  A cylinder containing R32 has a lightblue indication mark on the top.
- A unit designed for R32 has adopted a different size indoor unit service valve charge port and a different size check joint p rovided in the unit to prevent the charging of a wrong refrigerant by mistake.
  The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure.
  Accordingly, you are required to arrange dedicated R32 tools listed in the table on the next page before installing or servicing this unit.
- All indoor units must be models designed exclusively for R32. Check connectable indoor unit models in a catalog, etc. (A wrong in door unit, if connected into the system, will impair proper system operation)

	Dedicated R32 tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrusion control copper pipe gauge
g)	Vacuum pump adapter
h)	Gas leak detector

Check before installation work

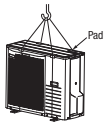
- Model name and power source
- Refrigerant piping length
- Piping, wiring and miscellaneous small parts
- Indoor unit installation manual

Accessories for outdoor unit		Q'ty
①	Grommet (Heat pump type only)	2
②	Drain elbow (Heat pump type only)	1
③	Reducer set φ9.52→ φ6.35	1

1. HAULAGE AND INSTALLATION (Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

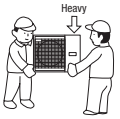
⚠CAUTION When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position. If not properly balanced, the unit can be thrown off-balance and fall.

1) Delivery



- Deliver the unit as close as possible to the installation site before removing it from the packaging.
- When you have to unpack the unit for a compelling reason before you haul it to the installation point, hoist the unit with nylon slings or ropes and protection pads so that you may not damage the unit.

2) Portage



- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.

3) Selection of installation location for the outdoor unit

Be sure to select a suitable installation place in consideration of following conditions.

- ○ A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- ○ A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit.
- ○ A place where the unit is not exposed to oil splashes.
- ○ A place where it can be free from danger of flammable gas leakage.
- ○ A place where drain water can be disposed without any trouble.
- ○ A place where the unit will not be affected by heat radiation from other heat source.
- ○ A place where snow will not accumulate.
- ○ A place where the unit can be kept away 5m or more from TV set and/or radio receiver in order to avoid any radio or TV interference.
- ○ A place where good air circulation can be secured, and enoug hservice space can be secured for maintenance and service of the unit safely.
- ○ A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- ○ A place where chemical substances like sulfuric gas, chloric gas, acid and alkali (includingammonia), which can harm the unit, will not be generated and not remain.
- ○ If a operation is conducted when the outdoor air temperature is -5˚C lower, the outdoor unit should be installed at a place where it is not influenced by natural wind.
- ○ A place where strong wind will not blow against the outlet air blow of the unit.

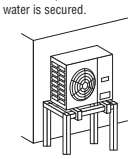
Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

4) Caution about selection of installation location

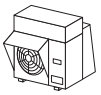
(1) If the unit is installed in the area where the snow will accumulate, following measures are required.

The bottom plate of unit and intake, outlet may be blocked by snow.

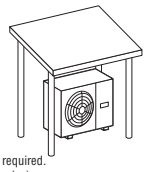
1 Install the unit on the base so that the bottom is higher than snow cover surface, and draining water is secured.



2 Provide a snow hood to the outdoor unit on site.



3 Install the unit under eaves or provide the roof on site.

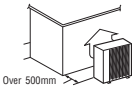


Since drain water generated by defrost control may freeze, following measures are required.

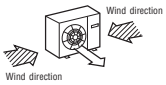
- Don't execute drain piping work by using a drain elbow and drain grommets (accessories). [Refer to DRAIN PIPING WORK.]
- Attached heater on a base plate on site, if there is possibility to freeze drain water. In case that the product has a corrective drainage system, the drainage paths should have suitable threatment against freezing but be sure not to melt the material of drainage paths with heat.

(2) If the unit can be affected by strong wind, following measures are required.
Strong wind can cause damage of fan (fan motor), or can cause performance degradation, or can trigger anomalous stop of the unit due to rising of high pressure.

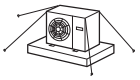
1.Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.



2.Install the outlet air blow side of the unit in a position perpendicular to the direction of wind.



3.The unit should be installed on the stable and level foundation. If the foundation is not level, the down the unit with wires.

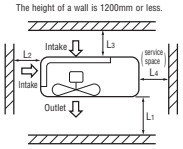


5) Installation space

- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space. In order to facilitate servicing of controls, please provide a sufficient space between units so that their top plates can be removed easily.
- Where a danger of short-circuiting exists, install guide louvers.
- When more than one unit are installed, provide sufficient intake space consciously so that short-circuiting may not occur.
- Where piling snow can bury the outdoor unit, provide proper snow guards.

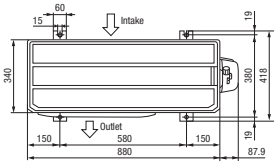
(mm)

Size \ Example installation	I	II	III
L1	Open	Open	500
L2	300	250	Open
L3	100	150	100
L4	250	250	250

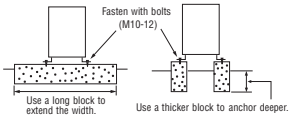


6) Installation

① Anchor bol tfixed position



② Notabilia for installation



- In installing the unit, fix the unit's legs with bolts specified on the above.
- The protrusion of an anchor bolt on the front side must be kept within 15mm.
- Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
- Refer to the above illustrations for information regarding concrete foundations.
- Install the unit in a level area. (With a gradient of 5mm or less.)
  Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

7) To run the unit for a cooling operation, when the outdoor temperature is –5°C or lower.

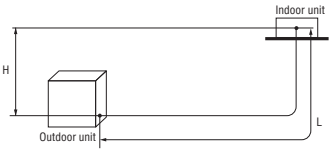
- When the outdoor air temperature is –5°C or lower, provide a snow hood to the outdoor unit on site. So that strong wind will not blow against the outdoor heat exchanger directly.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

- Check the following points in light of the indoor unit specifications and the installation site.
- Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Restrictions			Dimensional restrictions	Marks appearing in the drawing on the right
Indoor unit	FDT, FDE, FDU, FDUM, SRK	Main pipe length	30m or less	L
	FDF		25m or less	L
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher		20m or less	H
	When the outdoor unit is positioned lower		20m or less	H



⚠CAUTION ● The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, please see " 5. UTILIZATION OF EXISTING PIPING."

2) Determination of pipe size

- Determine refrigerant pipe size pursuant to the following guidelines based on the indoor unit specifications.

	Gas pipe	Liquid pipe
Outdoor unit connected	φ15.88 Flare	φ6.35 Flare
Refrigerant piping (branch pipeL)	φ15.88	φ6.35
Indoor unit connected	φ15.88	φ9.52

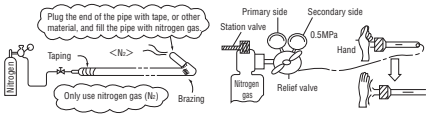
When pipe is brazing.

About brazing

Brazing must be performed under a nitrogen gas flow.

Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.

If the refrigerant is existing in the pipe at brazing, poisonous gas is produced.



3) Refrigerant pipe wall thickness and material

- Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each pipe size.

NOTE ● Select pipes having a wall thickness larger than the specified minimum pipe thickness.

Pipe diameter [mm]	φ6.35	φ15.88
Minimum pipe wall thickness [mm]	0.8	1.0
Pipe material*	O-type pipe	O-type pipe

*Phosphorus deoxidized seamless copper pipe ICS 23.040.15, ICS 77.150.30

4) On-site piping work

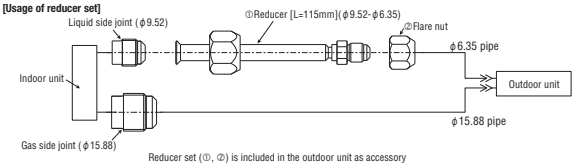
⚠ IMPORTANT Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

- Regarding the change in the size of liquid pipe; Use the reducer at indoor unit side. Reducer set is available in the outdoor unit as accessory.

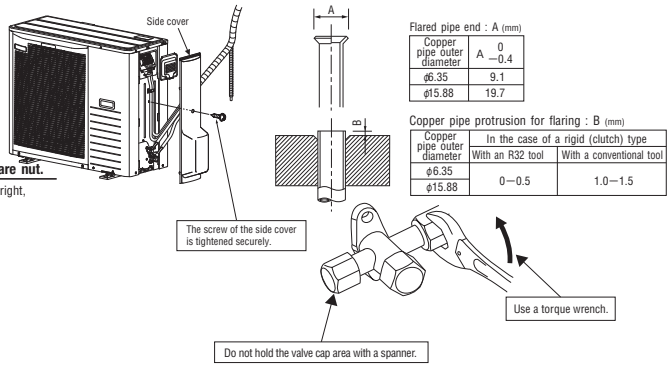
How to remove the side cover Please remove the screw of a side cover and remove to the front.

- Carry out the on site piping work with the service valve fully closed.
- Give sufficient protection to a pipe end (compressed and blazed, or with an adhesive tape) so that water or foreign matters may not enter the piping.
- Bend a pipe to a radius as large as practical.(R100–R150) Do not bend a pipe repeatedly to correct its form.
- Flare connection is used between the unit and refrigerant pipe. Flare a pipe after engaging a flare nut onto it. Flare dimensions for R32 are different from those for conventional R22 and R407C. Although we recommend the use of flaring tools designed specifically for R32, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- The pipe should be anchored every 1.5m or less to isolate the vibration.

[Usage of reducer set]



Reducer set (①, ②) is included in the outdoor unit as accessory



Flared pipe end : A (mm)

Copper pipe outer diameter	A 0 −0.4
φ6.35	9.1
φ15.88	19.7

Copper pipe protrusion for flaring : B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R32 tool	With a conventional tool
φ6.35	0−0.5	1.0−1.5
φ15.88		

⚠ CAUTION **Do not apply force beyond proper fastening torque in tightening the flare nut.**

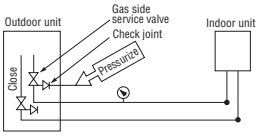
Fix both liquid and gas operation valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

Service valve size (mm)	Tightening torque (N·m)
φ6.35	14−18
φ9.52	34−42
φ12.7	49−61
φ15.88	68−82

5) Air tightness test

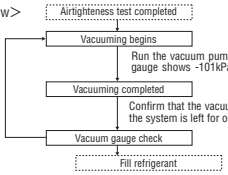
① Although outdoor and indoor units themselves have been tested for air tightness at the factory, check the connecting pipes after the installation work for air tightness from the service valve's check joint equipped on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
a) Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes to see if the pressure drops.
b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
d) If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable. When the ambient temperature fall 1℃, the pressure also fall approximately 0.01 MPa. The pressure, if changed, should be compensated for.
e) If a pressure drop is observed in checking e) and a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.

② In conducting an air-tightness test, use nitrogen gas and pressurize the system with nitrogen gas from the gas side. Do not use a medium other than nitrogen gas under any circumstances.

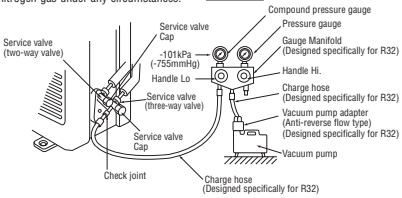


6) Evacuation

<Work flow>



When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise.
Check the system for a leaky point and then draw air to create a vacuum again.



Pay attention to the following points in addition to the above for the R32 and compatible machines.

○To prevent a different oil from entering, assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
○Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

Securely tighten the service valve cap and the check joint blind nut after adjustment.

Service valve size (mm)	Service valve cap tightening torque (N·m)	Check joint blind nut tightening torque (N·m)
φ6.35 (1/4")	20−30	10−12
φ15.88 (5/8")	30−40	

7) Additional refrigerant charge

(1) Calculate a required refrigerant charge volume from the following table.

Indoor unit	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe φ6.35)	Refrigerant volume charged for shipment at the factory (kg)	Installation's pipe length (m) covered without additional refrigerant charge
FDT, FDE FDU, FDUM, SRK	0.020	1.7	15
FDF	0.020	1.7	10

- This unit contains factory charged refrigerant covering 15m of refrigerant piping and additional refrigerant charge on the installation site is not required for an installation with up to 15m refrigerant piping. When refrigerant piping exceeds 15m, additionally charge an amount calculated from the pipe length and the above table for the portion in excess of 15m.
- If an existing pipe system is used, a required refrigerant charge volume will vary depending on the liquid pipe size. For further information, please see "5. UTILIZATION OF EXISTING PIPING."
- For an installation measuring 15m or shorter in pipe length, please charge the refrigerant volume charged for shipment at the factory, when you recharge refrigerant after servicing etc.

Formula to calculate the volume of additional refrigerant required

Additional charge volume (kg) = (Main length (m) – Factory charged volume) x 0.020 (kg/m)

*When an additional charge volume calculation result is negative, it is not necessary to charge refrigerant additionally.

(2) Charging refrigerant

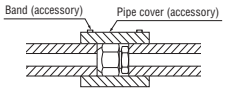
- Since R32 refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- When you find it difficult to charge a required amount, fully open the outdoor unit valves on both liquid and gas sides and charge refrigerant from the gas (suction) side service port, while running the unit in the cooling mode. In doing so, care must be taken so that refrigerant may be discharged from the cylinder in the liquid phase all the time. When the cylinder valve is throttled down or a dedicated conversion tool to change liquid-phase refrigerant into mist is used to protect the compressor, however, adjust charge conditions so that refrigerant will gasify upon entering the unit.
- In charging refrigerant, always charge a calculated volume by using a scale to measure the charge volume.
- When refrigerant is charged with the unit being run, complete a charge operation within 30 minutes. Running the unit with an insufficient quantity of refrigerant for a long time can cause a compressor failure.

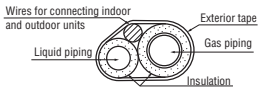
NOTE Put down the refrigerant volume calculated from the pipe length onto the caution label attached on the back side of the service panel.

8) Heating and condensation prevention

(1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
· Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.

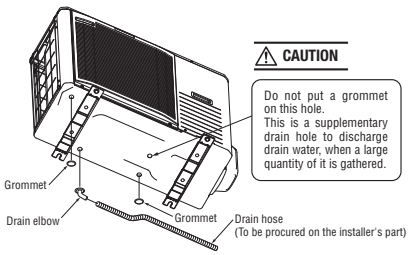
(2) Use a heat insulating material that can withstand 120℃ or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
· All gas pipes must be securely heat insulated in order to prevent damage from dripping water that comes from the condensation formed on them during a cooling operation or personal injury from burns because their surface can reach quite a high temperature due to discharged gas flowing inside during a heating operation.
· Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
· Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
· **Both gas and liquid pipes need to be dressed with 20mm or thicker heat insulation materials above the ceiling where relative humidity exceeds 70%.**





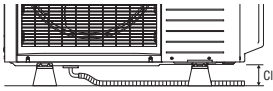
3. DRAIN PIPING WORK

- Execute drain piping by using a drain elbow and drain grommets supplied separately as accessories, where water drained from the outdoor unit is a problem.
- Water may drip where there is a larger amount of drain water. Seal around the drain elbow and drain grommets with putty or adequate caulking material.
- Condensed water may flow out from vicinity of service valve or connected pipes.
- Where you are likely to have several days of sub-zero temperatures in a row, do not use a drain elbow and drain grommets. (There is a risk of drain water freezing inside and blocking the drain.)



⚠ CAUTION

Do not put a grommet on this hole.
This is a supplementary drain hole to discharge drain water, when a large quantity of it is gathered.



- When condensed water needs to be led to a drain, etc., install the unit on a flat base or concrete blocks. (prepared on site)
Then, please secure space for the drain elbow and the drain hose.

4. ELECTRICAL WIRING WORK

For details of electrical cabling, refer to the indoor unit installation manual.

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- Do not use any supply cord lighter than one specified in parentheses for each type below.
  - · braided cord (code designation 60245 IEC 51),
  - · ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
  - · flat twin tinsel cord (code designation 60227 IEC 41);

  Use polychloroprene sheathed flexible cord (code designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.
- Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If improperly grounded, an electric shock or malfunction may result.
- A grounding wire must be connected before connecting the power source cable. Provide a grounding wire longer than the power cable.
- The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire.
- Do not turn on the power source until the electrical work is completeted .
- Do not use a condensive capacitor for power factor improvement under any circumstances. (It dose not improve power factor, while it can cause an abnormal overheat accident)
- For power source cables, use conduits.
- Do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in the malfunctioning or a failure of the unit due to electric noises.
- Fasten cables so that may not touch the piping, etc.
- When cables are connected, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
- Always use a three-core cable for an indoor-outdoor connecting cable. Never use a shield cable.

⚠ CAUTION

In case of faulty wiring connection, the indoor unit stops, and then the run lamp turns on and the timer lamp blinks.

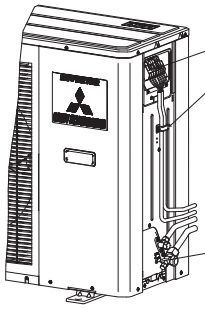
Use cables for interconnection wiring to avoid loosening of the wires.
CENELEC code for cables Required field cables.

H05RNR4G1.5 (Example) or 245IEC57

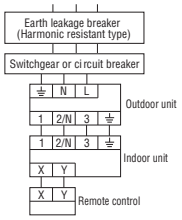
H	Harmonized cable type
05	300/500 volts
R	Natural-and/or synth. rubber wire insulation
N	Polychloroprene rubber conductors insulation
R	Stranded core
4or5	Number of conductors
G	One conductor of the cable is the earth conductor (yellow/green)
1.5	Section of copper wire (mm^2)

Main fuse specification

Specification	Part No.
250V 20A	SSA564A136A



Power source cable, indoor-outdoor connecting wires



- Always perform grounding system installation work with the power cord unplugged.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, fasten cables securely with cable clamps so that no external force may work on terminal connections.
- Grounding terminals are provided in the control box.

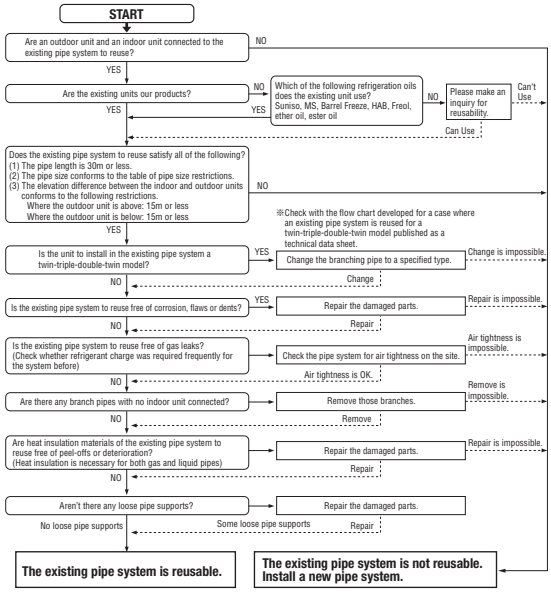
⚠ CAUTION Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.

Phase	Earth leakage breaker	Switchgear or circuit breaker		Power source (minimum)	Interconnecting and grounding wires (minimum)
		Switch breaker	Over current protector rated capacity		
Single-phase	20A,30mA, 0.1sec or less	30A	20A	2.5mm²	1.5mm×4

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear or circuit breaker capacity which is calculated from MAX. over current should be chosen along the regulations in each country.
- The cable specifications are based on the assumption that a metal or plastic conduit is used with no more than three cables contained in a conduit and a voltage drop is 2%. For an installation falling outside of these conditions, please follow the internal cabling regulations. Adapt it to the regulation in effect in each country.

5. UTILIZATION OF EXISTING PIPING

Check whether an existing pipe system is reusable or not by using the following flow chart.



<Table of pipe size restrictions>

◎:Standard pipe size ○:Usable △:Restricted to shorter pipe length limits

Additional charge volume per meter of pipe			0.025kg/m	0.06kg/m	
Indoor unit	Pipe size	Liquid pipe	φ6.35	φ9.52	φ9.52
		Gas pipe	φ15.88	φ12.7	φ15.88
FDT, FDE FDU, FDUM, SRK	Usability		◎	△	△
	Maximum one-way pipe length		30	12	12
	Length covered without additional charge		15	6	6
FDF	Usability		◎	△	△
	Maximum one-way pipe length		25	10	10
	Length covered without additional charge		10	4	4

- **Please consult with our distributor in the area, if you need to recover refrigerant and charge it again.**
- Any combinations of pipe sizes not listed in the table are not usable.

Formula to calculate additional charge volume

Additional charge volume (kg) = (Main pipe length (m) – Length covered without additional charge shown in the table (m)) × Additional charge volume per meter of pipe shown in the table (kg/m)

※ If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged.

Example) When FDT is installed in a 10m long existing pipe system (liquid φ9.52, gas φ12.7), the quantity of refrigerant to charge additionally should be (10m-6m) × 0.06kg/m = 0.24kg.

