

For Australian market only

Manual No.'12 PAC-T-179

INVERTER DUCT CONNECTED-HIGH STATIC PRESSURE TYPE AIR-CONDITIONERS

(Split system, air to air heat pump type)

HYPER INVERTER

FDUA71VNXVF FDUA100VNXVF FDUA125VNXVF FDUA140VNXVF

MICRO INVERTER

FDUA100VNVF FDUA160VSVF



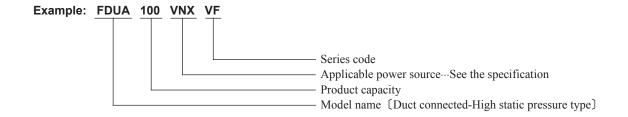
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■How to read the model name



1 SPECIFICATIONS

Adapted to RoHS directive

	Model	odel FDUA71VNXVF			
Item		Indoor unit FDUA71VF	Outdoor unit FDC71VNX		
Power source			240V~50Hz		
Operation data		Cooling	Heating		
Nominal capacity	kW	7.1 [3.2 (Min.)~8.0 (Max.)]	8.0 [3.6 (Min.) ~ 9.0 (Max.)]		
Power consumption	kW	2.22	2.22		
Running current	Α	9.4	9.4		
Power factor	%	98	98		
Inrush current	Α	5 <max.runnir< td=""><td>ng current 17></td></max.runnir<>	ng current 17>		
Sound Pressure Level	dB(A)	P-Hi:38 Hi:33 Me:29 Lo:25	Cooling: 51, Heating: 48		
Exterior dimensions Height × Width × Depth	mm	280 × 950 × 635	750 × 880 (+88) × 340		
Exterior appearance			Stucco White		
(Munsell color)			(4.2Y7.5/1.1) near equivalent		
Net weight	kg	34	60		
Refrigerant equipment Compressor type & Q'ty		_	RMT5118MDE2 × 1		
Starting method		_	Direct line start		
Refrigerant oil	l	_	0.675 (M-MA68)		
Heat exchanger		Louver fin & inner grooved tubing	M shape fin & inner grooved tubing		
Refrigerant control		_	Electronic expansion valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Propeller fan × 1		
Motor <starting method=""></starting>	W	130 < Direct line start>	86 < Direct line start>		
Air flow (Standard)	CMM	P-Hi:24 Hi:19 Me:15 Lo:10	Cooling: 60, Heating: 50		
External static pressure	Pa	Standard: 35 Max: 200	0		
Outside air intake		Possible	_		
Air filter, Q'ty		Procure locally	_		
Shock & vibration absorber		Rubber sleeve (for fan motor)	Rubber sleeve (for Compressor)		
Insulation (noise & heat)		Polyurethane form	_		
Electric heater	W	_	20 (Crank case heater)		
Remote control		wired : RC-EX1, RC-E5 (option)	wireless : RCN-KIT3-E (option)		
Room temperature control		Thermostat by electronics	_		
Safety equipment		Overload protection for fan motor Frost protection thermostat	Internal thermostat for fan motor Abnormal discharge temperature protection.		
Installation data		Liquid line : I/U φ 9.52 (3/8") Pipe φ	9.52 (3/8") × 0.8 O/U φ 9.52 (3/8")		
Refrigerant piping size	mm	Gas line : ϕ 15.88 (5/8") ϕ	5 15.88 (5/8") × 1.0 φ 15.88 (5/8")		
Connecting method		Flare piping	Flare piping		
Refrigerant line (one way) length		Max.50m			
Vertical height difference between outdoor unit and indoor unit		Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower) See page 36			
Refrigerant Quantity		R410A 2.95kg in outdoor unit (incl.	the amount for the piping of : 30m)		
Drain pump		Built-in Drain pump	_		
Drain		Hose Connectable with VP25	Holes size ϕ 20 × 3pcs		
Insulation for piping		Necessary (both L	iquid & Gas lines)		
IP code		IP20	IP24		
Standard Accessories		Drain hose	_		

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		emperature Outdoor air ter		External static pressure of indoor unit
Operation	BD	WB	DB	WB	Pa
Cooling	27°C	19°C	35°C	24°C	25
Heating	20)°C	7°C	6°C	35

- (2) This packaged air-conditioner is manufactured and tested in conformity with the ISO and AS/NZS.
- (3) Sound pressure level indicates the value in an anechoic chamber. During operation these value are somewhat higher due to ambient temperature.
- $\dot{}$ (4) The operation data indicates when the air-conditioner is operated at 240V50Hz.
- (5) The factory E.S.P. setting is set within the range of 80-150 Pa.

 If SW8-4 is turned to "ON", E.S.P. setting range can be changed to 10-200 Pa.
- (6) If wireless remote control is used, only 3-speed fan setting (Hi-Me-Lo) is available.

Option parts
SAFETY PAN : UA-SP1-E

	Model	del FDUA100VNXVF			
Item		Indoor unit FDUA100VF	Outdoor unit FDC100VNX		
Power source			240V~50Hz		
Operation data		Cooling	Heating		
Nominal capacity	kW	10.0 [4.0 (Min.)~11.2 (Max.)]	11.2 [4.0 (Min.) ~ 12.5 (Max.)]		
Power consumption	kW	2.85	2.74		
Running current	Α	12.1	11.7		
Power factor	%	98	98		
Inrush current	Α	5 < Max.runnir	ng current 25>		
Sound Pressure Level	dB(A)	P-Hi: 43 Hi: 42 Me: 40 Lo: 37	Cooling: 48 Heating: 50		
Exterior dimensions Height × Width × Depth	mm	398 × 1150 × 650	1300 × 970 × 370		
Exterior appearance (Munsell color)		_	Stucco White (4.2Y7.5/1.1) near equivalent		
Net weight	kg	52	105		
Refrigerant equipment Compressor type & Q'ty		-	RMT5134MDE2 × 1		
Starting method		_	Direct line start		
Refrigerant oil	l	-	0.9 M-MA68		
Heat exchanger		Louver fin & inner grooved tubing	M shape fin & inner grooved tubing		
Refrigerant control		_	Electronic expansion valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Propeller fan × 2		
Motor <starting method=""></starting>	W	350 < Direct line start>	86 × 2 < Direct line start>		
Air flow (Standard)	CMM	P-Hi: 39 Hi: 36 Me: 33 Lo: 29	100		
External static pressure	Pa	Standard: 60 Max: 200	0		
Outside air intake		Possible	_		
Air filter, Q'ty		Procure locally	_		
Shock & vibration absorber		Rubber sleeve (for fan motor)	Rubber sleeve (for Compressor)		
Insulation (noise & heat)		Polyurethane form	_		
Electric heater	W	-	20 (Crank case heater)		
Remote control		wired: RC-EX1, RC-E5 (option)	wireless : RCN-KIT3-E (option)		
Room temperature control		Thermostat by electronics	_		
Safety equipment		Overload protection for fan motor Frost protection thermostat	Internal thermostat for fan motor Abnormal discharge temperature protection.		
Installation data	mm	Liquid line : I/U ϕ 9.52 (3/8") Pipe ϕ	b 9.52 (3/8") × 0.8 O/U φ 9.52 (3/8")		
Refrigerant piping size	111111	Gas line : ϕ 15.88 (5/8") ϕ	b 15.88 (5/8") × 1.0 φ 15.88 (5/8")		
Connecting method		Flare piping	Flare piping		
Refrigerant line (one way) length		Max.100m			
Vertical height difference between outdoor unit and indoor unit		Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)	See page 36		
Refrigerant Quantity		R410A 4.5kg in outdoor unit (incl.	the amount for the piping of : 30m)		
Drain pump		Built-in Drain pump	_		
Drain		Hose Connectable with VP25	Holes size ϕ 20 × 3pcs		
Insulation for piping		Necessary (both L	Liquid & Gas lines)		
IP code		IP20	IP24		
Standard Accessories		Drain hose	Edging		

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature		External static pressure of indoor unit
Operation	BD	WB	DB	WB	Pa
Cooling	27°C	19°C	35°C	24°C	60
Heating	20	°C	7°C	6°C	60

- (2) This packaged air-conditioner is manufactured and tested in conformity with the ISO and AS/NZS.
- (3) Sound pressure level indicates the value in an anechoic chamber. During operation these value are somewhat higher due to ambient temperature.
- (4) The operation data indicates when the air-conditioner is operated at 240V50Hz.

(5) The factory E.S.P. setting is set within the range of 80-150 Pa.
 If SW8-4 is turned to "ON" ,E.S.P. setting range can be changed to 10-200 Pa.
 (6) If wireless remote control is used, only 3-speed fan setting (Hi-Me-Lo) is available.

Option parts SAFETY PAN: UA-SP2-E

	Model	flodel FDUA125VNXVF			
Item		Indoor unit FDUA125VF	Outdoor unit FDC125VNX		
Power source			240V~50Hz		
Operation data		Cooling	Heating		
Nominal capacity	kW	12.5 [5.0 (Min.) ~ 14.0 (Max.)]	14.0 [4.0 (Min.)~17.0 (Max.)]		
Power consumption	kW	3.83	3.68		
Running current	Α	16.3	15.6		
Power factor	%	98	98		
Inrush current	Α	5 <max.runnir< td=""><td>ng current 29></td></max.runnir<>	ng current 29>		
Sound Pressure Level	dB(A)	P-Hi:45 Hi:43 Me:41 Lo:37	Cooling: 48 Heating: 50		
Exterior dimensions Height × Width × Depth	mm	398 × 1150 × 650	1300 × 970 × 370		
Exterior appearance (Munsell color)		_	Stucco White (4.2Y7.5/1.1) near equivalent		
Net weight	kg	52	105		
Refrigerant equipment	Ny	JZ	100		
Compressor type & Q'ty		_	RMT5134MDE2 × 1		
Starting method			Direct line start		
Refrigerant oil	l		0.9 M-MA68		
Heat exchanger		Louver fin & inner grooved tubing	M shape fin & inner grooved tubing		
Refrigerant control		_	Electronic expansion valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Propeller fan × 2		
Motor <starting method=""></starting>	W	350 < Direct line start>	86 × 2 < Direct line start>		
Air flow (Standard)	CMM	P-Hi: 43 Hi: 39 Me: 36 Lo: 30	100		
External static pressure	Pa	Standard: 60 Max: 200	0		
Outside air intake		Possible	_		
Air filter, Q'ty		Procure locally	_		
Shock & vibration absorber		Rubber sleeve (for fan motor)	Rubber sleeve (for Compressor)		
nsulation (noise & heat)		Polyurethane form	_		
Electric heater	W		20 (Crank case heater)		
Remote control		wired : RC-EX1, RC-E5 (option)	wireless : RCN-KIT3-E (option)		
Room temperature control		Thermostat by electronics	_		
Safety equipment		Overload protection for fan motor Frost protection thermostat	Internal thermostat for fan motor Abnormal discharge temperature protection.		
Installation data		Liquid line : I/U φ 9.52 (3/8") Pipe φ			
Refrigerant piping size	mm	. , , , , ,	5 15.88 (5/8") × 1.0 φ 15.88 (5/8")		
Connecting method		Flare piping	Flare piping		
Refrigerant line (one way) length		Max.100m	l see Educa		
Vertical height difference between		Max.30m (Outdoor unit is higher)	See page 36		
outdoor unit and indoor unit		Max.15m (Outdoor unit is ligher)			
Refrigerant Quantity		R410A 4.5kg in outdoor unit (incl.	the amount for the piping of : 30m)		
Orain pump		Built-in Drain pump	_		
Drain Drain		Hose Connectable with VP25	Holes size φ20 x 3pcs		
nsulation for piping		Necessary (both L			
IP code		IP20	IP24		
Standard Accessories		Drain hose	Edging		
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Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature		External static pressure of indoor unit
Operation	BD	WB	DB	WB	Pa
Cooling	27°C	19°C	35°C	24°C	60
Heating	20	°C	7°C	6°C	60

- (2) This packaged air-conditioner is manufactured and tested in conformity with the ISO and AS/NZS.
- (3) Sound pressure level indicates the value in an anechoic chamber. During operation these value are somewhat higher due to ambient temperature.
- (4) The operation data indicates when the air-conditioner is operated at 240V50Hz.

(5) The factory E.S.P. setting is set within the range of 80-150 Pa.
 If SW8-4 is turned to "ON" ,E.S.P. setting range can be changed to 10-200 Pa.
 (6) If wireless remote control is used, only 3-speed fan setting (Hi-Me-Lo) is available.

Option parts SAFETY PAN : UA-SP2-E

	Model	del FDUA140VNXVF			
Item		Indoor unit FDUA140VF	Outdoor unit FDC140VNX		
Power source			240V~50Hz		
Operation data		Cooling	Heating		
Nominal capacity	kW	14.0 [5.0 (Min.) ~ 14.5 (Max.)]	16.0 [4.0 (Min.) ~ 18.0 (Max.)]		
Power consumption	kW	4.44	4.41		
Running current	Α	18.9	18.8		
Power factor	%	98	98		
Inrush current	Α	5 < Max.runnir	ng current 30>		
Sound Pressure Level	dB(A)	P-Hi: 47 Hi: 46 Me: 43 Lo: 40	Cooling: 49 Heating: 52		
Exterior dimensions Height × Width × Depth	mm	398 × 1150 × 650	1300 × 970 × 370		
Exterior appearance (Munsell color)		_	Stucco White (4.2Y7.5/1.1) near equivalent		
Net weight	kg	52	105		
Refrigerant equipment Compressor type & Q'ty		-	RMT5134MDE2 × 1		
Starting method		_	Direct line start		
Refrigerant oil	l	_	0.9 M-MA68		
Heat exchanger		Louver fin & inner grooved tubing	M shape fin & inner grooved tubing		
Refrigerant control		_	Electronic expansion valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Propeller fan × 2		
Motor <starting method=""></starting>	W	350 < Direct line start>	86 × 2 < Direct line start>		
Air flow (Standard)	CMM	P-Hi: 51 Hi: 48 Me: 42 Lo: 36	100		
External static pressure	Pa	Standard: 60 Max: 200	0		
Outside air intake		Possible	_		
Air filter, Q'ty		Procure locally	_		
Shock & vibration absorber		Rubber sleeve (for fan motor)	Rubber sleeve (for Compressor)		
Insulation (noise & heat)		Polyurethane form	_		
Electric heater	W	_	20 (Crank case heater)		
Remote control		wired : RC-EX1, RC-E5 (option)	wireless : RCN-KIT3-E (option)		
Room temperature control		Thermostat by electronics	_		
Safety equipment		Overload protection for fan motor Frost protection thermostat	Internal thermostat for fan motor Abnormal discharge temperature protection.		
Installation data	mm	Liquid line : I/U φ 9.52 (3/8") Pipe φ	⁶ 9.52 (3/8") × 0.8 O/U φ 9.52 (3/8")		
Refrigerant piping size	'''''	Gas line : ϕ 15.88 (5/8") ϕ	b 15.88 (5/8") × 1.0 φ 15.88 (5/8")		
Connecting method		Flare piping	Flare piping		
Refrigerant line (one way) length		Max.100m			
Vertical height difference between outdoor unit and indoor unit		Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)	See page 36		
Refrigerant Quantity		R410A 4.5kg in outdoor unit (incl.	the amount for the piping of : 30m)		
Drain pump		Built-in Drain pump	_		
Drain		Hose Connectable with VP25	Holes size ϕ 20 × 3pcs		
Insulation for piping		Necessary (both L	Liquid & Gas lines)		
IP code		IP20	IP24		
Standard Accessories		Drain hose	Edging		

Notes (1) The data are measured at the following conditions.

Item	Indoor air temperature		Outdoor air temperature		External static pressure of indoor unit
Operation	BD	WB	DB	WB	Pa
Cooling	27°C	19°C	35°C	24°C	60
Heating	20	°C	7°C	6°C	60

- (2) This packaged air-conditioner is manufactured and tested in conformity with the ISO and AS/NZS.
- (3) Sound pressure level indicates the value in an anechoic chamber. During operation these value are somewhat higher due to ambient temperature.
- (4) The operation data indicates when the air-conditioner is operated at 240V50Hz.
- (5) The factory E.S.P. setting is set within the range of 80-150 Pa.
 If SW8-4 is turned to "ON" ,E.S.P. setting range can be changed to 10-200 Pa.
 (6) If wireless remote control is used, only 3-speed fan setting (Hi-Me-Lo) is available.

Option parts SAFETY PAN : UA-SP2-E

	Model	Model FDUA100VNVF			
Item		Indoor unit FDUA100VF	Outdoor unit FDC100VN		
Power source			240V~50Hz		
Operation data		Cooling	Heating		
Nominal capacity	kW	10.0 [4.0 (Min.)~11.2 (Max.)]	11.2 [4.0 (Min.)~12.5 (Max.)]		
Power consumption	kW	3.05	2.87		
Running current	Α	13.0	12.2		
Power factor	%	98	98		
Inrush current	Α	5 <max.runnir< td=""><td>ng current 25></td></max.runnir<>	ng current 25>		
Sound Pressure Level	dB(A)	P-Hi: 43 Hi: 42 Me: 40 Lo: 37	49		
Exterior dimensions Height × Width × Depth	mm	398 × 1150 × 650	845 × 970 × 370		
Exterior appearance (Munsell color)		_	Stucco White (4.2Y7.5/1.1) near equivalent		
Net weight	kg	52	81		
Refrigerant equipment Compressor type & Q'ty		-	RMT5126MDE2 × 1		
Starting method		_	Direct line start		
Refrigerant oil	l	_	0.9 M-MA68		
Heat exchanger		Louver fin & inner grooved tubing	M shape fin & inner grooved tubing		
Refrigerant control		_	Electronic expansion valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Propeller fan × 1		
Motor <starting method=""></starting>	W	350 < Direct line start>	86 < Direct line start>		
Air flow (Standard)	CMM	P-Hi: 39 Hi: 36 Me: 33 Lo: 29	Cooling: 75, Heating: 73		
External static pressure	Pa	Standard: 60 Max: 200	0		
Outside air intake		Possible	_		
Air filter, Q'ty		Procure locally	_		
Shock & vibration absorber		Rubber sleeve (for fan motor)	Rubber sleeve (for Compressor)		
Insulation (noise & heat)		Polyurethane form	-		
Electric heater	W	_	20 (Crank case heater)		
Remote control		wired : RC-EX1, RC-E5 (option)	wireless : RCN-KIT3-E (option)		
Room temperature control		Thermostat by electronics			
Safety equipment		Overload protection for fan motor Frost protection thermostat	Internal thermostat for fan motor Abnormal discharge temperature protection.		
Installation data		Liquid line : I/U φ 9.52 (3/8") Pipe φ	9.52 (3/8") × 0.8 O/U ϕ 9.52 (3/8")		
Refrigerant piping size	mm —	Gas line : ϕ 15.88 (5/8") ϕ	ο 15.88 (5/8") × 1.0 φ 15.88 (5/8")		
Connecting method		Flare piping	Flare piping		
Refrigerant line (one way) length		Max.50m			
Vertical height difference between outdoor unit and indoor unit		Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower) See page 36			
Refrigerant Quantity		R410A 3.8kg in outdoor unit (incl. t	the amount for the piping of : 30m)		
Drain pump		Built-in Drain pump	_		
Drain		Hose Connectable with VP25	Holes size φ20 × 3pcs		
Insulation for piping			· · · · · · · · · · · · · · · · · · ·		
		Necessary (both Liquid & Gas lines) IP20 IP24			
IP code		IP20	IP24		

Notes (1) The data are measured at the following conditions.

Item	Indoor air t	emperature	Outdoor air	temperature	External static pressure of indoor unit
Operation	BD	WB	DB	WB	Pa
Cooling	27°C	19°C	35°C	24°C	60
Heating	20	°C	7°C	6°C	60

- (2) This packaged air-conditioner is manufactured and tested in conformity with the ISO and AS/NZS.
- (3) Sound pressure level indicates the value in an anechoic chamber. During operation these value are somewhat higher due to ambient temperature.
- (4) The operation data indicates when the air-conditioner is operated at 240V50Hz.
- (5) The factory E.S.P. setting is set within the range of 80-150 Pa.
 If SW8-4 is turned to "ON" ,E.S.P. setting range can be changed to 10-200 Pa.
 (6) If wireless remote control is used, only 3-speed fan setting (Hi-Me-Lo) is available.

Option parts SAFETY PAN : UA-SP2-E

Model	FDUA16	60VSVF
	Indoor unit FDUA160VF	Outdoor unit FDCA160VS
		415V 3N∼50Hz
	Cooling	Heating
kW	16.0 [7.0 (Min.)~20.0 (Max.)]	18.0 [7.6 (Min.) ~ 22.4 (Max.)]
kW	5.02	4.96
Α	7.6	7.5
%	92	92
Α	5 <max.runnin< td=""><td>ng current 27></td></max.runnin<>	ng current 27>
dB(A)	P-Hi: 49 Hi: 48 Me: 45 Lo: 42	Cooling: 57 Heating: 58
mm	398 × 1150 × 650	1505 × 970 × 370
		Stucco White
	_	(4.2Y7.5/1.1) near equivalent
kg	52	140
	_	GTC5150ND70K × 1
	_	Direct line start
l	_	1.45 M-MA32R
	Louver fin & inner grooved tubing	Straight fin & inner grooved tubing
	_	Electronic expansion valve
	0	5 " (6
	Centrifugal fan × 2	Propeller fan × 2
W	350 < Direct line start>	86 × 2 < Direct line start>
CMM	P-Hi: 51 Hi: 48 Me: 42 Lo: 36	Cooling: 150, Heating: 145
Pa	Standard: 60 Max: 200	0
	Possible	_
	Procure locally	_
	Rubber sleeve (for fan motor)	Rubber sleeve (for Compressor)
	Polyurethane form	_
W	_	33 (Crank case heater)
	wired : RC-EX1, RC-E5 (option)	wireless : RCN-KIT3-E (option)
	Thermostat by electronics	_
	Overload protection for fan motor Frost protection thermostat	Internal thermostat for fan motor Abnormal discharge temperature protection.
	Liquid line : I/U ϕ 12.7 (1/2") Pipe ϕ	5 12.7 (1/2") × 0.8 O/U φ 12.7 (1/2")
mm –	Gas line : φ 22.22 (7/8") φ	22.22 (7/8") × 1.6 φ 22.22 (7/8")
	Liquid : Flare / Gas : Brazing	Liquid : Flare / Gas : Brazing
	Max.70m	
	Max.30m (Outdoor unit is higher) Max.15m (Outdoor unit is lower)	See page 36
	R410A 7.2kg in outdoor unit (incl. t	the amount for the piping of : 30m)
	Built-in Drain pump	
	Hose Connectable with VP25	Holes size φ20 × 3pcs
	, ,	IP24
! !	IP20	IP24
	kW kW A 96 A dB(A) mm kg W CMM Pa	Indoor unit FDUA160VF

Notes (1) The data are measured at the following conditions.

Item	Indoor air t	emperature	Outdoor air	temperature	External static pressure of indoor unit
Operation	BD	WB	DB	WB	Pa
Cooling	27°C	19°C	35°C	24°C	60
Heating	20	°C	7°C	6°C	60

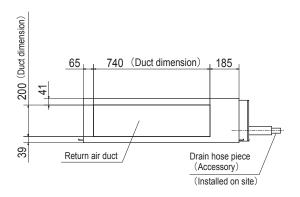
- (2) This packaged air-conditioner is manufactured and tested in conformity with the ISO and AS/NZS.
- (3) Sound pressure level indicates the value in an anechoic chamber. During operation these value are somewhat higher due to ambient temperature.
- (4) The operation data indicates when the air-conditioner is operated at 240V50Hz.

(5) The factory E.S.P. setting is set within the range of 80-150 Pa.
 If SW8-4 is turned to "ON" ,E.S.P. setting range can be changed to 10-200 Pa.
 (6) If wireless remote control is used, only 3-speed fan setting (Hi-Me-Lo) is available.

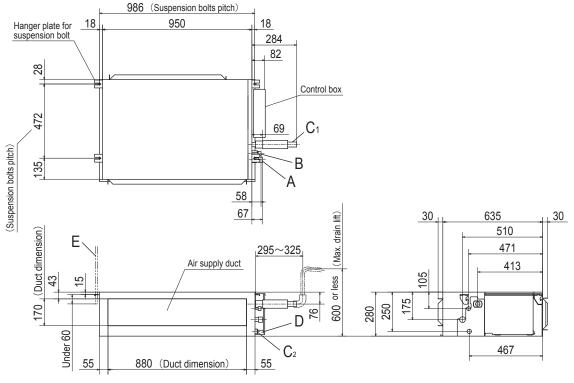
Option parts SAFETY PAN : UA-SP2-E

2 EXTERIOR DIMENSIONS

(1) Indoor units Model FDUA71VF

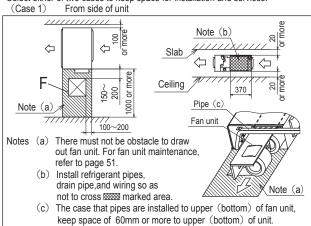


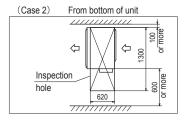
Symbol		Content
Α	Gas piping	ϕ 15.88 (5/8") (Flare)
В	Liquid piping	ϕ 9.52 (3/8") (Flare)
C1	Drain piping	VP25 (I.D.25,O.D.32)
C2	Drain piping (Gravity drainage)	VP20 (I.D.20,O.D.26)
D	Hole for wiring	
E	Suspension bolts	(M10)
F	Inspection hole	(450X450)



Space for installation and service

Select either of two cases to keep space for installation and services.



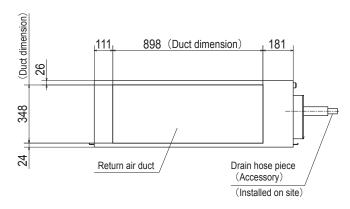


Unit:mm

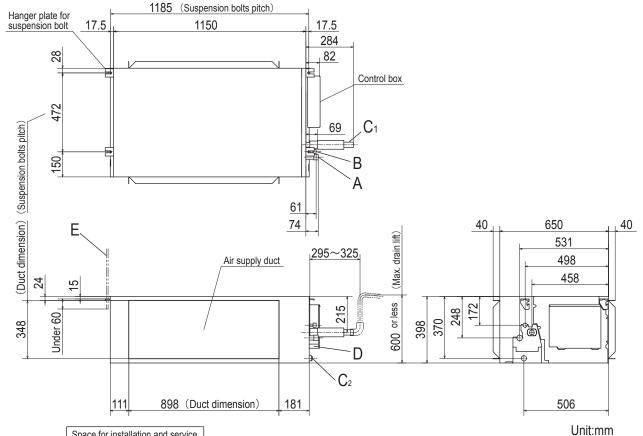
Note (1) The model name label is attached on the lid of the control box.

PJG000Z037 🛕

Models FDUA100VF, 125VF, 140VF

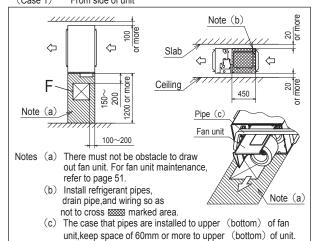


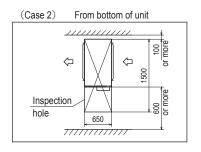
Symbol		Content
Α	Gas piping	ϕ 15.88 (5/8") (Flare)
В	Liquid piping	ϕ 9.52 (3/8") (Flare)
C1	Drain piping	VP25 (I.D.25,O.D.32)
C2	Drain piping (Gravity drainage)	VP25 (I.D.25,O.D.32)
D	Hole for wiring	
Е	Suspension bolts	(M10)
F	Inspection hole	(450X450)



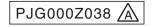
Space for installation and service

Select either of two cases to keep space for installation and services. (Case 1) From side of unit

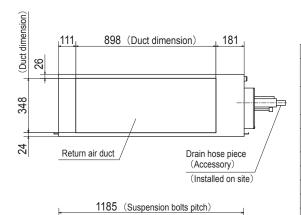




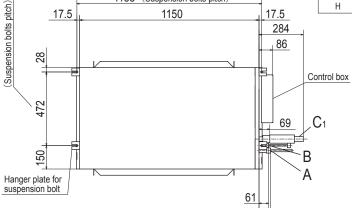
Note (1) The model name label is attached on the lid of the control box.

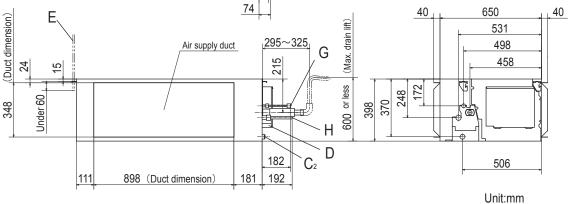


Model FDUA160VF



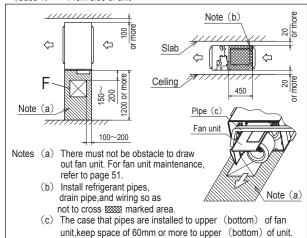
Symbol	Content	
А	Connecting position of the attached connecting pipe (gas side)	φ15.88 (5/8") (Flare)
В	Connecting position of the attached connecting pipe (liquid side)	ϕ 9.52 (3/8") (Flare)
C1	Drain piping	VP25 (I.D.25,O.D.32)
C2	Drain piping (Gravity drainage)	VP25 (I.D.25,O.D.32)
D	Hole for wiring	
Е	Suspension bolts	(M10)
F	Inspection hole	(450X450)
G	Connecting position of the local pipe. (liquid side)) φ12.7 (1/2") (Flare)
Н	Connecting position of the local pipe. (gas side)	φ22 22 (7/8") (Brazing)

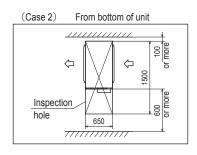




Space for installation and service

Select either of two cases to keep space for installation and services. (Case 1) From side of unit

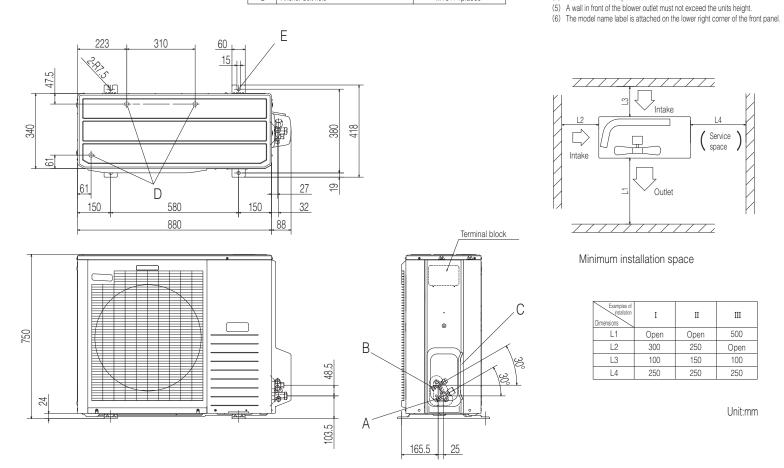


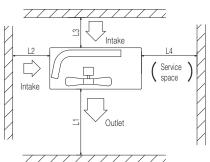


Notes (1) The model name label is attached on the lid of the control box.