⚠ WARNING <Where the existing unit can be run for a cooling operation.>

Carry out the following steps with the excising unit (in the order of (1), (2), (3) and (4))

(1) Run the unit for 30 minutes for a cooling operation.
(2) Stop the indoor fan and run the unit for 3 minutes for a cooling operation (returning liquid)
(3) Close the liquid side service valve of the outdoor unit and pump down (refrigerant recovery)
(4) Blow with nitrogen gas. ※ If discolored refrigeration oil or any foreign matters is discharged by the blow, wash the pipe system or install a new pipe system.
- For the flare nut, do not use the old one, but use the one supplied with the outdoor unit. Process a flare to the dimensions specified for R32.

<Where the existing unit cannot be run for a cooling operation.>

Wash the pipe system or install a new pipe system.
- If you choose to wash the pipe system, please contact our distributor in the area.

INSTALLATION TEST CHECK POINTS

Check the following points again after completion of the installation, and before turning on the power. Conduct a test run again and ensure that the unit operates properly.
Explain to the customer how to use the unit and how to take care of the unit following the instruction manual.

After installation

- ☐ Power cables and connecting wires are securely fixed to the terminal block.
- ☐ The power source voltage is correct as the rating.
- ☐ The drain hose is fixed securely.
- ☐ Service valve is fully open.
- ☐ No gas leaks from the joints of the service valve and joint.
- ☐ The pipe joints for indoor and outdoor pipes have been insulated.
- ☐ The reverse flow check cap is attached.
- ☐ The cover of the pipe cover (A) faces downward to prevent rain from entering.
- ☐ Gaps are properly sealed between the pipe covers (A) (B) and the wall surface / pipes.
- ☐ The screw of the side cover is tightened securely.

3.9.5 Safety precautions in handling air-conditioners with flammable refrigerant … See page 81.

3.10 TECHNICAL INFORMATION

Model FDF71VNPWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDF71VH**
Outdoor unit model name	**FDC71VNP-W**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**No**
Colder(if designated)	**No**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**7.10**	kW
heating / Average	Pdesignh	**5.70**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**5.85**	A+
heating / Average	SCOP/A	**3.91**	A
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	Pdh	**5.70**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**7.10**	kW
Tj=30℃	Pdc	**5.06**	kW
Tj=25℃	Pdc	**3.31**	kW
Tj=20℃	Pdc	**1.46**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**2.82**	-
Tj=30℃	EERd	**4.50**	-
Tj=25℃	EERd	**6.65**	-
Tj=20℃	EERd	**12.3**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**5.30**	kW
Tj=2℃	Pdh	**3.07**	kW
Tj=7℃	Pdh	**1.97**	kW
Tj=12℃	Pdh	**1.07**	kW
Tj=bivalent temperature	Pdh	**5.70**	kW
Tj=operating limit	Pdh	**5.12**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**2.72**	-
Tj=2℃	COPd	**3.74**	-
Tj=7℃	COPd	**5.00**	-
Tj=12℃	COPd	**6.00**	-
Tj=bivalent temperature	COPd	**2.30**	-
Tj=operating limit	COPd	**2.20**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-15**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**10**	W
standby mode	Psb	**10**	W
thermostat-off mode	Pto(cooling)	**23**	W
	Pto(heating)	**30**	W
crankcase heater mode	Pck	**0**	W

Annual electricity consumption			
cooling	Qce	**425**	kWh/a
heating / Average	Qhe	**2039**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**55**	dB(A)
Sound power level(outdoor)	Lwa	**67**	dB(A)
Global warming potential	GWP	**675**	kgCO_2eq.
Rated air flow(indoor)	-	**1080**	m^3/h
Rated air flow(outdoor)	-	**2520**	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

PGA000Z841 B

Model FDF90VNPWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	**FDF100VH**
Outdoor unit model name	**FDC90VNP-W**

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	**Yes**
heating	**Yes**

Average(mandatory)	**Yes**
Warmer(if designated)	**No**
Colder(if designated)	**No**

Item	symbol	value	unit
Design load			
cooling	Pdesignc	**9.00**	kW
heating / Average	Pdesignh	**6.00**	kW
heating / Warmer	Pdesignh	**-**	kW
heating / Colder	Pdesignh	**-**	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	**5.91**	A+
heating / Average	SCOP/A	**4.24**	A+
heating / Warmer	SCOP/W	**-**	-
heating / Colder	SCOP/C	**-**	-

Declared capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	Pdh	**6.00**	kW
heating / Warmer (2℃)	Pdh	**-**	kW
heating / Colder (-22℃)	Pdh	**-**	kW

Back up heating capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	elbu	**0**	kW
heating / Warmer (2℃)	elbu	**-**	kW
heating / Colder (-22℃)	elbu	**-**	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	**9.00**	kW
Tj=30℃	Pdc	**6.64**	kW
Tj=25℃	Pdc	**4.25**	kW
Tj=20℃	Pdc	**2.42**	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	**3.60**	-
Tj=30℃	EERd	**4.60**	-
Tj=25℃	EERd	**6.50**	-
Tj=20℃	EERd	**11.2**	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**5.33**	kW
Tj=2℃	Pdh	**3.25**	kW
Tj=7℃	Pdh	**2.12**	kW
Tj=12℃	Pdh	**1.75**	kW
Tj=bivalent temperature	Pdh	**6.00**	kW
Tj=operating limit	Pdh	**5.35**	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**3.30**	-
Tj=2℃	COPd	**4.14**	-
Tj=7℃	COPd	**5.20**	-
Tj=12℃	COPd	**5.40**	-
Tj=bivalent temperature	COPd	**3.10**	-
Tj=operating limit	COPd	**2.40**	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	**-**	kW
Tj=2℃	Pdh	**-**	kW
Tj=7℃	Pdh	**-**	kW
Tj=12℃	Pdh	**-**	kW
Tj=bivalent temperature	Pdh	**-**	kW
Tj=operating limit	Pdh	**-**	kW
Tj=-15℃	Pdh	**-**	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	**-**	-
Tj=2℃	COPd	**-**	-
Tj=7℃	COPd	**-**	-
Tj=12℃	COPd	**-**	-
Tj=bivalent temperature	COPd	**-**	-
Tj=operating limit	COPd	**-**	-
Tj=-15℃	COPd	**-**	-

Bivalent temperature			
heating / Average	Tbiv	**-10**	℃
heating / Warmer	Tbiv	**-**	℃
heating / Colder	Tbiv	**-**	℃

Operating limit temperature			
heating / Average	Tol	**-15**	℃
heating / Warmer	Tol	**-**	℃
heating / Colder	Tol	**-**	℃

Cycling interval capacity			
for cooling	Pcycc	**-**	kW
for heating	Pcych	**-**	kW

Cycling interval efficiency			
for cooling	EERcyc	**-**	-
for heating	COPcyc	**-**	-

Degradation coefficient			
cooling	Cdc	**0.25**	-

Degradation coefficient			
heating	Cdh	**0.25**	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	**7**	W
standby mode	Psb	**7**	W
thermostat-off mode	Pto(cooling)	**62**	W
	Pto(heating)	**68**	W
crankcase heater mode	Pck	**0**	W

Annual electricity consumption			
cooling	Qce	**535**	kWh/a
heating / Average	Qhe	**1981**	kWh/a
heating / Warmer	Qhe	**-**	kWh/a
heating / colder	Qhe	**-**	kWh/a

Capacity control(indicate one of three options)	
fixed	**No**
staged	**No**
variable	**Yes**

Other items			
Sound power level(indoor)	Lwa	**65**	dB(A)
Sound power level(outdoor)	Lwa	**67**	dB(A)
Global warming potential	GWP	**675**	kgCO_2eq.
Rated air flow(indoor)	-	**1620**	m^3/h
Rated air flow(outdoor)	-	**3540**	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

PGA000Z841 B

Model FDF100VNPWVH

Information to identify the model(s) to which the information relates to:	
Indoor unit model name	FDF100VH
Outdoor unit model name	FDC100VNP-W

If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.

Function(indicate if present)	
cooling	Yes
heating	Yes

Average(mandatory)	Yes
Warmer(if designated)	No
Colder(if designated)	No

Item	symbol	value	unit
Design load			
cooling	Pdesignc	10.0	kW
heating / Average	Pdesignh	6.40	kW
heating / Warmer	Pdesignh	-	kW
heating / Colder	Pdesignh	-	kW

Item	symbol	value	class
Seasonal efficiency and energy efficiency class			
cooling	SEER	5.43	A
heating / Average	SCOP/A	3.94	A
heating / Warmer	SCOP/W	-	-
heating / Colder	SCOP/C	-	-

Declared capacity at outdoor temperature Tdesignh			unit
heating / Average (-10℃)	Pdh	6.40	kW
heating / Warmer (2℃)	Pdh	-	kW
heating / Colder (-22℃)	Pdh	-	kW

Back up heating capacity at outdoor temperature Tdesignh			
heating / Average (-10℃)	elbu	0	kW
heating / Warmer (2℃)	elbu	-	kW
heating / Colder (-22℃)	elbu	-	kW

Declared capacity for cooling, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	Pdc	10.0	kW
Tj=30℃	Pdc	7.37	kW
Tj=25℃	Pdc	4.71	kW
Tj=20℃	Pdc	2.33	kW

Declared energy efficiency ratio, at indoor temperature 27(19)℃ and outdoor temperature Tj			
Tj=35℃	EERd	2.95	-
Tj=30℃	EERd	4.31	-
Tj=25℃	EERd	5.80	-
Tj=20℃	EERd	10.5	-

Declared capacity for heating / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	5.67	kW
Tj=2℃	Pdh	3.45	kW
Tj=7℃	Pdh	2.21	kW
Tj=12℃	Pdh	2.93	kW
Tj=bivalent temperature	Pdh	6.40	kW
Tj=operating limit	Pdh	5.05	kW

Declared coefficient of performance / Average season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	3.00	-
Tj=2℃	COPd	4.00	-
Tj=7℃	COPd	4.78	-
Tj=12℃	COPd	4.50	-
Tj=bivalent temperature	COPd	3.00	-
Tj=operating limit	COPd	2.50	-

Declared capacity for heating / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	Pdh	-	kW
Tj=7℃	Pdh	-	kW
Tj=12℃	Pdh	-	kW
Tj=bivalent temperature	Pdh	-	kW
Tj=operating limit	Pdh	-	kW

Declared coefficient of performance / Warmer season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=2℃	COPd	-	-
Tj=7℃	COPd	-	-
Tj=12℃	COPd	-	-
Tj=bivalent temperature	COPd	-	-
Tj=operating limit	COPd	-	-

Declared capacity for heating / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	Pdh	-	kW
Tj=2℃	Pdh	-	kW
Tj=7℃	Pdh	-	kW
Tj=12℃	Pdh	-	kW
Tj=bivalent temperature	Pdh	-	kW
Tj=operating limit	Pdh	-	kW
Tj=-15℃	Pdh	-	kW

Declared coefficient of performance / Colder season, at indoor temperature 20℃ and outdoor temperature Tj			
Tj=-7℃	COPd	-	-
Tj=2℃	COPd	-	-
Tj=7℃	COPd	-	-
Tj=12℃	COPd	-	-
Tj=bivalent temperature	COPd	-	-
Tj=operating limit	COPd	-	-
Tj=-15℃	COPd	-	-

Bivalent temperature			
heating / Average	Tbiv	-10	℃
heating / Warmer	Tbiv	-	℃
heating / Colder	Tbiv	-	℃

Operating limit temperature			
heating / Average	Tol	-15	℃
heating / Warmer	Tol	-	℃
heating / Colder	Tol	-	℃

Cycling interval capacity			
for cooling	Pcycc	-	kW
for heating	Pcych	-	kW

Cycling interval efficiency			
for cooling	EERcyc	-	-
for heating	COPcyc	-	-

Degradation coefficient			
cooling	Cdc	0.25	-

Degradation coefficient			
heating	Cdh	0.25	-

Electric power input in power modes other than 'active mode'			
off mode	Poff	7	W
standby mode	Psb	7	W
thermostat-off mode	Pto(cooling)	62	W
	Pto(heating)	67	W
crankcase heater mode	Pck	0	W

Annual electricity consumption			
cooling	Qce	645	kWh/a
heating / Average	Qhe	2274	kWh/a
heating / Warmer	Qhe	-	kWh/a
heating / colder	Qhe	-	kWh/a

Capacity control(indicate one of three options)	
fixed	No
staged	No
variable	Yes

Other items			
Sound power level(indoor)	Lwa	65	dB(A)
Sound power level(outdoor)	Lwa	68	dB(A)
Global warming potential	GWP	675	kgCO_2eq.
Rated air flow(indoor)	-	1620	m^3/h
Rated air flow(outdoor)	-	3780	m^3/h

Contact details for obtaining more information	
	Mitsubishi Heavy Industries Air-Conditioning Europe, Ltd. 5 The Square, Stockley Park, Uxbridge, Middlesex,UB11 1ET, United Kingdom
	MHIAE SERVICES B.V. Herikerbergweg 238, Luna ArenA, 1101 CM Amsterdam, Netherlands P.O.Box 23393 1100 DW Amsterdam, Netherlands

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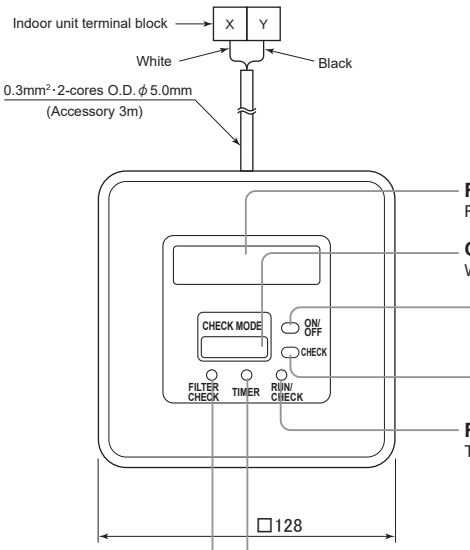
4. OPTION PARTS

CONTENTS

4.1 WIRELESS KIT (RCN-KIT4-E2)

(1) Specification

PJZ000Z323



REMOTE CONTROL SIGNAL RECEIVING SECTION
Receives a signal from the remote control.

CHECK MODE INDICATOR
When an irregularity occurs, the indicator indicates the status of malfunction by symbol.

BACKUP SWITCH
When the remote control is missing or defective, this switch can start and stop the air conditioner.

CHECK SWITCH
This switch is used for maintenance service.

RUN/CHECK LED
The lamp blinks are indicated in 3 patterns as follows.

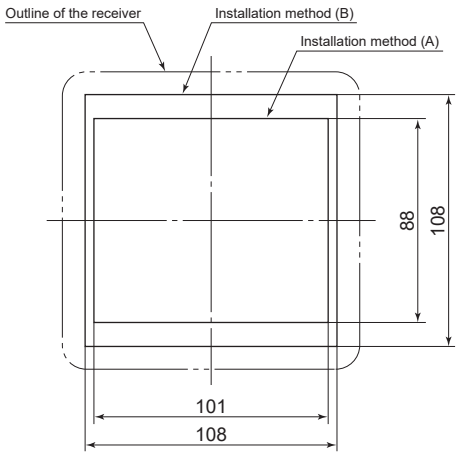
- Lit up in green : During operation
- Blinked in green : "PREPARATION OF HEATING" (during heating mode)
- Blinked in red : An irregularity occurs in the air conditioner.

These lamps blink when the signal is received from the remote control. Each lamp blinks two times in the order from TIMER to RUN/CHECK (green) for receiving sign.

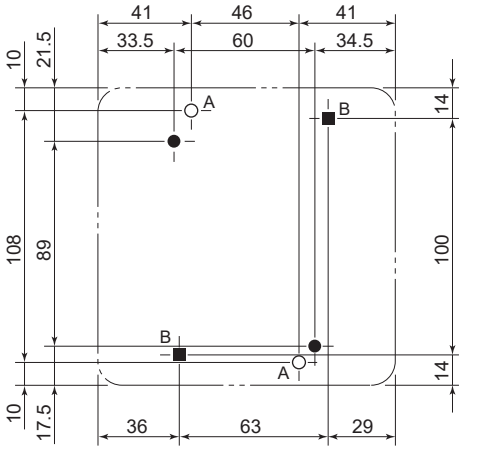
TIMER LED (GREEN)
This lamp is lit during the timer operation.

FILTER SIGN LED (RED)
When this lamp is blinked, clean the filter.

Dimensions of ceiling or wall opening



Dimensions of the receiver installation

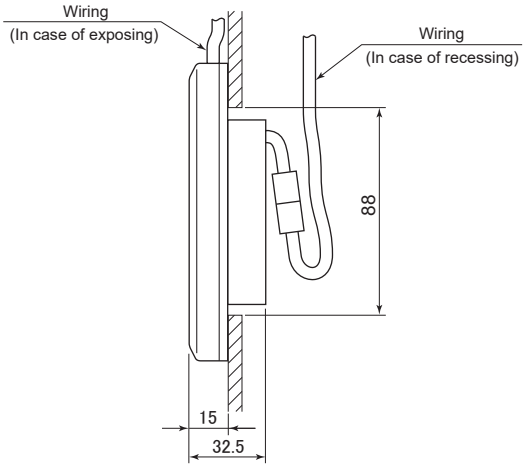


○ : (A) Direct installation onto the ceiling with screws
■ : (B) Installation with enclosed bracket

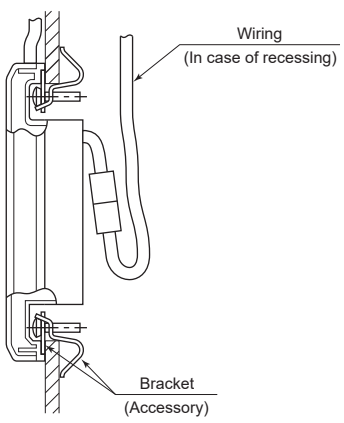
Installation of the receiver

The following two methods can be used to install the receiver onto a ceiling or a wall.
Select a method according to the installation position.

(A) Direct installation onto the ceiling with screws



(B) Installation with enclosed bracket



Installation precautions

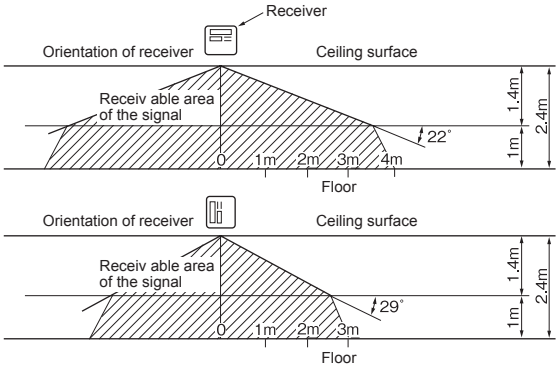
Do not install it on the following placesin order to avoid malfunction.
(1) Places exposed to direct sunlight
(2) Places near heat devices
(3) High humidity places
(4) Hot surface or cold surface enough to generate condensation
(5) Places exposed to oil mist or steam directly
(6) Uneven surface
(7) Places affected by the direct airflow of the AC unit
(8) Places where the receiver is influenced by the flourescent lamp (especially inverter type) or sunlight
(9) Places where the receiver is affected by infrared rays of any other communication devices
(10) Places where some pbject may obstruct the communication with the remote control

Adapted to **RoHS** directive

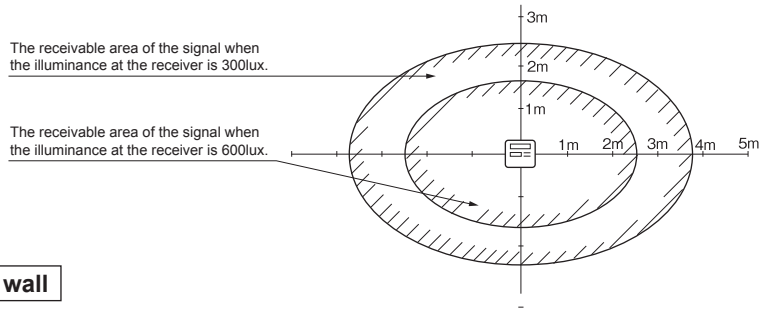
Wireless remote control operable area

When installed on ceiling

1. Standard reachable area of the signa
[Condition] Illuminance at the receiver : **300lux** (when no lighting is installed within 1m of the receiver in an ordinary office.)

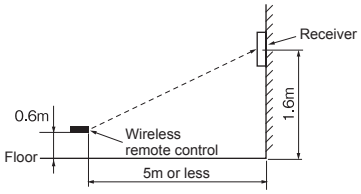


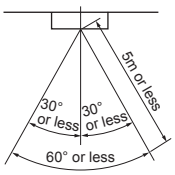
2. Correlation between illuminance at the receiver and reachable area of the signal in a plain view.
[Condition] Correlation between the reachable area of the signal and illuminance at the receiver when the wireless remote control is operated at 1m high under the condition of ceiling height of 2.4m.
When the illuminance becomes double, the area is narrowed down to two third.



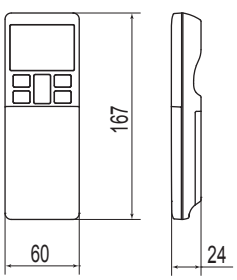
When installed on wall

[Condition] Illuminance at the receiver : **800lux**

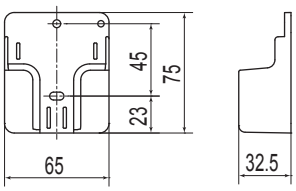




Remote control



Remote control holder



Note
(1) Two LR03 AAA dry cell batteries for remote control are enclosed.

(2) Installation manual

PJZ012D112A

Safety precautions

●Please read this manual carefully before starting installation work to install the unit properly.
Every one of the followings is important information to be observed strictly.
⚠WARNING Failure to follow these instructions properly may result in serious consequences such as death, severe injury, etc.
⚠CAUTION Failure to follow these instructions properly may cause injury or property damage. It could have serious consequences depending on the circumstances.
●The following pictograms are used in the text.

⃠	Never do.	❗	Always follow the instructions given.

●Keep this manual at a safe place where you can consult with whenever necessary. Show this manual to installers when moving or repairing the unit. When the ownership of the unit is transferred, this manual should be given to a new owner.

⚠WARNING

- **Consult your dealer or a professional contractor to install the unit.**
  Improper installation made on your own may cause electric shocks, fire or dropping of the unit.
- **Installation work should be performed properly according to this installation manual.**
  Improper installation work may result in electric shocks, fire or break-down.
- **Be sure to use accessories and specified parts for installation work.**
  Use of unspecified parts may result in drop, fire or electric shocks.
- **Install the unit properly to a place with sufficient strength to hold the weight.**
  If the place is not strong enough, the unit may drop and cause injury.
- **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**
  Power source with insufficient and improper work can cause electric shock and fire.
- **Shut OFF the main power source before starting electrical work.**
  Otherwise, it could result in electric shocks, break-down or malfunction.
- **Do not modify the unit.**
  It could cause electric shocks, fire, or break-down.
- **Be sure to turn OFF the power circuit breaker before repairing/inspecting the unit.**
  Repairing/inspecting the unit with the power circuit breaker turned ON could cause electric shocks or injury.
- **Do not install the unit in appropriate environment or where inflammable gas could generate, flow in, accumulate or leak.**
  If the unit is used at places where air contains dense oil mist, steam, organic solvent vapor, corrosive gas (ammonium, sulfuric compound, acid, etc) or where acidic or alkaline solution, special spray, etc. are used, it could cause electric shocks, break-down, smoke or fire as a result of significant deterioration of its performance or corrosion.
- **Do not install the unit where water vapor is generated excessively or condensation occurs.**
  It could cause electric shocks, fire, or break-down.
- **Do not use the unit in a place where it gets wet, such as laundry room.**
  It could cause electric shocks, fire, or break-down.
- **Do not operate the unit with wet hands.**
  It could cause electric shocks.

⚠WARNING

- **Do not wash the unit with water.**
  It could cause electric shocks, fire, or break-down.
- **Use the specified cables for wiring, and connect them securely with care to protect electronic parts from external forces.**
  Improper connections or fixing could cause heat generation, fire, etc.
- **When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.**
  It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.
  The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.
- **Do not leave the remote control with its PCB case removed.**
  If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.

⚠CAUTION

- Do not install the wireless kit at the following places in order to avoid malfunction.
  It could cause break-down or deformation of remote control.
  (1) Places exposed to direct sunlight
  (2) Places near heat devices
  (3) High humidity places
  (4) Hot surface or cold surface enough to generate condensation
  (5) Places exposed to oil mist or steam directly
  (6) Uneven surface
  (7) Places affected by the direct air flow of the AC unit
  (8) Places where the receiver is influenced by the fluorescent lamp (especially inverter type) or sunlight
  (9) Places where the receiver is affected by infrared rays of any other communication devices
  (10) Places where some object may obstruct the communication with the remote control

① Accessories

Please make sure that you have all of the following accessories.

① Receiver		1
② Wiring (3m)		1
③ Parts set (A)		1
④ Parts set (B)		1
⑤ Parts set (C)		1
⑥ Installation manual		1

① Wireless remote control (RCN-E2)		1
② Remote control holder		1
③ Screw for holder		2
④ AAA dry cell battery (LR03)		2
⑤ User's manual		1

① Screw for receiver		2
② Fixing band		1
③ Clamp		5
④ Screw for clamp		5

① Receiver installation bracket		1
② Screw for the bracket		2
③ Installation fitting		2

② Preparation before installation

Setting on site

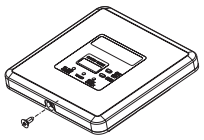
PCB on the receiver has the following switches to set the function. Default setting is shown with ☐ mark.

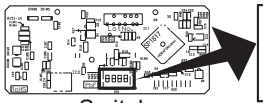
SW1	Prevents interference during plural setting	☐ ON : Normal	OFF : Customized
SW2	Receiver master/ slave setting	☐ ON : Master	OFF : Slave
SW3			
SW4	Auto restart	ON : Valid	☐ OFF : Invalid

② Preparation before installation (continued)

To change setting

1. Remove one screws located on the under of the receiver and detach the board.
2. Change the setting by the switch on PCB.





Switch

Default settings

3. When SW1 is turned to OFF position, change the wireless remote control setting.
   For the method of changing the setting, refer to Setting to avoid mixed communication of ④ Wireless remote control .
   *The receivable area of the signal refer to ⑤ Receiver .

Master/Slave setting when using plural remote controls

Up to two receiver or wired remote control can be installed in one indoor unit group.
When two receiver or wired remote control are used, it is necessary to change switch on the PCB to set it as slave.

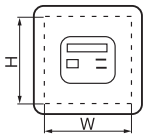
③ How to install the receiver

The following two methods can be used to install the receiver onto a ceiling or a wall.
Select a method according to the installation position.

<Installation position> (A) Direct installation onto the ceiling with wood screws.
(B) Installation with accessory's bracket

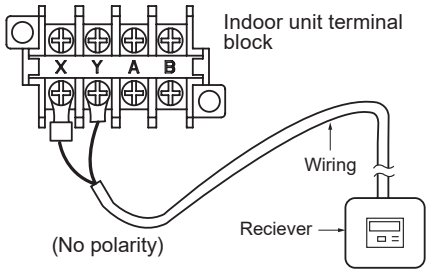
(1) **Drilling of the ceiling (ceiling opening)**

Drill the receiver installation holes with the dimensions shown right at the ceiling position where wires can be connected.



(A) Direct installation onto the ceiling with wood screws.	88mm(H)×101mm(W)
(B) Installation with enclosed bracket	108mm(H)×108mm(W)

(2) **Wiring connection of receiver**



⚠ Caution
Do not connect the wiring to the power source of the terminal block. If it is connected, printed board will be damaged.

(3) **Installation of the receiver**

Remove the screw on the side of the receiver and sprit it into the upper case and lower case.
Install the receiver with one of the two installation methods (A) to (C) shown below.

(A) Direct installation onto the ceiling with screws

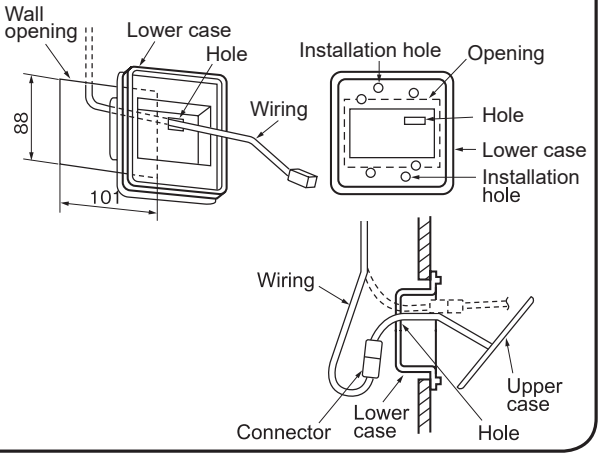
▷ Use this installation method when the ceiling is wooden, and there is no problem for strength in installing directly with wood screws.

① Put through the wiring from the back side to the hole of the lower case.

② Fit the lower case into the ceiling opening. Make sure that the clearance between the convex part of the back of the lower case and the ceiling opening must be as equal as possible on both sides.

③ Using the two installation holes shown right, fix the lower case onto the ceiling with the enclosed wood screws. (The other four holes are not used.)

④ Connect the wiring with the wiring from the upper case by the connector.

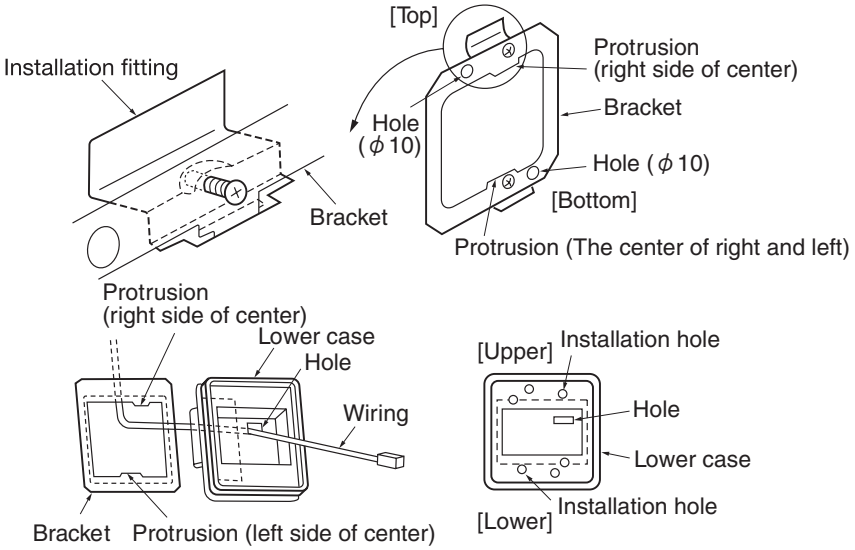


③ How to install the receiver(continued)

⑤ Take out the connector to the backside from the hole of the lower case putting through the wiring at ①.
⑥ Fit the upper case and the lower case, and tighten the screws.

(B) Installation with enclosed bracket

Use this method when installaing onto a gypsum board (7 to 18mm), etc.

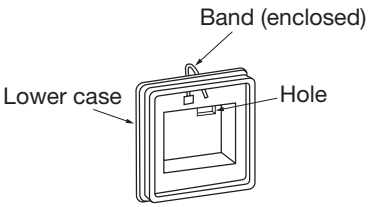


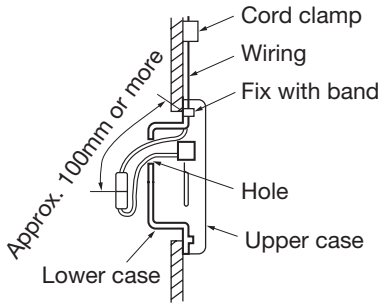
① Catch the two protrusion of the enclosed bracket onto the fitting as shown above, and temporarily fix with the screws. (The bracket has an Upper/Lower and front/back orientation. Confirm the Upper/Lower protrusion positions and the positional relation of the ϕ10 holes on the bracket and the installation hole on the lower case with the above drawing.)
② Insert the end of the installation fitting into the back of the ceiling from the opening, and tighten the screws to fix the bracket onto the ceiling.
③ Pass the wiring from the rear side through the hole on the lower case.
④ Fit the lower case onto the bracket, and fix the lower case to the bracket using the two installation holes shown above. (The other four holes are not used.)
⑤ Follow step ① to ⑥ for (A) to complete the installation.

③ How to install the receiver (continued)

(C) Exposed installation

Use the following procedure when installing the case with the wiring exposed.





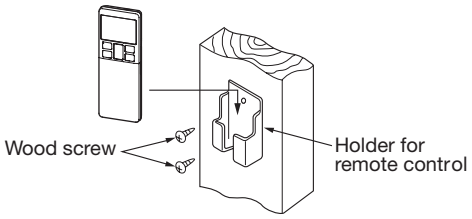
① Cut off the thin section on the side of the upper case with a pair of nippers or a knife, and remove the burrs with a file, etc. (The wiring is passed through this section.)
② Pass the enclosed band through the wiring outlet hole on the lower case.
③ Use on of the light detection adaptor installation methods (A) or (B) explained in section 3, and fix the lower case onto the wall. Do not pass the wiring through the hole on the lower case.
④ Fix the wiring using the band while leaving the wiring length from the band fixing section to the end of the wiring connector at 100mm or more.
⑤ Connect the wiring with the wiring protruding front the upper case using a connector.
⑥ Pass the connected connector and the excess wiring through the hole on the lower case.
⑦ Fit the upper case onto the lower case, and tighten the screws.
⑧ Adequately fix the wiring with the enclesed cord clamp.

④ Wireless remote control

Installation tips for the remote control holder

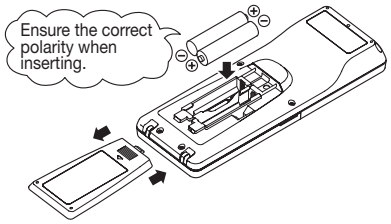
Fix the remote control holder using the screws supplied with this product.

* Precautions for installing the holder
- Adjust the position so that it is upright.
- Ensure that the screw heads are not protruding.
- Do not attach the holder on plaster wall.



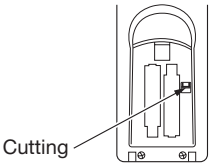
How to insert batteries

1. Detach the back lid.
2. Insert the batteries. (two AAA batteries)
3. Reattach the back lid.



Setting to avoid mixed communication

1. Detach the back lid, and remove the batteries.
2. Cut off the switching wire in the battery compartment using nippers.
3. Insert the batteries, and attach the back lid.

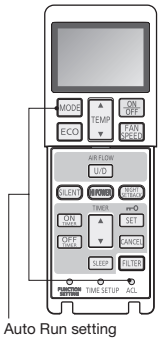


④ Wireless remote control (continued)

Changing the wireless remote control setting

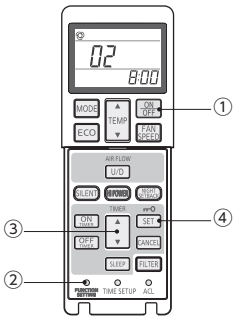
How to change the Auto Run setting
The Auto Run mode is not available on the building air-conditioner and gas heat pump series (excluding the cooling/heating free multi system).
When using the wireless remote control to operate those models, set the wireless remote control to disable the Auto Run mode.
To disable the Auto Run mode, press the ACL switch while holding down the MODE button, or insert batteries while holding down the MODE button.

* Note: Once the batteries are removed, the setting is reset to the factory default.
When the batteries are removed, repeat the steps described above.



Indoor function settings

1. How to set indoor functions
   ① Press the ON/OFF button to stop the unit.
   ② Press the desired one of the buttons shown below while holding down the FUNCTION SETTING switch.
   ③ Use the selection buttons, ▲ and ▼, to change the setting.
   ④ Press the SET button.
   The buzzer on the wireless remote control signal receiver beeps twice, and the LED lamp flashes four times at two-second intervals.
2. Setting details
   The following functions can be set.



Button	Number indicator	Function setting
FAN SPEED	00	Fan speed setting : Standard
	01	Fan speed setting : Setting 1 *
	02	Fan speed setting : Setting 2 *
MODE	00	Room heating temperature adjustment : Disable
	01	Room heating temperature adjustment : +1°C
	02	Room heating temperature adjustment : +2°C
	03	Room heating temperature adjustment : +3°C
FILTER	00	Filter sign display : OFF
	01	Filter sign display : 180 hours
	02	Filter sign display : 600 hours
	03	Filter sign display : 1000 hours
	04	Filter sign display : Operation stop after 1000 hours have elapsed
U/D (Up/Down)	00	Anti draft setting : Disable
	01	Anti draft setting : Enable
SILENT	00	Infrared sensor setting (Motion sensor setting) : Disable
	01	Infrared sensor setting (Motion sensor setting) : Enable
HI POWER	00	Infrared sensor control (Motion sensor control) : Disable
	01	Infrared sensor control (Motion sensor control) : Power control only
	02	Infrared sensor control (Motion sensor control) : Auto OFF only
	03	Infrared sensor control (Motion sensor control) : Power control and Auto OFF

Button	Number indicator	Function setting
ON TIMER	00	Cooling fan residual-period running : Disable
	01	Cooling fan residual-period running : 0.5 hours
	02	Cooling fan residual-period running : 2 hours
	03	Cooling fan residual-period running : 6 hours
OFF TIMER	00	Heating fan residual-period running : Disable
	01	Heating fan residual-period running : 0.5 hours
	02	Heating fan residual-period running : 2 hours
	03	Heating fan residual-period running : 6 hours
NIGHT SETBACK	00	Remote control signal receiver LED : Brightness High
	01	Remote control signal receiver LED : Brightness Low
	02	Remote control signal receiver LED : OFF

* Refer to service manual.

⑤ Receiver

1 Control plural indoor units with one remote control

Up to 16 indoor units can be connected.

1. Connect the XY terminal with 2 cores wire. As for the size, refer to the following note.
2. For Packaged air-conditioner series, set the indoor unit address with SW2 on the indoor unit PCB from [0] to [F] so as not to duplicate.

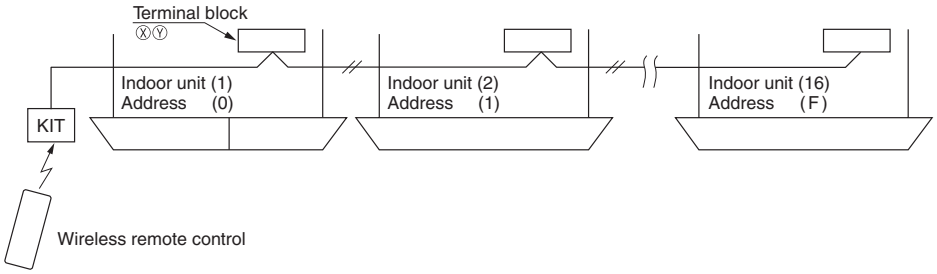
Restrictions on the thickness and length of wire (Maximun total extension 600m.)

Standard	Within 0.3 mm² × 100m
	Within 0.5 mm² × 200m
	Within 0.75mm² × 300m
	Within 1.25mm² × 400m
	Within 2.0 mm² × 600m

⑤ Receiver (continued)

For the shop series

For VRF series, set the indoor unit address with SW1, SW2 and SW5-2 on the indoor unit PCB from [000] to [127] so as not to duplicate.

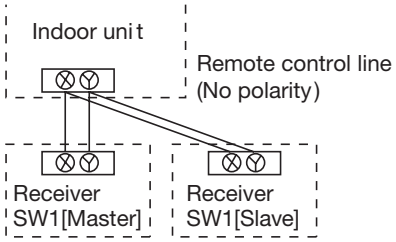


For the building air-conditioner and gas heat pump series

Set the indoor unit and outdoor unit numbers by manually specifying the addresses.
Use the rotary switches SW1 and SW2 provided on the indoor unit PCB (printed circuit board) to set the indoor unit numbers so that they are not duplicated.

Master/Slave setting when using plural remote control

Up to two receivers can be installed in one indoor unit group.

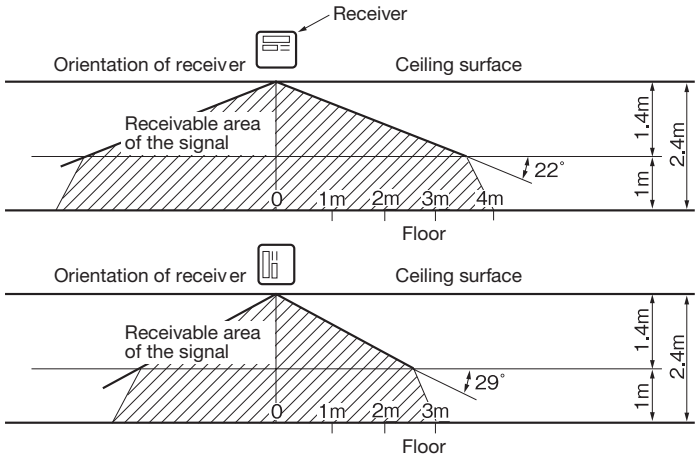


Switch	Setting	Function
SW2	ON	Master
	OFF	Slave

When installed on ceiling

1. Standard reachable area of the signa

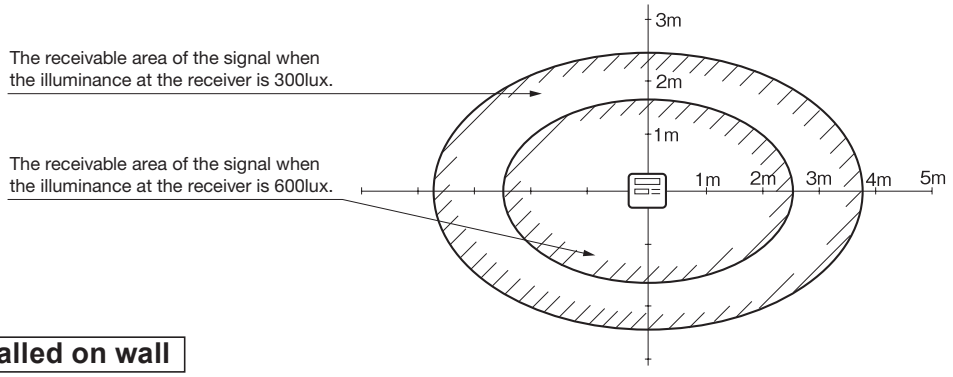
[Condition] Illuminance at the receiver : **300lux** (when no lighting is installed within 1m of the receiver in an ordinary office.)