(2) Connect the piping with local pipe by using the pipe of the attachment. (Liquid side and Gas side)

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





Minimum installation space

(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

(3) Where the unit is subject to strong winds, lay it in such a direction that the blower outlet faces perpendicularly

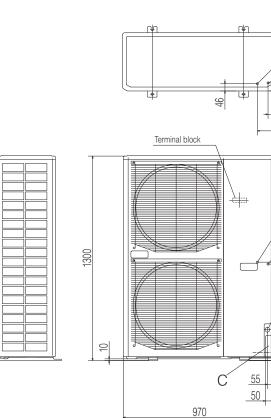
protrude more the 15mm.

to the dominant wind direction. (4) Leave 1m or more space above the unit.

Notes

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	
А	Service valve connection of the attached connecting pipe (gas side)	φ 15.88 (5/8*) (Flare)
В	Service valve connection (liquid side)	φ9.52 (3/8") (Flare)
С	Pipe/cable draw-out hole	
D	Drain discharge hole	φ 20 × 3places
Е	Anchor bolt hole	M10 x 4places
F	Cable draw-out hole	φ30 (front) φ45 (side) φ50 (back)

Notes

- It must not be surrounded by walls on the four sides.
 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.

- to the dominant wind direction.

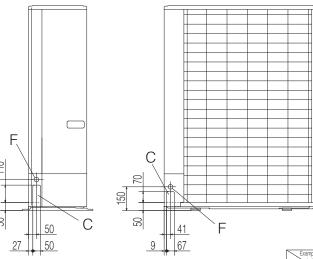
 (4) Leave 1m or more space above the unit.

 (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.

 (7) Connect the Service valve with local pipe by using the pipe of the attachment.

 (Gas side only)



Examples of installation Dimensions	I	II	III
L1	Open	Open	500
L2	300	5	Open
L3	150	300	150
L4	5	5	5

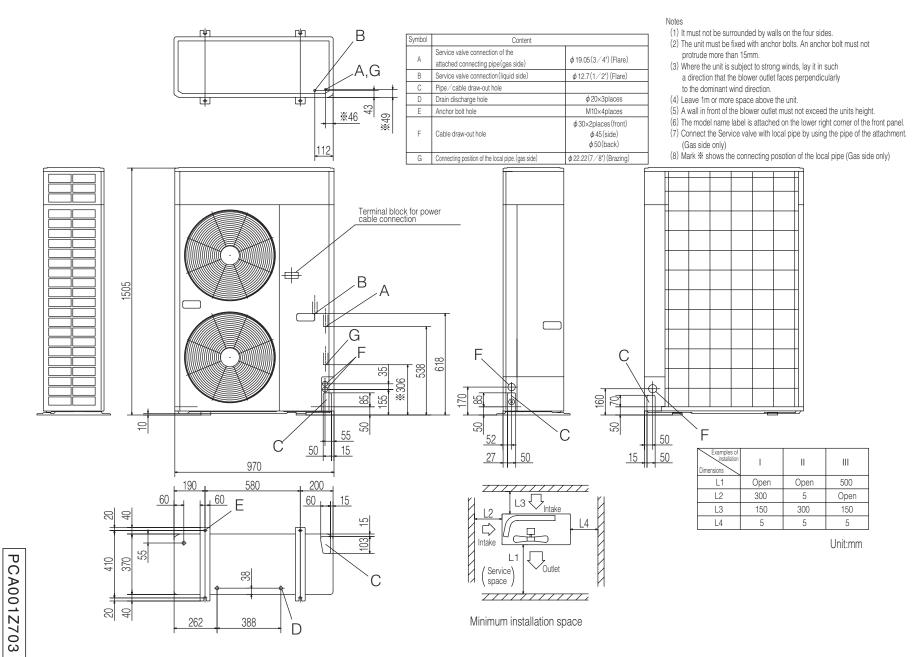
Unit:mm

	E	200
20 4 40	76	15
410 370 55	•	£ C
40	_ 00	60 15
	000 005 \	

Service space Outlet

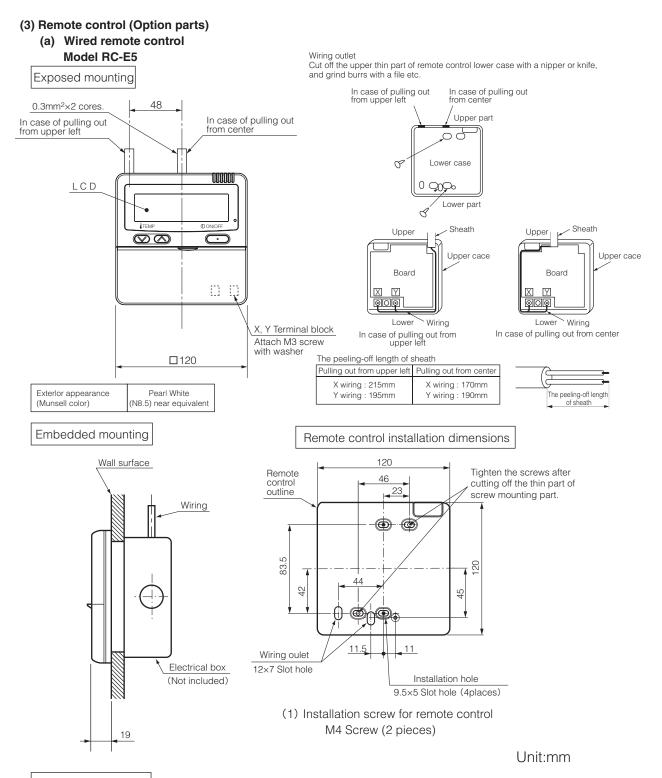
612 624

Minimum installation space



16 -

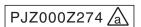
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Wiring specifications

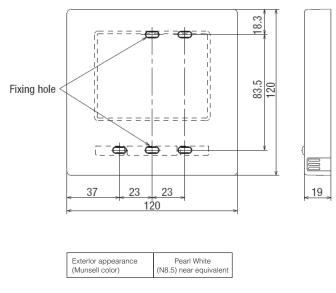
(1) If the prolongation is over 100m, change to the size below. But, wiring in the remote control case should be under 0.5mm². Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.

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



Model: RC-EX1A

Dimensions (Viewed from front)



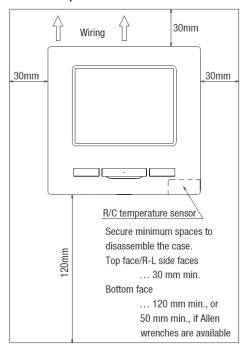
Unit:mm

Cautions for selecting installation place

- (1) Installation surface must be flat and sufficiently strong. R/C case must not be deformed.
- (2) Where the R/C can detect room temperatures accurately This is a must when detecting room temperatures with the temperature sensor of R/C.
 - · Install the R/C where it can detect the average temperature in the room.
 - \cdot Install the R/C sufficiently separated from a heat source.
 - · Install the R/C where it will not be influenced by the turbulence of air when the door is opened or closed.

Select a place where the R/C is not exposed to direct sunlight or blown by winds from the air conditioner or temperatures on the wall surface will not deviate largely from indoor air temperatures.

Installation space



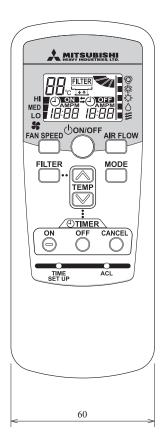
R/C cable:0.3mm² × 2-core

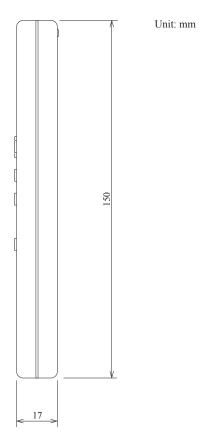
When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm². Connect them to wires of larger size near the outside of R/C. When wires are connected, take measures to prevent water, etc. from entering inside.

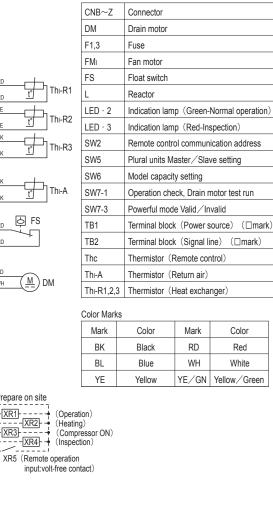
< 200 m	0.5 mm ² x 2-core
< 300 m	0.75 mm ² x 2-core
< 400 m	1.25 mm ² x 2-core
< 600 m	2.0 mm ² x 2-core

Adapted to **RoHS** directive

(b) Wireless remote control (RCN-E1R)







Power PCB Control PCB Connecting line between CNW0 YE/GN TB1 WH F1 (5A) indoor unit and outdoor unit RD Power source line 12 Signal line 3 Earth Power circuit CNW1 CNW2 CNN WH WH YΕ CNW3 WH YE/GN F3 (2A) LED · 2 LED · 3 **CNWR** SW2 CNM2 SW5 SW6 CNR SW7 WH For HA CNZ WH Notes 1. - - - - indicates wiring on site. 2. See the wiring diagram of outside unit about the line between inside unit and outside unit. Prepare on site +12 3. Use twin core card (0.3mm²) at remote control line. 4. Do not put remote control line alongside power source line. CNT : -_--- (Heating) ---- (Compressor ON) -XR4 (Inspection) Remote control TB2 Thc X WH 1 CNB Y BK 3 WH CNTA <u>t</u>

BL

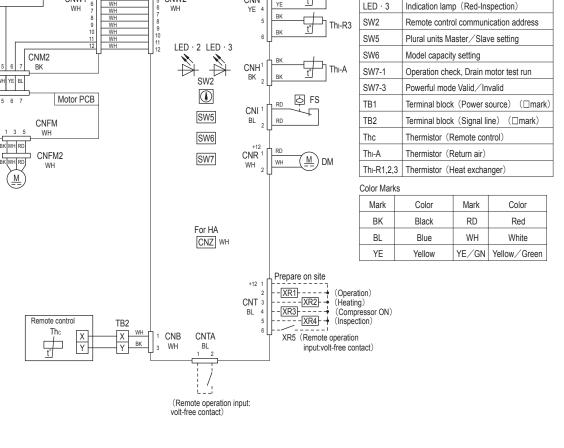
(Remote operation input: volt-free contact)

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ECTRICAL WIRING

Indoor units
Model FDUA71VF



Power PCB

CNW1

CNW0

WH

CNW3

WH

CNWR

F1 (6.3A)

F3 (4A)

CNM

Power circuit

YE/GN

TB1

Notes 1. - - - indicates wiring on site.

inside unit and outside unit.

___YE∕GN

2. See the wiring diagram of outside unit about the line between

4. Do not put remote control line alongside power source line.

3. Use twin core card (0.3mm²) at remote control line.

Control PCB

CNW2

CNN

CNB~Z

DM

F1,3

FΜι

LED · 2

Th_I-R1

Thı-R2

Connector

Drain motor

Fan motor

Float switch

Indication lamp (Green-Normal operation)

Reactor

Fuse

PJG000Z040 🗥

Connecting line between

Earth

indoor unit and outdoor unit Power source line 12
Signal line 3
Earth

Drain pan heater 52X1 Auxilliary relay (for CH) 52X3 Auxilliary relay (for 20S) 52X4 Auxilliary relay (for DH) Solenoid valve for 4 way valve SM1 Expansion valve for cooling SM2 Expansion valve for heating 63H1 High pressure switch Tho-A Thermistor (Outdoor air temp.) Tho-D Thermistor (Discharge pipe temp.) Tho-R1.R2 Thermistor (Heat exchanger temp.) Tho-S Thermistor (Suction pipe temp.) Thermistor (IPM) Tho-IPM Low pressure sensor IPM Intelligent power module

Terminal block

Pump down switch

Local setting switch Indication lamp (GREEN)

Indication lamp (RED)

Fuse

Connector

Compressor motor

Fan motor Crankcase heater

Description

Item

FM01

TB

F,F3

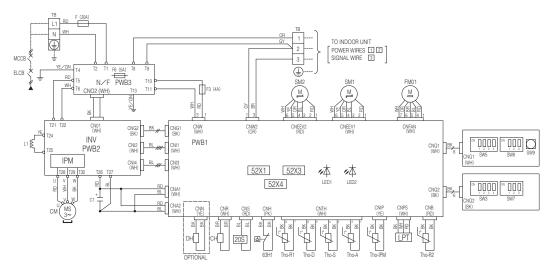
SW9

SW3,5

LED1

CnA~Z

POWER SOURCE 1~240V 50Hz



Mark	Color
BK	Black
BL	Blue
BR	Brown
OR	Orange
RD	Red
WH	White
YE	Yellow
YE/GN	Yellow/Green
GY	Gray
PK	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 x number	Earth wire size
71	17	3.5	21	φ 1.6mm x 3	φ1.6mm

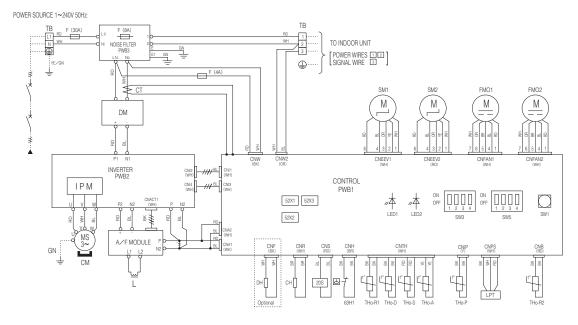
- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of Circuit breaker capacity which is calculated from MAX. over current should be chosen along the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

Local setting switch SW3, SW5 (Set up at shipment OFF)

SW3-1	Defrost control change	The defrosting 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 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-5 w5-5 after the trial operation is finished.

22

PCA001Z570



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

Item	Description
CnA~Z	Connector
CH	Crankcase heater
DH	Drain pan heater
CM	Compressor motor
CT	Current sensor
DM	Diode module
F	Fuse
FM01,02	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
LPT	Low pressure sensor
SM1	Expansion valve for cooling
SM2	Expansion valve for heating
SW1	Pump down switch
SW3,5	Local setting switch
TB	Terminal block
THo-A	Thermistor (Outdoor air temp.)
THo-D	Thermistor (Discharge pipe temp.)
THo-P	Thermistor (IPM)
THo-R1,2	Thermistor (Heat exchanger pipe temp.)
THo-S	Thermistor (Suction pipe temp.)
20S	Solenoid valve for 4 way valve
52X1	Auxilliary relay (for CH)
52X2	Auxilliary relay (for DH)
52X3	Auxilliary relay (for 20S)
63H1	High pressure switch

Models FDC100VNX, 125VNX, 140VNX

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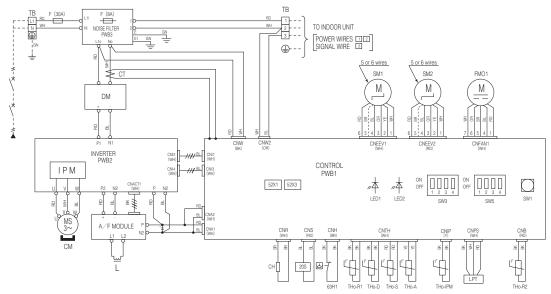
Power cable, indoor-outdoor connecting wires

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	25	5.5	24		
125	29		31	φ1.6mm x3	φ1.6
140	30	8	30		

- 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	(Set up at	shipment	OFF)

Local setting switch Sw3 (Set up at snipment OFF)		r iigir proces		
SW3-1	Defrost control change	The defrosting operation interval become by turning ON this switch. This switch turned ON in the area where outside to becomes below the freezing point.	should be	
SW3-2	Snow guard fan control	When this switch is turned ON, the out fan will run for 30 seconds in every 10 when outdoor temperature falls to 3°C the compressor is not runnning when t in a very snowy country, set this switch	minutes, or lower and he unit is used	
SW3-3,4	Trial operation	Method of trial operation Trial operation can be performed by Compressor will be in the operation: Cooling trial operation will be performed heating trial operation when SW Be sure to turn OFF SW3-3 after the is finished.	when SW3-3 is ned when SW3 3-4 is ON.	ON.



Color
Black
Blue
Brown
Green
Gray
Pink
Orange
Red
White
Yellow
Yellow / Green

Item	Description
CnA~Z	Connector
CH	Crankcase heater
CM	Compressor motor
CT	Current sensor
DM	Diode module
F	Fuse
FM01	Fan motor
IPM	Intelligent power module
L	Reactor
LED1	Indication lamp (GREEN)
LED2	Indication lamp (RED)
LPT	Low pressure sensor
SM1	Expansion valve for cooling
SM2	Expansion valve for heating
SW1	Pump down switch
SW3,5	Local setting switch
ТВ	Terminal block
THo-A	Thermistor (Outdoor air temp.)
THo-D	Thermistor (Discharge pipe temp.)
THo-IPM	Thermistor (IPM)
THo-R1,2	Thermistor (Heat exchanger pipe temp.)
THo-S	Thermistor (Suction pipe temp.)
20S	Solenoid valve for 4 way valve
52X1	Auxilliary relay (for CH)
52X3	Auxilliary relay (for 20S)
63H1	High pressure switch

Model FDC100VN

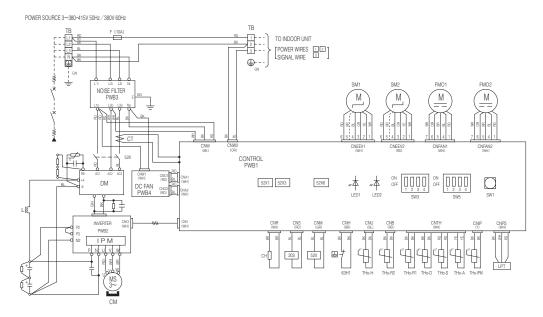
Power cable, indoor-outdoor connecting wires

MAX over current (A)	Power cable size (mm ²)	Power cable length (m)	indoor-outdoor wire size x number	Earth wire size (mm)
25	5.5	24	φ 1.6mm x 3	φ 1.6

- 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.

Local setting switch SW3 (Set up at shipment OFF)

SW3-1 Defrost control change		The defrosting 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 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 () Trial operation can be performed by using SW3-3,4. () Compressor will be in the operation when SW3-3 is ON. () Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. () Es sure to turn OFF SW3-3 after the trial operation is finished.		



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

Item	Description		
CnA~Z	Connector		
CH	Crankcase heater		
CM	Compressor motor		
CT	Current sensor		
DM	Diode module		
F	Fuse		
FM01,02	Fan motor		
IPM	Intelligent power module		
L	Reactor		
LED1	Indication lamp (GREEN)		
LED2	Indication lamp (RED)		
LPT	Low pressure sensor		
SM1	Expansion valve for cooling		
SM2	Expansion valve for heating		
SW1	Pump down switch		
SW3,5	Local setting switch		
TB	Terminal block		
THo-A	Thermistor (Outdoor air temp.)		
THo-D	Thermistor (Discharge pipe temp.)		
THo-H	Thermistor(Comp.undeneth temp.)		
THo-IPM	Thermistor (IPM)		
THo-R1,2	Thermistor (Heat exchanger pipe temp.)		
THo-S	Thermistor (Suction pipe temp.)		
20S	Solenoid valve for 4 way valve		
52X1	Auxilliary relay (for CH)		
52X3	Auxilliary relay (for 20S)		
52X6	Auxilliary relay (for 52X)		
63H1	High pressure switch		

Power cable, indoor-outdoor connecting wires

MAX over current (A)	Power cable size (mm) ²	Power cable length (m)	indoor-outdoor wire size x number	Earth wire size (mm)		
27	5.5	26	φ 1.6mm x 3	φ1.6		

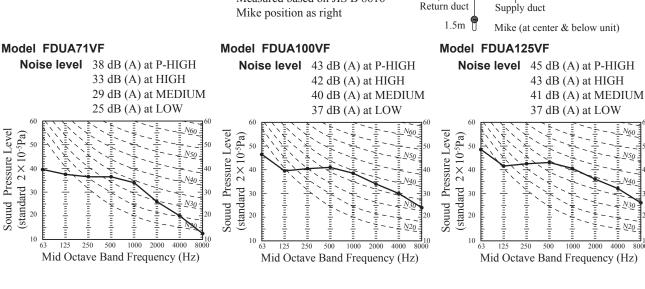
- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction instructions of the indoor unit.
- Switchgear of Circuit breaker capacity which is calculated from MAX. over current should be chosen along the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

Local cotting	ewitch SW3	(Sot up at	chinment OFF	-)

Local setting switch Sw3 (Set up at snipment OFF)				
SW3-1	Defrost control change	The defrosting 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 fam 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 IN.		
SW3-3,4	Trial operation	Method of trial operation (Trial operation can be performed by using SW3-3,4. (Compressor will be in the operation when SW3-3 is ON. (Cooling trial operation will be performed when SW3-4 is OFF, and heating trial operation when SW3-4 is ON. (Be sure to turn OFF SW3-3 after the trial operation is finished.		

4 NOISE LEVEL

(1) Indoor units



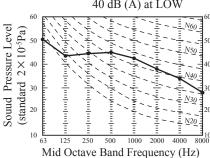
Measured based on JIS B 8616

1m

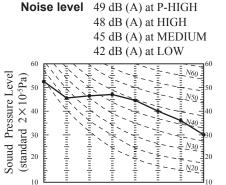
Unit



Noise level 47 dB (A) at P-HIGH 46 dB (A) at HIGH 43 dB (A) at MEDIUM 40 dB (A) at LOW



Model FDUA160VF



Mid Octave Band Frequency (Hz)

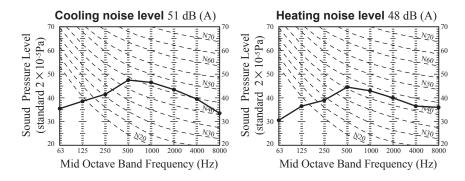
(2) Outdoor units

Measured based on JIS B 8616

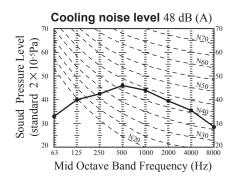
Mike position: at highest noise level in position as mentined below

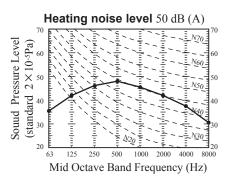
Distance from front side 1m Height 1m

Model FDC71VNX

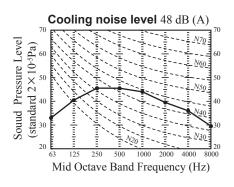


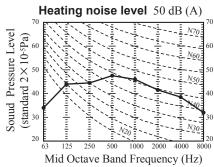
Model FDC100VNX



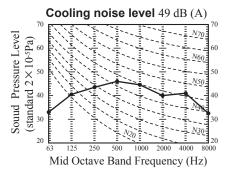


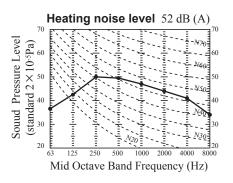
Model FDC125VNX



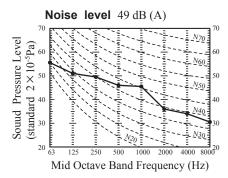


Model FDC140VNX

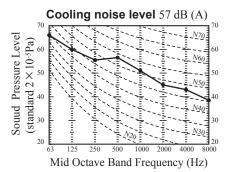


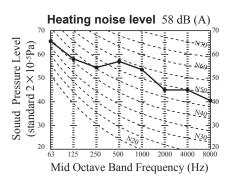


Model FDC100VN



Model FDCA160VS



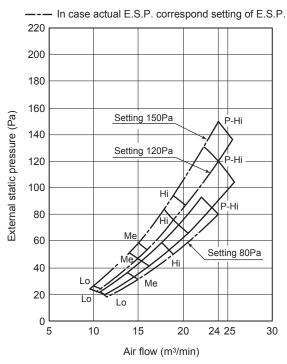


5 CHARACTERISTICS OF FAN

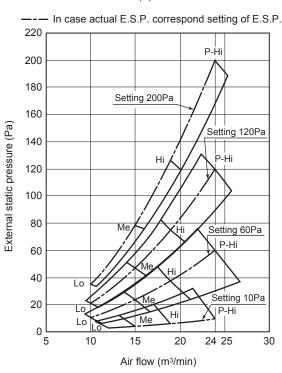
- · Characteristic FAN (1) shows air flow vs. External Static Pressure (E.S.P.) range where settings of E.S.P. are maximum E.S.P. (SW8-4 OFF : 150Pa, SW8-4 ON : 200Pa), rated E.S.P., and minimum E.S.P. (SW8-4 OFF : 80Pa, SW8-4 ON : 10Pa)
- · Characteristic FAN (2) shows air flow vs. E.S.P curve when set fan tap is set P-Hi with each setting of E.S.P. by remote control.
- · External Static Pressure (E.S.P.) can be set by wired remote control.
- · You can set required E.S.P. by wired remote control which calculate it with the set air flow rate and pressure loss of the duct connected.

Model FDUA71VF

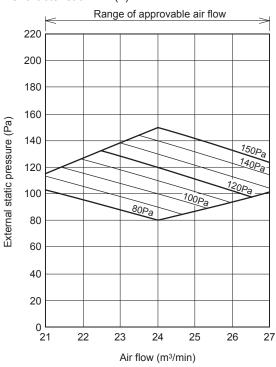
■SW8-4 : OFF (Range of use limitation : Setting 80Pa-150Pa) Characteristic FAN (1)

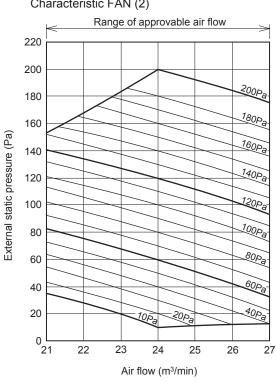


■SW8-4 : ON (Range of use limitation : Setting 10Pa-200Pa) Characteristic FAN (1)



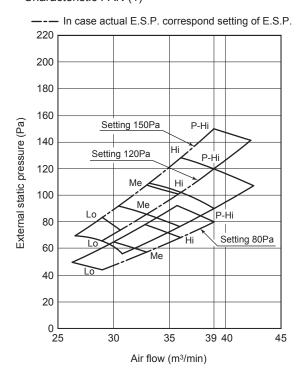
Characteristic FAN (2)



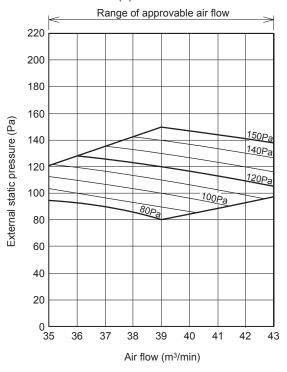


Model FDUA100VF

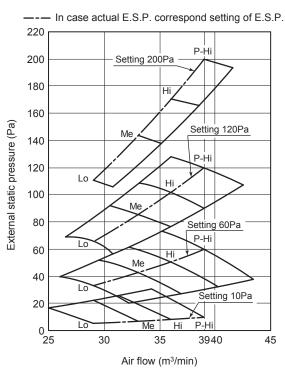
■SW8-4 : OFF (Range of use limitation : Setting 80Pa-150Pa)
Characteristic FAN (1)

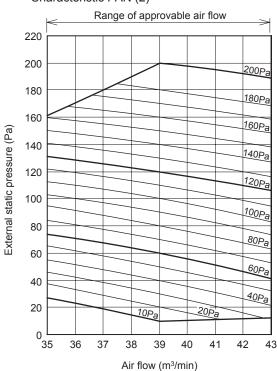


Characteristic FAN (2)



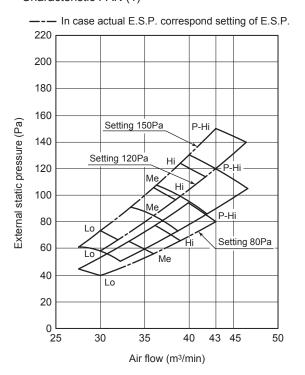
■SW8-4 : ON (Range of use limitation : Setting 10Pa-200Pa) Characteristic FAN (1)



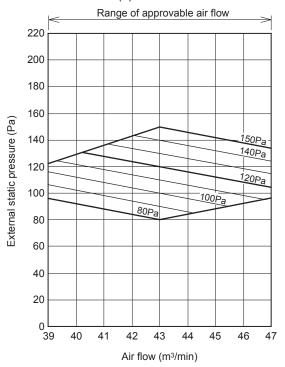


Model FDUA125VF

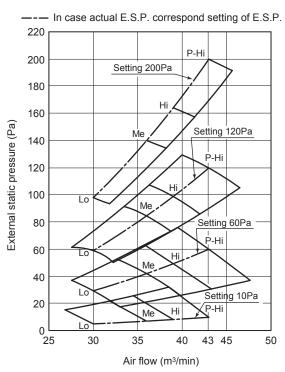
■SW8-4 : OFF (Range of use limitation : Setting 80Pa-150Pa)
Characteristic FAN (1)

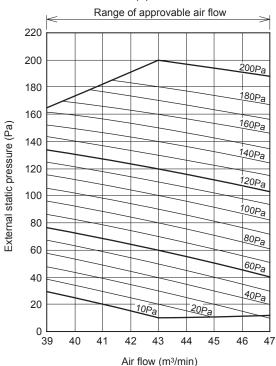


Characteristic FAN (2)



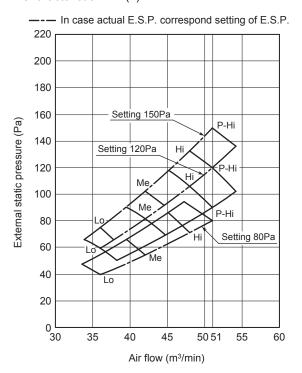
■SW8-4 : ON (Range of use limitation : Setting 10Pa-200Pa) Characteristic FAN (1)