2. Correlation between illuminance at the receiver and reachable area of the signal in a plain view.

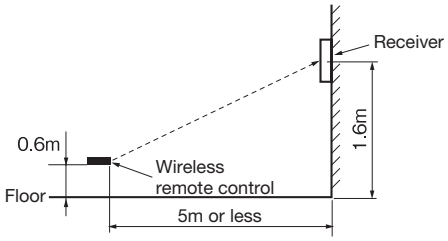
[Condition] Correlation between the reachable area of the signal and illuminance at the receiver when the wireless remote control is operated at 1m high under the condition of ceiling height of 2.4m. When the illuminance becomes double, the area is narrowed down to two third.

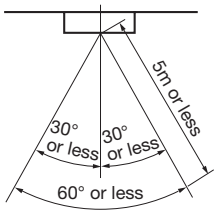
⑤ Receiver (continued)



When installed on wall

[Condition] Illuminance at the receiver : 800lux.

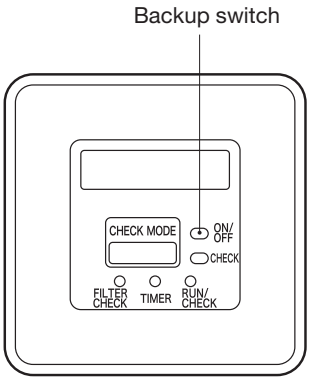




Backup switch

A backup switch is provided on the receiver section of the panel surface. When operation from the wireless remote control is not possible (due to flat batteries, a mislaid unit, a unit failure), you can use it as an emergency means. You should operate this switch manually.

1. If pressed while the air-conditioner is in a halt, it will cause the air-conditioner to start operation in the automatic mode (in the case of cooling only, in the cooling mode). Wind speed: Hi fan, Temperature setting: 23°C, Louver: horizontal
2. If pressed while the air-conditioner is in operation, it will stop the air-conditioner.



Cooling test run operation

- After safety confirmation, turn on the power.
- Transmit a cooling operation command with the wireless remote control, while the backup switch on the receiver is depressed.
- If the backup switch on the receiver is pressed during a test run, it will end the test run.
- If you cannot operate the unit properly during a test run, please check wiring by consulting with inspection guides.

How to read the 6-digit display

A 6-digit indicator (7-segment indicator) is provided on the receiver section.

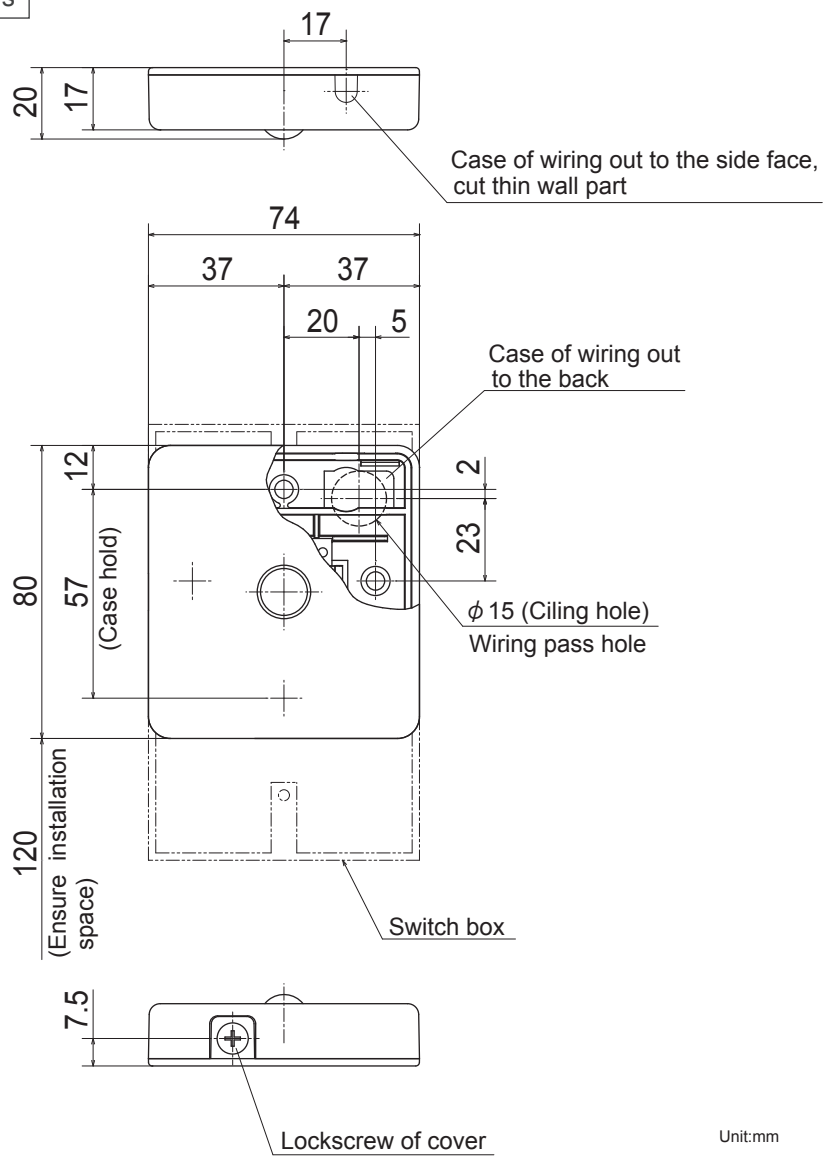
1. An indication will be displayed for one hour after power on.
2. An indication appears for 3.5 seconds when a “Stop” command is sent from the wireless remote control unit while the air-conditioner is not running.
3. An indication appearing in (1) or (2) above will go off as soon as the unit starts operation.
4. When there are no error records to indicate, addresses are displayed for all of the connected units.
5. When there are some error records remaining, the error records are displayed.
6. Error records can be cleared by transmitting a “Stop” command from the wireless remote control unit, while the backup switch is depressed.

4.2 MOTION SENSOR KIT (LB-KIT2)

(1) Specification

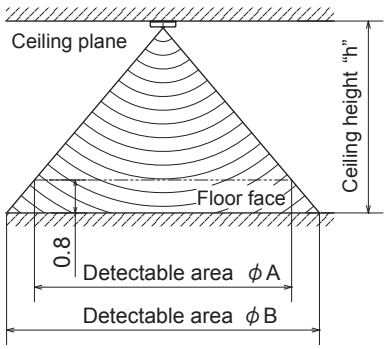
PJZ000Z341

External dimensions



Unit:mm

Detectable area



High of the ceiling h[m]	2.7	3.5	4.0
Detectable area ϕA[m]	4.5	6.4	7.6
Detectable area ϕB[m]	6.4	8.3	9.5

Notes
(1) The recommended height, is lower than 4m for motion sensor. When the installation height is higher, motion detection accuracy might be reduced.
(2) Connenction wiring (prepare on site) for signal wiring is 0.2mm^2 × 3 cores wire or more (Red,White,Black) and maximum total extension 8m.
(3) Motion sensor kit can be installed on the wall, but recommend installing is the ceiling plane.
(4) In the case of wall installation, the detectable area is 5m in front and about 100° left and right.
(5) Refer to the installation sheet for details.

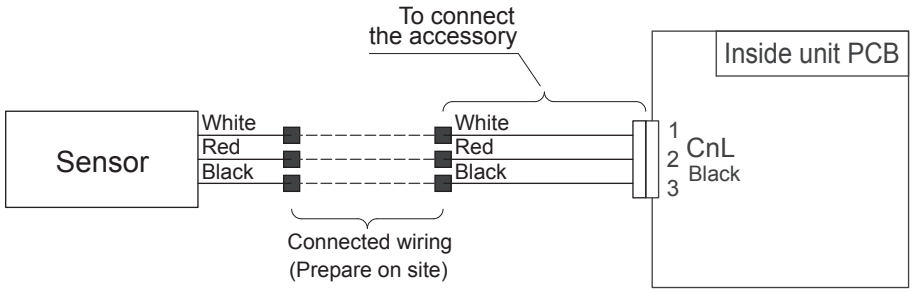
Installation precautions

Do not install the motion sensor kit at the following places in order to avoid malfunction.

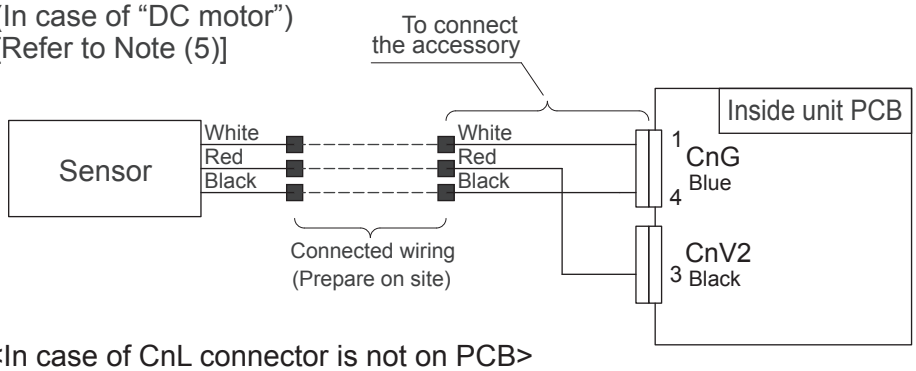
(1) Places exposed to direct sunlight
(2) Places near heat devices
(3) High humidity places
(4) Hot surface or cold surface enough to generate condensation
(5) Places exposed to oil mist or steam directly
(6) Uneven surface
(7) Places affected by the direct air flow of the AC unit
(8) Places where the motion sensor is influenced by the fluorescent lamp (especially inverter type) or sunlight
(9) Places where the motion sensor is affected by infrared rays of any other communication devices
(10) Place that the motion sensor have a shock
(11) Place with the strong radio wave or static electricity
(12) Place that motion sensor lens become tainted or have damaged.Dusty place
(13) Do not run in parallel with strong voltage lines such as power source wiring

Wiring connection

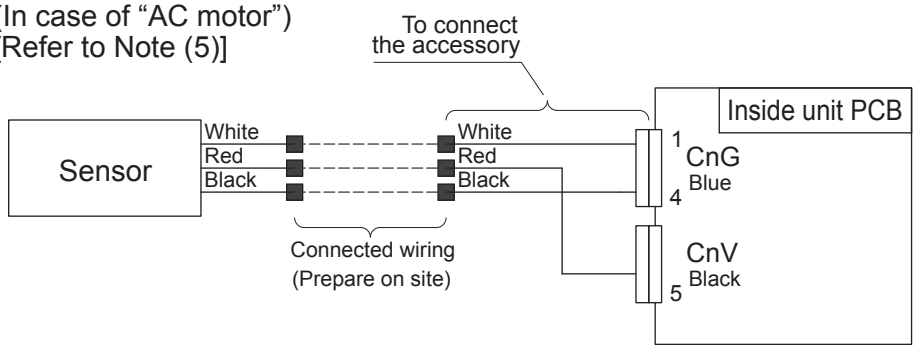
<In case of CnL connector is on PCB>



<In case of CnL connector is not on PCB>
(In case of “DC motor”)
[Refer to Note (5)]



<In case of CnL connector is not on PCB>
(In case of “AC motor”)
[Refer to Note (5)]



(2) Installation manual

PJZ012D134

⚠ WARNING

● Connect the wiring to the PCB in the control box on the indoor unit and hold the wiring securely so as not to apply unexpected stress on the PCB.
Loose connection or hold will cause abnormal heat generation or fire.

● Make sure the power source is turned off when electric wiring work.
Otherwise, electric shock, malfunction and improper running may occur.

⚠ CAUTION

● Do not install the motion sensor kit at the following places in order to avoid malfunction.

(1) Places exposed to direct sunlight
(2) Places near heat devices
(3) High humidity places
(4) Hot surface or cold surface enough to generate condensation
(5) Places exposed to oil mist or steam directly
(6) Places affected by the direct air flow of the Indoor unit
(7) Places where the motion sensor is influenced by the fluorescent lamp or sunlight
(8) Places where the motion sensor is affected by infrared rays of any other communication devices
(9) Places where some object may obstruct the motion sensor
(10) Place that the motion sensor have a shock
(11) Place with the strong radio wave or Static electricity
(12) Place that motion sensor lens become tainted or have damaged. Dusty place
(13) Place where it runs in parallel with strong voltage lines such as power source wiring

● Do not leave the motion sensor without the cover.
In case the cover needs to be detached, protect the motion sensor with a packaging or bag in order to keep it away from water and dust.

Attention

- This manual describes how to install the motion sensor kit.
- Instruct the customer how to operate it correctly referring to the instruction manual.
- For the installation method of the air-conditioner itself, refer to the installation manual enclosed in the package.

① Accessories

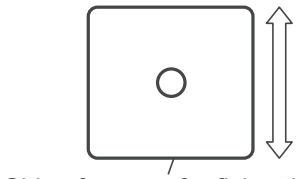
Please make sure that all components are in the package.

Motion sensor	Wiring <1>	Wiring <2>	Wiring <3>	2 screws	Manual
	In case of CnL connector on the indoor unit PCB (FDT/FDK/FDTC) 	In the case of CnV2 connector on the indoor unit PCB 	In the case of CnV connector on the indoor unit PCB (FDTQ/FDFL/FDFU) 		

ø Please prepare a relay wiring for connecting the motion sensor and indoor unit on site. (0.2mm^2 or thicker, triplex (red, white and black) cable for communication, with the maximum length of 8m.)

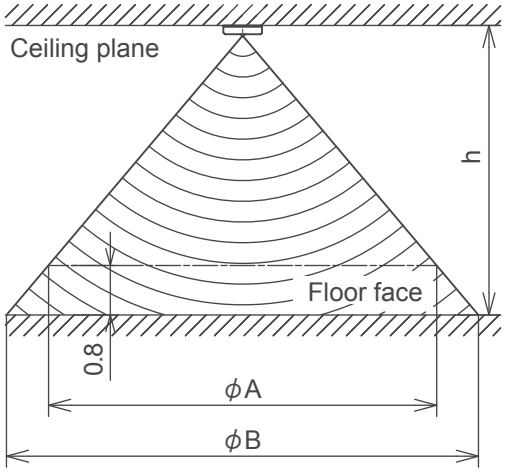
② Installing the motion sensor

- The recommended height is lower than 4000mm for motion sensor. When the installation height is higher, motion detection accuracy might be reduced.
- Sensor will detect the object with a different temperature from the surrounding.
- Motion sensor is more sensitive to motions in the direction of ⇔ mark.
- Sensor may not detect small children or infants with little motion.
- Although motion sensor can be installed on a wall, it is recommended to install it on the ceiling plane.
- If the sensor is installed on the wall, the sensing distance in the front direction is about 5m, covering the angle of about 100 degrees.



Side of screws for fixing the case

The detectable area



Height of the ceiling h (m)	2.7	3.5	4.0
Detectable area ϕ A (m)	4.5	6.4	7.6
Detectable area ϕ B (m)	6.4	8.3	9.5

Installing the motion sensor

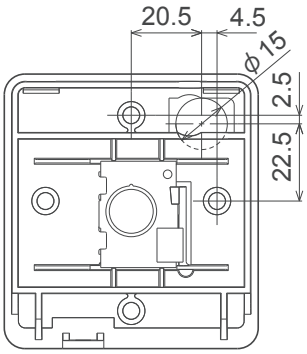
There are the following 3 methods to install the motion sensor on the ceiling plane or wall surface (hereinafter called “ceiling plane”). Select the method according to the installation position.

<How to install>

(A) Direct installation by screws to the ceiling plane with the wiring in the ceiling space.

(B) Direct installation by screws to the ceiling plane with the wiring in the room.

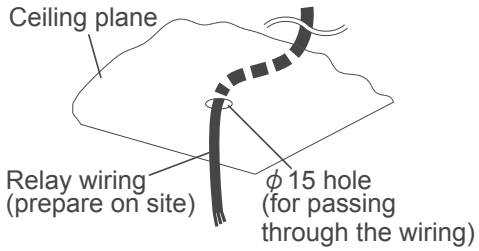
(C) Installation with switch box (prepare at the site)



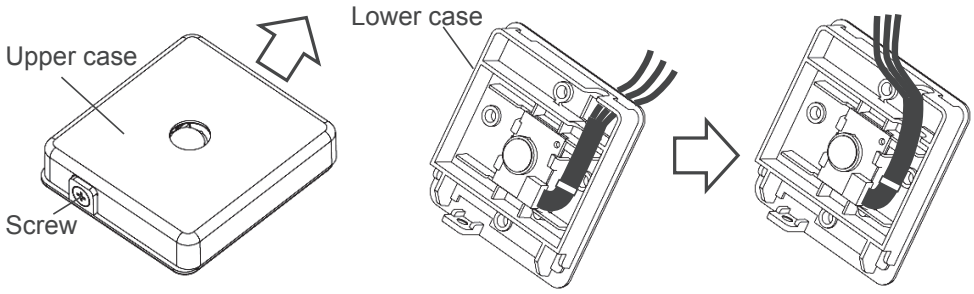
Positional relation for pulling out relay wiring hole and installing holes.

Option (A)

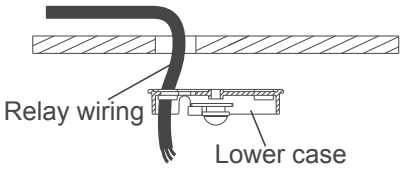
►Select this method if the ceiling plane has sufficient strength to install the motion sensor directly with screws.

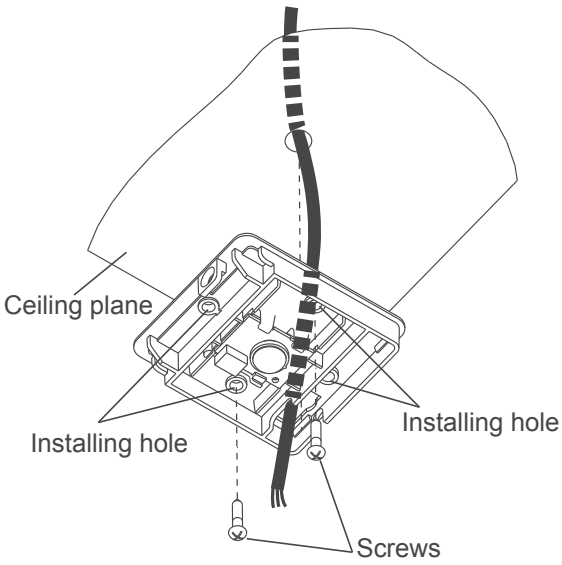


① Prepare a relay wiring on site and lay out the wiring in advance.
② Remove the screw at the side of the motion sensor and slide the upper case in the direction of the arrow.
③ Pull the wiring of the motion sensor as below.

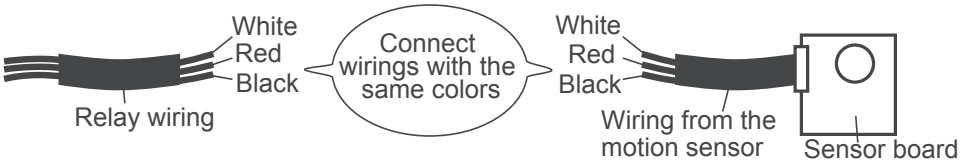


④ Pass the relay wiring through the hole on the lower case.
⑤ When fixing the lower case to the ceiling plane, tighten it in 2 locations of the installing holes (4 locations) with the attached screws.

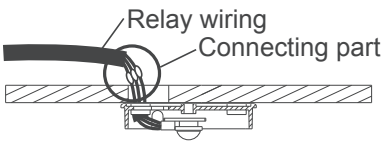




⑥ Using a crimping terminal, etc., connect the same color to the relay wiring (prepare on site) and the wiring of motion sensor.