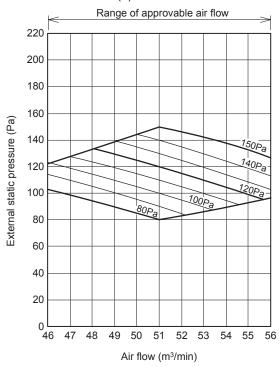


Models FDUA140VF, 160VF

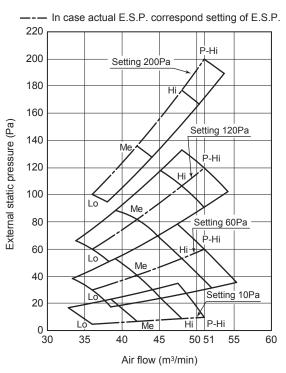
■SW8-4 : OFF (Range of use limitation : Setting 80Pa-150Pa)
Characteristic FAN (1)

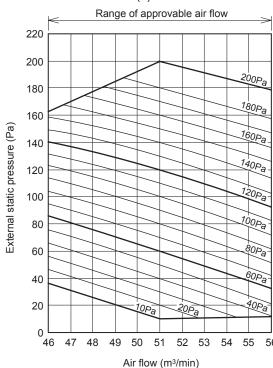


Characteristic FAN (2)



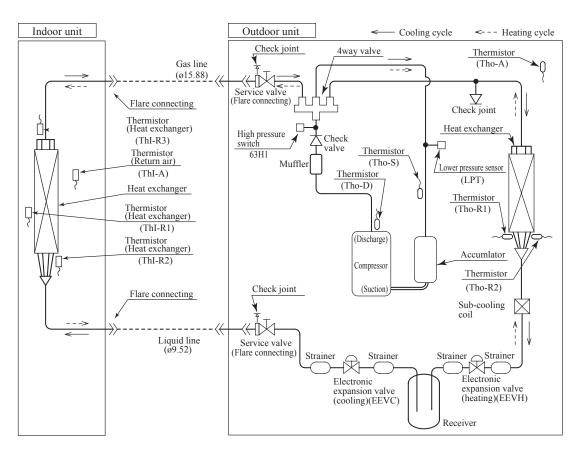
■SW8-4 : ON (Range of use limitation : Setting 10Pa-200Pa)
Characteristic FAN (1)



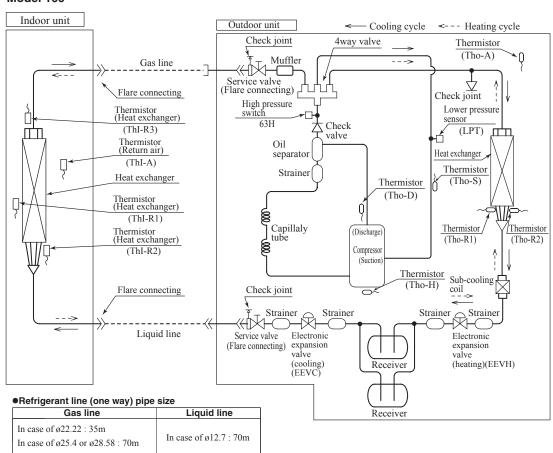


6 PIPING SYSTEM

Models 71, 100, 125, 140



Model 160



Preset point of the protective devices

Parts name	Mark	Equipped unit	71, 100, 125, 140 model	160 model
Thermistor (for protection over- loading in heating)	Thl-R.1.2	Indoor unit	ON 63°C OFF 56°C	
Thermistor (for frost prevention)	Thl-R.1.2		ON 1.0°C OFF 10°C	
Thermistor (for protection high pressure in cooling.)	Tho-R.1.2	Outdoor unit	ON 65°C OFF 51°C	
Thermistor (for detecting dis- charge pipe temp.)	Tho-D	Outdoor unit	ON 115°C OFF 85°C	ON 135°C OFF 90°C
High pressure switch (for protection)	63H1	Outdoor unit	ON 4.15MPa OFF 3.15MPa	
Low pressure sensor (for protection)	LPT	Outdoor unit	ON 0.079MPa OFF 0.227MPa	

7 RANGE OF USAGE & LIMITATIONS

Operating temperature range		See next page.	
		When used below -5°C, 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°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 3)		Dew point temperature : 28°C or less, relative hummdity : 80% or less	
Limitations on unit and piping installation		See page 36	
Compressor	Cycle Time	7 minutes or more (from OFF to OFF) or (from ON to ON)	
ON-OFF cycling	Stop Time	3 minutes or more	
	Voltage range	Rating ±10%	
Power source	Voltage drop at start-up	Min.85% of rating	
	Phase-to-phase imbalance	3% or less	

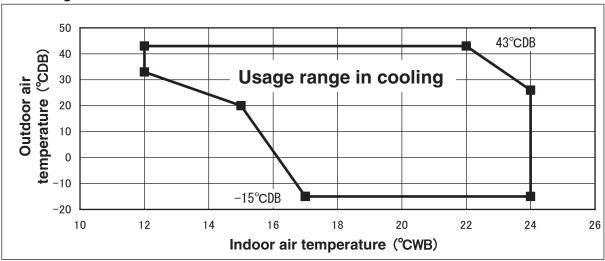
Note 1. Do not install the unit in places which:

- 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.
- Note 2. If the surrounding temperature and humidity exceed above values, paste polyurethane.
- Note 3. If ambient temperature and humidity exceed the above conditions, add polyurethane foam insulation on the outer plate (10mm or thicker) of indoor unit.

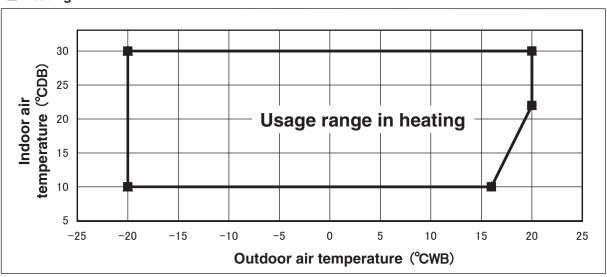
Both gas and liquid pipes need to be coverd with 20mm or thicker heat insulation materials at the place where humidity exceeds 70%.

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 airflow rate.

PJG000Z036

"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

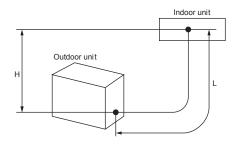
- 1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
- 2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, mount the flex flow adapter (prepared as optional part) or like such devices onto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

[Reason]

Under the low outdoor air temperature conditions of -5° 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	n.				
Descriptions	Мс	del for ou	tdoor units	Dimensional limitations	Marks appearing in the drawing
	FDC71VNX			≦ 50m	
	FDC100 • 12	5 • 140Vi	NX	≦ 100m	
One-way pipe length	FDC100VN			≦ 50m	L
	FDC160VS	Gas	ϕ 25.4 or ϕ 28.58	≦ 70m	
	1 0010000	piping	φ22.22	≦ 35m	
Elevation difference between indoor and outdoor units	When the ou	tdoor unit	is positioned higher	≦ 30m	Н
Lievation unlerence between indoor and outdoor units	When the ou	itdoor unit	ispositioned lower	≦ 15m	



(1) Reduce refrigerant amount by according to table below from factory charge when refrigerant piping is shorter than 3m.

Model for outdoor units	refrigerant to be reduced
FDC71, 100, 125, 140, 160	-1.0kg

PJG000Z036

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 (8.1) × Correction factors shown in the table (8.2) (8.3) (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.

(kW)

8.1 Capacity tables

Model FDUA71VNXVF Indoor unit FDUA71VF Outdoor unit FDC71VNX Cool Mode

Outdoor							Indo	or air t	emper	ature						
air temp.	18°0	CDB	21°0	DB	23℃	DB	26°0	DB	27°C	CDB	28°0	DB	31°0	DB	33°0	DB
un tomp.	12°C	WB	14°C	WB	16℃	WB	18℃	WB	19℃	WB	20°C	WB	22°C	WB	24°C	WB
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					4.87	4.77	6.02	5.60	6.59	5.67	6.79	5.62	7.19	5.96	7.59	5.82
13					5.33	5.01	6.32	5.70	6.82	5.74	7.03	5.69	7.45	6.03	7.88	5.89
15					5.79	5.17	6.63	5.80	7.05	5.82	7.27	5.76	7.71	6.10	8.16	5.96
17					6.26	5.35	6.94	5.91	7.27	5.89	7.51	5.84	7.97	6.17	8.44	6.03
19					6.59	5.47	7.16	5.98	7.44	5.95	7.68	5.89	8.15	6.22	8.63	6.08
21					6.93	5.60	7.38	6.06	7.60	6.00	7.84	5.94	8.33	6.27	8.82	6.13
23					6.91	5.59	7.35	6.05	7.57	5.99	7.81	5.93	8.30	6.26	8.78	6.11
25			6.46	5.76	6.89	5.58	7.32	6.04	7.54	5.98	7.78	5.92	8.26	6.25	8.74	6.10
27			6.45	5.75	6.87	5.57	7.30	6.03	7.52	5.97	7.74	5.91	8.18	6.23		
29			6.34	5.71	6.75	5.53	7.19	5.99	7.41	5.94	7.64	5.88	8.09	6.21		
31			6.23	5.66	6.64	5.49	7.08	5.96	7.31	5.90	7.54	5.85	7.99	6.18		
33	5.77	5.22	6.05	5.59	6.53	5.45	6.97	5.92	7.20	5.87	7.44	5.81	7.90	6.15		
35	5.67	5.18	5.95	5.55	6.42	5.40	6.86	5.88	7.10	5.83	7.34	5.78	7.81	6.13		
37	5.58	5.14	5.85	5.51	6.31	5.36	6.72	5.83	6.95	5.79	7.18	5.73	7.64	6.08		
39	5.49	5.10	5.76	5.47	6.20	5.32	6.59	5.79	6.81	5.74	7.03	5.69	7.46	6.03		
41	5.39	5.05	5.67	5.44	6.09	5.28	6.45	5.74	6.66	5.69	6.87	5.64	7.29	5.99		
43	5.30	5.02	5.57	5.40	5.97	5.24	6.31	5.70	6.51	5.65	6.71	5.59	7.12	5.94		

Heat	Mode:	HC				(kW)
Out	door	In	door a	ir tem	peratu	re
air t	emp.			°CDB		
°CDB	℃WB	16	18	20	22	24
-19.8	-20	3.95	3.93	3.91	3.88	3.86
-17.7	-18	4.18	4.16	4.14	4.11	4.09
-15.7	-16	4.42	4.39	4.37	4.34	4.32
-13.5	-14	4.68	4.65	4.63	4.60	4.57
-11.5	-12	4.94	4.91	4.88	4.85	4.82
-9.5	-10	5.20	5.17	5.14	5.11	5.08
-7.5	-8	5.46	5.43	5.40	5.36	5.33
-5.5	-6	5.59	5.55	5.52	5.48	5.44
-3.0	-4	5.71	5.68	5.64	5.60	5.56
-1.0	-2	5.84	5.80	5.76	5.72	5.67
1.0	0	5.97	5.92	5.88	5.83	5.79
2.0	1	6.03	5.98	5.94	5.89	5.85
3.0	2	6.45	6.40	6.35	6.30	6.25
5.0	4	7.29	7.23	7.18	7.12	7.06
7.0	6	8.13	8.06	8.00	7.93	7.87
9.0	8	8.42	8.36	8.29	8.23	8.16
11.5	10	8.72	8.65	8.59	8.52	8.46
13.5	12	9.20	9.13	9.06	9.00	8.92
15.5	14	9.69	9.61	9.53	9.47	9.39
16.5	16	9.93	9.85	9.77	9.71	9.62

PJG000Z035

Model FDUA100VNXVF Indoor unit FDUA100VF Outdoor unit FDC100VNX Cool Mode

Cool M	ode													_		(kW)
Outdoor							Indo	or air t	emper	ature						
air temp.	18°0	DB	21°C	DB	23°C	DB	26°C	DB	27℃	DB	28°C	DB	31°C	DB	33℃	DB
all tomp.	12°C	WB	14°C	WB	16℃	WB	18℃	WB	19°C	WB	20℃	WB	22°C	WB	24°C	WB
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					8.33	7.32	8.84	8.02	9.10	7.89	9.38	7.77	9.94	8.26	10.50	7.98
13					8.63	7.41	9.17	8.10	9.43	7.97	9.73	7.84	10.32	8.33	10.92	8.04
15					8.93	7.49	9.49	8.17	9.77	8.05	10.09	7.92	10.71	8.40	11.34	8.10
17					9.23	7.58	9.82	8.26	10.11	8.13	10.44	8.00	11.10	8.47	11.75	8.16
19					9.44	7.64	10.04	8.31	10.34	8.18	10.68	8.05	11.35	8.51	12.01	8.19
21					9.64	7.70	10.26	8.37	10.57	8.23	10.91	8.10	11.59	8.56	12.28	8.24
23					9.64	7.70	10.28	8.37	10.59	8.24	10.94	8.10	11.63	8.56	12.32	8.24
25			8.95	8.03	9.64	7.70	10.30	8.38	10.62	8.25	10.97	8.11	11.66	8.57	12.36	8.25
27			8.91	8.02	9.64	7.70	10.33	8.39	10.64	8.25	10.96	8.11	11.59	8.56		
29			8.84	8.00	9.51	7.66	10.16	8.34	10.48	8.21	10.80	8.07	11.45	8.53		
31			8.76	7.97	9.37	7.62	10.00	8.30	10.32	8.17	10.65	8.04	11.30	8.50		
33	8.21	7.37	8.58	7.91	9.23	7.58	9.83	8.26	10.16	8.14	10.49	8.01	11.15	8.48		
35	7.77	7.21	8.31	7.82	9.09	7.54	9.66	8.22	10.00	8.10	10.34	7.97	11.01	8.45		
37	7.68	7.18	8.18	7.78	8.92	7.49	9.49	8.17	9.81	8.06	10.13	7.93	10.77	8.41		
39	7.58	7.14	8.04	7.74	8.76	7.44	9.31	8.13	9.62	8.01	9.93	7.89	10.54	8.37		
41	7.49	7.11	7.91	7.69	8.59	7.39	9.14	8.09	9.43	7.97	9.73	7.84	10.31	8.33		
43	7.40	7.08	7.78	7.62	8.42	7.35	8.96	8.04	9.24	7.93	9.52	7.80	10.08	8.29		

Note(1)	These	data	show	average	statuses.
	D	40			1

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.

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)

)	Heat I	Mode:	НС				(kW)
]	Out	door	In	door a	ir tem	peratu	re
l	air te	emp.			°CDB		
1	°CDB	°CWB	16	18	20	22	24
1	-19.8	-20	7.30	7.24	7.18	7.12	7.06
1	-17.7	-18	7.74	7.68	7.62	7.55	7.49
1	-15.7	-16	8.18	8.12	8.05	7.99	7.92
1	-13.5	-14	8.54	8.47	8.40	8.33	8.27
1	-11.5	-12	8.89	8.82	8.75	8.68	8.61
1	-9.5	-10	9.25	9.17	9.10	9.03	8.95
1	-7.5	-8	9.60	9.53	9.45	9.38	9.30
1	-5.5	-6	10.00	9.92	9.84	9.76	9.68
1	-3.0	-4	10.39	10.31	10.23	10.14	10.06
1	-1.0	-2	10.79	10.70	10.62	10.53	10.44
1	1.0	0	11.18	11.09	11.01	10.91	10.82
1	2.0	1	11.38	11.29	11.20	11.10	11.01
1	3.0	2	11.38	11.29	11.20	11.10	11.01
1	5.0	4	11.38	11.29	11.20	11.11	11.01
1	7.0	6	11.37	11.29	11.20	11.11	11.01
1	9.0	8	11.85	11.76	11.67	11.58	11.48
1	11.5	10	12.32	12.23	12.15	12.05	11.95
	13.5	12	12.97	12.88	12.78	12.68	12.72
_	15.5	14	13.62	13.52	13.41	13.32	13.49
	16.5	16	13.95	13.84	13.72	13.63	13.87

PJG000Z035

⁽²⁾ Capacities are based on the following conditions.

Model FDUA125VNXVF Indoor unit FDUA125VF Outdoor unit FDC125VNX Cool Mode

Outdoor							Indo	or air t	emper	ature						
Outdoor air temp.	18°0	DB	21℃	DB	23℃	DB	26°C	DB	27°C	DB	28°C	DB	31℃	DB	33°C	DB
dii terrip.	12°C	WB	14°C	WB	16°C	WB	18℃	WB	19°C	WB	20℃	WB	22°C	WB	24℃	WB
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					10.41	8.77	11.05	9.56	11.37	9.41	11.72	9.27	12.42	9.83	13.12	9.49
13					10.79	8.88	11.46	9.67	11.79	9.52	12.16	9.37	12.91	9.92	13.65	9.57
15					11.16	8.99	11.87	9.77	12.22	9.62	12.61	9.47	13.39	10.01	14.17	9.65
17					11.54	9.11	12.27	9.88	12.64	9.73	13.05	9.57	13.87	10.11	14.69	9.74
19					11.80	9.19	12.55	9.96	12.93	9.80	13.34	9.64	14.18	10.17	15.02	9.79
21					12.05	9.26	12.83	10.03	13.21	9.87	13.64	9.71	14.49	10.23	15.34	9.84
23					12.05	9.26	12.85	10.04	13.24	9.88	13.67	9.72	14.54	10.24	15.40	9.85
25			11.19	9.65	12.05	9.26	12.88	10.05	13.27	9.89	13.71	9.73	14.58	10.25	15.45	9.86
27			11.14	9.63	12.05	9.26	12.91	10.06	13.30	9.89	13.70	9.73	14.49	10.23		
29			11.05	9.60	11.88	9.21	12.70	10.00	13.10	9.84	13.51	9.68	14.31	10.19		
31			10.95	9.57	11.71	9.16	12.49	9.94	12.90	9.79	13.31	9.63	14.13	10.16		
33	10.26	8.88	10.73	9.49	11.53	9.10	12.29	9.89	12.70	9.74	13.11	9.59	13.94	10.12		
35	9.71	8.67	10.39	9.37	11.36	9.05	12.08	9.83	12.50	9.69	12.92	9.54	13.76	10.08		
37	9.60	8.63	10.22	9.32	11.15	8.99	11.86	9.77	12.26	9.63	12.67	9.48	13.47	10.03		
39	9.48	8.58	10.05	9.26	10.94	8.92	11.64	9.71	12.03	9.57	12.41	9.42	13.18	9.97		
41	9.36	8.54	9.89	9.21	10.74	8.86	11.42	9.66	11.79	9.52	12.16	9.37	12.89	9.92		
43	9.25	8.49	9.72	9.15	10.53	8.80	11.21	9.60	11.55	9.46	11.90	9.31	12.60	9.86		

(kW)		Heat I	Mode:	НС				(kW)
	Ш	Out	door	In	door a	ir tem	peratu	·e
DВ	Ш	air te	emp.			°CDB		
VB	Ш	°CDB	℃WB	16	18	20	22	24
SHC	Ш	-19.8	-20	9.12	9.05	8.97	8.90	8.83
9.49	Ш	-17.7	-18	9.67	9.60	9.52	9.44	9.37
9.57	Ш	-15.7	-16	10.23	10.15	10.07	9.98	9.90
9.65	Ш	-13.5	-14	10.67	10.59	10.50	10.42	10.33
9.74	Ш	-11.5	-12	11.11	11.03	10.94	10.85	10.76
9.79	Ш	-9.5	-10	11.56	11.47	11.38	11.29	11.19
9.84	Ш	-7.5	-8	12.00	11.91	11.82	11.72	11.62
9.85	Ш	-5.5	-6	12.49	12.40	12.30	12.20	12.10
9.86	Ш	-3.0	-4	12.99	12.89	12.79	12.68	12.57
	Ш	-1.0	-2	13.48	13.38	13.27	13.16	13.05
	Ш	1.0	0	13.98	13.87	13.76	13.64	13.52
	Ш	2.0	1	14.22	14.11	14.00	13.88	13.76
	Ш	3.0	2	14.22	14.11	14.00	13.88	13.76
	Ш	5.0	4	14.22	14.11	14.00	13.88	13.76
	Ш	7.0	6	14.22	14.11	14.00	13.88	13.77
		9.0	8	14.81	14.70	14.59	14.47	14.35
	П	11.5	10	15.41	15.29	15.18	15.06	14.94
	П	13.5	12	16.22	16.09	15.97	15.85	15.90
	1	15.5	14	17.03	16.90	16.76	16.65	16.86
		16.5	16	17.44	17.30	17.16	17.04	17.34

PJG000Z035

22

24

Indoor air temperature

°CDB

20

10.42 10.34 10.26 10.17 10.09 11.06 10.97 10.88 10.79 10.70

16.25 | 16.13 | 16.00 | 15.86 | 15.73 16.12 16.00

> 18.25 18.12 18.17

19.61

Model FDUA140VNXVF Indoor unit FDUA140VF Outdoor unit FDC140VNX Cool Mode

Cool M		A140	• 147.		10001	uiiit i	Вол	14011		ataooi	unit	100	1-10 0 1 4	^		(kW)	<u> </u>	leat I	Mode:	HC
Outdoor							Indo	or air t	emper	ature							lΓ	Out	door	
air temp.	18°C	DB	21°C	DB	23°C	CDB	26°0	DB	27°C	DB	28℃	DB	31°C	DB	33°C	DB	П	air te	emp.	
all temp.	12°C	:WB	14°C	:WB	16°C	WB	18℃	WB	19°C	:WB	20℃	WB	22°C	WB	24°C	:WB	(℃DB	℃WB	16
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	l I-	-19.8	-20	10.4
11					11.66	9.85	12.38	10.75	12.73	10.58	13.13	10.42	13.91	11.05	14.70	10.66	l F	-17.7	-18	11.0
13					12.08	9.98	12.83	10.87	13.21	10.70	13.62	10.53	14.45	11.15	15.28	10.75	l F	-15.7	-16	11.69
15					12.50	10.10	13.29	10.99	13.68	10.81	14.12	10.64	14.99	11.25	15.87	10.84	l F	-13.5	-14	12.20
17					12.92	10.23	13.75	11.11	14.16	10.93	14.62	10.75	15.54	11.36	16.45	10.93	l E	-11.5	-12	12.7
19					13.21	10.31	14.06	11.19	14.48	11.01	14.95	10.83	15.88	11.42	16.82	10.99	П	-9.5	-10	13.2
21					13.50	10.40	14.36	11.27	14.80	11.09	15.28	10.91	16.23	11.49	17.19	11.05	П	-7.5	-8	13.7
23					13.50	10.40	14.40	11.28	14.83	11.10	15.31	10.91	16.28	11.50	17.25	11.06	П	-5.5	-6	14.2
25			12.53	10.84	13.50	10.40	14.43	11.29	14.87	11.11	15.35	10.92	16.33	11.51	17.30	11.07	П	-3.0	-4	14.8
27			12.48	10.83	13.50	10.40	14.46	11.30	14.90	11.11	15.34	10.92	16.23	11.49			П	-1.0	-2	15.4
29			12.37	10.79	13.31	10.35	14.23	11.24	14.68	11.06	15.13	10.87	16.03	11.45			П	1.0	0	15.9
31			12.26	10.75	13.11	10.28	13.99	11.17	14.45	11.00	14.91	10.82	15.82	11.41			П	2.0	1	16.2
33	11.49	9.97	12.02	10.67	12.92	10.23	13.76	11.11	14.23	10.95	14.69	10.77	15.61	11.37			П	3.0	2	16.2
35	10.88	9.74	11.63	10.54	12.72	10.17	13.53	11.05	14.00	10.89	14.47	10.72	15.41	11.33			П	5.0	4	16.2
37	10.75	9.69	11.45	10.48	12.49	10.10	13.29	10.99	13.74	10.83	14.18	10.65	15.08	11.27			ΙГ	7.0	6	16.2
39	10.62	9.65	11.26	10.41	12.26	10.03	13.04	10.92	13.47	10.76	13.90	10.59	14.76	11.21			П	9.0	8	16.9
41	10.49	9.60	11.07	10.35	12.02	9.96	12.80	10.86	13.21	10.70	13.62	10.53	14.44	11.15			П	11.5	10	17.6
43	10.35	9.55	10.89	10.29	11.79	9.89	12.55	10.80	12.94	10.63	13.33	10.46	14.11	11.09			П	13.5	12	18.5

-11.5	-12	12.70	12.60	12.50	12.40	12.30
-9.5	-10	13.21	13.11	13.00	12.90	12.79
-7.5	-8	13.71	13.61	13.50	13.39	13.28
-5.5	-6	14.28	14.17	14.06	13.94	13.83
-3.0	-4	14.84	14.73	14.61	14.49	14.37
-1.0	-2	15.41	15.29	15.17	15.04	14.91
1.0	0	15.97	15.85	15.72	15.59	15.45
2.0	1	16.26	16.13	16.00	15.86	15.73
2.0	2	16.25	16 13	16.00	15.96	15.73

16.25

16.93 16.80

17.61 17.48 17.35

18.53 18.39

19.93 19.77

19.46 19.31 19.16

18 16

-15.7 -16 11.69 11.60 11.50 11.41 11.32 -13.5 -14 12.20 12.10 12.00 11.91 11.81

15.5 14

16.5

16

Note(1) These data show average statuses.

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 (Cooling only)

(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)

19.48 PJG000Z035

19.82

15.87 15.73

16.54 16.40

17.21 17.07

19.02 19.27 Model FDUA100VNVF Indoor unit FDUA100VF Outdoor unit FDC100VN Cool Mode

Outdoor							Indo	or air t	emper	ature						
air temp.	18℃	DB	21℃	DB	23℃	DB	26℃	DB	27℃	DB	28℃	DB	31℃	DB	33℃	DB
all tomp.	12°C	WB	14°C	WB	16℃	WB	18℃	WB	19°C	WB	20℃	WB	22°C	WB	24°C	WB
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					8.12	7.26	8.59	7.96	8.82	7.83	9.07	7.71	9.56	8.20	10.06	7.92
13					8.50	7.37	9.00	8.05	9.26	7.93	9.52	7.80	10.06	8.28	10.60	7.99
15					8.88	7.48	9.42	8.16	9.69	8.03	9.98	7.90	10.56	8.37	11.14	8.07
17					9.26	7.59	9.84	8.26	10.12	8.13	10.43	7.99	11.05	8.46	11.67	8.14
19					9.46	7.64	10.05	8.32	10.34	8.18	10.65	8.04	11.29	8.50	11.92	8.18
21					9.65	7.70	10.25	8.37	10.56	8.23	10.88	8.09	11.52	8.54	12.16	8.22
23					9.65	7.70	10.28	8.37	10.59	8.24	10.91	8.10	11.56	8.55	12.21	8.22
25			8.93	8.03	9.64	7.70	10.31	8.38	10.62	8.25	10.95	8.11	11.61	8.56	12.27	8.23
27			8.86	8.00	9.64	7.70	10.34	8.39	10.65	8.25	10.96	8.11	11.57	8.55		
29			8.80	7.98	9.50	7.66	10.17	8.35	10.49	8.21	10.81	8.08	11.45	8.53		
31			8.73	7.96	9.35	7.61	9.99	8.30	10.32	8.17	10.66	8.04	11.32	8.51		
33	8.22	7.37	8.58	7.91	9.21	7.57	9.82	8.26	10.16	8.14	10.51	8.01	11.19	8.48		
35	8.05	7.31	8.44	7.86	9.06	7.53	9.64	8.21	10.00	8.10	10.36	7.98	11.07	8.46		
37	7.92	7.26	8.30	7.82	8.91	7.49	9.46	8.17	9.79	8.05	10.13	7.93	10.80	8.41		
39	7.78	7.21	8.16	7.77	8.75	7.44	9.28	8.12	9.59	8.01	9.90	7.88	10.53	8.37		
41	7.64	7.16	8.02	7.73	8.60	7.40	9.09	8.08	9.38	7.96	9.68	7.83	10.26	8.32		
43	7.50	7.11	7.88	7.69	8.45	7.36	8.91	8.03	9.18	7.91	9.45	7.79	9.99	8.27		

(kW)		Heat Mode:HC (kW										
		Out	door	In	door a	ir temp	peratu	re				
DВ		air te	emp.			°CDB						
VB		°CDB	°CWB	16	18	20	22	24				
SHC	П	-19.8	-20	5.64	5.62	5.60	5.58	5.56				
7.92	П	-17.7	-18	5.97	5.95	5.92	5.90	5.87				
7.99		-15.7	-16	6.30	6.27	6.25	6.22	6.19				
8.07		-13.5	-14	6.66	6.63	6.60	6.57	6.54				
8.14		-11.5	-12	7.03	6.99	6.96	6.93	6.90				
8.18		-9.5	-10	7.39	7.36	7.32	7.29	7.25				
8.22		-7.5	-8	7.75	7.72	7.68	7.64	7.60				
8.22		-5.5	-6	7.92	7.88	7.85	7.80	7.76				
8.23		-3.0	-4	8.10	8.05	8.01	7.97	7.92				
		-1.0	-2	8.27	8.22	8.18	8.13	8.08				
		1.0	0	8.44	8.39	8.34	8.29	8.24				
		2.0	1	8.52	8.47	8.42	8.37	8.32				
		3.0	2	9.08	9.03	8.98	8.94	8.90				
		5.0	4	10.21	10.15	10.09	10.08	10.07				
		7.0	6	11.33	11.27	11.20	11.22	11.23				
		9.0	8	11.78	11.71	11.64	11.62	11.59				
		11.5	10	12.23	12.16	12.09	12.02	11.94				
		13.5	12	12.91	12.83	12.75	12.65	12.60				
		15.5	14	13.59	13.50	13.42	13.29	13.26				
		16.5	16	13.93	13.84	13.75	13.61	13.59				

PJG000Z035

Model FDUA160VSVF Indoor unit FDUA160VF Outdoor unit FDCA160VS Cool Mode

Outdoor	Indoor air temperature															
air temp.	18°C	DB	21℃	DB	23℃	DB	26℃	DB	27℃	DB	28℃	DB	31℃	DB	33°C	DB
un tomp.	12°C	WB	14°C	:WB	16°C	WB	18℃	WB	19°C	WB	20℃	WB	22°C	WB	24°C	WB
°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
11					13.37	10.74	14.15	11.63	14.55	11.47	14.97	11.30	15.80	11.92	16.64	11.53
13					13.90	10.92	14.74	11.81	15.15	11.64	15.60	11.46	16.50	12.08	17.39	11.67
15					14.43	11.09	15.32	11.98	15.76	11.81	16.23	11.63	17.18	12.24	18.13	11.82
17					14.96	11.28	15.89	12.16	16.36	11.98	16.87	11.80	17.87	12.40	18.87	11.97
19					15.28	11.39	16.23	12.26	16.71	12.08	17.22	11.90	18.24	12.49	19.26	12.05
21					15.48	11.45	16.57	12.37	17.05	12.18	17.57	12.00	18.60	12.58	19.64	12.13
23					15.44	11.44	16.55	12.36	17.04	12.18	17.56	11.99	18.60	12.58	19.64	12.13
25			14.12	11.77	15.40	11.43	16.53	12.36	17.02	12.17	17.55	11.99	18.59	12.57	19.64	12.13
27			14.03	11.74	15.37	11.42	16.52	12.35	17.01	12.17	17.50	11.98	18.48	12.55		
29			13.93	11.70	15.14	11.34	16.26	12.27	16.76	12.10	17.26	11.91	18.26	12.49		
31			13.82	11.66	14.92	11.26	15.99	12.19	16.50	12.02	17.02	11.84	18.05	12.44		
33	13.16	10.94	13.68	11.60	14.70	11.19	15.73	12.11	16.26	11.95	16.78	11.78	17.83	12.39		
35	12.90	10.83	13.47	11.52	14.48	11.11	15.46	12.03	16.00	11.88	16.54	11.71	17.61	12.34		
37	12.67	10.74	13.25	11.44	14.23	11.03	15.16	11.93	15.66	11.78	16.18	11.62	17.20	12.24		
39	12.46	10.65	13.03	11.36	13.99	10.95	14.85	11.84	15.34	11.69	15.81	11.52	16.78	12.14		
41	12.24	10.56	12.81	11.28	13.74	10.86	14.54	11.75	15.00	11.59	15.45	11.43	16.36	12.05		
43	12.02	10.47	12.59	11.20	13.49	10.78	14.24	11.66	14.66	11.50	15.09	11.33	15.94	11.95		

Note(1)	These	data	show	average	statuses.	
	TO.	1.	- 1		. 1	ı,

te(1) These data show average statuses.

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.(Cooling only)

(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)

(kW)		Heat I	Mode:	НС				(kW)
		Out	door	In	door a	ir temp	peratur	e.
DВ	П	air te	emp.			°CDB		
VB		°CDB	°CWB	16	18	20	22	24
SHC		-19.8	-20	9.06	9.04	9.02	8.99	8.97
11.53		-17.7	-18	9.58	9.55	9.52	9.50	9.46
11.67		-15.7	-16	10.10	10.06	10.03	9.99	9.96
11.82		-13.5	-14	10.67	10.64	10.59	10.55	10.52
11.97		-11.5	-12	11.25	11.20	11.16	11.12	11.07
12.05		-9.5	-10	11.83	11.78	11.73	11.68	11.63
12.13		-7.5	-8	12.40	12.35	12.30	12.24	12.19
12.13		-5.5	-6	12.67	12.61	12.56	12.50	12.44
12.13		-3.0	-4	12.94	12.87	12.81	12.75	12.68
		-1.0	-2	13.21	13.14	13.07	13.00	12.93
		1.0	0	13.48	13.41	13.33	13.25	13.18
		2.0	1	13.62	13.54	13.46	13.38	13.31
		3.0	2	14.54	14.45	14.37	14.30	14.23
		5.0	4	16.38	16.28	16.18	16.14	16.09
		7.0	6	18.23	18.11	18.00	17.97	17.95
		9.0	8	18.89	18.78	18.66	18.56	18.45
		11.5	10	19.55	19.44	19.33	19.15	18.96
		13.5	12	20.62	20.49	20.36	20.17	20.01
	'	15.5	14	21.68	21.53	21.39	21.20	21.07
		16.5	16	22.21	22.06	21.90	21.71	21.59

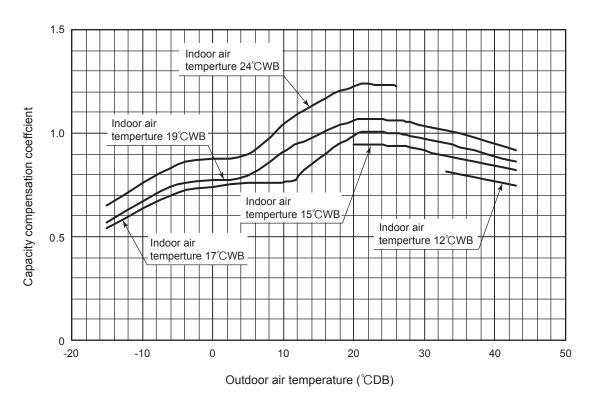
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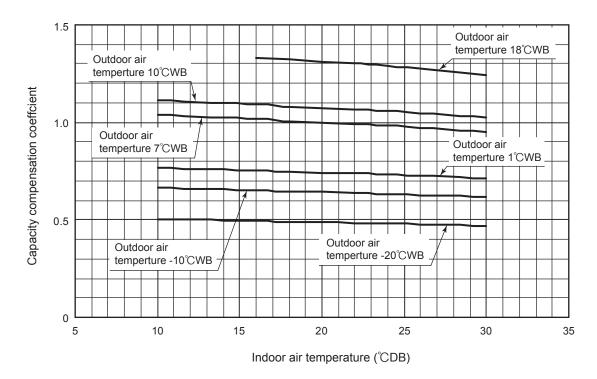
[References data]

Capacity variation against outdoor and indoor temperature at rated capacity condition.

(I) Model FDC71VNX

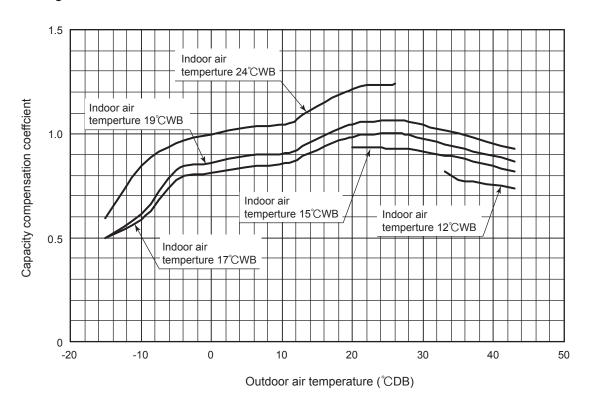
1 Cooling

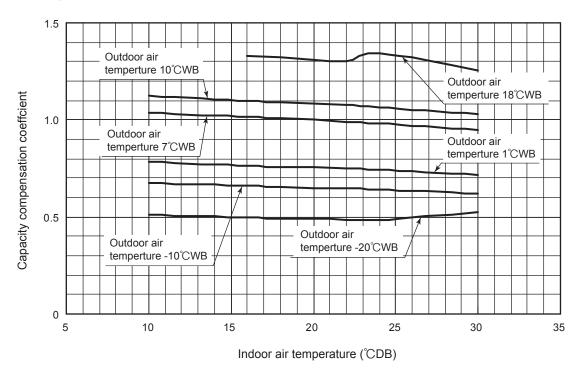




$({\tt I\hspace{-.1em}I})$ Models FDC100, 125, 140VNX

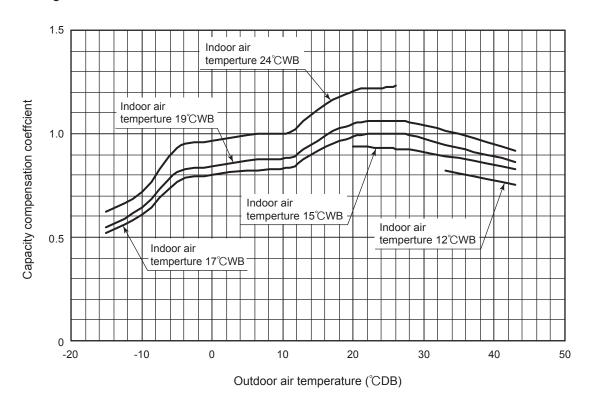
1 Cooling

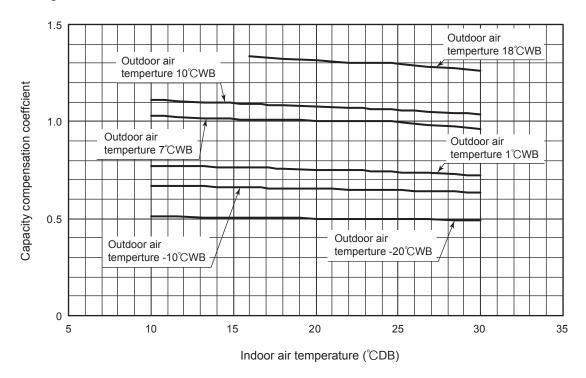




(III) Model FDC100VN

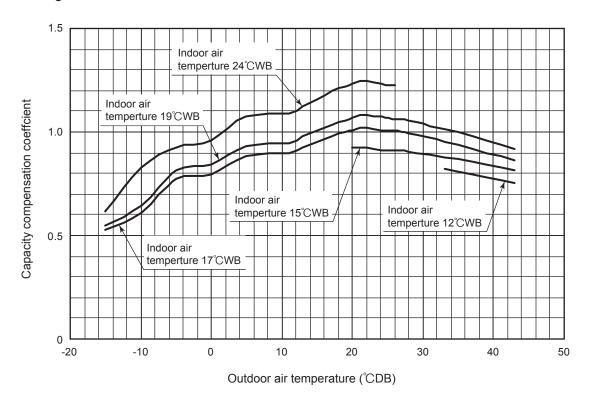
1 Cooling

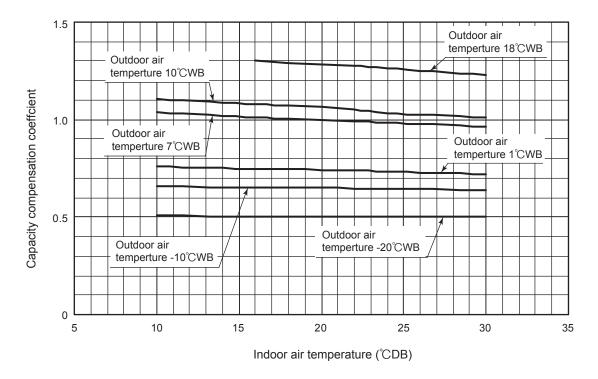




(IV) Model FDCA160VS

1 Cooling





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

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.

(1) Models FDUA71 - 140VNXVF

Equivale	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
	71 model		1	0.996	0.989	0.982	0.975	0.968	0.961	0.954	0.947	0.940	0.933
	100 model	A 15 00	1	0.991	0.978	0.964	0.951	0.937	0.924	0.910	0.897	0.883	0.870
	125 model	ϕ 15.88	1	0.986	0.968	0.950	0.932	0.914	0.896	0.878	0.860	0.842	0.824
Cooling	140 model		1	0.985	0.966	0.946	0.927	0.907	0.888	0.868	0.849	0.829	0.810
Cooming	71 model		1.008	1.006	1.003	1	0.997	0.994	0.991	0.988	0.985	0.982	0.979
	100 model	φ 19.05	1.016	1.013	1.007	1.002	0.996	0.991	0.985	0.980	0.974	0.969	0.963
	125 model	Ψ 19.03	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

Equivale	nt piping length(1) (m	1)	60	65	70	75	80	85	90	95	100	105
Heating	eating		0.983	0.983	0.978	0.978	0.973	0.973	0.968	0.968	0.963	0.963
	71 model		_	_	_	_	_	_	_	_	_	_
	100 model	φ 15.88	0.856	0.834	0.829	0.816	0.803	0.789	0.776	0.762	0.749	0.736
	125 model	Ψ13.88	0.806	0.788	0.770	0.752	0.734	0.716	0.698	0.680	0.662	0.644
Cooling	140 model		0.790	0.771	0.751	0.732	0.712	0.693	0.673	0.654	0.634	0.615
Occining	71 model		_	_	_	_	_	_	_	_	_	_
	100 model	φ 19.05	0.959	0.955	0.951	0.948	0.944	0.940	0.936	0.932	0.929	0.926
	125 model	Ψ 19.03	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.

(2) Model FDUA100VNVF

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	φ 15.88	1	0.991	0.978	0.964	0.951	0.937	0.924	0.910	0.897	0.883	0.870
	φ 19.05	1.016	1.013	1.007	1.002	0.996	0.991	0.985	0.980	0.974	0.969	0.963

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.

(3) Model FDUA160VSVF

Equivalent 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
	φ 25.4	1.012	1.008	1.002	0.996	0.990	0.984	0.978	0.972	0.966	0.960	0.953	0.947	0.941	0.935	0.929
Cooling	ϕ 22.22	1	0.995	0.985	0.975	0.965	0.954	0.944	_	_	_	_	_	_	_	_
	ϕ 28.58	1.016	1.015	1.011	1.008	1.004	1.001	0.997	0.994	0.990	0.987	0.983	0.980	0.976	0.973	0.969

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)	φ 12.7	ϕ 15.88	ϕ 19.05	ϕ 22.22	ϕ 25.4	ϕ 28.58
Equivalent Bend Length	0.20	0.25	0.30	0.35	0.40	0.45

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	098	0.97	0.96	0.95	0.94

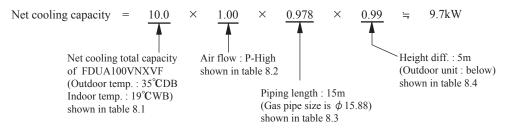
Piping length limitations

Model	FDUA71VNXVF, 100VNVF	FDUA100, 125, 140VNXVF	FDUA160VSVF
Max. one way piping length	50m	100m	70m
Max. vertical height difference		Outdoor unit is higher 30m 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 FDUA100VNXVF 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° C and outdoor dry-bulb temperature 35° C is



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9 APPLICATION DATA

9.1 Installation of indoor unit

(1) Indoor unit

This manual is for the installation of an indoor unit.

For electrical wiring work (Indoor), refer to page 52. For remote control installation, refer to page 56. For wireless kit installation, refer to page 208. For electrical wiring work (Outdoor) and refrigerant pipe work installation for outdoor unit, refer to page 70.

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, [AWARNING] and [ACAUTION] AWARNING: Wrong installation would cause serious consequences such as injuries or death.

 ACAUTION: 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

• Install the system correctly according to these installation manuals. er installation may cause explosion, injury, water leakage, electric shock, and fire

● Check the density refered by the foundula (accordance with ISO5149).

If the density exceeds the limit density, please consult the dealer and installate the ventilation system.

Use the genuine accessories and the specified parts for installation. 0 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.

Install the unit in a location that can hold heavy weight. Improper installation may cause the unit to fall leading to accident

• 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 $\frac{1}{2}$

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

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 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

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 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 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

Shut off the power before electrical wiring work.

It could cause electric shock, unit failure and improper running

PJG012D002A

⚠ 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 coul cause unit failure and electric shock or fire due to a short circuit.

Earth leakage breaker must be installed.

If the earth leakage breaker is not installed, it could cause electric shocks or fire

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 canacity 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, 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 Do not install not use tile system med equipment within general properties of the state of the s

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.

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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 Places where machinery which generates high harmonics is used.

On vehicles and ships

Places where cosmetics or special sprays are

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 intel 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 experience with a supplemental productions of the infrared experience with a supplemental production.)

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 put any valuables which will break down by getting wet under the air conditioner.

n could drop when the relative humidity is higher than 80% or drain pipe is clogged, and it damages user's 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.

Improper connection of the drain pipe may cause dropping water into room and damaging user's belongings

 Do not share the drain pipe for indoor unit and GHP (Gas Heat Pump system) outdoor unit Toxic exhaust gas would flow into room and it might cause serious damage (some poisoning or deficiency of oxygen) to user's health and safety

 Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping w 0 If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxy 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 main

 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 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 by the aluminum fin.

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 but

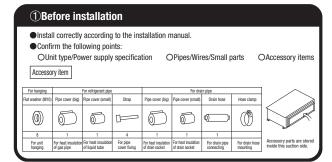
 Do not clean up the air conditioner with water. It could cause electric shock.

 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

OThis model is middle static ducted type air conditioning unit. Therefore, do not use this model for direct blow type air conditioning unit.



2 Selection of installation location 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 airflow 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 28°C and relative humidity is lower than 80% This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, 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.)

 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

Make installation altitude over 2.5m.

(Indoor Unit)

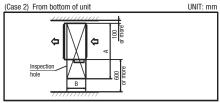
Select either of two cases to keep space for installation and services.



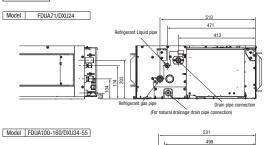
		Olair. IIIIII
FDUA	71	100-160
DXU	24	34-55
A	1000	1200
В	370	450

UNIT: mm

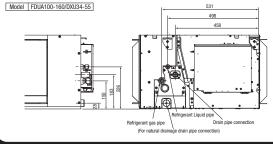
Notes (a) There must not be obstacle to draw out fan motor. (marked area) (b) Install refrigerant pipe, drain pipe, and wiring so as not to cross marked area

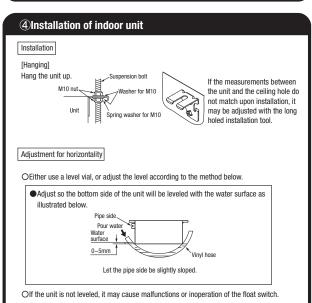


③Preparation before installation If suspension bolt becomes longer, do reinforcement of earthquake resistant. OFor grid ceiling When the suspension bolt length is over 500mm, or the gap between the ceiling and roof is over 700mm, apply earthquake resistant brace to the bolt. Oln case the unit is hanged directly from the slab and is installed on the ceiling plane which has enough strength. When suspension bolt length is over 1000mm, apply the earthquake resistant brace to the bolt. Prepare four (4) sets of suspension bolt, nut and spring washer (M10) on site. Suspension Bolt Location Return duct O Adhere to the below for the length of the suspension bolts. Air supply duct 100-160



Pipe locations UNIT: mm





⑤Duct Work

- ①A corrugated board (for preventing sputtering) is attached to the main body of the air conditioner (on the outlet port). Do not remove it until connecting the duct.
 - An air filter can be provided on the main body of the air conditioner (on the inlet port). Remove it when connecting the duct on the inlet port.

2 Blowout duct

- Use rectangular duct to connect with unit.
- Duct size for each unit is as shown below.

	A	882	900	
	В	172	350	
		A		
				
_Ŧ				9
립	[]		17	8
<u> </u>				

- Duct should be at their minimum length.
- •We recommend to use sound and heat insulated duct to prevent it from condensation.
- Connect duct to unit before ceiling attachment.

3 Inlet port

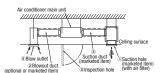
• When connecting the duct to the inlet port, remove the air filter if it is fitted to the inlet port.

UNIT: mm

Inlet port size for each unit is as shown below.

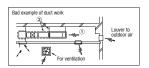
	DXU	24	34-55	
	A	742 202	900	
	В	202	350	
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- Make sure to insulate the duct to prevent dewing on it.
- (4)Install the specific blowout duct in a location where the air will circulate to the entire room.
- Conduct the installation of the specific blowout hole and the connection of the duct before attaching them to the ceiling.
- Insulate the area where the duct is secured by a band for dew condensation prevention.
- (5) Make sure provide an inspection hole on the ceiling. It is indispensable to service electric equipment, motor, functional components and cleaning of heat exchanger.



Bad example of duct work

- ①If a duct is not provided at the suction side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the out door air louver, weather (rainy day) and others.
 - a)Moisture in air is likely to condense over the external plates of the unit and to drip on the ceiling. Unit should be operated under the conditions as listed in the above table and within the limitation of wind volume. When the building is a concrete structure, especially immediately after the construction, humidity tends to rise even if the space over the ceiling is not substituted in place of a duct. In such occasion, it is necessary to insulate the entire unit with glass wool (25mm). (Use a wire net or equivalent to hold the glass wool in place.)
 - b)It may run out the allowable limit of unit operation (Example: When outdoor air temperature is 35°C DB, suction air temperature is 27°C WB) and it could result in such troubles as compressor overload, etc..
- c)There is a possibility that the blow air volume may exceed the allowable range of operation due to the capacity of ventilation fan or strength of wind blowing against external air louver so that drainage from be heat exchanger may fall to reach the drain pan but leak outside (Example: drip on to the ceiling) with consequential water leakage in the room.
- ②If vibration damping is not conducted between the unit and the duct, and between the unit and the slab, vibration will be transmitted to the duct and vibration noise may occur. Also, vibration may be transmitted from the unit to the slab. Vibration damping must be performed.



5 Duct Work (continued)

Connecting the air intake/vent ducts

1)Fresh Air Intake

[for air intake duct only]

OUse the side fresh air intake hole, or supply through a part of the suction duct.

[for simultaneous air intake/vent]
OIntake air through the suction duct.
(the side cannot be used)

②Air Vent

OUse the side air vent hole.
(always use together with the air intake)

Side fresh air intake hole

Fresh air intake through the suction duct

Air vent hole

Air vent hole

Fresh air intake through the suction duct

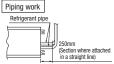
Olnsulate the duct to protect it from dew condensation

6Refrigerant pipe

Caution

Secure with a band, etc.

- Use the new refrigerant pipe.
- When re-using the existing pipe system for R22 or R407C, pay attention to the following items.
- Change the flare nuts with the attached ones (JIS category 2), and reprocess the flare parts.
- · Do not use thin-walled pipes.
- Use phosphorus deoxidized copper alloy seamless pipe (C1220T specified in JIS H3300) 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 R410A.
- Using other refrigerant except R410A (R22 etc.) 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 R410A refrigerant.



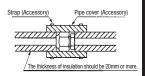
When conducting piping work, make sure to allow the pipes to be aligned in a straight line for at least 250 mm, as shown in the left illustration. (This is necessary for the drain pump to function)

Work procedure

- 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.)
- Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit. XBend the pipe with as big radius as possible and do not bend the pipe repeatedly. In addition, do not twist and crush the pipes.
 - *Do a flare connection as follows:
 - 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.
 - 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 below. Make sure to hold the pipe on the indoor unit securely by a spanner when tightening the nut in order to avoid unexpected stress on the copper pipe.
- 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
- 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.

Pipe diameter	Tightening torque N·m
φ 6.35	14 to 18
φ 9.52	34 to 42
φ 12.7	49 to 61
φ 15.88	68 to 82
φ 19.05	100 to 120



7 Drain pipe

Caution

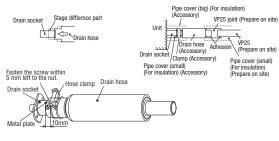
- Install the drain pipe according to the installation manual in order to drain properly.
 Imperfection in draining may cause flood indoors and wetting the household goods, etc.
- Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is 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.

Work procedure

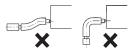
Make sure to insert the drain hose (the end mode of soft PVC) to the end of the step part
of drain socket.

Attach the hose clamp to the drain hose around 10mm from the end, and fasten the screw within 5mm left to the nut.

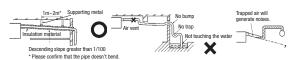
- Do not apply adhesives on this end.
- Do not use acetone-based adhesives to connect to the drain socket.



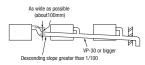
- Prepare a joint for connecting VP-25 pipe, adhere and connect the joint to the drain hose (the
 end made of rigid PVC), and adhere and connect VP-25 pipe (prepare on site).
 XAs for drain pipe, apply VP-25 made of rigid PVC which is on the market.
 - Make sure that the adhesive will not get into the supplied drain hose.
 It may cause the flexible part broken after the adhesive is dried up and gets rigid.
 - The flexible drain hose is intended to absorb a small difference at installation of the unit or drain pipes. Intentional bending, expanding may cause the flexible hose broken and water leakage.



- Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway.
 - Pay attention not to give stress on the pipe on the indoor unit side, and support and fix the pipe as close place to the unit as possible when connecting the drain pipe.
 - Do not set up air vent.



●When sharing a drain pipe for more than one unit, lay the main pipe 100mm below the drain outlet of the unit. In addition, select VP-30 or bigger size for main drain pipe.

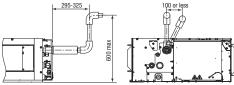


- 4. Insulate the drain pipe.
- Be sure to insulate the drain socket and rigid PVC pipe installed indoors otherwise it may cause dew condensation and water leakage.
 - After drainage test implementation, cover the drain socket part with pipe cover (small size), then use the pipe cover (big size) to cover the pipe cover (small size), clamps and part of the drain hose, and fix and wrap it with tapes to wrap and make joint part gapless.

7 Drain pipe (continued)

Drain up

• The position for drain pipe outlet can be raised up to 600mm above the ceiling. Use elbows for installation to avoid obstacles inside ceiling. If the horizontal drain pipe is too long before vertical pipe, the backflow of water will increase when the unit is stopped, and it may cause overflow of water from the drain pan on the indoor unit. In order to avoid overflow, keep the horizontal pipe length and offset of the pipe within the limit shown in the figure below.



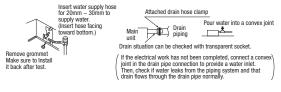
Otherwise, the construction point makes it same as drain pipe construction

Drain test

- 1. Conduct a drain test after completion of the electrical work.
- During the trail, make sure that drain flows properly through the piping and that no water leaks from connections.
- 3. In case of a new building, conduct the test before it is furnished with the ceiling.
- 4. Be sure to conduct this test even when the unit is installed in the heating season.

Procedures

- 1. Supply about 1000 cc of water to the unit through the air outlet by using a feed water pump.
- 2. Check the drain while cooling operation.



Outline of bottom drain piping work

● If the bottom drain piping work

If the bottom drain piping can be done with a descending gradient (1/50-1/100), it is possible to connect the pipes as shown in the drawing below.

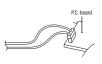
Connecting port of bottom drain pipes

Connecting port of bottom dra

Uncoupling the drain motor connector

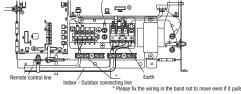
Uncouple the connector CNR for the drain motor as illustrated in the drawing on the right.

Note: If the unit is run with the connector coupled, drain water will be discharged from the upper drain pipe joint, causing a water leak.



®Wiring-out position and wiring connection

- Electrical installation work must be performed according to the installation manual by an electrical installation service provider qualified by a power provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country.
 - Be sure to use an exclusive circuit.
- Use specified cord, fasten the wiring to the terminal securely, and hold the cord securely in
 order not to apply unexpected stress on the terminal.
- Do not put both power source line and signal line on the same route. It may cause miscommunication and malfunction.
- For the details of electrical wiring work, see attached instruction manual for electrical wiring work.
- Remove a lid of the control box (2 screws).
- Hold each wiring inside the unit and fasten them to terminal block securely.
 Fix the wiring with clamps.
- 4. Install the removed parts back to original place.



You can set External Static Pressure (E.S.P.) by method of MANUAL SETTING on remote control. Indoor unit will control fan-speed to keep rated air flow volume at each fan speed setting (Lo-Uhi) You can set required E.S.P. by wired remote control that calculated with the set air flow rate and pressure loss of the duct connected.

- How to set E.S.P. by wired remote control
 - ① Push "◆" marked button(E.S.P. button). ② Select indoor unit No. by using ◆ button.

 - ③ Select setting No. by using ♦ button and set E.S.P. by button. See detailed procedure in technical manual.

Notice

You can NOT set E.S.P. by wireless remote control.

E.S.P. buttor

With E.S.P. setting, confirm that actual E.S.P. agrees with E.S.P. setting.
When E.S.P. setting is higher than actual E.S.P., the airflow rate becomes excessively higher. This will cause water leakage if water splashes.

When E.S.P. setting is lower than actual E.S.P., the airflow rate becomes excessively lower and the

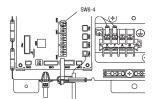
cooling or heating may become ineffective.

In order to reduce the risk above the factory E.S.P. setting is set within the range of 80 - 150 Pa (E.S.P. setting No. 8-15). Be sure to use within the range of 80-150 Pa in actual operations. If actual E.S.P. is lower than 80 Pa, it may cause water leakage.

 Setting No.
 8
 9
 10
 11
 12
 13
 14
 15

 E.S.P (Pa)
 80
 90
 100
 110
 120
 130
 140
 150

 \times If 1 – 7 is selected for the setting No. on the remote control, the setting No. shows No. 8. If 16 – 20 is selected for the setting No. on the remote control, the setting No. shows No. 15. Factory default is No. 8.







If SW8-4 is turned to "ON", E.S.P. setting range can be changed to 10 – 200 Pa (E.S.P. setting No. 1 – 19). This should not be used when actual E.S.P. cannot be confirmed, because the risk above becomes higher.

Setting No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
E.S.P. (Pa)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	200

* If 20 is selected for the setting No. on the remote control, the setting No. shows No. 19.

① Check list after installation

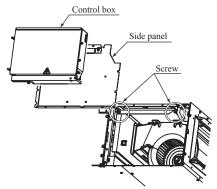
• Check the following items after all installation work completed.

Check if	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Supply voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
No 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 airflow on air inlet and outlet?	Insufficient capacity	
Is setting of E.S.P finished?	Excessive air flow, water drop blow out	

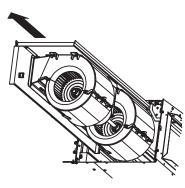
(2) Replacement procedure of the fan unit

Notes(1) The unit is a heavy item. It must be supported securely and handled with care not to drop when it is necessary to replace.

- (2) For the maintenance space, refer to page 47.
- (a) Remove the control box and the side panel, and remove the screws marked in the circles (2 places) in the figure.



(b) Take out the fan unit in the arrow direction.



PSB012D994

9.2 Electric wiring work installation

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.

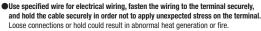
- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ACAUTION .

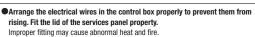
AWARNING: Wrong installation would cause serious consequences such as injuries or death. ACAUTION: Wrong installation might cause serious consequences depending on circumstances. Both mentions the important items to protect your health and safety so strictly follow

- The meanings of "Marks" used here are as shown on the right:
- Never do it under any circumstances.
- Accord with following items. Otherwise, there will be the risks of electric shock and fire caused by overheating or short circuit.

↑WARNING

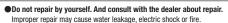
- Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit
 - Power source with insufficient capacity and improper work can cause electric shock and fire.







If you install the unit by yourself, it could cause water leakage, electric shock and fire





Improper installation may cause water leakage, electric shock or fire. Turn off the power source during servicing or inspection work.