⑦ Place the connecting part inside of the ceiling space.
⑧ Seal the wiring hole on the lower case with putty.
⑨ Taking care not to pinch the wirings, slip the upper case into the lower case, and tighten the screws.

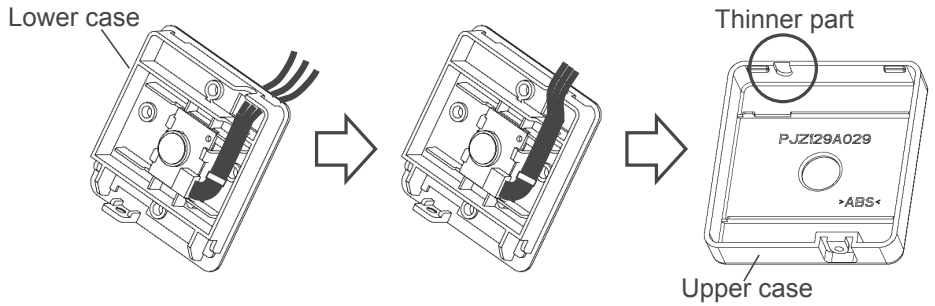


Caution:
In order to prevent tracking, be sure to perform construction so as not to clog up the connecting part with dust, etc.

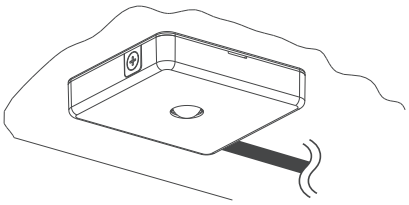
Option (B)

►Select this method if the ceiling plane has sufficient strength to install the motion sensor directly with screws.

① Remove the screw at the side of the motion sensor and slide the upper case in the direction of the arrow. (The same as ② of Option (A))
② Pull the wiring of the motion sensor toward the side. Cut off the thinner part of the upper case.

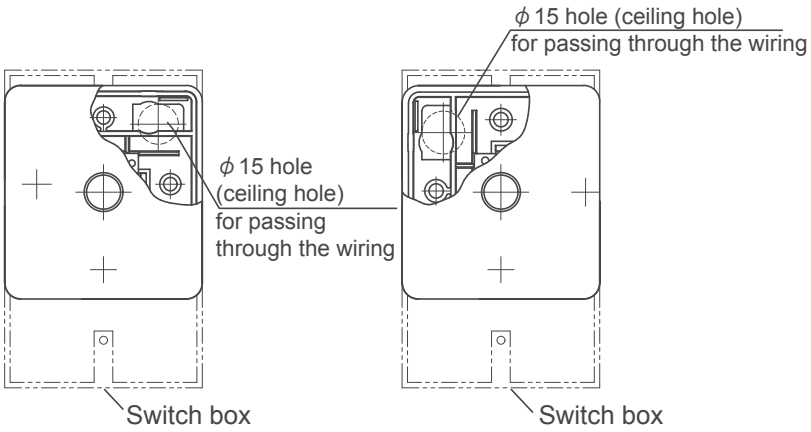


③ When fixing the lower case to the ceiling plane, tighten it in 2 locations of the installing holes (4 locations) with the attached screws. (The same as ⑤ of Option (A))
④ Using a crimping terminal, etc., connect the same color to the relay wiring (prepare on site) and the wiring of motion sensor.
(The same as ⑥ of Option (A))
⑤ Taking care not to pinch the wirings, slip the upper case into the lower case, and tighten the screws.
(The same as ⑨ of Option (A))
⑥ Seal the cut part at Step ② with putty.

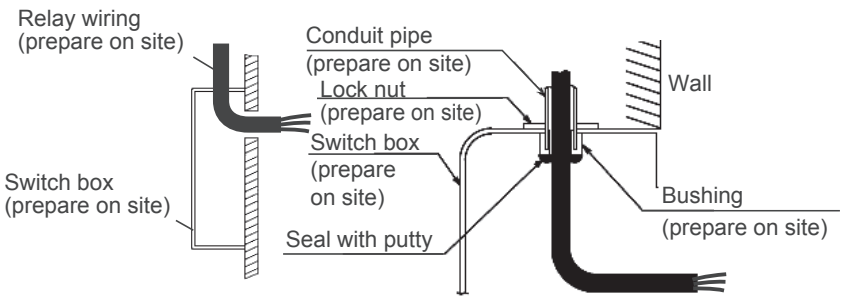


Option (C)

① Set up the switch box and relay wiring (prepare on site) in advance.
Seal the relay wiring inlet with putty.



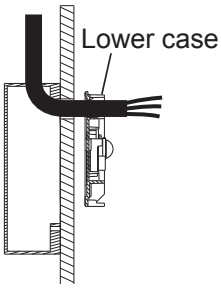
Positional relation for the switch box and installing holes



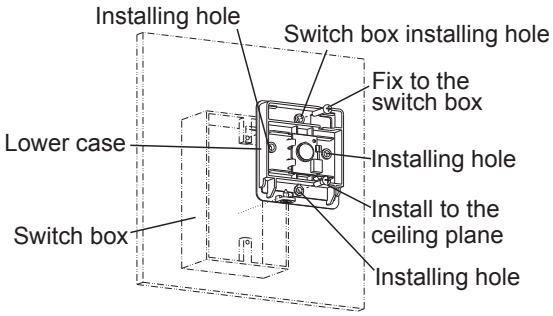
② Remove the screw at the side of the motion sensor and slide the upper case in the direction of the arrow. (The same as ② of Option (A))

③ Pull the wiring of the motion sensor. (The same as ③ of Option (A))

④ Pass the relay wiring through the hole on the lower case from switch box.

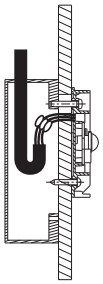


⑤ Fix the lower case to switch box using the installing hole (1 place).

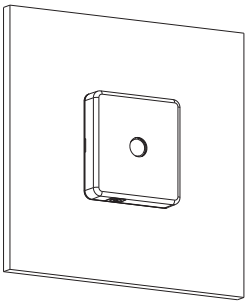


⑥ Connect the same color to the relay wiring (prepare on site) and the wiring of motion sensor. (The same as ⑥ of Option (A))

⑦ Place the connecting part between switch box and the hole of the lower case through passed the wiring at step ④ .



⑧ Taking care not to pinch the wirings, slip the upper case into the lower case, and tighten the screws. (The same as ⑨ of Option (A))

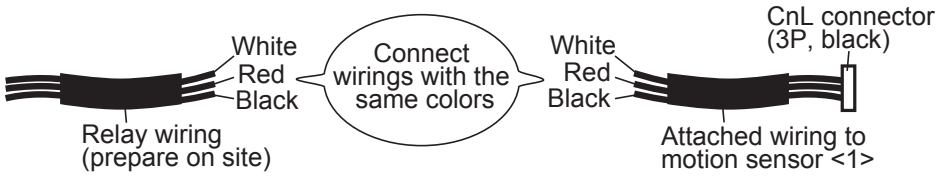


Wiring connection in the control box of indoor unit

CAUTION: Attached wirings to the motion sensor vary depending on the model of the indoor unit. Make sure your model before installing.

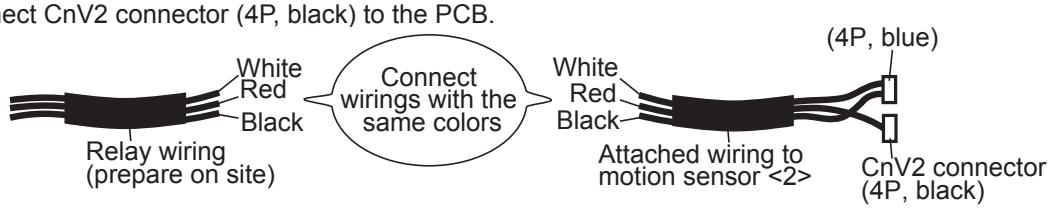
<In case of the CnL connector is on the indoor unit PCB (FDT/FDK/FDTC)>

① Connect the same color to the relay wiring (prepare on site) and the attached wiring <1>.
② Remove the control box cover from the indoor unit.
③ Connect CnL connector (3P, black) to the PCB.



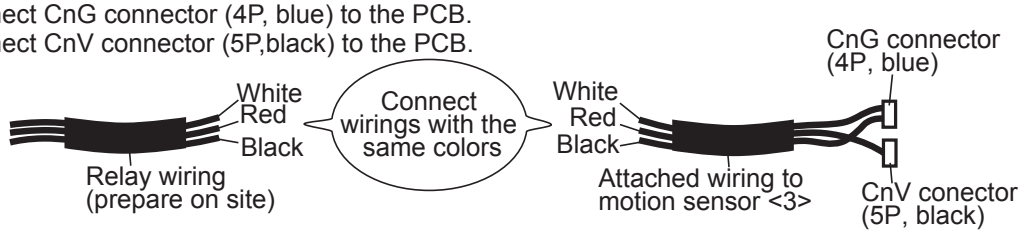
<In the case of CnV2 connector on the indoor unit PCB>

① Connect the same color to the relay wiring (prepare on site) and the attached wiring <2>.
② Remove the control box cover from the indoor unit.
③ Connect CnG connector (4P, blue) to the PCB.
④ Connect CnV2 connector (4P, black) to the PCB.

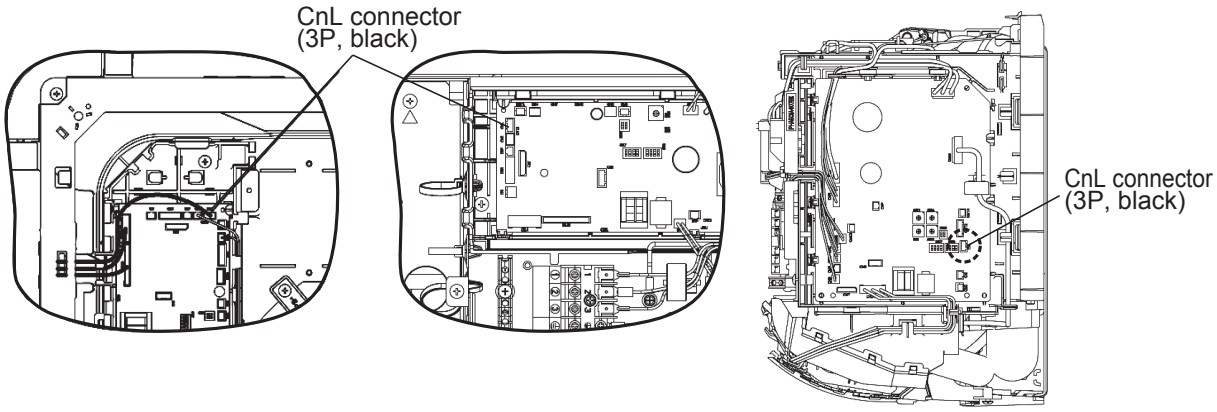


<Incase of the CnV connector is not on the indoor unit PCB (FDTQ/FDFL/FDFU)>

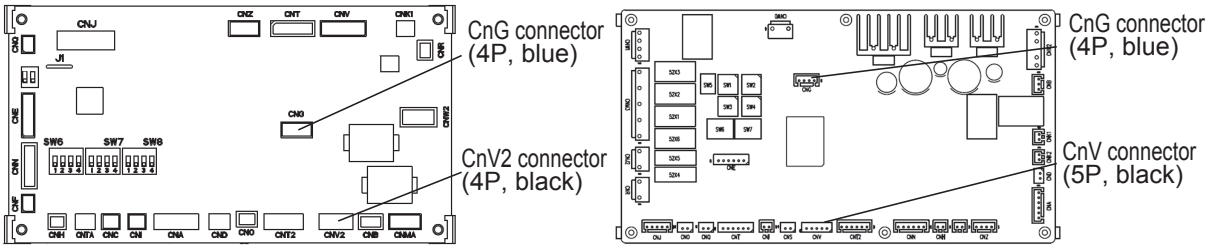
① Connect the same color to the relay wiring (prepare on site) and the attached wiring <3>.
② Remove the control box cover from the indoor unit.
③ Connect CnG connector (4P, blue) to the PCB.
④ Connect CnV connector (5P,black) to the PCB.



<For FDT> **<For FDTC>** **<For FDK>**



<For the other indoor units> **<In case of FDTQ/FDFL/FDFU>**



③ Setting the motion sensor

The motion sensor will not function if it is only installed.

Set the function of the motion sensor by the wired or wireless remote control.

Refer to the manual instruction of each remote control for the setting procedure.

Note: It is not possible to set by the following remote control models or older.

Wired:RC-EX1A, RC-E5, RCH-E3

Wireless: RCN-E1R

(3) User's manual

PJZ012A164

SAFETY PRECAUTIONS

⚠ WARNING

● **If a child, person with disease or other persons needed for assist uses this product, people around the person should take sufficient care.**
A halt of the air-conditioner due to abnormal situation or motion sensor's control may cause a feeling of sickness or accident.

ATTENTION

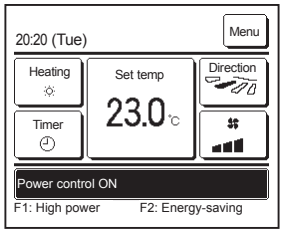
- The sensor may not detect a person near the border of detection range.
- Installation near an object with a different temperature from the surrounding may cause a false detection of human.
- Due to correction of temperature setting, some people may feel chilly.

This product uses infrared sensor to detect person's activity level to support control of air-conditioner.
Please set the control you like from the remote control.

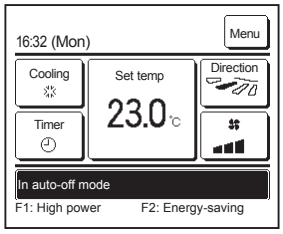
Indoor unit control	Detective situation	Description of control	Display of eco touch remote control
① Power control	Activity level is large	Lower the indoor temperature setting for comfort.	Power control ON
	Activity level is small	Raise the indoor temperature setting for energy-saving.	Power control ON
② Auto-off	No one is detected for 1 hour.	Stop operation and stand by	In auto-off mode
	No one is detected for 12 hours.	Stop operation	-
① + ②	Any combination of the above	Any of the above	Any of the above
All disabled (default setting)	-	Standard control	-

If the sensor is disconnected or defective, the control will be set as if it no detects (or less) activity level.

Refer to the next section for setting method.



- When power control is enabled
  The amount of human motion is detected by a motion sensor to adjust the Set temp.
  During power control, "Power control ON" will be displayed on the message display.



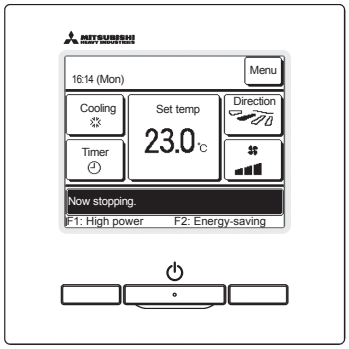
- When auto-off is enabled
  The unit will enter the "Operation wait" state when an hour has elapsed since the last time a human presence was detected and will be in "Complete stop" state after another 12 hours.

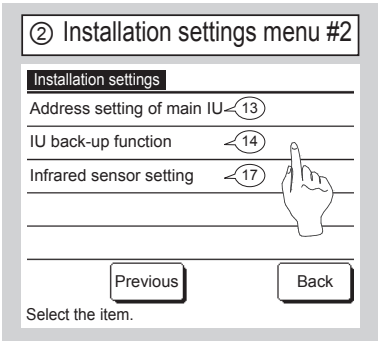
"Operation wait"...The unit stops but will resume operation when human presence is detected. When the unit is in "Complete stop", "In auto-off mode" will be displayed on the message display.

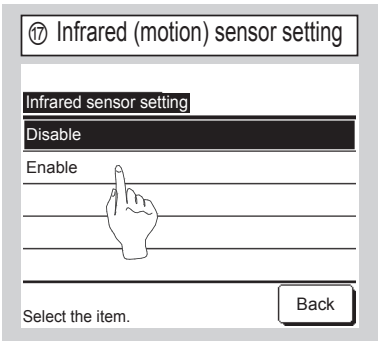
"Complete stop"...When auto-off is enabled, the unit stops. The unit will not resume operation even when human presence is detected.
The message "In auto-off mode" will disappear from the message display, and the operation lamp will turn off.

Control setting (from eco touch remote control)

● Refer to the installation manual for eco touch remote control to activate the infrared sensor (motion sensor).
TOP screen **Menu** ⇨ **Service setting** ⇨ **Installation settings** ⇨ **Service password**



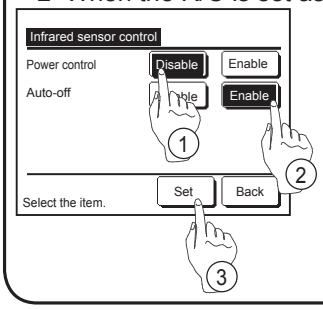




● Refer to the installation manual for eco touch remote control to set control mode.

■ Infrared sensor (motion sensor) control (for IUs with motion sensors)
Presence of humans and the amount of motion are detected by a motion sensor to perform various controls.

■ When the R/C is set as the sub R/C, the infrared sensor (motion sensor) control cannot be set.



Tap the **Menu** button on the TOP screen and select **Energy-saving setting** ⇨ **Infrared sensor control** or **Motion sensor control**.

The Infrared sensor control screen and contents of the current settings are displayed.

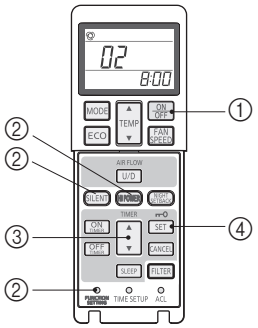
① Enable/disable power control.
② Enable/disable auto-off.
③ After you set each item, tap the **Set** button.
The display returns to the Energy-saving setting menu screen.

Control setting (from wireless remote control)

● Refer to the installation manual for wireless remote control to enable motion sensor in **Indoor function settings**

Indoor function settings

1. How to set indoor functions
① Press the ON/OFF button to stop the unit.
② Press the desired one of the buttons shown item **2.** while holding down the FUNCTION SETTING switch.
③ Use the selection buttons, ▲ and ▼, to change the setting.
④ Press the SET button.
The buzzer on the remote control signal receiver beeps twice, and the LED lamp flashes four times at two-second intervals.