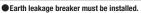
If the power is supplied during servicing or inspection work, it could cause electric

shock and injury by the operating fan. Shut off the power before electrical wiring work. It could cause electric shock, unit failure and improper running

ACAUTION

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 or fire due to a short circuit.



If the earth leakage breaker is not installed, it could cause electric shocks or fire

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. 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.

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

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

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.

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1 Electrical Wiring Connection

- Use three-core cable as wiring between indoor and outdoor unit. As for detail, refer to "INSTAL-LATION MANUAL" of outdoor Unit.
- Set earth of D-type
- Keep "remote control line" and "power source line" away from each other on constructing of unit outside.
- Run the lines (power source, remote control and "between indoor and outdoor unit") upper ceiling through iron pipe or other tube protection to avoid the damage by mouse and so on.
- Do not add cord in the middle of line route (of power source, remote control and "between indoor and outdoor unit") on outside of unit. If connecting point is flooded, it could cause problem as for electric or communication. (In the case that it is necessary to set connecting point on the way, perform thorough waterproof measurement.)
- Do not connect the power source line [220V/240V/380V/415V] to signal side terminal block. Otherwise, it could cause failure.
- Screw the line to terminal block without any looseness, certainly.
- Do not turn on the switch of power source, before all of line work is done.
- Connection of the line ("Between indoor and outdoor unit", Earth and Remote control)
- (1) Remove lid of control box before connect the above lines, and connect the lines to terminal block according to number pointed on label of terminal block.

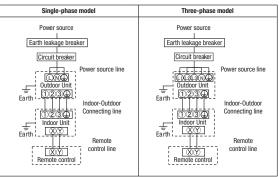
In addition, pay enough attention to confirm the number to lines, because there is electrical polarity except earth line. Furthermore, connect earth line to earth position of terminal block of nower source

- 2)Install earth leakage breaker on power source line. In addition, select the type of breaker for inverter circuit as earth leakage breaker.
- ③If the function of selected earth leakage breaker is only for earth-fault protection, hand switch (switch itself and type "B" fuse) or circuit breaker is required in series with the earth leakage hreaker
- (4) Install isolator or disconnect switch on the power supply wiring in accordance with the local codes and regulations

The isolator should be set in the box with key to prevent touching by another person when servicing.

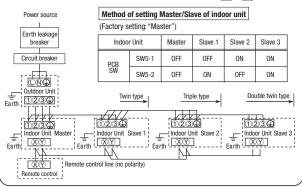
Cable connection for single unit installation

- (1) As for connecting method of power source, select from following connecting patterns. In principle, do not directly connect power souce line to inside unit.
 - *As for exceptional connecting method of power souce, discuss with the power provider of the country with referring to technical documents, and follow its instruction
- 2) For 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 " \otimes and \otimes " 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.



2 Remote Control, Wiring and functions

- ●D0 N0T install it on the following places
- ①Places exposed to direct sunlight
- 2)Places near heat devices
- 3High 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

- ①Install remote control referring to the attached installation manual.
- ②Wiring of remote control should use $0.3 \text{mm}^2 \times 2$ 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 0.5mm². 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.

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

Avoid using multi-core cables to prevent malfunction.

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

⑥Make 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

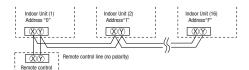
(1)A remote control can control plural indoor units (Up to 16)

In above setting, all plural indoor units will operate under same mode and temperature setting ②Connect 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

After a unit is energized, it is possible to display an indoor unit address by pressing

[AIR CON NO.] button on the remote control unit. Press the or button to make sure that all indoor units connected are displayed in order.



Confirming method of indoor units

When indoor unit address number is displayed on remote control, pushing the \bigcirc (MODE) button to make the indoor unit with that number blow air (Display example:" 1/1001 $\stackrel{\lessapprox}{=}$ ") Push the \bigcirc (MODE) button again to stop the operation.

However, this operation is invalid on the air-conditioning running.

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.)

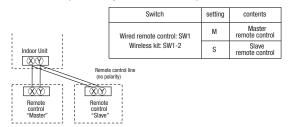
The air conditioner operation follows the last operation of the remote control regardless of the master/slave setting of it.

Acceptable combination is "two (2) wired remote controls", "one (1) wired remote control and

Acceptable combination is "two (2) wired remote controls", "one (1) wired remote control and one (1) wireless kit" or "two (2) wireless kits".

Set SW1 (wired remote control) or SW1-2 (wireless kit) to "Slave" for the slave remote control unit. It was factory set to "Master" for shipment.

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.



3Trial operation

The method of trial cooling operation

Operate the remote control unit as follows.

Starting a cooling test run.

①Start the system by pressing the ②ON/OFF button.

②Select " 🗱 (Cool)" with the 🔼 (MODE) button.

③Press the TEST button for 3 seconds or longer.

The screen display will switch to: " \$ TEST RUN ▼ "

The screen display will switch to " TEST RUN ".

2. Ending a cooling test run.

Pressing the OONOFF button, the (TEMP) button or (MODE) button will end a cooling test run. (Cooling test run will end after 30 minutes pass.)

" TEST RUN " shown on the screen will go off.

Checking operation data

Operation data can be checked with remote control unit operation.

1. Press the CHECK button.

" OPER DATA ▼ " is displayed.

 When only one indoor unit is connected to remote control, "DATALDADING" is displayed (blinking indication during data loading).

Next, operation data of the indoor unit will be displayed. Skip to step 7.

 When plural indoor units is connected, the smallest address number of indoor unit among all connected indoor unit is displayed.

[Example]:

 Select the indoor unit number you would like to have data displayed with the
 button.

6. Determine the indoor unit number with the O(SET) button.

(The indoor unit number changes from blinking indication to continuous indication) "I/U000" (The address of selected indoor unit is blinking for 2 seconds.)

Number		Data Item
01	*	(Ope ration Mode)
02	SET TEMPb	(Set Temperature)
03	RETURN AIR6	(Return Air Temperature)
04	■SENSORc	(Remote Control ThermistorTemperature)
05	THI-R1c	(Indoor Unit Heat Exchanger Thermistor / U Bend)
06	THI-R2c	(Indoor Unit Heat Exchanger Thermistor /Capillary)
07	THI-R3c	(Indoor Unit Heat Exchanger Thermistor /Gas Header)
08	I/U FANSPEED	(Indoor Unit Fan Speed)
09	DEMANDHz	(Frequency Requirements)
10	ANSWERHz	(Response Frequency)
11	I/U EEVP	(Pulse of Indoor Unit Expansion Value)
12	TOTAL I/U RUN	_H (Total Running Hours of The Indoor Unit)
21	OUTDOORc	(Outdoor Air Temperature)
22	THO-R1°c	(Outdoor Unit Heat Exchanger Thermistor)
23	TH0-R2c	(Outdoor Unit Heat Exchanger Thermistor)
24	COMPHz	(Compressor Frequency)
25	HPMPa	(High Pressure)
26	LPMPa	(Low Pressure)
27	Tdc	(Discharge Pipe Temperature)
28	COMP BOTTOM	(Comp Bottom Temperature)
29	CTAMP	(Current)
30	TARGET SH	(Target Super Heat)
31	SHc	(Super Heat)
32	TDSHc	(Discharge Pipe Super Heat)
33	PROTECTION No	(Protection State No. of The Compressor)
34	O/U FANSPEED	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN_	
38	0/U EEV 1P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	0/U EEV2P	(Pulse of The Outdoor Unit Expansion Valve EEVH)
WD		

*Depending on outdoor unit model, there are data not shown.

" DATA LOADING" (A blinking indication appears while data loaded.)

Next, the operation data of the indoor unit is indicated.

7. Upon operation of the 🛕 🔻 button, the current operation data is displayed in order from data number 01.

The items displayed are in the above table.

*Depending on models, the items that do not have corresponding data are not displayed.

- 8. To display the data of a different indoor unit, press the AIR CONNO. button, which allows you to go back to the indoor unit selection screen.
- 9. Pressing the OON/OFF button will stop displaying data.

Pressing the (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

Off two (2) remote controls are connected to one (1) inside unit, only the master control is available for trial operation and confirmation of operation data. (The slave remote control is not available.)

Trail operation of drain pump

Drain pump operation from remote control unit is possible. Operate a remote control unit by following the steps described below.

1. To start a forced drain pump operation.

①Press the TEST button for three seconds or longer.

The display will change " ※ TEST RUN ▼ "

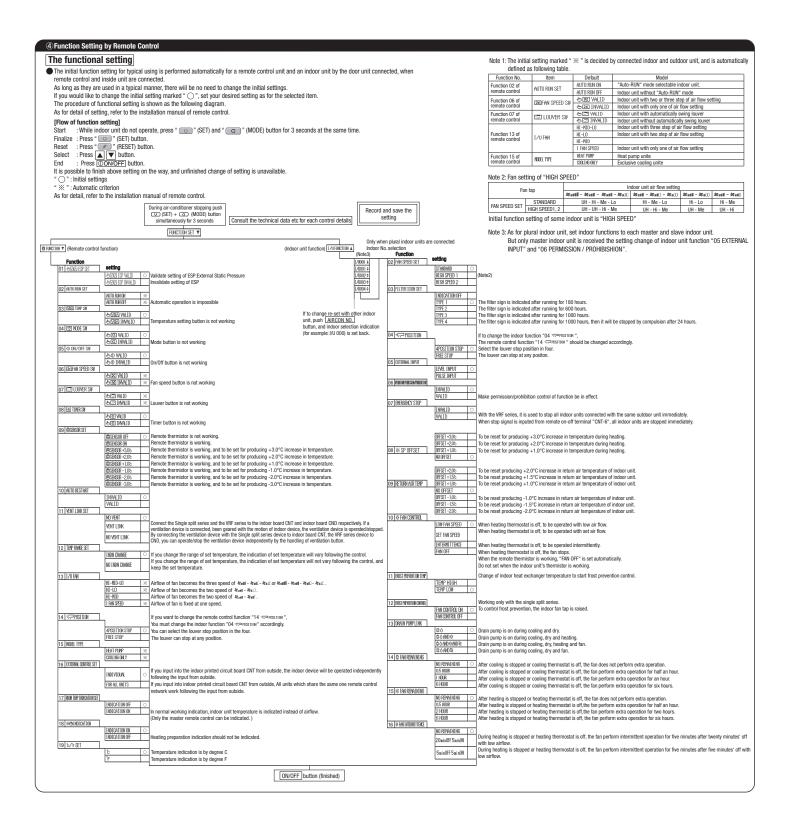
③When the (SET) button is pressed, a drain pump operation will start.

Display: " # FIGURE 110 STIP "

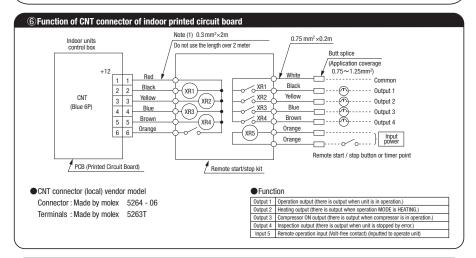
2. To cancel a drain pump operation.

①If either ③ (SET) or ③ON/OFF button is pressed, a forced drain pump operation will stop. The air conditioning system will become OFF.

(S) If two (2) remote controls are connected to one (1) inside unit, only the master control is available for trial operation and confirmation of operation data. (The slave remote control is not available.)



⑤Control mode switching ● The control content of indoor units can be switched in following way. (______ is the default setting) Switch No. Control Content SW₂ Indoor unit address (0-Fh) SW5-1 Master/Slave Switching (plural /Slave unit Setting) SW5-2 SW6-1~4 Model capacity setting ON Operation check, Drain motor test run SW7 - 1 OFF Normal operation



Error Code of indoor unit

LED on indoor

green (normal)

Continuous blinking

Continuous blinking

Not sure Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking Continuous blinking

Continuous blinking

Continuous blinking

Continuous blinking

red (checking)

Off

Off

Not sure Blinking twice

Blinking once

Blinking once

Blinking once

Blinking once Blinking twice

Off

nking for three tim

Blinking once

Blinking twice

Blinking once

Blinking once Blinking twice

F1

E6

E7

E9

E14

F16

F19

E20

E28

Over E30

Content

Pault on the transmission between indoor circuit board and remote control

Indoor air inhaling sensor broken or short-circuit

The temperature of heat exchange abnormal

Float SW actions (only with FS)

Drain pump over current excess number of remote control

Fan motor (1) abnormal
Fan motor (2) abnormal
Configuration fault on running checking

an motor (1) abnormal rotation

Fan motor (2) abnormal rotation
Remote control sensor interrupte
Outdoor unit checking (outdoor cir

short-circuit

(7)Troubleshooting

The operation data is saved when the situation of abnormal operation happen, and the data can be confirmed by remote control. [Operating procedure]

- 1. Press the CHECK button. The display change " NPFR DATA
- 2. Once, press the button, and the display change " ERROR DATA 🚡
- 3. Press the \bigcirc (SET) button and abnormal operation data mode is started.
- 4. When only one indoor unit is connected to remote control, following is displayed.
- $\ensuremath{\textcircled{1}}\xspace The case that there is history of abnormal operation.$
- → Error code and " DATA LOADING " is displayed.
- [Example]: [E8] (ERROR CODE)
- "DATA LOADING" is displayed (blinking indication during data loading). Next, the abnormal operation data of the indoor unit will be displayed. Skip to step 8.
- 2)The case that there is not history of abnormal operation.
- \rightarrow " NO ERROR " is displayed for 3 seconds and this mode is closed.
- 5. When plural indoor units is connected, following is displayed. 1)The case that there is history of abnormal operation.
 - → Error code and the smallest address number of indoor unit among all connected indoor unit is displayed.
 - [Example]: [E8] (ERROR CODE) ▲ " blinking 1711000
- ②The case that there is not history of abnormal operation.
- Only address number is displayed. 6. Select the indoor unit number you would like to have data displayed with the ▲ ▼ button.
- 7. Determine the indoor unit number with the O (SET) button.

[Example]: [E8] (ERROR CODE)

 $\underline{\blacktriangle}$ " (The address of selected indoor unit is blinking for 2 seconds.) " I/U000

[E8] "DATA LOADING" (A blinking indication appears while data loaded.)

Next, the abnormal operation data is indicated.

If the indoor unit doing normal operation is selected, NO ERROR $\,$ " is displayed for 3 seconds and address of indoor unit is displayed.

8. By the 🛕 🔻 button, the abnormal operation data is displayed.

Displayed data item is based on (3) Trial operation

*Depending on models, the items that do not have corresponding data are not displayed.

9. To display the data of a different indoor unit, press the AIR CON No. button, which allows you to go back to the indoor unit slection screen.

10.Pressing the OON/OFF button will stop displaying data.

Pressing the (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

Olf two (2) remote controls are connected to one (1) indoor unit, only the master control is available for trial operation and confirmation of operation data.

9.3 Installation of wired remote control (option)

(1) Model RC-E5

PJA012D730

Read together with indoor unit's installation manual.

MARNING

- 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 supply is turned off when electric wiring work. Otherwise, electric shock, malfunction and improper running may occur.



ACAUTION

- DO NOT install the remote control at the following places in order to avoid malfunction.
 - (1) Places exposed to direct sunlight
- (4) Hot surface or cold surface enough to generate condensation
- (2) Places near heat devices(3) High humidity places
- (5) Places exposed to oil mist or steam directly(6) Uneven surface



■DO NOT leave the remote control without the upper case.

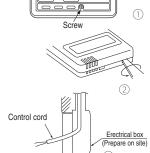
In case the upper cace needs to be detached, protect the remote control with a packaging box or bag in order to keep it away from water and dust.



Accessories	Remote control, wood screw (ø3.5×16) 2 pieces
Prepare on site	Remote control cord (2 cores) the insulation 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

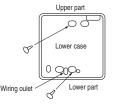
- Open the cover of remote control, and remove the screw under the buttons without fail.
- ② Remove the upper case of remote control. Insert a flat-blade screwdriver into the dented part of the upper part of the remote control, and wrench slightly.

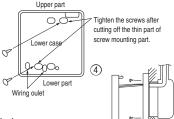


[In case of embedding cord]

3 Embed the erectrical box and remote control cord beforehand.

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.

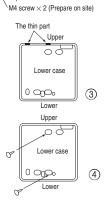




- S Connect the remote control cord to the terminal block. Connect the terminal of remote control (X,Y) with the terminal of indoor unit (X,Y). (X and Y are no polarity)
- Install the upper case as before so as not to catch up the remote control cord, and tighten with the screws.

[In case of exposing cord]

- 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.

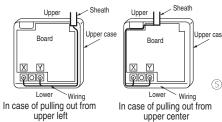


(4)

S 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)

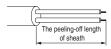
Wiring route is as shown in the right diagram depending on the pulling out direction.



The wiring inside the remote control case should be within 0.3mm² (recommended) to 0.5mm². 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	X wiring : 170mm
Y wiring: 195mm	Y wiring : 190mm



- 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, 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 0.3mm² × 2 core wires or cables. (on-site configuration)
- ② Maximum prolongation of remote control wiring is 600 m.

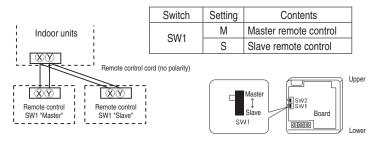
If the prolongation is over 100m, change to the size below.

But, wiring in the remote control case should be under 0.5mm². 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.

100 - 200m	$\cdots \cdot 0.5$ mm ² \times 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.)



Set SW1 to "Slave" for the slave remote control. It was factory set to "Master" for shipment.

Note: The setting "Remote control thermistor 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.

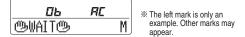
The indication when power source is supplied

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"

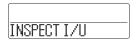
At the same time, a mark or a number will be displayed for two seconds first.

This is the software's administration number of the remote control, not an error cord.



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 ②TEMP 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 ② TEMP 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

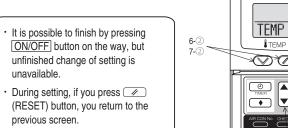
1. Stop the air-conditioner, and press (SET) and (MODE) button at the same time for over three seconds.

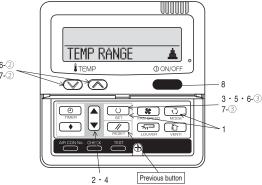
The indication changes to "FUNCTION SET ▼".

- 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 O (SET) button to fix.
- 6. When "UPPER LIMIT ▼" is selected (valid during heating)
 - ① Indication: " \bigcirc \lor \land SET UP" \rightarrow "UPPER 30°C \lor "
 - 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 **\(\Lambda \)**" is selected (valid during cooling, dry, fan, automatic)
 - ① Indication: " $\textcircled{b} \lor \land \mathsf{SET} \mathsf{UP}" \to "\mathsf{LOWER} \mathsf{18}^\circ\mathsf{C} \land"$
 - ② Select the lower limit value with temperature setting button $\boxed{\ }$ $\boxed{\ }$. Indication example: "LOWER 24°C $\lor \land$ " (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.





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 wiil be no need to change the initial settings.

If you would like to change the initial setting marked " O ", set your desired setting as for the selected item. The procedure of functional setting is shown as the following diagram.

Flow	of f	unction	setting	ıl

Start Finalize

Record and keep the setting

Reset Select

Consult the technical data etc. for each control details

It is possible to finish above setting on the way. and unfinished change of setting is unavailable.

": Initial settings

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

> FUNCTION SET ▼ To next page

☐ FUNCTION ▼ (Remote control function) Function setting 01 6MAEF 3E SP VALID SP INVALID ○ Validate setting of ESP:External Static Pressure Invalidate setting of ESP 02 AUTO RUN SE Automatical operation is impossible 03 I ☑ ☑ TEMP SW ⊹D⊠ VALID S⊠⊠ INVALII Temperature setting button is not working 04 🖾 MODE SW (SEE VALID (SEE INVALI Mode button is not working 05 O ON/OFF SW On/Off button is not working 06 FAN SPEED SW 용절 INVALID Fan speed button is not working 07 🖾 LOUVER SW Louver button is not working OR 1 TIMER SW ७७ VALID ७७ INVALID Timer button is not working 09 ■ SENSOR SE ESENSOR OF Remote thermistor is not working. Remote thermistor is working.

Remote thermistor is working.

Remote thermistor is working, and to be set for producing +3.0°C increase in temperature.

Remote thermistor is working, and to be set for producing +2.0°C increase in temperature.

Remote thermistor is working, and to be set for producing +1.0°C increase in temperature. © SENSOR +2.0° © SENSOR +1.0° Remote thermistor is working, and to be set for producing -1.0°C increase in temperature. Remote thermistor is working, and to be set for producing -2.0 °C increase in temperature. Remote thermistor is working, and to be set for producing -3.0 °C increase in temperature. 10 AUTO RESTART 11 | VENT LINK SET NO VENT 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. VENT LTNK operation of indoor unit.

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. NO VENT LINK 12 TEMP RANGE SET If you change the range of set temperature, the indication of set temperature INDN CHANGE will vary following the control.

If you change the range of set temperature, the indication of set temperature will not vary following the control, and keep the set temperature. NO INDN CHANG 13 I/U FAN Airflow of fan becomes of ﴿مَالَا خُمُونَا لَهُ مَا اللَّهُ * Airflow of fan becomes of مُعَالِدُ خُمُونَا - كُمُونَا Airflow of fan becomes of & all - & all] Airflow of fan becomes of *****
Airflow of fan is fixed at one speed. If you change the remote control function "14 %¬POSITION", you must change the indoor function "04 %¬POSITION" accordingly. 14 ⇒¬POSITION You can select the louver stop position in the four. The louver can stop at any position. 4POSITION STOR 15 MODEL TYPE COOLENG ONLY 16 EXTERNAL CONTROL SET 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. 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. INDIVIDUAL FOR ALL UNITS 17 ROOM TEMP INDICATION SET INDICATION OFF In normal working indication, indoor unit temperature is indicated instead of airflow (Only the master remote control can be indicated.) 18 * INDICATION Heating preparation indication should not be indicated. 19 | 6/° SET Temperature indication is by degree C Temperature indication is by degree F To next page

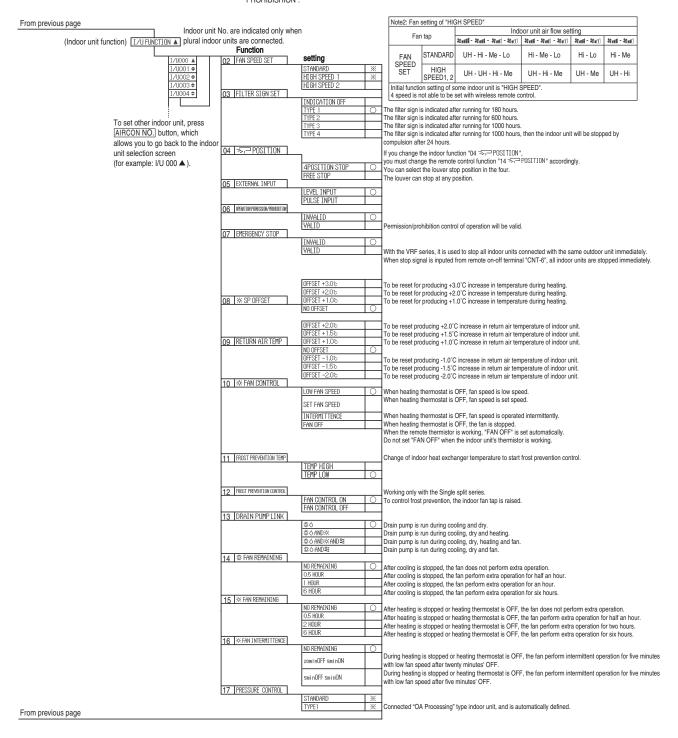
> ON/OFF button (finished)

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 S₩	6國 VALID	Indoor unit with two or three step of air flow setting
		கு INVALID	Indoor unit with only one of air flow setting
Remote control function07	☑ LOUVER SW	&⊡ VALID	Indoor unit with automatically swing louver
		ভ⊡ INVALID	Indoor unit without automatically swing louver
Remote control function13		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	HODEL THE	HEAT PUMP	Heat pump unit
function15		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".



How to set function

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.
- 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 ▼" (remo

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]

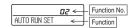
① "DATA LOADING" (Indication with blinking)

Display is changed to "01 ₺☑∆ ESP SET".

② Press ▲ or ▼ button.

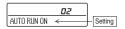
"No. and function" are indicated by turns on the remote control function table, then you can select from them.

(For example)



Press (SET) button.

The current setting of selected function is indicated. (for example) "AUTO RUN ON" \leftarrow If "02 AUTO RUN SET" is selected



Press or button. Select the setting.



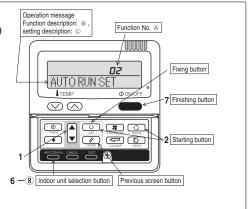
⑤ Press ○ (SET)

"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.



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".

[Note]

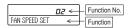
(1) If plural indoor units are connected to a remote control, the indication is "I/U 000" (blinking) ← The lowest number of the indoor unit connected is indicated.



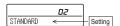
- (2) Press ▲ or ▼ button. Select the number of the indoor unit you are to set If you select "ALL UNIT ▼", you can set the same setting with all unites.
- (3) Press (SET) button.
- ② Press ▲ or ▼ button.

"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



- Press or button. Select the setting.
- S 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 <u>AIRCON NO.</u> button, which allows you to go back to the indoor unit selection screen. (example "I/U 000 A")

- It is possible to finish by pressing ON/OFF button on the way, but unfinished change of setting is unavailable.
- $\boldsymbol{\cdot}$ During setting, if you press $\begin{picture}() \put(0,0){\line(0,0){100}} \put(0,0){\line(0$
- · Setting is memorized in the control and it is saved independently of power failure.

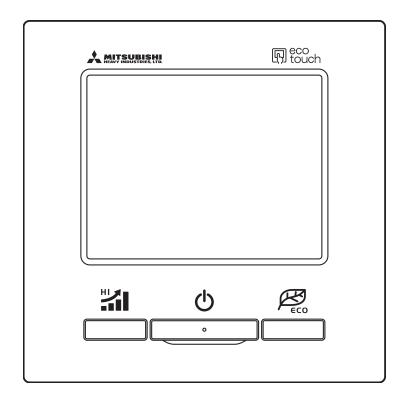
[How to check the current setting]

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.)

(2) Model RC-EX1A PJZ012D077

eco touch REMOTE CONTROL RC-EX1A INSTALLATION MANUAL



1. Safety Precautions

This installation manual describes the installation methods and precautions related to the remote control. Use this manual together with the user's manuals for the indoor unit, outdoor unit and other optional equipment. Please read this manual carefully before starting the installation work to install the unit properly.

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.

<u></u>∴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.



• 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, the "Installation Manual" should be given to a new owner.

MARNING

Ask a professional contractor to carry out installation work according to the installation manual. Improper installation work may result in electric shocks, fire or break-down.



Shut OFF the main power supply before starting electrical work.

Otherwise, it could result in electric shocks, break-down or malfunction.



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.



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.



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.

A CAUTION

Do not install the remote control at following places.

It could cause break-down or deformation of remote control.

- (1) Where it is exposed to direct sunlight
- (2) Near the equipment to generate heat
- (3) Where the surface is not flat



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

When the upper case is removed, put it in a packing box or packing bag to protect internal PCBs or other parts from dust, moisture, etc.



2. Accessories & Prepare on site

Accessories

R/C main unit, wood screw (ø3.5 x 16) 2 pcs User's Manual. Installation Manual

Parts procured at site

Item name	Q'ty	Remark	
Switch box For 1 piece or 2 pieces (JIS C8340 or equivalent)	1	These are not required when installing directly on a wall.	
Thin wall steel pipe for electric appliance (JIS C8305 or equivalent)	As required		
Lock nut, bushing (JIS C8330 or equivalent)	As required		
Lacing (JIS C8425 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 mm² x 2 pcs)	As required	See right table when longer than 100 m	

When the cable length is longer than 100 m, the max size for wires used in the R/C case is $0.5~\text{mm}^2$. 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 mm² x 2-core
< 300 m	0.75 mm ² x 2-core
< 400 m	1.25 mm ² x 2-core
< 600 m	2.0 mm ² x 2-core

3. Remote control installation procedure

Determine where to install the remote control

Installation "Using a switch box"

"Installed directly on a wall"

Wiring direction "Backward"

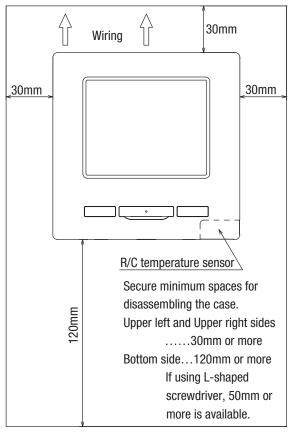
"Upper center", "Upper left"

Cautions for selecting installation place

- (1) Installation surface must be flat and sufficiently strong. R/C case must not be deformed.
- (2) Where the R/C can detect room temperatures accurately. This is a must when detecting room temperatures with the temperature sensor of R/C.
 - · Install the R/C where it can detect the average temperature in the room.
 - · Install the R/C separated from a heat source sufficiently.
 - · Install the R/C where it will not be influenced by the turbulence of air when the door is opened or closed.

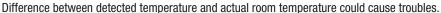
Select a place where the R/C is not exposed to direct sunlight or blown by winds from the air conditioner or temperatures on the wall surface will not deviate largely from actual room temperature.

Installation space



Request

Be sure not to install R/C at a place where temperatures around the installation surface of R/C may differ largely from actual room temperature.



The correction for detected temperature by the R/C cannot offset such temperature difference because it corrects the detected temperatures itself.



Request

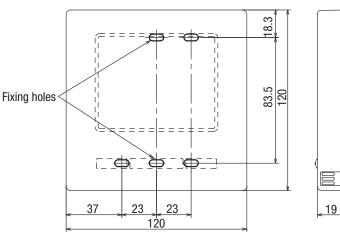
Do not install the R/C at a place where it is exposed to direct sunlight or where surrounding air temperature exceeds 40° C or drops below 0° C.



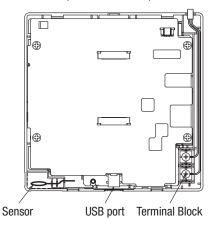
It could cause discoloration, deformation, malfunction or breakdown.

Installation procedure

Dimensions (Viewed from front)



PCB side (Viewed from rear)



- $\ensuremath{\textcircled{1}}$ To remove the upper case from the bottom cases of R/C
 - 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.

Take care to protect the removed upper case from moisture or dust.



② 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.

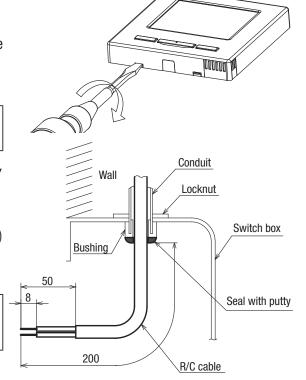
In case of embedding wiring (When the wiring is retrieved "Backward")

③ Embed the switch box and the R/C wires beforehand.

Seal the inlet hole for the R/C wiring with putty.

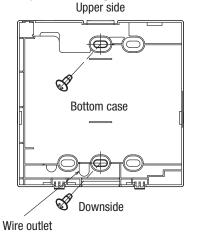
 If dust or insect enters, it could cause electric shocks, fire or breakdown.



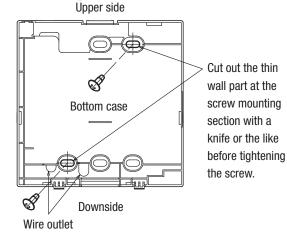


4 When wires are passed through the bottom case, fix the bottom case at 2 places on the switch box.

Switch box for 1 pc



Switch box for 2 pcs

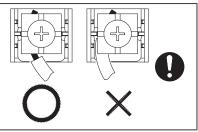


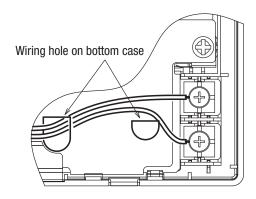
- ⑤ When fixing the bottom case diagonally at 2 places, cut out the thin wall section on the case.
- ⑥ Fix wires such that the wires will run around the terminal screws on the top case of R/C.

Cautions for wire connection

Use wires of no larger than 0.5 mm² 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.

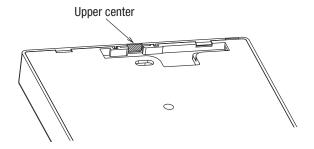




Install the upper case with care not to pinch wires of R/C.

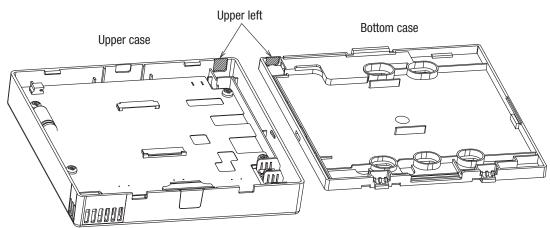
In case of exposing wiring (When the wiring is taken out from the "upper center" or "upper left" of R/C)

③ 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.

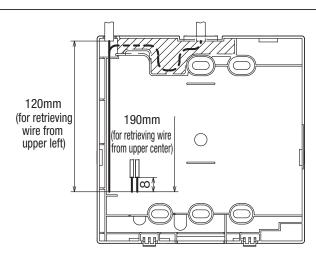
When taking the wiring out from the upper left, take care not to damage the PCB and not to leave any chips of cut thin wall inside.

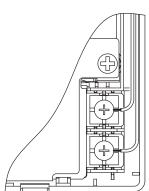


If the hole is cut too large, moisture, dust or insects may enter. Seal gaps with putty or the like.



- ④ Fix the bottom R/C case on a flat surface with wood screws.
- (5) In case of the upper center, pass the wiring behind the bottom case. (Hatched section)
- ⑥ Fix wires such that the wires will run around the terminal screw of the top case of R/C.
- Install the top case with care not to pinch wires of R/C.



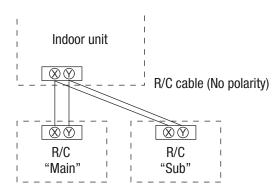


Main/Sub setting when more than one remote control are used

Main-Sub setting for use of two or more R/Cs

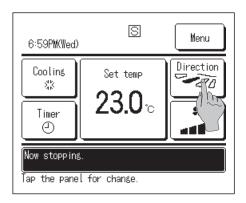
Up to two units of R/C can be used at the maximum for 1 indoor unit or 1 group. One is main R/C and the other is sub R/C.

Operating range is different depending on the main or sub R/C.



Set the "Main" and "Sub" as described at Section 7 of installtion manual attached to the remote control.

R/C function		Sub
Run/Stop, setting temperature, fan speed and flap		
direction operations		
High power and energy-saving operations		\circ
Energy-saving setting		_
R/C sensor		_
Test run menu operation		_
Room temperature range setting		_
Indoor unit settings		_
Individual flap control		_
Operation data display		_
Error history display	0	0



Note: 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.

If dust, insect, etc. enters, it could cause electric shocks or breakdown.



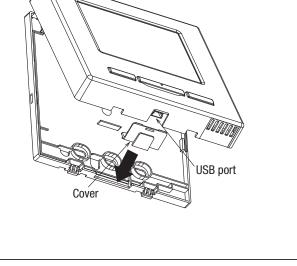
Special software is necessary for the connection.

For details, view the web site or refer to the engineering data.

Do not connect to a personal computer without using the special software.



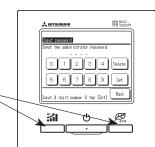
It could cause malfunction or breakdown of R/C or personal computer.



Note: 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). When the administrator password is forgotten, it can be initialized, if the [Highpower] and the [Energy-saving] buttons are pushed simultaneously for 5 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.



Note: Combination of R/C and indoor unit

- (1) It can be used as the combination of Main and Sub with RC-E3 to -E5 type of wireless R/C (option part).
- (2) It can be combined with FD-V or FD-KX E6 type and later types of indoor units
- (3) In cases of combination with FD-V or FD-KX E6 type unit, there are some controlling items which cannot be used. If operating such items, the message "Invalid request" is displayed.

For details, refer to the installation manual attached to the remote control.

Inverter driven single split PAC

71V

Designed for R410A refrigerant

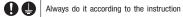
This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 46.

When install the unit, be sure to check whether the selection of installation place, power supply specifications, usage limitation (piping length, height differences between indoor and outdoor units, power supply 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
- The precautions described below are divided into AMARNING 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 AWARNING 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 ACAUTION. 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.



•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

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 IS05149.

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 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 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 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

• 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.



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 FN60204-1

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.

Re sure to insulate the refrigerant pines 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.
- · 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 coastline
- 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
- · 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

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.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A 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 R410A 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 R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system

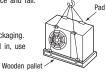
	Dedicated R410A tools		
a)	Gauge manifold		
b)	Charge hose		
c)	Electronic scale for refrigerant charging		
d)	Torque wrench		
e)	Flare tool		
f)	Protrusion control copper pipe gauge		
g)	Vacuum pump adapter		
h)	Gas leak detector		

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.)

When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity CAUTION Willing a unit is indicated with simps for industry, and in the 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



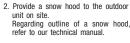
3) Selection of installation location for the outdoor unit

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

- O A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- O A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- O A place where the unit is not exposed to oil splashes.
- O A place where it can be free from danger of flammable gas leakage.
- O A place where drain water can be disposed without any trouble.
- O A place where the unit will not be affected by heat radiation from other heat source.
- A place where snow will not accumulate.
- O 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.
- O 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.
- O 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.
- O A place where strong wind will not blow against the outlet air blow of the unit.

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









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.]

Wind direction

- (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.

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



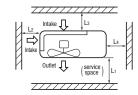
Install the outlet air blow side of the unit in a position perpendicular to the direction of wind. 3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.



5) Installation space

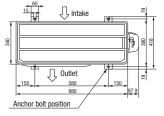
- Walls surrounding the unit in the four sides are not acceptable.
- There must be a 1-meter or larger space in the above.
- When more than one unit are installed side by side, provide a 250mm or wider interval between them as a service space. In
 order to facilitate servicing of controllers, please 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.

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

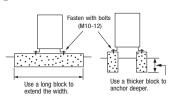


6) Installation

(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

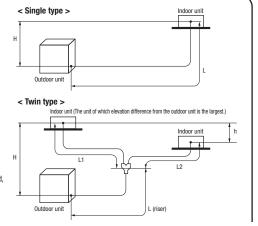
- Check the following points in light of the indoor unit specifications and the installation site.
- Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

Wind direction

Do	Dimensional	Marks appearing in the drawing on the right		
ne:	Restrictions			Twin type
One-way pipe length of refrigerant piping	Model 71V	50m or less	L	L1+L1+L2
Main pipe length	Widdel 71V	20111 01 1628	L	L
One-way pipe length after	20m or less	_	L1, L2	
Difference of pipe length a	Difference of pipe length after the first branching point			L1—L2
Elevation difference between	When the outdoor unit is positioned higher,	30m or less	Н	Н
indoor and outdoor units	When the outdoor unit is positioned lower,	15m or less	Н	Н
Elevation difference bet	0.5m or less	_	h	



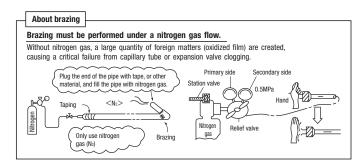
• The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, please see "6. UTILIZATION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



2) Determination of pipe size

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

		Mode	el 71V
		Gas pipe	Liquid pipe
Outdoor un	it connected	φ15.88 Flare	φ9.52 Flare
Refrigerant pipi	φ15.88	φ9.52	
In the case of a single type	Indoor unit connected		φ9.52
iii tile case of a siligle type	Capacity of indoor unit	Model 71V	
	Branching pipe set	DIS-WA1	
In the case of a built have	Refrigerant piping (branch pipe L1,L2)	φ12.7	φ9.52
In the case of a twin type	Indoor unit connected	φ12.7 φ6.35	
	Capacity of indoor unit	Model 40V×2	



ACAUTION

- •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 ϕ 6.35 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*	0-type pipe	0-type pipe	0-type pipe	0-type pipe

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

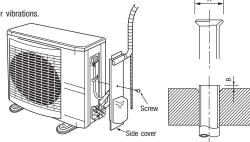
*Phosphorus deoxidized seamless copper pipe C1220T, JIS H3300

4) On-site piping work

• 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 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 R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, 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				
$\phi 6.35$	9.1				
$\phi 9.52$	13.2				
φ12.7	16.6				
φ15.88	19.7				

Copper pipe protrusion for flaring: B (mm)

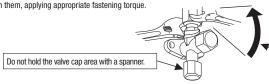
Copper pipe outer	In the case of a rigid (clutch) type					
diameter	With an R410A tool	With a conventional tool				
$\phi 6.35$						
φ9.52 φ12.7	0~0.5					
		0.7~1.3				
φ15.88						



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

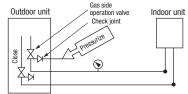
Operation valve size (mm)	Tightening torque (N-m)	Tightening angle (°)	Recommended length of a tool handle (mm)
φ6.35 (1/4")	14~18	45~60	150
φ9.52 (3/8")	34~42	30~45	200
φ12.7 (1/2")	49~61	30~45	250
φ15.88(5/8")	68~82	15~20	300



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 quide.

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 operation valve's check joint equipped on the outdoor unit side. While conducting a test, keep the operation 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.

Pay attention to the following points in addition to the above for the R410A and compatible machines.

Airtighteness test completed

Vacuuming begins

Vacuuming completed

Vacuum gauge check

Fill refrigerant

- OTo 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.).
- Ouse 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.

		•			
	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	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
Model 71V	2.35	20	0.06	2.95	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.
- When refrigerant piping is shorter than 3m, reduce refrigerant by 1kg from the factory charged volume and adjust to 1.95kg.
- 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 0.06 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

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

- For an installation measuring 3m or longer, but not more than 20m, in pipe length, please charge the standard refrigerant charge volume, when you recharge refrigerant after servicing etc
- When refrigerant piping is shorter than 3m, recharge 1.95kg of refrigerant.

Ex.) For a 10m installation, charge 2.35 kg of refrigerant.

For a 25m installation, charge "2.35 + (25-20) \times 0.06 = 2.65 kg."

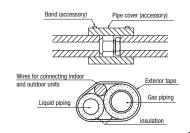
(2) Charging refrigerant

- Since R410A 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 operation 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.

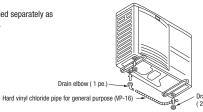
8) Heating and condensation prevention

- (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.
 - 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.



- O There are 3 drain holes provided on the bottom plate of an outdoor unit to discharge condensed water.
- O 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.
- O Connect a drain elbow as shown in the illustration and close the other two drain holes with

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,

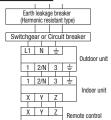
- •Do not use any supply cord lighter than one specified in parentheses for each type below.
- braided cord (code designation 60245 IEC 51),
- ordinary tough rubber sheathed cord (code designation 60245 IEC 53)
- flat twin tinsel cord (code designation 60227 IEC 41);
- Do not use anything lighter than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

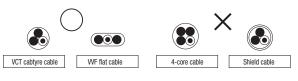


Always use an earth leakage circuit breaker designed for inverter circuits to prevent a faulty operation.

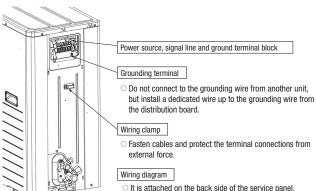


Model	Power source	Power cable thickness (mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness X number
71V	Single phase 3 wire 220-240V 50Hz	3.5	17	21	φ1.6mm	φ1.6mm x 3

- 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. 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



- 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.



- Before conduct a test run, do not fail to make sure that the operation valves are closed.
- 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.

⚠ CAUTION

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- When you operate switches for on-site setting, be careful not to touch a live part.
- You cannot check discharge pressure from the liquid operation 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, "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:

Cooling during a test run

Heating during a test run

Normal or After the test operation

(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.

SW-5-3 SW-5-4

ON

0FF

0FF

ON

(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 supply, when the unit runs in the cooling mode at outside temperature 5°C or lower, it automatically changes into the cooling mode after it runs in the heating mode for 10 minutes.

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 operation 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.

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° C 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	Printed circuit board LED(The cycles of 5 seconds)		Failure event	Action
remote control unit	Red LED	Green LED	I allule 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 operation valves shut (occurs mainly during a heating operation)	Check whether the operation valves are open. If an error has been canceled when 3 minutes have elapsed since
E49	Blinking once	Blinking continuously	Low pressure error or operation with operation valves shut (occurs mainly during a cooling operation)	a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.

• 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 com	es to a normal stop	When the unit comes	to an abnormal stop
	When power is turned on	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.

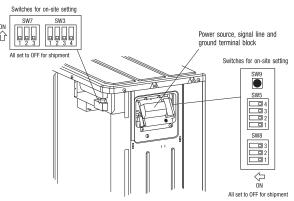
A failure to observe these instructions can result in a compressor breakdown.

| Items to checkbefore 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
		If brazed, was it brazed under a nitrogen gas flow?	
	Refrigerant	Were air-tightness test and vacuum extraction surely performed?	
2	plumbing	Are heat insulation materials installed on both liquid and gas pipes?	
	••••	Are operation 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?	
		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?	
4	Electric	Do indoor-outdoor connecting cables connect between the same terminal numbers?	
	wiring	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?	
_	Indeed was	Is indoor unit installation work completed?	
_	Indoor unit	Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

Test run procedu	 Always carry out a test run and check the following in order as liste 	d.
------------------	---	----

Turn	The contents of operation	Check
1	Open the gas side operation valve fully.	
2	Open the liquid side operation 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.	
(3)	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.	

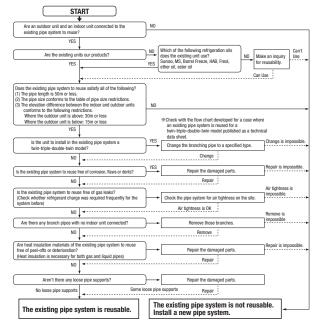


%1 Do not operate SW3-3, SW5-1, SW5-2, SW8.
%2 Refer to TECHNICAL MANUAL about SW9. (Pump down SW)

'12 • PAC-T-179

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 operation 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 R410A.
- Turn on-site setting switch SW8-1 to the ON position. (Where the gas pipe size is ϕ 19.05)

<Table of pipe size restrictions>

②:Standard pipe size ○:Usable △:Restricted to shorter pipe length limits Cool ↓ : Cooling capacity drop

Additio	nal charge volume per meter of pipe	0.06	ikg/m	0.08kg/m
Dina sina	Liquid pipe	φ9.52	φ9.52	φ12.7
Pipe size	Gas pipe	φ12.7	φ15.88	φ15.88
	Usability	Cool ↓	0	\triangle
71V	Maximum one-way pipe length	35	50	25
	Length covered without additional charge	30	30	15

- The pipe length should be at least 3m. If the pipe length is shorter than 3m, 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 ref	rigerant per 1m	0.06	kg/m
D:		Liquio	l pipe	φ9	1.52
PI	ipe size	Gas	pipe	φ12.7	φ15.88
-	Model	Combination type	Combination of capacity		
F	FDC71	Twin	40+40	0	0

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

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

The branching pipes used with models other than those listed above are not reusable.

Use our genuine branching pipes for R410A.

Formula to calculate additional charge volume

Additional charge volume (kg) = {Main pipe length (m) - Length covered without additional charge shown in the table (m)} \times Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes (m) \times 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 ϕ 12.7, gas ϕ 15.88), the quantity of refrigerant to charge additionally should be (30m-15m) x 0.08kg/m = 1.2 kg.

Example) When an 71V (twin installation) is installed in a 30m long existing pipe system

(main pipe length 20m, liquid ϕ 12.7, gas ϕ 15.88; pipe length after branching pipe 5m x 2, liquid ϕ 9.52, gas ϕ 12.7), the quantity of refrigerant to charge additionally should be (20m-15m) x 0.08kg/m + 5m x 2 x 0.06kg/m = 1.0 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.

100VNX~140VNX.100VSX~140VSX

Designed for R410A refrigerant

(2) Models FDC100VNX, 125VNX, 140VNX

- This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 46
- When install the unit, be sure to check whether the selection of installation place, power supply specifications, usage limitation (piping length, height differences between indoor and outdoor units, power supply 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 AWARNING 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 ACAUTION. 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.
- 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

[Accessory]



- 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

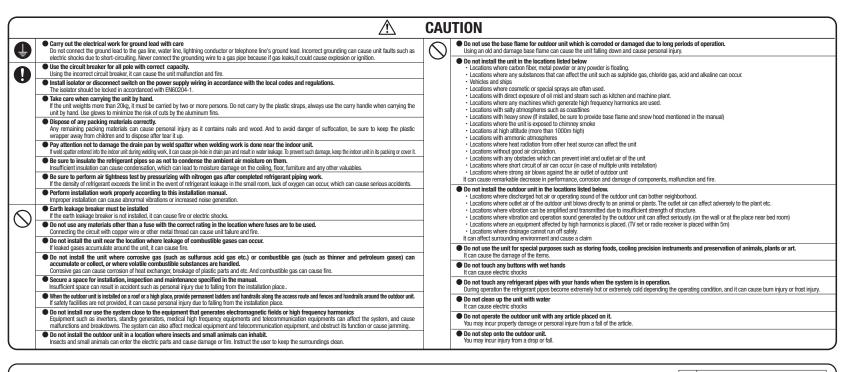
- Install the system in full accordance with the instruction manual.
- Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- Use the original accessories and the specified components for installation. If parts other than those prescribed by us are used, it 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 joiting 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.



Do not perform brazing work in the airtight room

It can cause lack of oxygen.

- Use the prescribed pipes, flare nuts and tools for 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
- 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
- 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
- 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
- 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



Notabilia as a unit designed for R410A

• Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.

 A unit designed for R410A 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 R410A 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 R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

		Dedicated R410A tools
	a)	Gauge manifold
	b)	Charge hose
	c)	Electronic scale for refrigerant charging
Э.	d)	Torque wrench
9	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 urill is center position.

When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity

If not properly balanced, the unit can be thrown off-balance and fall.

• 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

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

- O A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- O A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- O A place where the unit is not exposed to oil splashes.
- $\ensuremath{\bigcirc}$ A place where it can be free from danger of flammable gas leakage.
- O 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.
- O A place where snow will not accumulate.

unit, will not be generated and not remain.

- O 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.
- O A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely.
- O 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
- O A place where strong wind will not blow against the outlet air blow of the unit.

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 providen the roof on site

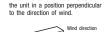


Since drain water generated by defrost control may freeze, following measures are required.

- 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.]

(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 2.Install the outlet air blow side of 3.The unit should be installed on unit to face a wall of building, or provide a fence or a windbreak screen.







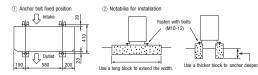
5) Installation space

- 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)
e Example installation	I	II	Ш
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 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.

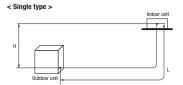
• When the outdoor air temperature is -5°C or lower, provide a snow hood to the outdoor unit on site. So that strong wind will not blow against the outdoor heat exchanger directly. Regarding outline of a snow hood, refer to our technical manual.

2. REFRIGERANT PIPING WORK

1) Restrictions on unit installation and use

- Check the following points 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.

						Marks appearting in the drawing		
		One-way pipe length difference	from the first branching po	oint to the indoor ur	nit	< 3m	≥ 3m	
Descriptions	Mode	I for outdoor units	Dimensional limitations	Single type	Twin type	Triple type A	Triple type B	
	100VN,125VN,	100VS,125VS				-	-	
One-way pipe length of	140VN,140VS	N,140VS ≤ 50m				L+L1+L2+L3	L+La+L1+L2+L3	
refrigerant piping	100VNX,125VN	IX,100VSX,125VSX	≤ 100m	L .	L+L1+L2	-	-	
	140VNX,140VS	Х	= 100III			L+L1+L2+L3	L+La+L1+L2+L3	
	100VN,125VN,	100VS,125VS	≤ 50m			-	_	
	140VN,140VS		≥ 50III	_	l .	L	L	
Main pipe length	100VNX,125VN	IX,100VSX,125VSX	≤ 100m	_	L	_	ı	
	140VNX,140VS	X	= 100III			L	L	
One-way pipe length between the first branching point from to the second branching point	140VN,140VS, 140VNX,140VS	х	≤ 5m	-	-	=	La	
One-way pipe length after the first	100VN,125VN,1		≤ 30m	_		-	=	
branching point	100VNX,125VNX,100VSX,125VSX		≥ 30III	_	L1, L2	L1, L2, L3	L1 (1)	
One-way pipe length after the first branching point and second branching point	140VN,140VS,	140VNX,140VSX	≤ 27m	-	-	-	La+L2, La+L3 (1)	
One-way nine length difference	Twin type		≤ 10m			-	_	
One-way pipe length difference from the first branching point to	Triple type	Trials to 140VN,140VS, ≤ 3		_	L1-L2	L1-L2 , L2-L3 , L3-L1		
the indoor unit	Triple type	140VNX,140VSX	≤ 10m			_	L-(La+L2), L1-(La+L3) (1)	
One-way pipe length difference from the second branching point to the indoor unit	140VN,140VS, 140VNX,140VS	ix	≤ 10m	-	-	-	L2—L3	
Elevation difference between	When the outd	oor unit is positioned higher,	≤ 30m	Н	н	н	Н	
indoor and outdoor units		oor unit is positioned lower,	≤ 15m	n	n	п	н	
Elevation difference between indoor units			≤ 0.5m	-	h	h1, h2, h3	h1, h2, h3	



< Twin type > (The unit of which elevation difference from the outdoor unit is the largest.)

△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.

Note (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) Determination of pipe size

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

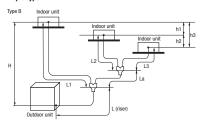
		Mode	1100V	Model	125V	Mode	el 140V
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
		φ15.88	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52
Out	tdoor unit connected	Flare	Flare	Flare	Flare	Flare	Flare
Refriger	ant piping (branch pipeL)	φ15.88	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52
	Indoor unit connected	φ15.88	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52
In the case of a single type	Capacity of indoor unit	Mode	el 100V	Mode	125V	Mode	1 140V
	Branching pipe set	DIS-	WA1	DIS	-WA1	DIS	-WA1
	Refrigerant piping (branch pipe L1,L2)	φ12.7	φ9.52	φ12.7	φ9.52	φ15.88	φ9.52
In the case of a twin type	Indoor unit connected	φ12.7	φ6.35	φ12.7	φ6.35	φ15.88	φ9.52
	Capacity of indoor unit	Model	50V×2	Model 6	0V×2	Model 7	71V×2
	Branching pipe set					DIS-	-TA1
	Refrigerant piping (branch pipe L1,L2,L3)					φ12.7	φ9.52
In the case of a triple type A	Indoor unit connected	1 -	-	_		φ12.7	φ6.35
	Capacity of indoor unit	7				Model 5	50Vx3
	Branching pipe set					DIS-	WA1
	Refrigerant piping (branch pipe La)					φ15.88	φ9.52
	Refrigerant piping (branch pipe L1)					φ12.7	φ9.52
In the case of a triple type B	Indoor unit connected		-	-		DIS-	WA1
	Refrigerant piping (branch pipe L2,L3)					φ12.7	φ9.52
	Indoor unit connected					φ12.7	φ6.35
	Capacity of indoor unit	7				Model	50V×3

- CAUTION When the 50V or 60V model is connected as an indoor unit, always use a \$\phi 9.52\$ 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 (ϕ 6.35 on the liquid pipe side)
 - If a ϕ 6.35 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.

< Triple type >

Indoor unit (The unit of which elevation difference from the outdoor unit is the largest.)

< Triple type >

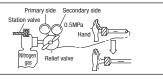


About brazing

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

- ullet Select refrigerant pipes of the table shown on the right wall thickness and material as specified for each nine size
- This unit uses R410A. Always use 1/2H pipes having a 1.0mm or thicker wall for φ19.05 or larger pipes, because 0-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*	0-type pipe	0-type pipe	0-type pipe	0-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

*Phosphorus deoxidized seamless copper pipe, C1220T, JIS H3300

NOTE

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

4) On-site piping work

 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. **↑** IMPORTANT

How to remove the service panel

First remove the five screws (xnark) 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.
- 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
- 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 R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, 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 9.1 $\phi 6.35$ φ9.52 13.2 φ12.7 16.6 φ15.88 19.7

6	\vdash	L

Copper	In the case of a	rigid (clutch) type			
pipe outer diameter	With an R410A tool With a conventional tool				
$\phi 6.35$		0.7~1.3			
ϕ 9.52	0~0.5				
φ12.7	0~0.5				
φ15.88					

<u>ACAUTION</u> 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.

Operation 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



For side right connection

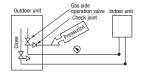
For downward connection

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 operation valve's check joint equipped on the outdoor unit side. While conducting a test, keep the operation 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

Vacuuming begins Run the vacuum numn for at least one hour after the vacuum nauge shows Confirm that the vacuum gauge indicator does not rise even if the system is Vacuum gauge check Fill refrigerant

Pay attention to the following points in addition to the above for the R410A 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.

Configuration Co							
Item Capacity	Standard refrigerant charge volume (kg)	standard refrigerant	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)		Installation's pipe length (m) covered without additional refrigerant charge		
100VN~140VN 100VS~140VS	2.0	_		3.8			
100VNX~140VNX 100VSX~140VSX		U	0.06	4.5	30		

Twin triple W-twin type>

Item	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional char per meter of re (liquid pipe)		Refrigerant volume charged for shipment at the factory (kg) Installation's pipe length (m) covered without additional refrigerant charge	
Capacity		charge volume (m)	Main pipe	Branch pipe	at the factory (kg)	renigerant charge
100VN~140VN 100VS~140VS	2.0			20	3.8	
100VNX~140VNX 100VSX~140VSX		0	0.06		4.5	30

- A standard refrigerant charge volume means a refrigerant charge volume for an installation with 0m long refrigerant piping.
 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.
- When refrigerant piping is shorter than 3m, reduce refrigerant by 1kg from the factory charged volume and adjust to 2.8kg.
 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 0.06 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

*When an additional charge volume calculation result is negative

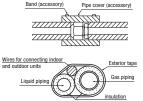
it is not necessary to charge refrigerant additionally.

- To charge refrigerant again, recover refrigerant from the system first and then charge the volume calculated from the above table (Standard refrigerant charge volume + branch pipes charge volume)
- (2) Charging refrigerant
- Since R410A 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 operation 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.

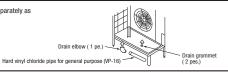
8) Heating and condensation prevention

- (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°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.



- O There are 3 drain holes provided on the bottom plate of an outdoor unit to discharge
- 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.
- O Connect a drain elbow as shown in the illustration and close the other two drain holes with grommets

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

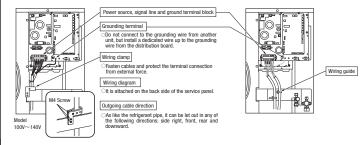
Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country. Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- •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 .
- •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.
- 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.

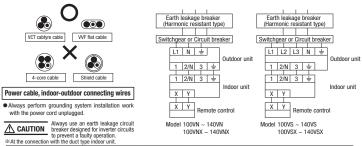


Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness \times number	
100VN~140VN	Single phase 3 wire						
100VNX	220-240V 50Hz		24	25	φ1.6mm	φ1.6mm x 3	
125VNX,140VNX			26	23			
100VS~140VS	3 phase 4 wire						
100VSX~140VSX		3.5	15	27			

- The specifications shown in the above table are for units without heaters. For units with heaters, refer to the installation instructions or the construction
- institucions or the indoor unit.

 Switchigear 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 cacles contained in a conduit and a voltage drop is 2%. For an installation failing outside of these conditions, follow the internal cabling regulations. Adapt it to the regulation in effect in each voltage drop is 2%. For an installation failing outside of these conditions. (Indoor the capacity of the condition of the condit



Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness \times number
100VN,100VNX	Single phase 3 wire 220-240V 50Hz 220V 60Hz			24		
125VN		5.5	27	22	φ1.6mm	φ1.6mm x 3
140VN			28	32		
125VNX		8	29	31		
140VNX			30	30		
100VS,100VSX	3 phase 4 wire 380-415V 50Hz 380V 60Hz		16	26		
125VS,125VSX		3.5	18	23		
140VS,140VSX			19	21		

5. TEST RUN

№ WARNING

Before conduct a test run, do not fail to make sure that the operation valves are closed.
 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.

• When you operate switches (SW3, SW5) for on-site setting, be careful not to touch a live part.

CAUTION

Willer you operate Symbol Card, 1975, 1

• 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"

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.