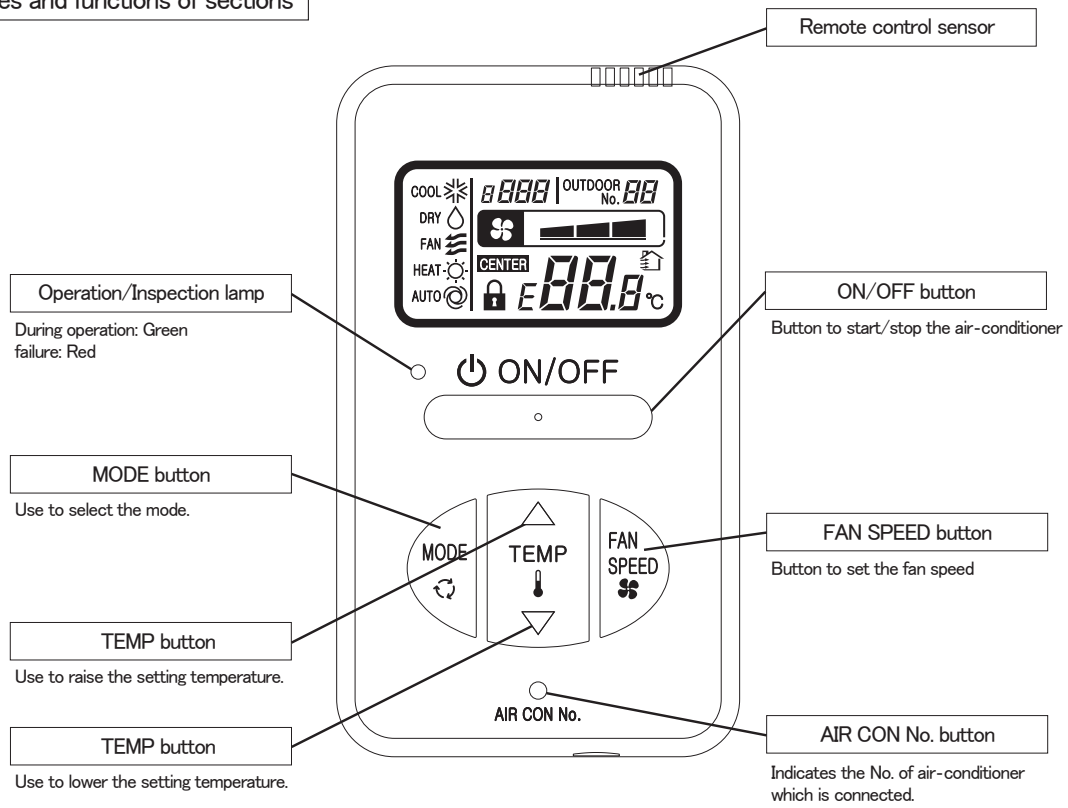
2. Setting details

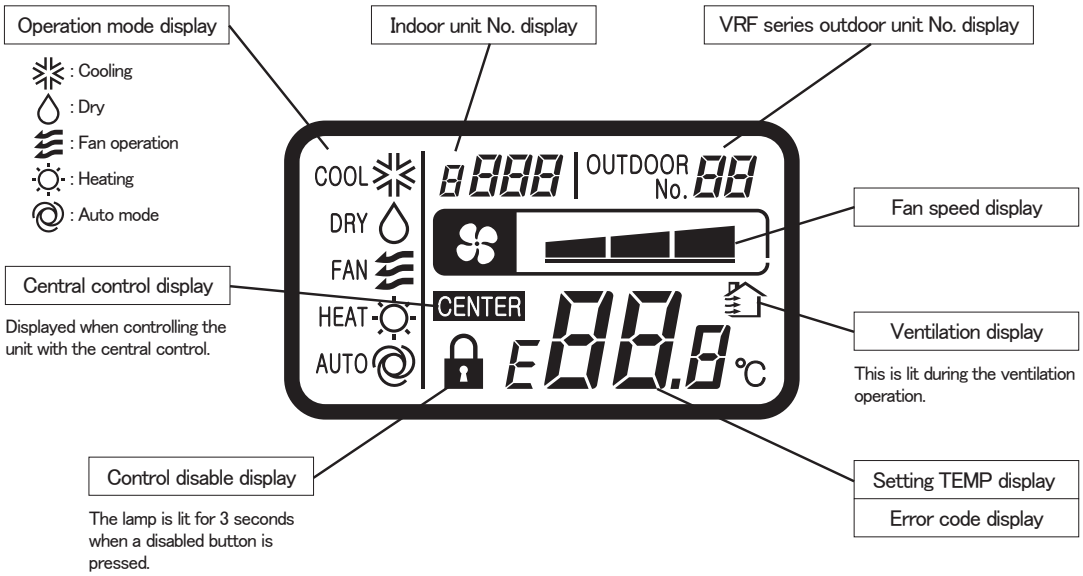
Button	Number indicator	Function setting
SILENT	00	Infrared sensor setting (Motion sensor setting) : Disable
	01	Infrared sensor setting (Motion sensor setting) : Enable
HI POWER	00	Infrared sensor control (Motion sensor control) : Disable
	01	Infrared sensor control (Motion sensor control) : Power control only
	02	Infrared sensor control (Motion sensor control) : Auto OFF only
	03	Infrared sensor control (Motion sensor control) : Power control and Auto OFF

4.3 SIMPLE WIRED REMOTE CONTROL (RCH-E3)

Note:
Following functions of FDU indoor unit series are not able to be set with this simple wired remote control (RCH-E3).
1. 4-fan speed setting (P-Hi/Hi/Me/Lo) → 3-fan speed setting (Hi/Me/Lo)

Names and functions of sections





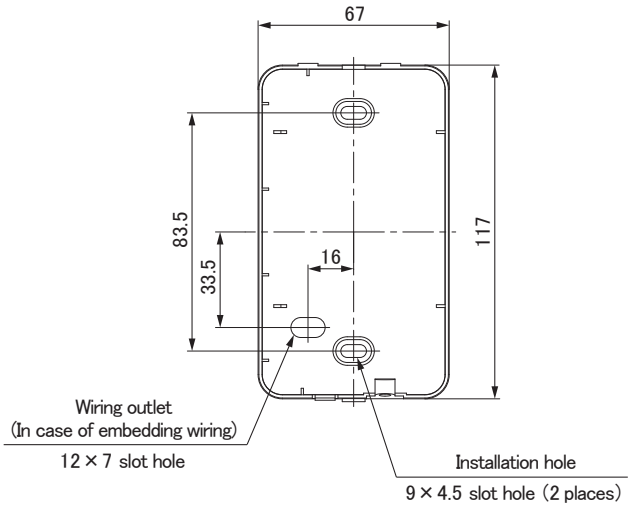
Installation of remote control

Do not install the remote control at the following places in order to avoid malfunction.

(1) Places exposed to direct sunlight
(2) Places near heat devices
(3) High humidity places
(4) Hot surface or cold surface enough to generate condensation
(5) Places exposed to oil mist or steam directly
(6) Uneven surface

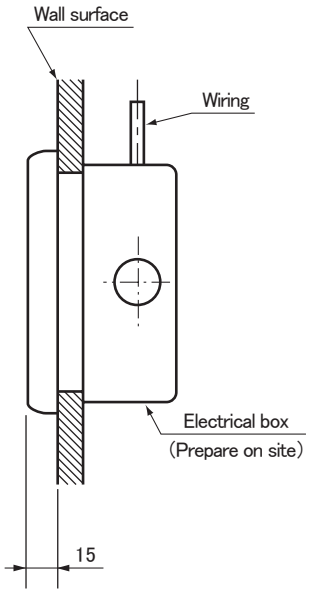
PJZ000Z272

Remote control installation dimensions

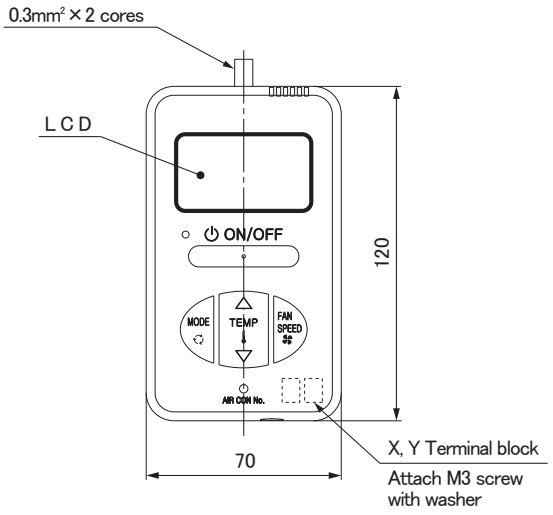


Note: Installation screw for remote control
M4 screw (2 pieces)

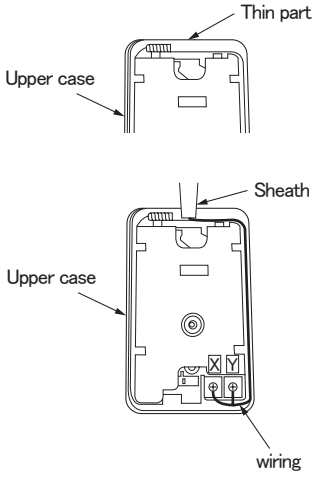
In case of embedding wiring



In case of exposing wiring

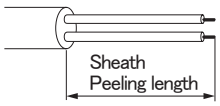


The remote control wiring can be extracted from the upper center.
After the thin part in the upper side of the remote control upper case is scraped with a nipper or knife, remove burr with a file.



The peeling length of each wiring is as follows:

X wiring : 160mm Y wiring : 150mm



Wiring specifications

(1) Wiring of remote control should use 0.3mm² × 2 cores wires or cables. (on-site configuration)
(2) Maximum prolongation of remote control wiring is 600m.
If the prolongation is over 100m, change to the size below.
But, the wiring in the remote control case should be 0.3mm² (recommended) to 0.5mm².
Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

Unit:mm

Length	Wiring thickness
100 to 200m	0.5mm² × 2 cores
Under 300m	0.75mm² × 2 cores
Under 400m	1.25mm² × 2 cores
Under 600m	2.0mm² × 2 cores

Adapted to **RoHS** directive

Simple Remote Control Installation Manual

PJZ012D069Ⓐ

Read together with indoor unit's installation manual.

⚠WARNING

- **Fasten the wiring to the terminal securely and hold the cable securely so as not to apply unexpected stress on the terminal.**
  Loose connection or hold will cause abnormal heat generation or fire.
- **Make sure the power source is turned off when electric wiring work.**
  Otherwise, electric shock, malfunction and improper running may occur.

⚠ CAUTION

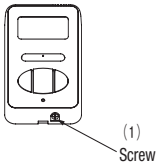
- **Do not install the remote control at the following places in order to avoid malfunction.**
  (1) Places exposed to direct sunlight
  (2) Places near heat devices
  (3) High humidity places
  (4) Hot surface or cold surface enough to generate condensation
  (5) Places exposed to oil mist or steam directly
  (6) Uneven surface
- **Do not leave the remote control without the upper case.**
  In case the upper cace needs to be detached, protect the remote control with a packaging box or bag in order to keep it away from water and dust.

Accessories	Remote control, wood screw (ϕ 3.5×16) 2 pieces
Prepare on site	Remote control cord (2 cores) (Refer to [2. Installation and wiring of remote control]) [In case of embedding cord] Electrical box, M4 screw (2 pieces) [In case of exposing cord] Cord clamp (if needed)

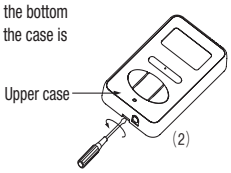
1. Installation procedure

In case of embedding cord

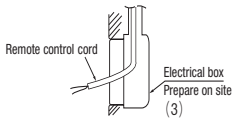
(1) Make certain to remove the screw on the bottom surface of the remote control.



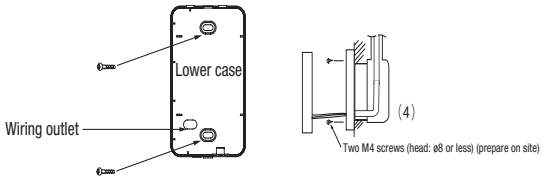
(2) Remove the upper case of the remote control.
Insert a flat-blade screwdriver to a concave portion of the bottom surface of the remote control and slightly twist it, and the case is removed.



(3) Pre-bury the electrical box and remote control cord.



(4) Prepare two M4 screws (recommended length: 12 – 16mm), and install the lower case to the electrical box.
Do not use a screw whose screw head is larger than the height of the wall around the screw hole.

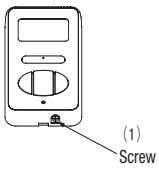


(5) Connect the remote control cord to the terminal block.
Connect the terminals (X and Y) of the remote control and the terminals (X and Y) of the indoor unit. (No polarity of X and Y)

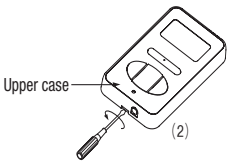
(6) Mount the upper case for restoring to its former state so as not to crimp the remote control cord, and secure with the removed screw.

In case of exposing cord

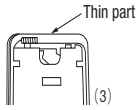
(1) Make certain to remove a screw on the bottom surface of the remote control.



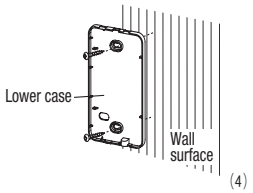
(2) Remove the upper case of the remote control.
Insert a flat-blade screwdriver to a concave portion of the bottom surface of the remote control and slightly twist it, and the case is removed.



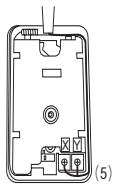
(3) The remote control cord can be extracted from the upper center.
After the thin part in the upper side of the remote control upper case is scraped with a nipper or knife, remove burr with a file.



(4) The lower case of the remote control is mounted to a flat wall with two accessory wood screws.

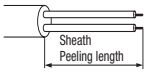


(5) Connect the remote control cord to the terminal block.
Connect the terminals (X and Y) of the remote control and the terminals (X and Y) of the indoor unit. (No polarity of X and Y)
The wiring route is as shown in the right.



The wiring in the remote control case should be 0.3 mm^2 (recommended) to 0.5 mm^2 at maximum.
Further, peel off the sheath.
The peeling length of each wiring is as follows:

X wiring : 160mm
Y wiring : 150mm



(6) Mount the upper case for restoring to its former state so as not to crimp the remote control cord, and secure with the removed screw.

(7) In the case of exposing installation, secure the remote control cord to the wall surface with a cord clamp so as not to loosen the remote control cord.

2. Installation and wiring of remote control

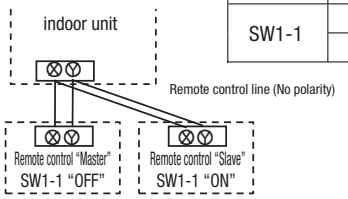
(1) Wiring of remote control should use 0.3mm^2 × 2 cores wires or cables. (on-site configuration)
(2) Maximum prolongation of remote control wiring is 600 m.
If the prolongation is over 100m, change to the size below.
But, the wiring in the remote control case should be 0.3mm^2 (recommended) to 0.5mm^2.
Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

100 - 200m · · · · · · · · · · · · · · · · 0.5mm^2 × 2 cores
Under 300m · · · · · · · · · · · · · · · · 0.75mm^2 × 2 cores
Under 400m · · · · · · · · · · · · · · · · 1.25mm^2 × 2 cores
Under 600m · · · · · · · · · · · · · · · · 2.0mm^2 × 2 cores

3. Master/ slave setting when more than one remote control are used

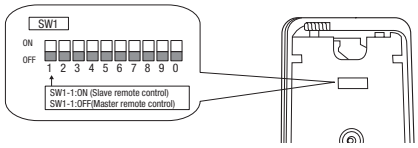
(1) Up to two remote controls can be connected to one unit (or one group) of indoor unit.

Switch	Setting	Function detail
SW1-1	ON	Slave remote control
	OFF	Master remote control



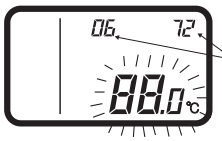
(2) Set the switch SW1-1 of the slave remote control is "Slave" (ON). The factory default is set as "Master" (OFF).

(Note) • The remote control temperature sensor enabled setting can be set only to the master remote control.
• Install the master remote control at the position to detect room temperature.
• The air-conditioner operation follows the last operation of the remote control in case of the master / slave setting.



4. The indication when power source is supplied

(1) At the time of turning the power source on, after the light is on for the first 2 seconds, the display becomes as shown below.
The number displayed on the upper side of LCD in the remote control is the software number, and this is not an error code.



Software number
(The number in the left is one example. Another number may be shown.)

(2) Then, "88.0 °C" blinks on the remote control until the communication between the remote control and the indoor unit is established.

(3) In the case of connecting one remote control with one unit (or one group) of indoor unit, make certain to set the master remote control (factory default).
If the slave remote control is set, a communication cannot be established.

(4) If a state where the communication between the remote control and the indoor unit cannot be established continues about for 30 minutes, "E" is displayed. Confirm the wiring of the indoor unit and the outdoor unit and master/slave setting of the remote control.

5. Confirmation method for return air temperature

Return air temperature can be confirmed by the remote control operation.

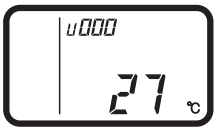
(1) **Press AIR CON No. button for over 5 seconds.**
"88" blinks on the temperature setting indicator.
("88" blinks for approximately 2 seconds while data is read.)
↓
Then, the return air temperature is displayed.
(Example) return air temperature: "27 °C" (blinking)

(Note) For the return air temperature, in the normal case, the return air temperature of the indoor unit is displayed; however, in the case that the remote control temperature sensor is effective, detected temperature by the remote control temperature sensor is displayed.

(2) **Press ⏻ ON/OFF button.**
End.

[In the case that the remote temperature sensor is ineffective and plural indoor units are connected to one remote control]

(1) **Press AIR CON No. button for over 5 seconds.**
indoor unit No. indicator: "U 000" (blinking)
(Among the connected indoor units, the lowest number is displayed.)



(2) **Press TEMP△ or TEMP▽ button.**
Select the indoor unit No.

(3) **Press MODE button.**
Dectder the indoor unit No.
(Example) indoor unit No. indicator: "U 000"
"88" blinks on the temperature setting indicator. (blinking for approximately 2 to 10 seconds while data is read) Then, the return air temperature is displayed. When **AIR CON No.** is pressed, return to the indoor unit selection display (example, "U 000").

(4) **Press ⏻ ON/OFF button.**
End.

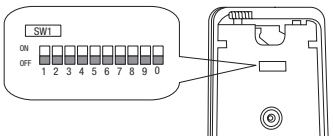
6. Function setting

Each function of the remote control and the indoor unit is automatically set to the initial setting, which is the standard use, on the occasion of connecting the remote control with the indoor unit. In the case of the standard use, the setting change is unnecessary. However, if you whould like to change the initial setting " ○ ", change the setting for only the item of the function number. Record the setting contents and stored them.

(1) Function setting item by switch on PCB

Switch No.	Setting	Setting detail	Initial setting
SW1-1	ON	Slave remote control	
	OFF	Master remote control	○
SW1-2	ON	Remote control temperature sensor enabled	
	OFF	Remote control temperature sensor disabled	○
SW1-3	ON	"MODE" button prohibited	
	OFF	"MODE" button enabled	○
SW1-4	ON	"ON/OFF" button prohibited	
	OFF	"ON/OFF" button enabled	○

Switch No.	Setting	Setting detail	Initial setting
SW1-5	ON	"TEMP" button prohibited	
	OFF	"TEMP" button enabled	○
SW1-6	ON	"FAN SPEED" button prohibited	※ Note 1
	OFF	"FAN SPEED" button enabled	※ Note 1
SW1-7	ON	Auto restart function enabled	
	OFF	Auto restart function disabled	○
SW1-8, 9, 0	ON	Not used	
	OFF		



- As for the slave remote control, function setting is impossible other than SW1-1.
- In the indoor unit with only one fan speed, "FAN SPEED" button cannot be enabled.

(2) Function setting item by button operation

Classification	Function No.	Function	Setting No.	Setting	Initial setting	Remarks
Remote control function	01	Indoor unit fan speed	01	Fan speed: three steps	※ Note 1	The fan speed is three steps, ■■■ - ■■ - ■ .
			02	Fan speed: two steps (Hi-Lo)	※ Note 1	The fan speed is two steps, ■■■ - ■ .
			03	Fan speed: two steps (Hi-Me)		The fan speed is two steps, ■■■ - ■■ .
			04	Fan: one step	※ Note 1	The fan speed is fixed to one step.
	03	Remote control thermistor at the time of cooling	01	Remote control temperature sensor: no offset	○	
			02	Remote control temperature sensor: +3.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at +3.0°C.
			03	Remote control temperature sensor: +2.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at +2.0°C.
			04	Remote control temperature sensor: +1.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at +1.0°C.
			05	Remote control temperature sensor: -1.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at -1.0°C.
			06	Remote control temperature sensor: -2.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offset temperature at -2.0°C.
			07	Remote control temperature sensor: -3.0 °C		At the time of cooling, in the case of remote control temperature sensor enabled, offsett temperature at -3.0°C.
	04	Remote control thermistor at the time of heating	01	Remote control temperature sensor: no offset	○	
			02	Remote control temperature sensor: +3.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at +3.0°C.
			03	Remote control temperature sensor: +2.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at +2.0°C.
			04	Remote control temperature sensor: +1.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at +1.0°C.
			05	Remote control temperature sensor: -1.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at -1.0°C.
			06	Remote control temperature sensor: -2.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at -2.0°C.
			07	Remote control temperature sensor: -3.0 °C		At the time of heating, in the case of remote control temperature sensor enabled, offset temperature at -3.0°C.
	05	Ventilation setting	01	No ventilator connection	○	
			02	Ventilator links air-conditioner		In case of Single split series, by connecting ventilation device to CNT of the indoor printed circuit board (in case of VRF series, by connecting it to CND of the indoor printed circuit board), the operation of ventilation device is linked with the operation of indoor unit.
	06	"Auto" operation setting	01	"Auto" operation enabled	※ Note 1	
			02	"Auto" operation disabled	※ Note 1	"Auto" operation disabled
Indoor unit function	07	Operation permission/ prohibition	01	Disabled	○	
			02	Enabled		Operation permission/prohibition control is enabled.
	08	External input	01	Level input	○	
			02	Pulse input		
	09	Fan speed setting	01	Standard	※ Note 2	
			02	High speed 1	※ Note 2	
			03	High speed 2	※ Note 2	
	10	Fan remaining operation at the time of cooling	01	No remaining operation	○	After cooling stopped, no fan remaining operation
			02	0.5 hours		After cooling stopped, fan remaining operation for 0.5 hours
			03	1 hour		After cooling stopped, fan remaining operation for 1 hour
			04	6 hours		After cooling stopped, fan remaining operation for 6 hours
	11	Fan remaining operation at the time of heating	01	No remaining operation	○	After heating stopped or after heating thermostat OFF, no fan remaining operation
			02	0.5 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 0.5 hours
			03	2 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 2 hours
			04	6 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 6 hours
	12	Setting temperature offset at the time of heating	01	No offset	○	
			02	Setting temperature offset + 3.0 °C		The setting temperature at the time of heating is offset by +3.0 °C.
			03	Setting temperature offset + 2.0 °C		The setting temperature at the time of heating is offset by +2.0 °C.
			04	Setting temperature offset + 1.0 °C		The setting temperature at the time of heating is offset by +1.0 °C.
	13	Heating fan controller	01	Low fan speed	※ Note 1	At the time of heating thermostat OFF, operate with low fan speed.
			02	Setting fan speed		At the time of heating thermostat OFF, operate with the setting fan speed.
			03	Intermittent operation	※ Note 1	At the time of heatingr thermostat OFF, intermittently operate.
			04	Fan off		At the time of heating thermostat OFF, a fan will be stopped. When the remote control thermistor is enabled, automatically set to "Fan off". Do not set at the time of the indoor unit temperature sensor.
	14	Return air temperature offset	01	No offset	○	
			02	Return air temperature offset +2.0 °C		Offset the return air temperature of the indoor unit by +2.0 °C.
			03	Return air temperature offset +1.5 °C		Offset the return air temperature of the indoor unit by +1.5 °C.
			04	Return air temperature offset +1.0 °C		Offset the return air temperature of the indoor unit by +1.0 °C.
			05	Return air temperature offset -1.0 °C		Offset the return air temperature of the indoor unit by -1.0 °C.
			06	Return air temperature offset -1.5 °C		Offset the return air temperature of the indoor unit by -1.5 °C.
			07	Return air temperature offset -2.0 °C		Offset the return air temperature of the indoor unit by -2.0 °C.