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 operation valve
Cooling operation	Discharge pressure (High pressure)	Suction pressure (Low pressure)
Heating	Suction pressure	Discharge pressure

Cooling during a test run

Heating during a test run

Normal or After the test operation

SW-3-3 SW-3-4

ON

OFF

0FF

ON

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

(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°C 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	Printed circuit board LED	(The cycles of 5 seconds)	Failure event	Action
	remote control unit	Red LED	Green LED	ranule 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 operation valves shut (occurs mainly during a heating operation)	Check whether the operation valves are open. If an error has been canceled when 3 minutes have elapsed.
	E49	Blinking once	Blinking continuously	Low pressure error or operation with operation valves shut (occurs mainly during a cooling operation)	since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.

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	
	when power is turned on	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.

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

Items to checkbefore a test run

• When you leave the outdoor unit with power supplied to it, he sure to close the nanel

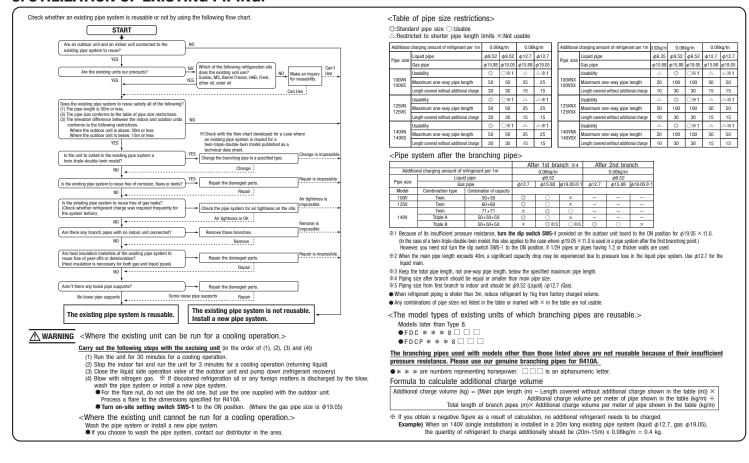
Item No.used in the installation manual	Item	Check item	Check
		If brazed, was it brazed under a nitrogen gas flow?	
2	Refrigerant	Were air-tightness test and vacuum extraction surely performed?	
	plumbing	Are heat insulation materials installed on both liquid and gas pipes?	
		Are operation valves surely opened for both liquid and gas systems?	
		Have you recorded the additional refrigerant charge volume and refrigerant pipe length on the panel's label?	
		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?	
4	Electric	Do indoor-outdoor connecting cables connect between the same terminal numbers?	
	wiring	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?	
	I	Is indoor unit installation work completed?	
_	Indoor unit	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 operation valve fully.	
2	Open the liquid side operation 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.	
0	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.	



6. UTILIZATION OF EXISTING PIPING.



Designed for R410A refrigerant

This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 46.

When install the unit, be sure to check whether the selection of installation place, power supply specifications, usage limitation (piping length, height differences between indoor and outdoor units, power supply 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.
- death or serious personal injury due to erroneous handling are listed in the AWARNING 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 ACALITION. 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.
- 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

[Accessory 1



- 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

- 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 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 joiting 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 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
 - 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
- 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 Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.
- personal injury. Do not run the unit with removed panels or protections
- If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks
- Re sure to fix up the service nanels.
- 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.

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. 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.

CAUTION

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
- 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 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
- 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.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A 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 R410A 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 R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated 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.)

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

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.



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3) Selection of installation location for the outdoor unit

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

- O A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit.
- O 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.
- O A place where it can be free from danger of flammable gas leakage.
- A place where drain water can be disposed without any trouble.
- O A place where the unit will not be affected by heat radiation from other heat source.
- O 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.
- O 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.
- O 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.
- O A place where strong wind will not blow against the outlet air blow of the unit.

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



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



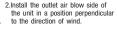
3.Install the unit under eaves or providen the roof on site.



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.]
- (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 stoo of the unit due to rising of high pressure.
- Install the outlet air blow side of the unit to face a wall of building, or provide a fence or a windbreak screen.





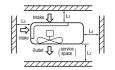
3.The unit should be installed on the stable and level foundation. If the foundation is not level, tie down the unit with wires.



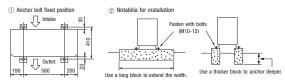
5) Installation space

- 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
	100V~140V		
Size Example installation	I	II	Ш
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 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.

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.

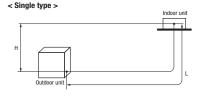
Observe the following restrictions on unit installation and use. Improper installation can result in a compressor failure or performance degradation.

						Marks appearting in the drawing					
		One-way pipe length difference	from the first branching po	int to the indoor ur	nit	< 3m	≥ 3m				
Descriptions	Mod	del for outdoor units	Dimensional limitations	Single type	Twin type	Triple type A	Triple type B				
One-way pipe length of	100V,125V		≤ 50m			-	-				
refrigerant piping	140V		≥ 50III	L -	L+L1+L2	L+L1+L2+L3	L+La+L1+L2+L3				
Main pipe length	100V,125V		≤ 50m	_		-	-				
main pipe length	140V		= 30111	_	L	L	L				
One-way pipe length between the first branching point from to the second branching point	140V		≦ 5m	_	_	-	La				
One-way pipe length after the first	100V,125V 140V		100V,125V		100V,125V		≤ 30m			=	-
branching point			≥ 30III	_	L1, L2	L1, L2, L3	L1 (1)				
One-way pipe length after the first branching point and second branching point	140V		≤ 27m	-	-	-	La+L2, La+L3 (1)				
One-way pipe length difference	Twin type		≤ 10m			-	_				
from the first branching point to	Triple type	140V	≤ 3m	_	L1-L2	L1-L2 , L2-L3 , L3-L1					
the indoor unit	mpio typo	1407	≤ 10m		1	-	L-(La+L2), L1-(La+L3) (1)				
One-way pipe length difference from the second branching point to the indoor unit	140V		≤ 10m	-	-	-	L2-L3				
Elevation difference between		door unit is positioned higher,	≤ 30m	н	н	Н	Н				
indoor and outdoor units	When the out	door unit is positioned lower,	≤ 15m	н		н	n				
Elevation difference between indoor units			≤ 0.5m	-	h	h1, h2, h3	h1, h2, h3				

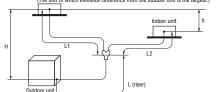


- The use restrictions appearing in the table above are applicable to the standard pipe size combinations shown in the table below. Where an existing pipe system is utilized, different one-way pipe length restrictions should apply depending on its pipe size. For more information, see " 6. UTILIZATION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

Note (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.







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2) Determination of pipe size

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

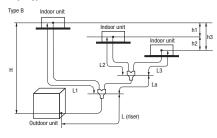
		Model	100V		Model	125V		Model	I 140V
		Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
		φ15.88	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52
Outdoor unit connected		Flare	Flare	Flare	Flare	Flare	Flare	Flare	Flare
Refrigerant piping (branch pipeL)		φ15.88	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52
In the case of a single type Indoor unit connected Capacity of indoor unit		φ15.88	φ9.52	φ15.88	φ9.52			φ15.88	φ9.52
		Model 100V	Model VA40	Model 125V	, Model VA50] -	-	Model 140V,	Model VA60
	Branching pipe set	DIS-I	WA1	DIS	S-WA1	DIS	-WA1	DIS-	-WA1
In the case of a twin type	Refrigerant piping (branch pipe L1,L2)	φ12.7	φ9.52	φ12.7	φ9.52	φ15.88	φ9.52	φ15.88	φ9.52
	Indoor unit connected	φ12.7	φ6.35	φ12.7	φ6.35	φ15.88	φ6.35	φ15.88	φ9.52
	Capacity of indoor unit	Model 50V×2, Model VA20×2		Model 6	60V×2	Model \	/A25×2	Model 71V×2,	Model 30V×2
	Branching pipe set							DIS-TA1	
	Refrigerant piping (branch pipe L1,L2,L3)							φ12.7	φ9.52
In the case of a triple type A	Indoor unit connected] -	-	_		· ·	_	φ12.7	φ6.35
	Capacity of indoor unit	1						Model 50Vx3, Model VA20x3	
	Branching pipe set							DIS-	WA1
	Refrigerant piping (branch pipe La)	1						φ15.88	φ9.52
	Refrigerant piping (branch pipe L1)	1						φ12.7	φ9.52
In the case of a triple type B	Indoor unit connected	1	-	-		-	-	DIS-	WA1
	Refrigerant piping (branch pipe L2,L3)	1						φ12.7	φ9.52
	Indoor unit connected	1						φ12.7	φ6.35
	Capacity of indoor unit	1						Model 50V×3.	Model VA20×3

- ↑ 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 (ϕ 6.35 on the liquid pipe side). If a \$\phi 6.35\$ 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 canacity • 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

< Triple type >

Indoor unit (The unit of which elevation difference from the outdoor unit is the largest.)

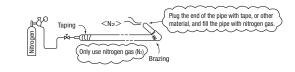
< Triple type >

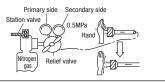


About brazing

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 R410A. Always use 1/2H pipes having a 1.0mm or thicker wall for φ19.05 or larger pipes, because 0-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*	0-type pipe	0-type pipe	0-type pipe	0-type pipe	1/2H-type pipe	1/2H-type pipe	1/2H-type pipe

Flared pipe end: A (mm)

-n 4

9.1

13.2

16.6

19.7

pipe outer

diameter $\phi 6.35$

φ9.52

 ϕ 12.7

 ϕ 15.88

*Phosphorus deoxidized seamless copper pipe C1220T, JIS H3300

· Select pipes having a wall thickness larger than the specified minimum nine thickness

4) On-site piping work

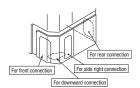
 Take care so that installed pipes may not touch components within a unit. If touching with an internal component, it will generate abnormal sounds and/or vibrations.

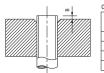
First remove the five screws (x mark) of the service panel and push it down into the direction of How to remove the service panel the arrow mark and then remove it by pulling it toward you.

- 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.
- 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 R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B
- The pipe should be anchored every 1.5m or less to isolate the vibration.
- Tighten a flare joint securely with a double spanner.

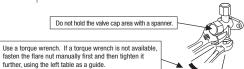
Do not apply force beyond proper fastening torque in tightening **⚠** CAUTION the flare nut. Fix both liquid and gas service valves at the valve main bodies as illustrated on the right, and then fasten them, applying appropriate fastening torque.

<u>ıg</u>	Operation valve size (mm)	Tightening torque (N-m)	Tightening angle (°)	Recommended length of a tool handle (mm)
d	6.35 (1/4")	14~18	45~60	150
u	9.52 (3/8")	34~42	30~45	200
	12.7 (1/2")	49~61	30~45	250
	15.88 (5/8")	68~82	15~20	300



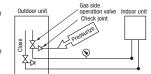


Copper In the case of a rigid (clutch) type					
pipe outer diameter	protrusion for flaring: 8 (mm) In the case of a rigid (clutch) type With an R410A tool With a conventional too 0~0.5 0.7~1.3				
$\phi 6.35$					
ϕ 9.52	0.05				
φ12.7	0~0.5	0.7~1.3			
φ15.88					



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 operation valve's check joint equipped on the outdoor unit side. While conducting a test, keep the operation 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.

Pay attention to the following points in addition to the above for the R410A 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.). Ouse a counterflow prevention adapter to prevent vacuum pump oil from

Fill refrigerant 7) Additional refrigerant charge

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

<single th="" type<=""><th>></th><th></th><th></th><th></th><th></th></single>	>				
Item Capacity	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional charge volume (kg) per meter of refrigerant piping (liquid pipe)		Installation's pipe length (m) covered without additional refrigerant charge
Model 100V					
Model 125V	2.0	0	0.06	3.8	30
Model 140V					

-Twin triple W-twin type-

Airtighteness test completed

Vacuuming begins

Vacuuming completed

Vacuum gauge check

,	, typor						
Item	Standard refrigerant charge volume (kg)	Pipe length for standard refrigerant charge volume (m)	Additional char per meter of re (liquid pipe)	ge volume (kg) frigerant piping	gerant piping Refrigerant volume charged for shipment at the factory (kg) refringerant charge		
Capacity		charge volume (m)	Main pipe	Branch pipe	at the factory (kg)	reingerant charge	
Model 100V							
Model 125V	2.0	0	0.	06	3.8	30	
Model 140V							

entering the refrigerant system

- A standard refrigerant charge volume means a refrigerant charge volume for an installation with 0m long refrigerant piping.
- 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.
- When refrigerant piping is shorter than 3m, reduce refrigerant by 1kg from the factory charged volume and adjust to 2.8kg.
- 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 0.06 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

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

● To charge refrigerant again, recover refrigerant from the system first and then charge the volume calculated from the above table (Standard refrigerant charge volume + branch pipes charge volume)

(2) Charging refrigerant

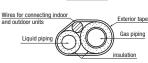
- Since R410A refrigerant must be charged in the liquid phase, you should charge it, keeping the container cylinder upside down or using a refrigerant cylinder equipped with a siphon tube.
- Charge refrigerant always from the liquid side service port with the operation valve shut. When you find it difficult 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

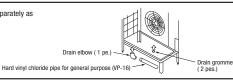
- (1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.
- (2) Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.
- Improper 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%.

Band (accessory Pipe cover (accessory)



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.



- O There are 3 drain holes provided on the bottom plate of an outdoor unit to discharge
- O 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
- O Connect a drain elbow as shown in the illustration and close the other two drain holes with arommets.

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

Flectrical 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.



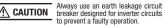
Model	Power source	Power cable thickness(mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness \times number
100VN	Single phase 3 wire					
125VN	220-240V 50Hz	5.5	24	25		
140VN	220V 60Hz				φ1.6mm	φ1.6mm x 3
100VS	3 phase 4 wire				Ψ1.0111111	φ1.011111χ0
125VS	380-415V 50Hz	3.5	15	27		
140VS	380V 60Hz					

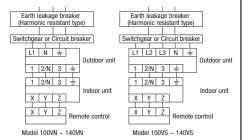
OAs like the refrigerant pipe, it can be let out in any of the following directions: side right, front, rear and

- 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.
- Connect a pair bearing a common terminal number with an indoor-outdoor connecting wire.
- In cabling, faster 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.





*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 \times number
100VN	Single phase 3 wire		25	24		
125VN	220-240V 50Hz	5.5	27	22		
140VN	220V 60Hz		28	32	φ1.6mm	φ1.6mm x 3
100VS	3 phase 4 wire		16	26	ψ1.0	
125VS	380-415V 50Hz	3.5	18	23		
140VS	380V 60Hz		19	21		

- 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.

5. TEST RUN

Model 100V~140V

♠ WARNING

- Before conduct a test run, do not fail to make sure that the operation valves are closed.
- 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.

4-core cable

Shield cable

- 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.

↑ 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 operation 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"

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
- (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.

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

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

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

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

Items to checkbefore a test run

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

tem No.used in the enstallation manual	Item	Check item	Check
		If brazed, was it brazed under a nitrogen gas flow?	
	Refrigerant	Were air-tightness test and vacuum extraction surely performed?	
2	plumbing	Are heat insulation materials installed on both liquid and gas pipes?	
		Are operation 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?	
		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?	
4	Electric	Do indoor-outdoor connecting cables connect between the same terminal numbers?	
	wiring	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?	
	In decree 100	Is indoor unit installation work completed?	
_	Indoor unit	Where a face cover should be attached onto an indoor unit, is the face cover attached to the indoor unit?	

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

(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°C 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	Printed circuit board LED	(The cycles of 5 seconds)	Failure event	Action	
remote control unit	Red LED	Green LED	i aliule event	ACBOIL	
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 operation valves shut (occurs mainly during a heating operation)	Check whether the operation valves are open. If an error has been canceled when 3 minutes have elapsed.	
E49	Blinking once	Blinking continuously	Low pressure error or operation with operation valves shut (occurs mainly during a cooling operation)	since a compressor stop, you can restart the unit by effecting Check Reset from the remote control unit.	

• 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.

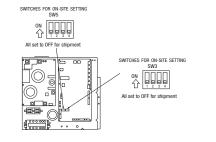
	When power is turned on	When the unit comes to a normal stop		When the unit comes to an abnormal stop	
	When power is turned on	During a cooling operation	During a heating operation	During a cooling operation	During a heating operation
Valve for a cooling operation	Complete shut position	Complete shut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

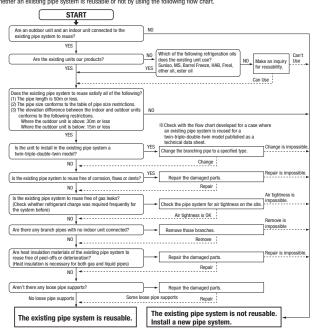
Test run procedure Always carry out a test run and check the following in order as listed.

Turn	The contents of operation	Check			
1	Open the gas side operation valve fully.				
2	Open the liquid side operation 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.				
(3)	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.				



6. UTILIZATION OF EXISTING PIPING.

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



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 operation 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 nine system or install a new nine 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 R410A.
- Turn on-site setting switch SW5-1 to the ON position. (Where the gas pipe size is ϕ 19.05)
- <Where the existing unit cannot be run for a cooling operation.>
- Wash the pine system or install a new pine system.
- If you choose to wash the pipe system, contact our distributor in the area.

<Table of pipe size restrictions>

○:Standard pipe size ○:Usable

Additional	charging amount of refrigerant per 1m	0.06	kg/m	0.08	kg/m
Dies sies	Liquid pipe	φ9.52	φ9.52	φ12.7	φ12.7
Pipe size	Gas pipe	φ15.88	φ19.05	φ15.88	φ19.05
	Usability	0	○※1	Δ	△※1
100V	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15
	Usability	0	○*1	Δ	△※1
125V	Maximum one-way pipe length	50	50	25	25
140V	Length covered without additional charge	30	30	15	15
	Usability	0	○*1	Δ	△※1
	Maximum one-way pipe length	50	50	25	25
	Length covered without additional charge	30	30	15	15

%1 Because of its insufficient pressure resistance, turn the dip switch SW5-1 provided on the outdoor unit board to the ON position for ϕ 19.05 \times 11.0.

(In the case of a twin-triple-double-twin model, this also applies to the case where ϕ 19.05 \times 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 \$\phi\$ 12.7 for the liquid main. *3 Keep the total pipe length, not one-way pipe length, below the
- specified maximum pipe length. When refrigerant piping is shoter than 3m, reduce refrigerant by
- 1kg from factory charged volume and adjust to 2.8kg. Any combinations of pipe sizes not listed in the table or marked with X in the table are not usable

<Pipe system after the branching pipe>

○:Standard pipe size ○:Usable ×:Not usable

Any combinations of pipe sizes not listed in the table or

marked with X in the table are not usable

		After 1st branch #4			After 2nd branch			
Additional charging amount of refrigerant per 1m		0.06kg/m			0.06kg/m			
Liquid pipe			φ9.52		φ9.52			
Pipe Size	Pipe size Gas pipe		φ12.7	φ15.88	ϕ 19.05 $\%$ 1	φ12.7	φ15.88	φ19.05 ± 1
Model	Combination type	Combination of capacity	·					
100V	Twin	50+50	0	0	×	-	_	_
125V	Twin	60+60	0	0	×	-	_	_
	Twin	71+71	×	0	0	-	-	-
140V	Triple A	50+50+50	0	0	×	-	-	-
	Triple B	50+50+50	×	○ ※5	○※5	0	0	×

¾4 Piping size after branch should be equal or smaller than main pipe size.

3.5 Piping size from first branch to indoor unit should be ϕ 9.52 (Liquid) $/\phi$ 12.7 (Gas).

<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 R410A.

• * * 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 ϕ 12.7, gas ϕ 19.05), the quantity of refrigerant to charge additionally should be (20m-15m) x 0.08kg/m = 0.4 kg.

Inverter driven single split PAC Designed for R410A refrigerant

This installation manual deals with outdoor units and general installation specifications only. For indoor units, refer to page 46 When install the unit, be sure to check whether the selection of installation place, power supply specifications, usage limitation (piping length, height differences between indoor and outdoor units, power supply voltage and etc.) and installation spaces

SAFETY PRECAUTIONS

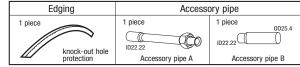
- We recommend you to read this "SAFETY PRECAUTIONS" carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into AWARNING and ACAUTION. The matters with possibilities 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 A CALITION. 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 this outdoor unit, AS/NZS61000.3.2 is not applicable if consent by the utility company or nortification to the utility company is given before usage.
- 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]



- 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
- 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 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.



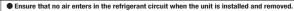


It can cause lack of oxygen.

Use the prescribed pipes, flare nuts and tools for 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 pining 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



- 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 nanels 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.

CAUTION Carry out the electrical work for ground lead with care Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation. 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 Using an old and damage base flame can cause the unit falling down and cause personal injury. electric shocks and fire due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks, it could cause explosion or ignition. Do not install the unit in the locations listed below Use the circuit breaker for all pole with correct capacity · Locations where carbon fiber, metal powder or any powder is floating. Using the incorrect circuit breaker, it can cause the unit malfunction and fire Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur. Install isolator or disconnect switch on the power supply wiring in accordance with the local codes and regulations. · Locations where cosmetic or special sprays are often used. The isolator should be locked in accordanced with EN60204- Locations with direct exposure of oil mist and steam such as kitchen and machine plant. Take care when carrying the unit by hand Locations where any machines which generate high frequency harmonics are used. 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 Locations with salty atmospheres such as coastlines unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins. Locations with heavy snow (If installed, be sure to provide base flame and snow hood mentioned in the manual) Dispose of any packing materials correctly. · Locations where the unit is exposed to chimney smoke 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 · Locations at high altitude (more than 1000m high) wrapper away from children and to dispose after tear it up. Locations with ammonic atmospheres Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit. Locations where heat radiation from other heat source can affect the 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. · Locations without good air circulation. Locations with any obstacles which can prevent inlet and outlet air of the unit Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them. · Locations where short circuit of air can occur (in case of multiple units installation) Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables. · Locations where strong air blows against the air outlet of outdoor unit Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work. It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire. the day in the day in the state of the state Do not install the outdoor unit in the locations listed below. Perform installation work properly according to this installation manual. · Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood. Improper installation can cause abnormal vibrations or increased noise generation. · 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. Earth leakage breaker must be installed Locations where vibration can be amplified and transmitted due to insufficient strength of structure If the earth leakage breaker is not installed, it can cause fire or electric shocks. Locations where vibration and operation sound generated by the outdoor unit can affect seriously, (on the wall or at the place near bed room) Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used. · Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m) Connecting the circuit with copper wire or other metal thread can cause unit failure and fire. · 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. Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art. If leaked gases accumulate around the unit, it can cause fire. It can cause the damage of the items. 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. Do not touch any buttons with wet hands 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. Do not touch any refrigerant pines with your hands when the system is in operation. Insufficient space can result in accident such as personal injury due to falling from the installation place. During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury. 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. Do not clean up the unit with water 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 Do not operate the outdoor unit with any article placed on it. Equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause You may incur property damage or personal injure from a fall of the article. malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause iamming. Do not step onto the outdoor unit. 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 keen the surroundings clean.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant. A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A 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 put's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A 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 R410A. Check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated 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.)

When a unit is noisited with simple for madeles, all find properly balanced, the unit can be thrown off-balance and fall. When a unit is hoisted with slings for haulage, take into consideration the offset of its gravity center position.

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.



• 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

- O A place where it is horizontal, stable and can endure the unit weight and will not allow vibration transmittance of the unit
- O A place where it can be free from possibility of bothering neighbors due to noise or exhaust air from the unit
- O A place where the unit is not exposed to oil splashes.
- A place where it can be free from danger of flammable gas leakage.
- O A place where drain water can be disposed without any trouble.
- O A place where the unit will not be affected by heat radiation from other heat source.
- O A place where snow will not accumulate.
- O 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.
- O A place where good air circulation can be secured, and enough service space can be secured for maintenance and service of the unit safely. O A place where the unit will not be affected by electromagnetic waves and/or high-harmonic waves generated by other equipment.
- O 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.
- O A place where strong wind will not blow against the outlet air blow of the unit

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,]

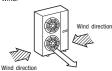
(2) If the unit can be affected by strong wind, following measures are required.

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



the unit in a position perpendicular to the direction of



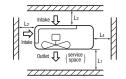
3 The unit should be installed on the stable and level foundation. If the foundation is not level. tie down the unit with wires



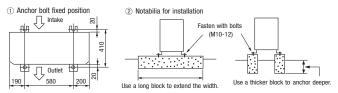
5) Installation space

- 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	Ш
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 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 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.

	One-way pipe length difference from the first branching point to the indoor unit					
Restrictions	Model fe	Dimensional restrictions	Single type			
One-way pipe length of refrigerant piping	Gas piping	φ25.4 or φ28.58	≦ 70m			
one-way pipe length or remigerant piping	das piping	φ22.22	≦ 35m			
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned higher,		≦ 30m			
Elevation difference between indoor and outdoor units	When the outdoor unit is positioned lower,		≤ 15m	Н		



• 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."

< Single type > Indoor unit Outdoor unit

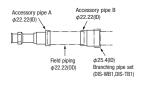
2) Determination of pipe size

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

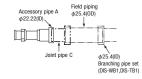
		Gas pipe	Liquid pipe	
0.44		φ22.22	φ12.7	
Outdoor unit connected		Brazing	Flare	
Refrigerant	Refrigerant piping (branch pipeL)		φ12.7	
In the case of a single type	Indoor unit connected	φ25.4	φ12.7	
in the case of a single type	Capacity of indoor unit	Model 180V		

3) How to use pipe reducer

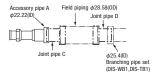
 φ22.22(0D) size of the refrigerant gas pipe can be used by using accessory pipe A,B.



 φ25.4(0D) 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.



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. Plug the end of the pipe with tape, or other material, and fill the pipe with nitrogen gas. Primary side Secondary side Station valve 0.5MPa Hand Only use nitrogen gas (Nz) Relief valve gas (Nz)

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 R410A. Always use 1/2H pipes having a 1.0mm or thicker wall for φ19.05 or larger pipes, because 0-type pipes do not meet the pressure resistance requirement.



*Phosphorus deoxidized seamless copper pipe C1220T, JIS H3300

NOTE

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

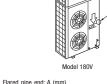
5) On-site piping work

• 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 (x 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.
- 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 R410A are different from those for conventional R407C. Although we recommend the use of flaring tools designed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- ■Use accessory pipes.
- For detailed installation procedures, consult with the installation manual attached to your accessory pipe.
- ●The pipe should be anchored every 1.5m or less to isolate the vibration.
- Tighten a flare joint securely with a double spanner.



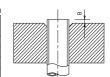
-0.4

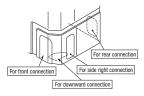
9.1

13.2

16.6

19.7





Copper pipe protrusion for flaring: B (mm)

	- Pro Pro	,	` '			
	Copper pipe outer	In the case of a rigid (clutch) type				
	diameter	With an R410A tool	With a conventional tool			
	φ6.35					
	φ9.52	0~0.5	0.7~1.3			
F	φ12.7	0~0.5	0.7~1.3			
	φ15.88					



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.

:	Operation valve size (mm)	Tightening torque (N-m)	Tightening angle (°)	Recommended length of a tool handle (mm)
	φ12.7 (1/2")	49~61	30~45	250
	φ19.05(3/4")	100~120	15~20	450

pipe outer

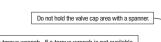
diameter

φ6.35

φ9.52

φ12.7

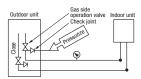
 ϕ 15.88



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.

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 operation valve's check joint equipped on the outdoor unit side. While conducting a test, keep the operation 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
- (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.

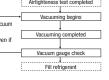


7) Evacuation

<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

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 evetem is left for one hour or more



Pay attention to the following points in addition to the above for the R410A 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.).
- OUse a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

8) Additional refrigerant charge

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

<Single type>

Standard retrigerant	standard refrigerant	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
3.6	0	0.12	7.2	30

- A standard refrigerant charge volume means a refrigerant charge volume for an installation with 0m long refrigerant piping.
- 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.
- When refrigerant piping is shoter than 3m, reduce refrigerant by 1kg from factory charged volume and adjust to 6.2kg.
- 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 0.12 (kg/m) + Total length of branch pipes (m) x 0.06 (kg/m)

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

• To charge refrigerant again, recover refrigerant from the system first and then charge the volume calculated from the above table (Standard refrigerant charge volume + branch pipes charge volume)

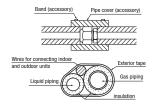
(2) Charging refrigerant

- Since R410A 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 operation 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.

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°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
 - 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.



- There are 3 drain holes provided on the bottom plate of an outdoor unit to discharge condensed water.
- O 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.
- O Connect a drain elbow as shown in the illustration and close the other two drain holes with grommets.

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

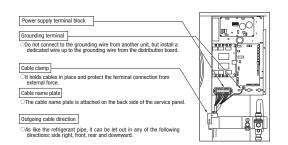
Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country. Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

- 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.
- •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.
- 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.



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

Earth I (Harmo					
Switchge	ar or (Circu	it b	reake	er
L1 L	2 L	3	N	÷	l
1 2	/N :	3 :	÷		Outdoor unit
1 2	/N :	3 -	F		
X I	y :	7		Indo	oor unit
X	Y :	5	· · ·		control
		'	rer	note	control

Power source	Power cable thickness (mm²)	MAX. over current (A)	Cable length (m)	Grounding wire thickness	Indoor-outdoor wire thickness × number
415V 50Hz	5.5	27	26	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.
- 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.

• Before conduct a test run, do not fail to make sure that the operation valves are closed.

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

• Turn on power 6 hours prior to a test run to energize the crank case heater. • 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.

↑ 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 operation 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"

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
UN	ON	Heating during a test run
0FF		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 operation 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, J7 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

*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°C or lower and the compressor is not running.

·When the unit is used in a very snowy country, set this switch to ON.

(3) Higth pressure control (J7)

•When the option parts that change air flow from outlet are used, cut (open) J7. Cut the jumper wire into two parts and ensure that they are kept isolated from each other.



4) Failure diagnosis in a test run

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

• 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		
	when power is turned on	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.

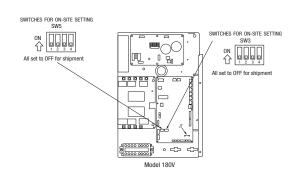
Items to checkbefore a test run

• 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	
		If brazed, was it brazed under a nitrogen gas flow?	
	Refrigerant	Were air-tightness test and vacuum extraction surely performed?	
2	plumbing	Are heat insulation materials installed on both liquid and gas pipes?	
	p	Are operation 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?	
		Is the unit free of cabling errors such as uncompleted connection, an absent or reversed phase?	
	Electric wiring	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?	
4		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?	
		Is indoor unit installation work completed?	
_	Indoor unit	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 operation valve fully.					
2	Open the liquid side operation valve fully.					
3	Close the panel.					
4	Where a remote control unit is used for unit setup on the installation site, please follow instructions for unit setup on the installation site with a remote control unit.					
SW3-3 ON / SW3-4 OFF: the unit will start a cooling operation.						
(3)	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.					