Note 1: The symbol " ※ " in the initial setting varies depending upon the indoor unit and the outdoor unit to be connected, and this is automatically determined as follows:

Swith No. Function No.	Function	Setting	Product model
SW1-6	"FAN SPEED" button	"FAN SPEED" button prohibited	Product model whose indoor fan speed is only one step
		"FAN SPEED" button enabled	Product model whose indoor fan speed is two steps or three steps
Remote control function 01	Indoor unit fan speed	Fan speed: three steps	Product model whose indoor unit fan speed is three steps
		Fan speed: two steps (Hi-Lo)	Product model whose indoor unit fan speed is two steps
		Fan speed: two steps (Hi-Me)	
		Fan: one step	Product model whose indoor unit fan speed is only one step
Remote control function 06	"Auto" operation setting	"Auto" operation enabled	Product model where "Auto" mode is selectable
		"Auto" operation disabled	Product model without "Auto" mode
Indoor unit function 13	Heating fan control	Low fan speed	Product model except FDUS
		Intermittent operation	FDUS

Note 2: Fan speed of "High speed" setting

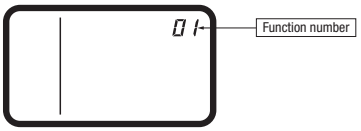
Fan speed setting	Indoor unit fan speed setting		
	■■■ - ■■ - ■	■■■ - ■	■■■ - ■■
Standard	Hi — Mid — Lo	Hi — Lo	Hi — Mid
High speed 1・2	UHi — Hi — Mid	UHi — Mid	UHi — Hi

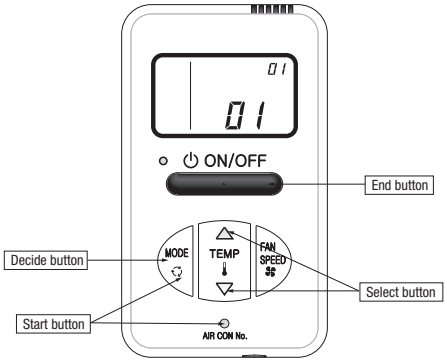
Initial setting of some indoor unit is "High speed".

Note 3: As for plural indoor unit, set indoor functions to each master and slave indoor unit.
But only master indoor unit is received the setting change of indoor unit function "07 Operation permission/ prohibition" and "08 External input".

7. How to set functions by button operation

(1) **Stop air-conditioner, and simultaneously press AIR CON No. and MODE buttons at the same time for over three seconds.**
The function number "01" blinks in the upper right.

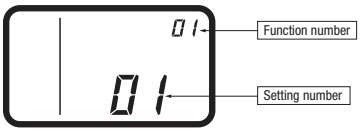




(2) **Press TEMP△ or TEMP▽ button.**
Select the function number.

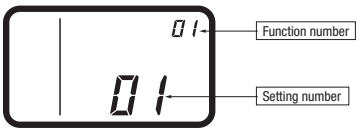
(3) **Press MODE button.**
Decide the function number.

(4) **[In the case of selecting the remote control function (01-06)]**
① The current setting number of the selected function number blinks
(Example)
Function number: "01" (lighting)
Setting number: "01" (blinking)



② **Press TEMP△ or TEMP▽ button.**
Select the setting number.

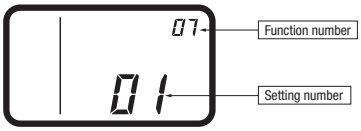
③ **Press MODE button.**
The setting is completed.
Light is on for approximately 3 to 20 seconds while data of the decided function No. and setting No. is transmitted.
(Example)
Function number: "01" (lighting for 3 to 20 seconds)
Setting number: "01" (lighting for 3 to 20 seconds)



Then, the screen goes back to the function number blinking indication (1), if the setting is sequentially conducted, continue with the same procedures. If the setting is finished, proceed to (5).

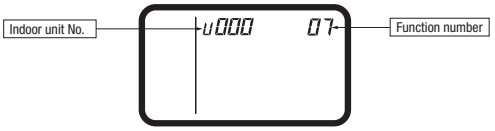
(5) **Press ON/OFF button.**
The setting is completed.

[In the case of selecting the indoor unit function (07-14)]
① **"88" blinks on the temperature setting indicators.**
(blinking for approximately 2 to 10 seconds while data are read)
↓
After that, the current setting number of the selected function number blinks.
(Example)
Function number: "07" (lighting)
Setting number: "01" (blinking)



Proceed to ② .

[Note]
a. In the case of connecting one remote control to plural indoor units, the display will be as follows:
Indoor unit No. display: "U 000" (blinking)
(Display the lowest number among the connected indoor units.)

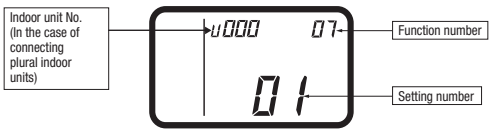


b. Press TEMP△ or TEMP▽ button.
Select the indoor unit No. to be set.
If "U ALL" is selected, the same setting can be set to all units.

c. Press MODE button.
Decide the indoor unit No.
"88" blinks on the temperature setting indicators. (blinking for 2 to 10 seconds while data is read)
When AIR CON No. button is pressed, go back to the indoor unit selection display (for example, "U 000" blinking).

② **Press TEMP△ or TEMP▽ button.**
Select the setting number

③ **Press MODE button.**
The setting is completed.
Light is on for approximately 3 to 20 seconds while data of the decided function No. and setting No. is transmitted.
(Example)
Indoor unit No.: "U 000" (lighting for 3 to 20 seconds)
Function number: "07" (lighting for 3 to 20 seconds)
Setting number: "01" (lighting for 3 to 20 seconds)



Then, the screen goes back to the function number blinking indication (1), if the setting is sequentially conducted, continue with the same procedures. If the setting is finished, proceed to (5).

- Even if ON/OFF button is pressed during setting, the setting is ended. However, any details where the setting has not been completed will be ineffective.
- The setting contents are stored in the control, and even if the power failure occur, this will not be lost.

[Confirmation method for current setting]
According to the operation, the "setting number" displayed first after selecting "function number" and pressing MODE button is the currently set content.
(However, in the case of selecting "U ALL" (all units), the setting number of the lowest number among the indoor units is displayed.)

4.4 BASE HEATER KIT (CW-H-E1)

PCZ012D007A A

Model Name: CW-H-E1

⚠ WARNING

- Follow the instruction and installation manual for outdoor unit when installing the heater.
- This heater must be installed by authorized personnel.
- Turn off the power source when the kit is installed.
- Failure to follow the above will result in serious accident like electrical shock or fire.

⚠ CAUTION

- Follow the law or regulation of the country where it is installed.
- Do not alter the heater.
- Lay down the heater so that the edge of the sheet metal does not damage the heater.
- Bending radius must be bigger than 25mm.
- Do not use the heater near flammable substances.
- Be sure to check the electrical insulation before use.
- Be sure to check the drain is not trapped by the heater.
- Do not leave refrigerant oil on the base.

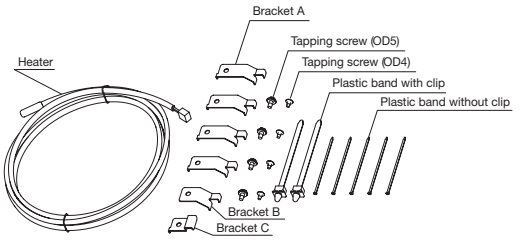
AREAS TO BE APPLIED

This kit is to be used in an area where the lowest temperature drops below zero.

⚠Caution: In case the heater is not applied on the unit which is installed in an area mentioned above, it may be regarded as installation failure and warranty may not be given.

Components

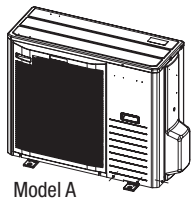
- Heater : 1 pc.
- Bracket A : 4 pcs.
- Bracket B : 1 pcs.
- Bracket C : 1 pcs.
- Tapping screw (OD5) : 4 pcs.
- Tapping screw (OD4) : 4 pcs.
- Plastic band with clip : 2 pcs.
- Plastic band : 5 pcs.



Applicable model

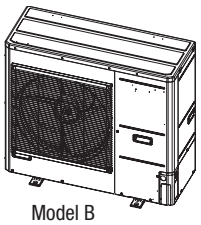
This heater kit is applicable for 3 different models.

<Model A>
Single fan with plastic fan guard model



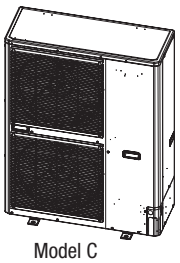
Model A

<Model B>
Single fan model



Model B

<Model C>
Double fan model



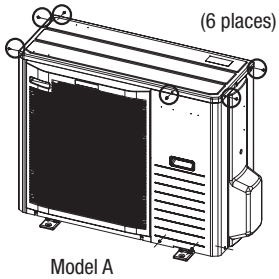
Model C

Installation procedure

Step 1

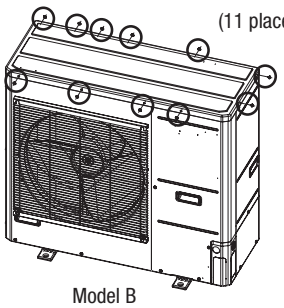
1. Remove the top panel of the outdoor unit.

(6 places)



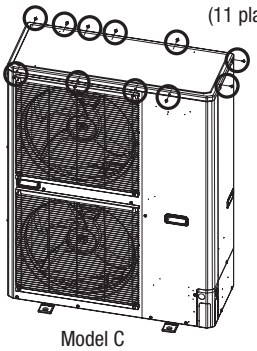
Model A

(11 places)



Model B

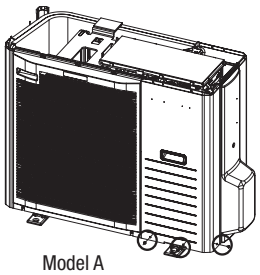
(11 places)



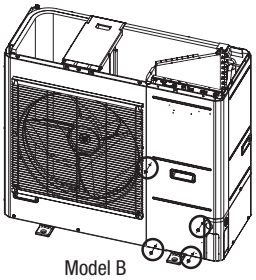
Model C

Step 2

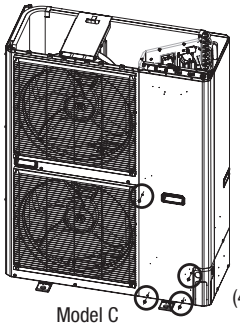
2. Remove the service panel.



Model A (3 places)



Model B (4 places)

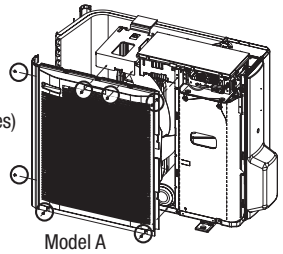


Model C (4 places)

Step 3

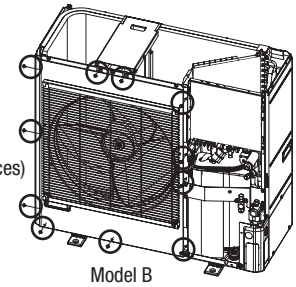
3. Remove the front panel.
Pull the panel straightforward so that the panel doesn't touch the fan blade.

(7 places)



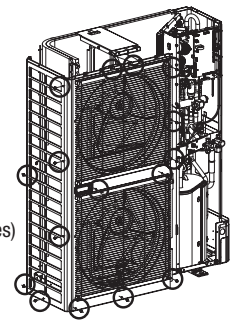
Model A

(11 places)



Model B

(16 places)

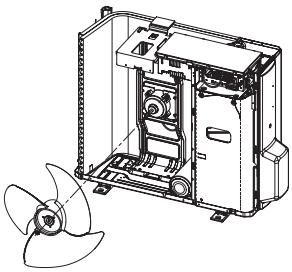


Model C

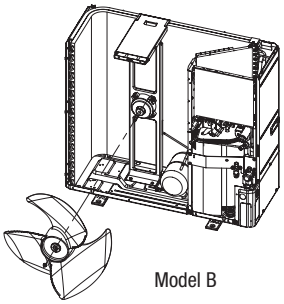
Step 4

4. Remove the fan blade if necessary.

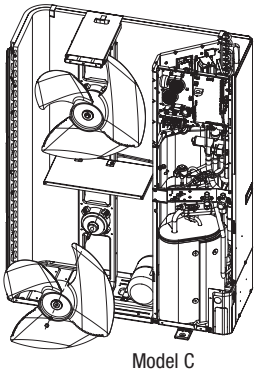
<Note>
Do not rotate the axis of fan motor when removing the fan blade.
It may cause malfunction of the fan motor.



Model A



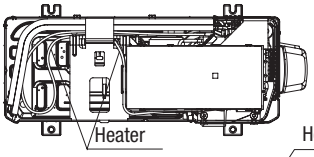
Model B

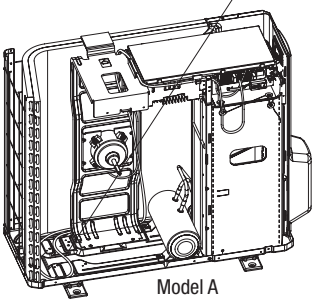


Model C

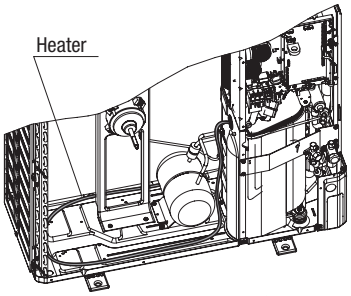
Step 5

5. Lay down the drain pan heater on the base.
For model A, put the cables rear the fan motor bracket.

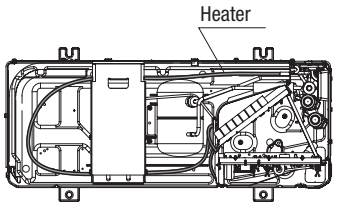




Model A

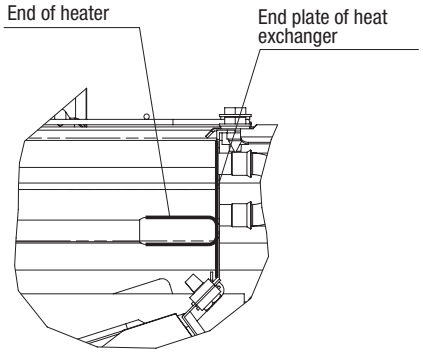


Model B, C



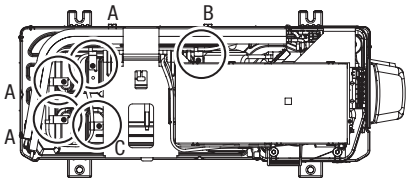
Step 6

6. Put the heater underneath the heat exchanger and align the end of heater with the end plate of heat exchanger.

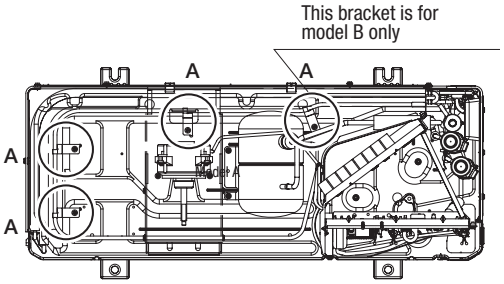


Step 7

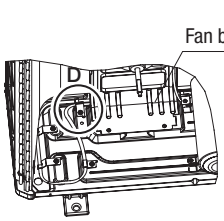
7. Fix the heater with brackets.



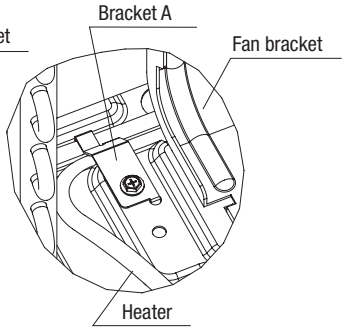
For model A, use 3 pcs of bracket A, 1pc of bracket B and C. Fix bracket A and C with the attached screw (OD4), and fix bracket B with the removed screw which is fastened at the same place.



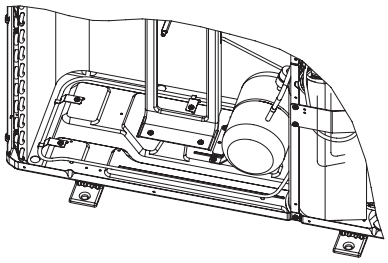
For model B and C, fix bracket A with the attached screw (OD5).



Model A



Detail view D



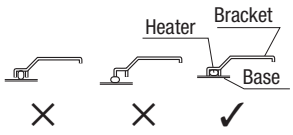
Model B, C

<Note for model A>

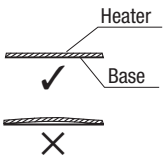
1) Put the end of heating part just after the bracket C.
2) Fix the incoming and out going cable with one bracket A on the left of fan bracket as figure shows.

<Note>

1) Fix the heater so that the bracket doesn't pinch the heater as figure shows.



2) Place the heater so as to touch the base completely.

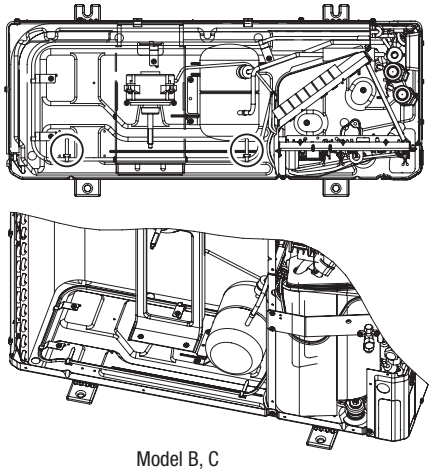


3) In bending position, twist the heater to make it easier to bend, and get back to be able to fix it with bracket.

4) Be careful not to be injured by aluminum fin when fixing the heater with screw.

Step 8

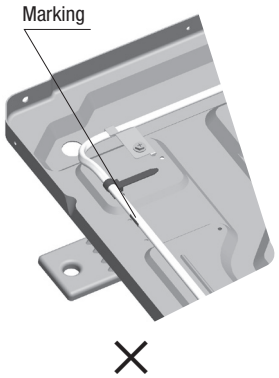
8. Insert the plastic band with clip on the designated place (2 places), and fix the heater.(Model B,C only)



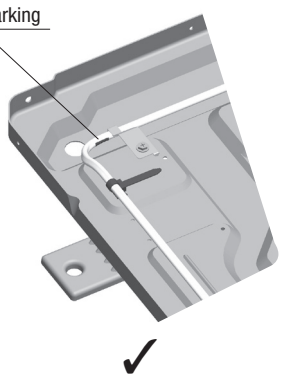
Model B, C

<Notes>

1) Do not fasten the heating part with the plastic band.
There is a marking on the end of heating part.



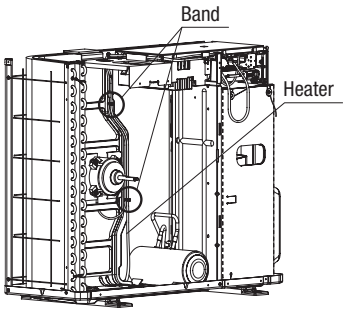
2) When the heater is laid down correctly, the end of heating part comes to the corner of the base.



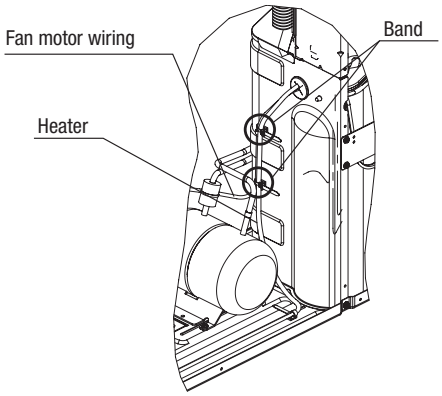
Step 9

9. Lay down the wiring on the same route of fan motor wiring, and fix the wire with attached plastic band at the same place where the fan motor wiring is banded.

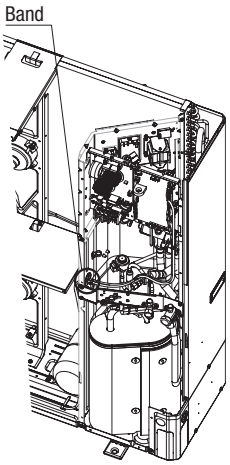
Model A

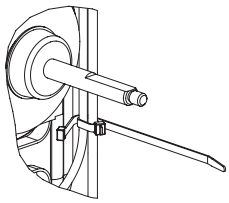


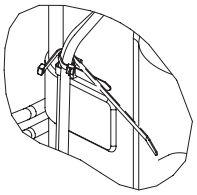
Model B

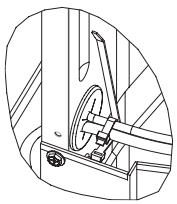


Model C









<Note>

Fan motor wiring is banded on the bracket so that it doesn't loosen.
Do not loose the band for the motor wiring to band the heater wire together but use the attached plastic band.

Step 10

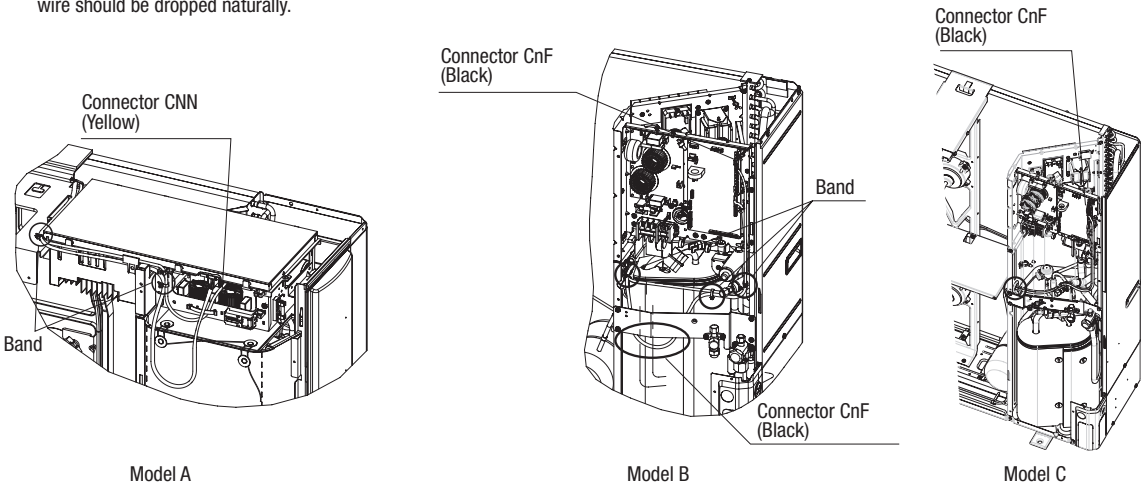
10.Insert the connector to the port (Model A: CNN, Model B,C:CNF) on the PCB, and fix the wire with bands. Excess part of the wire should be dropped naturally.

<Note>

Be sure to cut the excess part of plastic band.

It may cause abnormal noise when hit by fan blade or misassembling of panels.

Do not bundle excess part of the wire. It may damage the heater.



Model A Model B Model C

Step 11

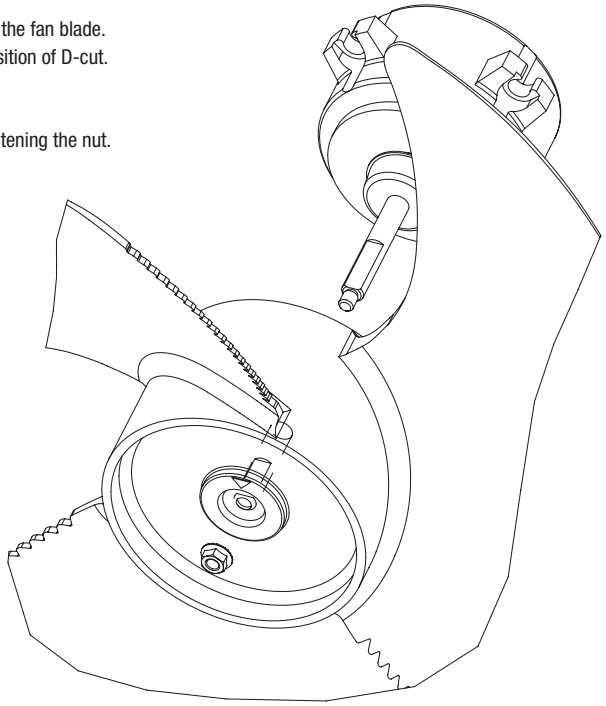
11. Reassemble the fan blade.

Take care to align the D-cut of motor shaft and the fan blade.

▽ mark on the center of the fan shows the position of D-cut.

<Notes>

1. Tightening torque of the nut is 4.0-4.9 N·m.
2. Do not rotate the axis of fan motor when tightening the nut. It may cause malfunction of the fan motor.



<Notes>

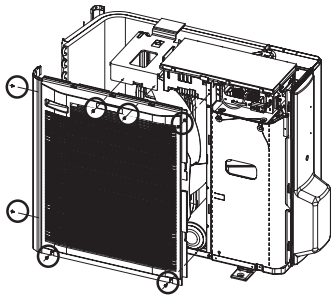
- This heater should have bending radius of at least 25mm including non-heating part. Do not bundle the excess part of the wire. It may cause disconnection of the heater or insufficient capacity.
- Be sure to prevent the heater from touching any refrigerant piping.

  Especially, pay close attention not to make it touch with pipes which are close to the wiring route such as suction pipe, check valve and check joint.

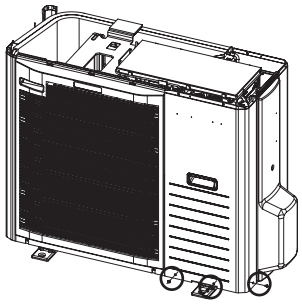
Step 12

12. Reassemble the panels.

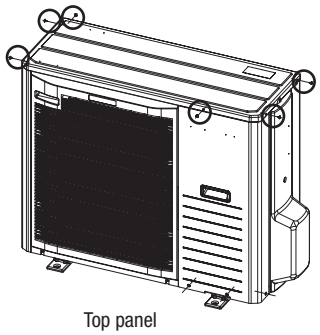
[Model A]



Front panel

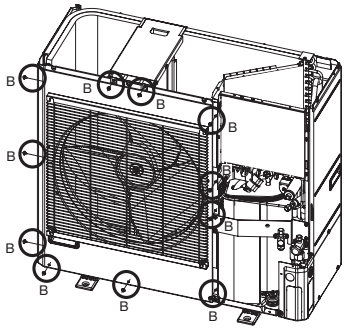


Service panel

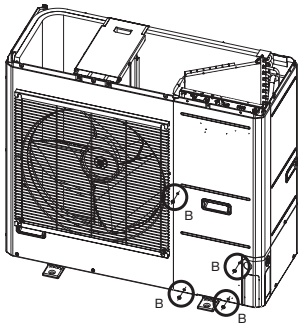


Top panel

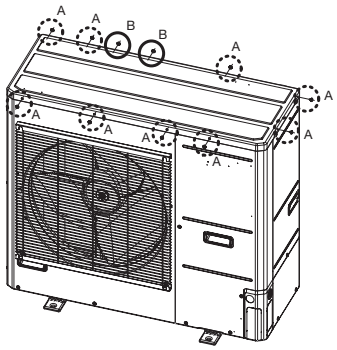
[Model B]



Front panel

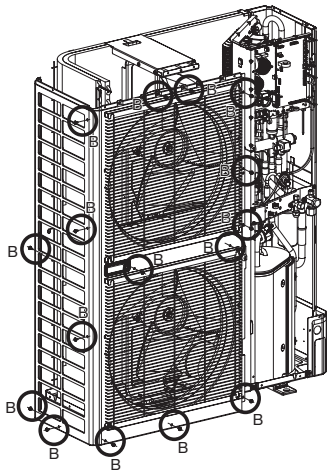


Service panel

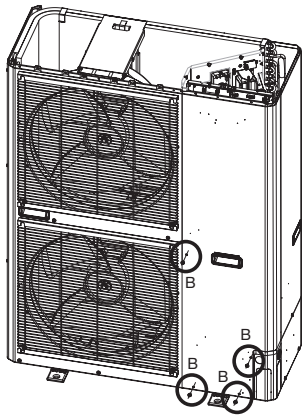


Top panel

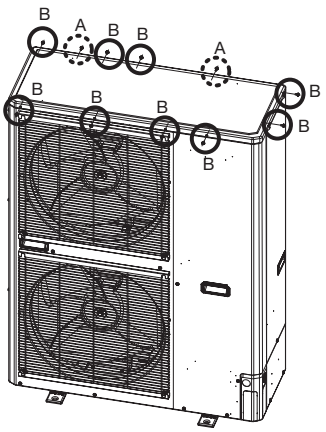
[Model C]



Front panel



Service panel

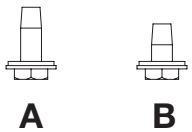


Top panel

<Notes>

1) When reassembling the service panel, take care not to damage the front panel with the edge.

2) Top panel of model B and model C is fixed with two different screws.
Be sure to use correct screw as figure shows.



A **B**

4.5 SUPERLINK E BOARD (SC-ADNA-E)

PJZ012D029K K

- Read and understand the instructions completely before starting installation.
- Refer to the instructions for both indoor and outdoor units.

Safety precautions

- Carefully read "Safety precautions" first. Follow the instructions for installation.
- Precautions are grouped into "Warning⚠" and "Caution⚠". The "Warning⚠" group includes items that may lead to serious injury or death if not observed. The items included in the "Caution⚠" group also may lead to serious results under certain conditions. Both groups are crucial for safety installation. Read and understand them carefully.
- After installation, conduct the test operation of the device to check for any abnormalities. Describe how to operate the device to the customer following the installation instruction manual. Instruct the customer to keep this installation instruction for future reference.

⚠Warning

- This device should be installed by the dealer where you purchase the device or a licensed professional shop. If the device is incorrectly installed by the customer, it may result in electric shock or fire.
- Install the device carefully following the installation instruction. If the device is incorrectly installed, it may result in electric shock or fire.
- Use the accessory parts and specified parts for installation. If any parts that do not match the specifications are used, it may result in electric shock or fire.
- A person with the electrical service certification should conduct the service based on the "Technical standards for electrical facilities", "Electrical Wiring Code", and the installation instruction. If the work is done incorrectly, it may result in electric shock or fire.
- Wiring should be securely connected using the specified types of wire. No external force on the wire should be applied to any terminals. If a secure connection is not achieved, it may result in electric shock or fire.

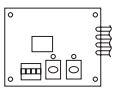
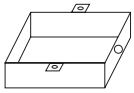
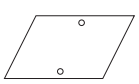
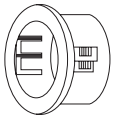
⚠Caution

- Provide ground connection.
  The ground line should never be connected to the gas supply piping, the water supply piping, the lightning conductor rod, nor the telephone ground.If the grounding is improper, it may result in electric shock.
- Do not install the device in the following locations.
  1.Where there is mist/spray of oil or steam such as kitchens.
  2.Where there is corrosive gases such as sulfurous acid gas.
  3.Where there is a device generating electromagnetic waves.
  These may interfere with the control system resulting in the device becoming uncontrollable.
  4.Where flammable volatile materials such as paint thinner and gasoline may exist or where they are handled. This may cause a fire.

1 Application

Indoor-to-outdoor three core communication specification type 3 (since October 2007)

2 Accessories

SL E board	Metal box	Metal cover	Screw for ground
			M4×8 2 pieces 
Pan head screws	Locking supports	Binding band	Grommet
M4×8 2 pieces 	To secure the print board and the metal box Made of nylon 4 pieces 		

3 Function

Allowing the central control SL1N-E, SL2NA-E, and SL4-AE/BE to control and monitor the commercial air-conditioner unit.

4 Control switching

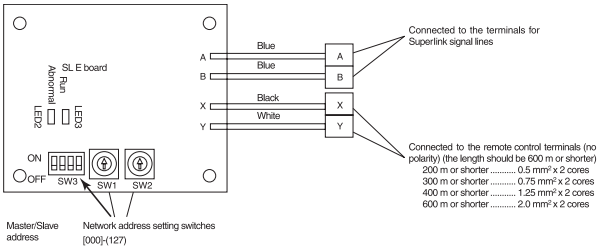
Settings can be changed by the DIP switch SW3 on the SL E board as in the following.

Switch	Symbol	Switch	Remarks
SW3	1	ON	Master
		OFF (default)	Slave
	2	ON	Fixed previous protocol
		OFF (default)	Automatic adjustment of Superlink protocol
	3	ON	Indicates the forced operation stop when abnormality has occurred.
		OFF (default)	Indicates the status of running/stop as it is, when abnormality has occurred.
	4	ON	The hundredth address activated "1"
		OFF (default)	The hundredth address activated "0"

5 Connection outline

Note for setting the address

- Set the address between 00 and 47 for the previous Superlink connection and between 000 and 127 for the new Superlink connection. (*1)
- Do not set the address overlapping with those of the other devices in the network. (The default is 000)



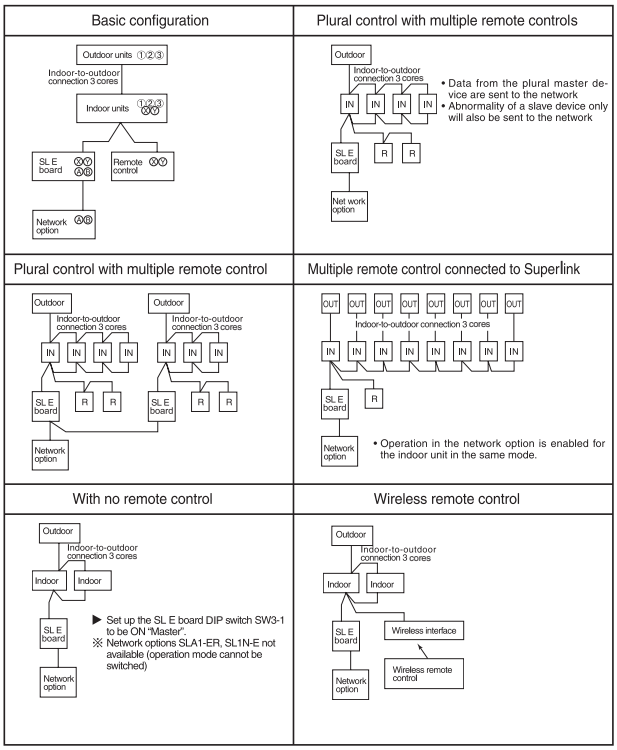
(*1) Whether the actual link is either the new Superlink or the previous Superlink depends on the models of the connected outdoor and indoor units. Consult the agent or the dealer.

Signal line specification

Communication method	Previous Superlink	New Superlink
Line type	MVVS	MVVS
Line diameter	0.75 - 1.25mm²	0.75/1.25mm²
Signal line (total length)	up to 1000m	up to 1500/1000m (*2)
Signal line (maximum length)	up to 1000m	up to 1000m

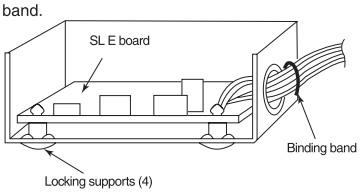
(*2) Up to 1500 m for 0.75 mm², and up to 1000 m for 1.25 mm².
Do not use 2.0 mm². It may cause an error.
(*3) Connect grounding on both ends of the shielding wire.
For the grounding method, refer to the section "6 Installation".

(1) Set the Superlink network address with SW1 (tens place), SW2 (ones place), and SW3 (hundreds place).
(2) Set the SL E board SW3-1 to be ON (Master) when using this without any remote control (no wired remote controller nor wireless remote control).
(3) Set up the plural master/slave device using the DIP switches on the indoor unit board.
(4) Set up the remote control master/slave device using the slide switch on the remote control board.
(5) Set up "0" to "F" using the address rotary switch on the indoor unit board when controlling the indoor unit with the multiple remote control.

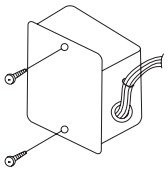


6 Installation

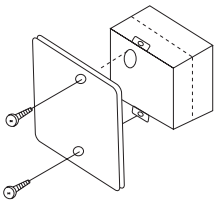
1. When using the metal box (mounted on the indoor unit / mounted on the back of the remote control):
   (1) Mount the SL E board in the metal box using the locking supports.
   (2) Wiring should go through the provided grommet since then through the wiring to the hole on the Metal box.
   Secure the grommet after inserting the grommet into the Metal box as shown in below figure, then tie the wiring at the outlet of the unit using a binding band.



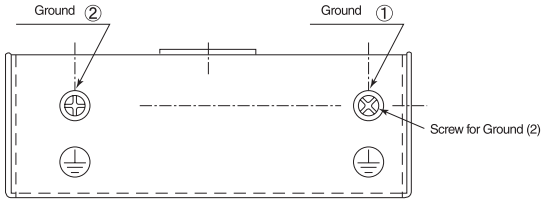
▲ When installed outside the indoor unit, put the metal cover on.



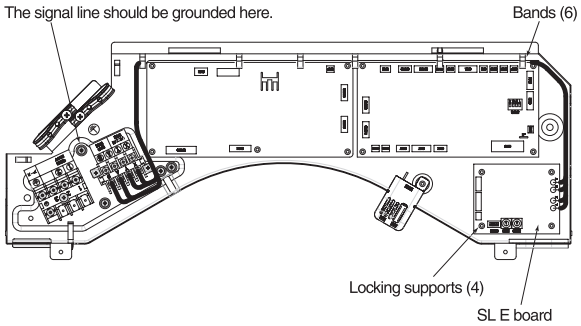
▲ When installed on the back of the remote control, mount it directly on the remote control bottom case.



Connect grounding. Connect grounding for the power line to Ground ①, and grounding for the signal line to Ground ② or to the Ground on the indoor unit control box.



2. When connecting to the indoor unit control box (ceiling-concealed type and FDT type only):
   (1) Mount the SL E board in the control box using the locking supports.
   (2) Remove 6 bands from the box and put the wiring through the bands to be secured.



Electrical shock hazard make sure to turn the power off for servicing. Be cautious so that no abnormal force should be applied to the wiring. Do not let the SL E board hung by the wiring. Do not damage the board with a screwdriver.
The board is sensitive to static electricity. Release the static electricity of your body before servicing.
(You can do this by touching the control board which is grounded).

Location of installation

Install the device at the location where there are no electromagnetic waves nor where there is water and dust. The specified temperature range of the device is 0 to 40°C. Install the device at the location where the ambient temperature stays within the range. If it exceeds the specification, make sure to provide solution such as installing a cooling fan. When used outside of the range, it may cause abnormal operation.

7 Indicator display

Check the LED 3 (green) and LED 2 (red) on the SL E board for flashing.

SL E board LEDs		Inspection mode	Display on the integrated network control device
Red	Green		
Off	Flashing	Normal communication	
Off	Off	• Disconnection in the remote control communication line (X or Y) • Short-circuit in the remote control communication line (between X and Y) • Faulty indoor unit remote control power • Faulty remote control communication circuit • Faulty CPU on SL E board	No corresponding unit number
One flash	Flashing	• Disconnection in the Superlink signal line (A or B) • Short-circuit in the Superlink signal line (between A and B) • Faulty Superlink signal circuit	
Two flashes	Flashing	• Faulty address setting for the SL E board (Set up the address for previous SL E board : more than 48 new SL E board : more than 128)	
Three flashes	Flashing	• SL E board parent not set up when used without a remote control • Faulty remote control communication circuit	E1
Four flashes	Flashing	• Address overlapping for the SL E board and the Superlink network connected indoor unit	E2
Off	Flashing	• Number of connected devices exceeds the specification for the multiple indoor unit control	E10

INVERTER PACKAGED AIR-CONDITIONERS

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