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6. UTILIZATION OF EXISTING PIPING.

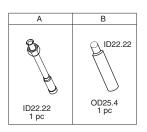
Check whether an existing pipe system is reusable or not by using the following flow chart.	
START	<table of="" pipe="" restrictions="" size=""> ©:Standard pipe size ○:Usable △:Restricted to shorter pipe length limits</table>
Are an outdoor unit and an indoor unit connected to the NO	Cool ↓ : Cooling capacity drop ×:Not usable
Are an outdoor unit and an indoor unit connected to the existing pipe system to reuse?	Additional charging amount of refrigerant per 1m 0.12kg/m 0.2kg/m
YES	Pipe size Liquid pipe
Are the existing units our products? NO Make an inquiry Use NO Make an inquiry Use	Gas pipe φ22.22 φ25.4 φ28.6 φ22.22 φ25.4 φ28.6 Usability □ □ △ △ ★1 △ ★1 △ ★1
YES Suniso, MS, Barrel Freeze, HAB, Freol, ether oil, ester oil	Maximum one-way pipe length 35 70 70 40 40 40
Can Use	Length covered without additional charge 30 30 25 18 18 13
Does the existing pipe system to reuse satisfy all of the following?	*1 Keep the total pipe length, not one-way pipe length, below the specified maximum pipe length.
(1) The pipe length is 50m or less. (2) The pipe size conforms to the table of pipe size restrictions.	
(3) The elevation difference between the indoor and outdoor units conforms to the following restrictions.	• When refrigerant piping is shoter than 3m, reduce refrigerant by 1kg from factory charged volume and adjust to 6.2kg.
Where the outdoor unit is above: 30m or less Where the outdoor unit is below: 15m or less Where the outdoor unit is below: 15m or less **Check with the flow chart developed for a case where	$lue{}$ Any combinations of pipe sizes not listed in the table or marked with $ imes$ in the table are not usable.
Where the outdoor unit is below. 19th or less an existing pipe system is reused for a twin-triole-double-twin model published as a	
technical data sheet. Change is impossible.	
twin-triple-double-twin model? Change the branching pipe to a specified type.	<the are="" branching="" existing="" model="" of="" pipes="" reusable.="" types="" units="" which=""></the>
NO Change	Models later than Type 8.
Is the existing pipe system to reuse free of corrosion, flaws or dents? YES Repair the damaged parts. Repair s impossible.	●FDC * * * 8 □ □
NO Repair	●FDCP * * * 8 □ □
Is the existing pipe system to reuse free of gas leaks?	The broading place used with models about they there listed about one act yourselfs because of their insufficient
(Check whether retrigerant charge was required frequently for the system before)	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 R410A.
NO → Air tightness is OK Remove is	• * * * are numbers representing horsepower.
Are there any branch pipes with no indoor unit connected? Remove those branches.	Formula to calculate additional charge volume
NO Remove	Additional charge volume (kg) = (Main pipe length (m) - Length covered without additional charge shown in the table (m)} ×
Are heat insulation materials of the existing pipe system to Repair is impossible.	Additional charge volume per meter of pipe shown in the table (kg/m) + Total length of branch pipes $(m) \times$ Additional charge volume per meter of pipe shown in the table (kg/m)
reuse free of peel-offs or deterioration? (Heat insulation is necessary for both gas and liquid pipes)	
NO ◀	If you obtain a negative figure as a result of calculation, no additional refrigerant needs to be charged. Example) When a twin installation is installed in a 40m long existing gipe system
Aren't there any loose pipe supports? Repair the damaged parts.	(main pipe length 30m, liquid ϕ 15.88, gas ϕ 25.4; pipe length after branching pipe 5m x 2, liquid ϕ 9.52, gas ϕ 15.88),
No loose nine sunnorts Some loose pipe supports Renair	the quantity of refrigerant to charge additionally should be (30m-18m) \times 0.2kg/m + 5m \times 2 \times 0.06kg/m = 3.0 kg.
The existing pipe system is reusable.	
Install a new pipe system.	
A management of the socialism with one has more for a socilism association.	
<u>MARNING</u> <where a="" be="" can="" cooling="" existing="" for="" operation.="" run="" the="" unit=""></where>	
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 operation 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	e 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 R410A.	
$lacktriangle$ Turn on-site setting switch SW5-1 to the ON position. (Where the gas pipe size is ϕ 19.05)	
<where a="" be="" cannot="" cooling="" existing="" for="" operation.="" run="" the="" unit=""></where>	
Wash the pipe system or install a new pipe system. ● If you choose to wash the pipe system, contact our distributor in the area.	
• ii you choose to wash the pipe system, contact our distributor in the afea.	



(5) Method for connecting the accessory pipe (FDCA160VS model only)

Be sure to use the accessory pipe to connect the operation valve on the gas side with the field pipe.

- ① Referring to Table ① and Table ②, prepare the straight pipe and the elbow in the field, which are used in the construction examples (A) ~ (D) 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 figures of construction examples \bigcirc \sim \bigcirc applicable to the connecting direction(chain double dashed line), braze the accessory pipe and the parts prepared in the above \bigcirc .
- 3 After assembly of the connecting pipe, connect it to the service valve on the gas side inside the outdoor unit.
- Tighten the flare nut with appropriate torque.
- After connection of the connecting pipe assembly to the service valve on the gas side, braze the connecting pipe assembly and the field pipe.



Appropriate torque					
φ 19.05	100~120N·m				

Table ① Parts used for the connecting pipe assembly

No.	Name	Qty.	Remarks			
1	Accessory pipe A	1 Accessories				
2	Straight pipe ①	1	Procured in the field			
3	Straight pipe ②	1 or 0	Procured in the field (Not required for downward direction)			
4	Elbow	1 or 0	Procured in the field (Not required for downward direction)			

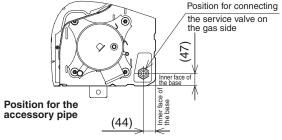


Table 2 Length of the straight pipe (prepared in the field)

	Pipe size	Downward	® Forward	© Rightward	D Backward
Straight pipe1	φ22.22×t1.6	above 415mm	185~235mm	185~235mm	185~235mm
Straight pipe2	φ22.22×t1.6	-	above 125mm	above 125mm	above 405mm

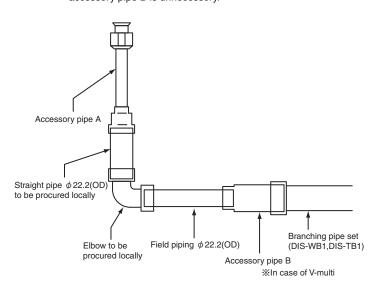
- Be sure to use pipes of 1/2H material, and wall thickness above 1mm. (Pressure resistance of O-type pipe is not enough)
- Switch ON SW5-1 on the control PCB, if O-type pipe must be used and bent with the bender.
 During heating operation, the high-pressure protection may be actuated under the condition lower than the normal pressure, and the heating capacity may decrease.

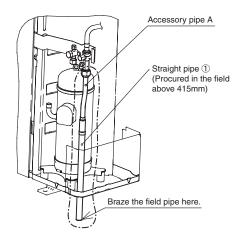
About brazing

• Be sure to braze while supplying nitrogen gas.

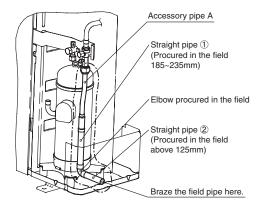
If no nitrogen gas is supplied, a large amount of impurity (oxidized fi lm) will be generated, which may clog the capillary tube and the expansion valve, resulting in fatal malfunction.

Branching pipe set can be used by using the accessory pipe B.
 When \$\phi 22.22(\text{OD})\$ size of the indoor unitgas pipe is used, the accessory pipe B is unnecessory.

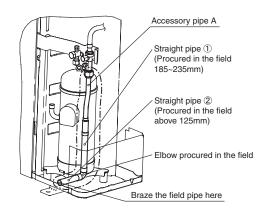




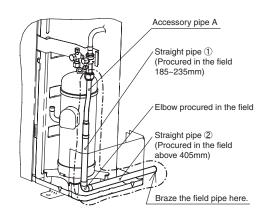
Construction example (A) (Downward)



Construction example © (Rightward)



Construction example ® (Forward)



Construction example (D) (Backward)

10 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

10.1 Remote control

(1) Wired remote control Model RC-E5

This button is used during test operation.

The figure below shows the remote control with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation Characters displayed with dots in the liquid crystal display area are abbreviated.

The figure below shows the remote control with the cover opened. Ventilaion display Weekly timer display Displayed during ventilation operation Displays the settings of the weekly timer. Centeal control display Operation setting display area Displayed when the air conditioning system is Displays setting temperature, airflow controlled by centralized remote control. volume, operation mode and oparation message. Timer operation display Displays the timer operation setting. Operation/check indicator light During oparation: Lit in green In case of error: Flashing in red Temperature setting buttons Operation/stop button These buttons are used to set the This button is used to operate and stop temperature of the room. the air conditioning system. **ITEMP** ①ON/OFF Press the button once to operate the system and press it once again to stop Timer button the system. This button is used to set the timer mode. MODE button This button is used to change the **(**-) operation mode. Timer setting buttons TIMER SET **FAN SPEED button** These buttons are used to set 灬 釙 This button is used to set the airflow the timer mode and the time. volume 团 **VENT** button ESP button -This button is used to operate external This button is used to ventilator. select the auto static pressure adjustment mode. LOUVER button This button is used to operate/stop the Cover swing louver. AIR CON No. button Display the indoor unit number connected to this SET button remote control. •This button is used to fix the setting. •This button is used to set the silent mode. **CHECK button** This button is used at servicing. **RESET button** •Press this button while making settings to go back to the previous operation. TEST button

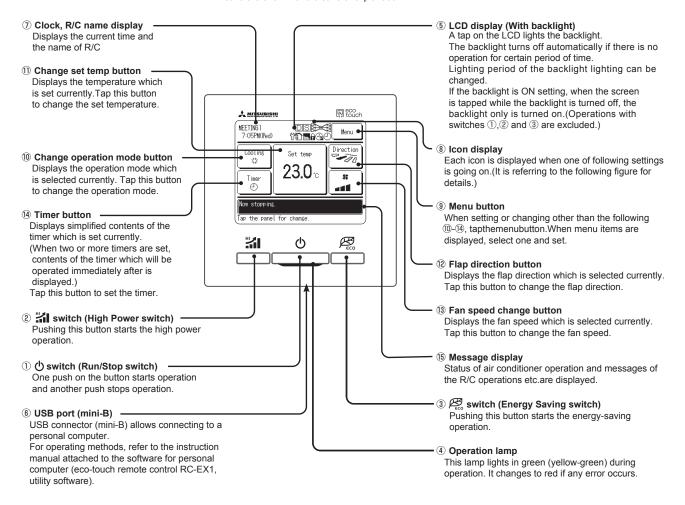
•This button is also used to reset the "FILTER CLEANING" display.

(Press it after cleaning the air filter)

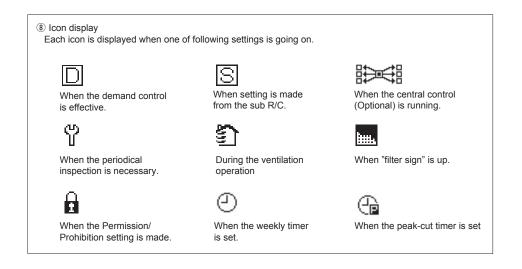
^{*} All displays are described in the liguid crystal display for explanation.

Model RC-EX1A

All icons are shown for the sake of explanation.

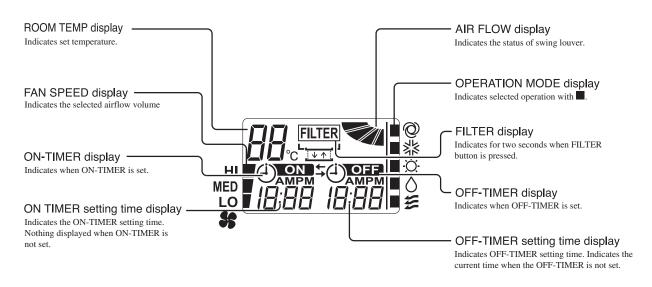


Touch panel system, which is operated by tapping the LCD screen with a finger, is employed for any operations other than the 1 Run/Stop, 2 High power and 3 Energy-saving switches.

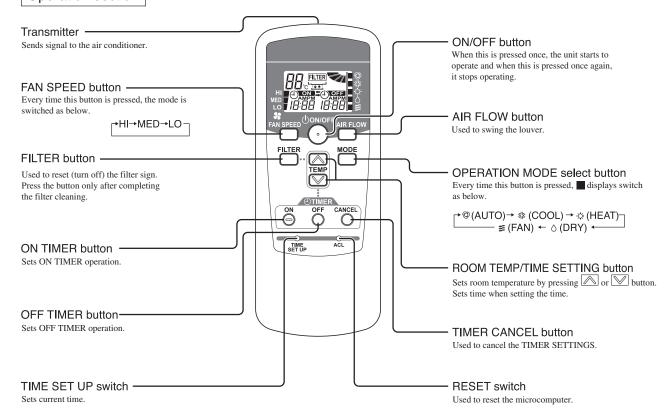


(2) Wireless remote control

Indication section



Operation section

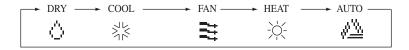


^{*} All displays are described in the liquid crystal display for explanation

10.2 Operation control function by the wired remote control

Model RC-E5

(1) Switching sequence of the operation mode switches of remote control



(2) CPU reset

This functions when "CHECK" and "ESP" buttons on the remote control are pressed simultaneously. Operation is same as that of the power supply reset.

(3) Power failure compensation function (Electric power supply failure)

- This becomes effective if "Power failure compensation effective" is selected with the setting of remote control function.
- Since it memorizes always the condition of remote control, it starts operation according to the contents of memory no sooner than normal state is recovered after the power failure. Although the auto swing stop position and the timer mode are cancelled, the weekly timer setting is restored with the holiday setting for all weekdays.

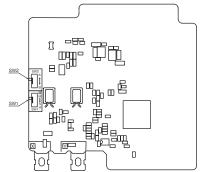
After recovering from the power failure, it readjusts the clock and resets the holiday setting for each weekday so that the setting of weekly timer becomes effective.

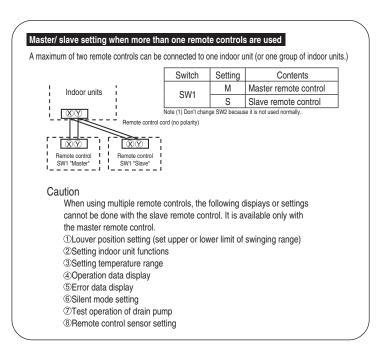
• Content memorized with the power failure compensation are as follows.

Note (1) Items (f), (g) and (h) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.

- (a) At power failure Operating/stopped
 - If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized. (Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)
- (b) Operation mode
- (c) Airflow volume mode
- (d) Room temperature setting
- (e) Louver auto swing/stop
 - However, the stop position (4-position) is cancelled so that it returns to Position (1).
- (f) "Remote control function items" which have been set with the remote control function setting ("Indoor function items" are saved in the memory of indoor unit.)
- (g) Upper limit value and lower limit value which have been set with the temperature setting control
- (h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

[Parts layout on remote control PCB]

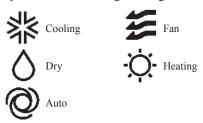




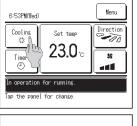
Model RC-EX1A

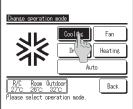
(1) Switching sequence of the operation mode switches of remote control

- (a) Tap the change operation mode button on the TOP screen.
- (b) When the change operation mode screen is displayed, tap the button of desired mode.
- (c) When the operation mode is selected, the display returns to the TOP screen. Icons displayed have the following meanings.

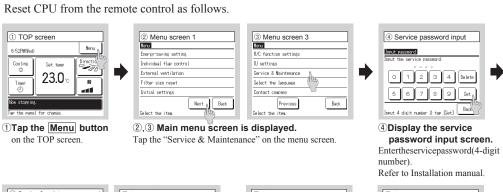


- Notes(1) Operation modes which cannot be selected depending on combinations of IU and OU are not displayed.
 - When the Auto is selected, the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.





(2) CPU reset





(5).(6) Service & maintenance menus are displayed.

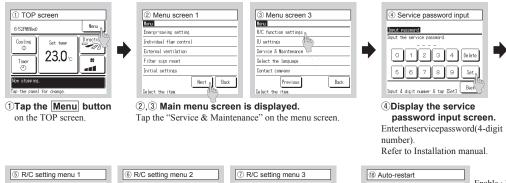
③ Special settings CPU reset: Microcomputers of IU and OU connected are reset (State of restoration after

® CPU reset

All microcomputers on the R/C operated, other R/Cs, IUs and OUs are reset (State of restoration after power failure). Tap [Yes] to reset CPU

(3) Power failure compensation function (Electric power supply failure)

Enable the Auto-restart function from the remote control as follows.





Return air temp

R/C sensor adjustmen

⑤,⑥,⑦ Display the R/C setting menu screens.

Yentilation setting



Enable: It returns to the state be fore the supply power failure as soon as the power is restored (After the end of the primary control at the power on).

Disable: It stops after the restoration of power supply, regardless the state of operation before the power failure.

18 Auto-restart

Set the state of operation to be started when the power supply is restored after a power failure.

Back

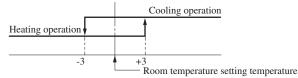
- Since it memorizes always the condition of remote control, it starts operation according to the contents of memory no sooner than normal state is recovered after the power failure. Although the auto swing stop position and the timer mode are cancelled, the weekly timer setting is restored with the holiday setting for all weekdays.
 - After recovering from the power failure, it readjusts the clock and resets the holiday setting for each weekday so that the setting of weekly timer becomes effective.
- Content memorized with the power failure compensation are as follows.
 - Note (1) Items (f), (g) and (h) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.
 - (a) At power failure Operating/stopped

 If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized. (Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)
 - (b) Operation mode
 - (c) Airflow volume mode
 - (d) Room temperature setting
 - (e) Louver auto swing/stop
 - However, the stop position (4-position) is cancelled so that it returns to Position (1).
 - (f) "Remote control function items" which have been set with the remote control function setting ("Indoor function items" are saved in the memory of indoor unit.)
 - (g) Upper limit value and lower limit value which have been set with the temperature setting control
 - (h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

10.3 Operation control function by the indoor control

(1) Auto operation

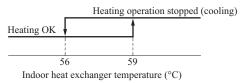
(a) If "Auto" mode is selected by the remote control, the heating and the cooling are automatically switched according to the difference between outdoor air temperature and setting temperature and the difference between setting temperature and return air temperature. (When the switching of cooling mode ↔ heating mode takes place within 3 minutes, the compressor does not operate for 3 minutes by the control of 3-minute timer.) This will facilitate the cooling/heating switching operation in intermediate seasons and the adaptation to unmanned operation at stores, etc (ATM corner of bank).



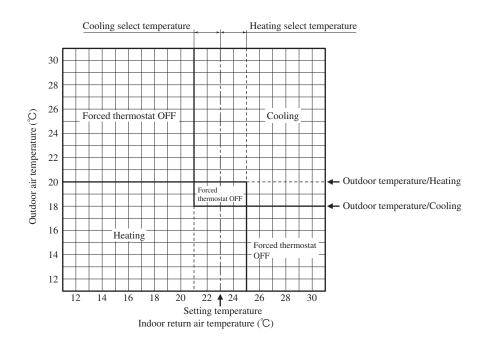
Room temperature (detected with Thi-A) [deg]

Notes (1) Temperature range of switching cooling/heating mode can be changed by RC-EX1A from $\pm 1.0 \sim \pm 4.0$.

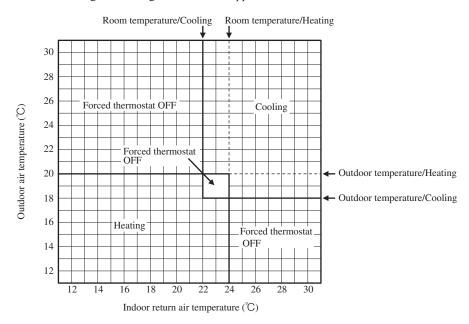
- (2) Room temperature control during auto cooling/auto heating is performed according to the room temperature setting temperature. (DIFF: ±1 deg)
- (3) If the indoor heat exchanger temperature rises to 59°C or higher during heating operation, it is switched automatically to cooling operation. In addition, for 1 hour after this switching, the heating operation is not performed, regardless of the temperature shown at right.



- (b) The following automatic controls are performed other than (a) above.
 - (i) Cooling or heating operation mode is judged according to the conditions of the "Judgment based on Setting temperature + Cooling select temperature and Indoor return air temperature" and the "Judgment based on Outdoor temperature".
 - 1) In "Setting temperature Cooling select temperature < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor return air temperature" \Rightarrow Operation mode: Cooling
 - 2) "Setting temperature + Heating select temperature > Indoor return air temperature" and "Outdoor temperature/Heating > Outdoor air temperature" \Rightarrow Operation mode: Heating
 - 3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.
 - 4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF



- (ii) Regardless of the setting temperature, the cooling or heating operation mode is judged according to the "Judgment based on Room temperature/Cooling or Heating and Outdoor temperature/Cooling or Heating".
- 1) In case of "Room temperature/Cooling < Indoor return air temperature" and "Outdoor temperature/Cooling < Outdoor air temperature" \Rightarrow Operation mode: Cooling
- 2) In case of "Room temperature/Heating > Indoor return air temperature" and "Outdoor temperature /Heating > Outdoor air temperature" \Rightarrow Operation mode: Heating
- 3) The outdoor air temperature of the above judgment conditions is sampled at every 10 minutes.
- 4) In the range where the above cooling and heating zones are overlapped ⇒ Forced thermostat OFF



(2) Operations of functional items during cooling/heating

Operation	Cod	ling					
Functional item	Thermostat ON	Thermostat OFF	Fan	Thermostat ON	Thermostat OFF	Hot start (Defrost)	Dehumidify
Compressor	0	×	×	0	×	0	O/×
4-way valve	×	×	×	0	0	○(×)	×
Outdoor unit fan	0	×	×	0	×	○(×)	O/×
Indoor unit fan	0	0	0	O/×	O/×	O/×	O/×
Drain pump ⁽³⁾	0	X (2)	× ⁽²⁾		O/× ⁽²⁾		Thermostat ON: O Thermostat OFF: X ⁽²⁾

Note (1) \bigcirc : Operation \times : Stop \bigcirc/\times : Turned ON/OFF by the control other than the room temperature control.

- (2) ON during the drain motor delay control.
- (3) Drain pump ON setting may be selected with the indoor unit function setting of the wired remote control.

(3) Dehumidifying operation

Return air temperature thermistor [Thi-A (by the remote control when the remote control thermistor is enabled)] controls the indoor temperature environment simultaneously.

- (a) Operation is started in the cooling mode. When the difference between the return air temperature and the setting temperature is 2°C or less, the indoor unit fan tap is brought down by one tap. That tap is retained for 3 minutes after changing the indoor unit fan tap.
- (b) If the return air temperature exceeds the setting temperature by 3°C during dehumidifying operation, the indoor unit fan tap is raised. That tap is retained for 3 minutes after changing the indoor unit fan tap.
- (c) If the thermostat OFF is established during the above control, the indoor unit fan tap at the thermostat ON is retained so far as the thermostat is turned OFF.

(4) Timer operation

(a) RC-EX5

(i) Sleep timer

Set the duration of time from the present to the time to turn off the air-conditioner.

It can be selected from 10 steps in the range from "OFF 1 hour later" to "OFF 10 hours later". After the sleep timer setting, the remaining time is displayed with progress of time in the unit of hour.

(ii) OFF timer

Time to turn OFF the air-conditioner can be set in the unit of 10 minutes.

(iii) ON timer

Time to turn ON the air-conditioner can be set. Indoor temperature can be set simultaneously.

(iv) Weekly timer

Timer operation (ON timer, OFF timer) can be set up to 4 times a day for each weekday.

(v) Timer operations which can be set in combination

Item Item	Timer	OFF timer	ON timer	Weekly timer
Timer		×	0	×
OFF timer	×		0	×
ON timer	0	0		×
Weekly timer	×	×	×	

Note (1) ○: Allowed ×: Not

(2) Since the ON timer, sleep timer and OFF timer are set in parallel, when the times to turn ON and OFF the airconditioner are duplicated, the setting of the OFF timer has priority.

(b) RC-EX1A

(i) Sleep timer

Set the time from the start to stop of operation. The time can be selected in the range from 30 to 240 minutes (in the unit of 10-minute).

Note (1) Enable the "Sleep timer" setting from the remote control. If the setting is enabled, the timer operates at every time.

(ii) Set OFF timer by hour

Set the time to stop the unit after operation, in the range from 1 to 12 hours (in the unit of hour).

(iii) Set ON timer by hour

Set the time to start the unit after the stop of operation, in the range from 1 to 12 hours (in the unit of hour). It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

(iv) Set ON timer by clock

Set the time to start operation. The time can be set in the unit of 5-minute. This setting can be activated only once or at every time. It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

Note (1) It is necessary to set the clock to use this timer.

(v) Set OFF timer by clock

Set the time to stop operation. The time can be set in the unit of 5-minute. This setting can be activated only once or at every time.

Note (1) It is necessary to set the clock to use this timer.

(vi) Weekly timer

Set the ON or OFF timer for a week. Up to 8 patterns can be set for a day. The day-off setting is provided for holidays and non-business days.

Note (1) It is necessary to set the clock to use the weekly timer.

(vii) Combination of patterns which can be set for the timer operations

	Sleep time	Set OFF timer by hour	Set ON timer by hour	Set OFF timer by clock	Set ON timer by clock	Weekly timer
Sleep time		×	×	0	0	0
Set OFF timer by hour	×		×	×	×	×
Set ON timer by hour	×	×		×	×	×
Set OFF timer by clock	0	×	×		0	×
Set ON timer by clock	0	×	×	0		×
Weekly timer	0	×	×	×	×	

Note (1) ○: Allowed ×: Not

(5) Remote control display during the operation stop

When the operation is stopped (the power supply is turned ON), it displays preferentially the "Room temperature", "Center/Remote", "Filter sign", "Inspection" and "Timer operation".

(6) Hot start (Cold draft prevention at heating)

(a) Operating conditions

When either one of following conditions is met, the hot start control is performed.

- (i) From stop to heating operation
- (ii) From cooling to heating operation
- (iii) Form heating thermostat OFF to ON
- (iv) After completing the defrost control (only on units with thermostat ON)

(b) Contents of operation

- (i) Indoor fan motor control at hot start
 - Within 7 minutes after starting heating operation, the fan mode is determined depending on the condition of thermostat (fan control with heating thermostat OFF).
 - a) Thermostat OFF
 - i) Operates according to the fan control setting at heating thermostat OFF.
 - ii) Even if it changes from thermostat OFF to ON, the fan continues to operate with the fan control at thermostat OFF till the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher.
 - iii) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set airflow volume.
 - b) Thermostat ON
 - i) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 25°C or lower, the fan is turned OFF and does not operate.
 - ii) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 25°C or higher, the fan operates with the fan control at heating thermostat OFF.
 - iii) When the heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set airflow volume.
 - c) If the fan control at heating thermostat OFF is set at the "Set airflow volume" (from the remote control), the fan operates with the set airflow volume regardless of the thermostat ON/OFF.
 - 2) Once the fan motor is changed from OFF to ON during the thermostat ON, the indoor fan motor is not turned OFF even if the heat exchanger thermistor detects lower than 25°C.
 - Note (1) When the defrost control signal is received, it complies with the fan control during defrosting.
 - 3) Once the hot start is completed, it will not restart even if the temperature on the heat exchanger thermistor drops.
- (ii) During the hot start, the louver is kept at the horizontal position.
- (iii) When the fan motor is turned OFF for 7 minutes continuously after defrosting, the fan motor is turned ON regardless of the temperatures detected with the indoor heat exchanger thermistors (ThI-R1, R2).

(c) Ending condition

- (i) If one of following conditions is met during the hot start control, this control is terminated, and the fan is operated with the set airflow volume.
 - 1) Heat exchanger thermistor (ThI-R1 or R2, whichever higher) detects 35°C or higher.
 - 2) It has elapsed 7 minutes after starting the hot start control.

(7) Hot keep

Hot keep control is performed at the start of the defrost control.

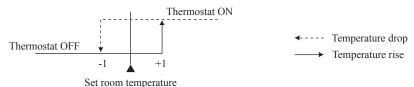
- (a) Control
 - (i) When the indoor heat exchanger temperature (detected with Thi-R1 or R2) drops to 35°C or lower, the speed of indoor fan is changed to the lower tap at each setting.
 - (ii) During the hot keep, the louver is kept at the horizontal position.
- (b) Ending condition

When the indoor fan is at the lower tap at each setting, it returns to the set airflow volume as the indoor heat exchanger temperature rises to 45°C or higher.

(8) Thermostat operation

(a) Cooling

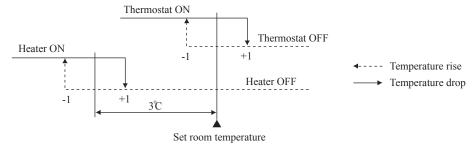
- (i) Thermostat is operated with the room temperature control.
- (ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



(iii) Thermostat is turned ON when the room temperature is in the range of -1 < Set temperature < +1 at the start of cooling operation (including from heating to cooling).

(b) Heating

- (i) Thermostat is operated with the room temperature control.
- (ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



(iii) Thermostat is turned ON when the room temperature is in the range of -1 < Set point < +1 at the start of cooling operation (including from cooling to heating).

(c) Fan control during heating thermostat OFF

- (i) Following fan controls during the heating thermostat OFF can be selected with the indoor function setting of the wired remote control.
 - ① Low fan speed (Factory default), ② Set fan speed, ③ Intermittence, ④ Fan OFF
- (ii) When the "Low fan speed (Factory default)" is selected, the following taps are used for the indoor fans.
 - · For DC motor: ULo tap
- (iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.
- (iv) If the "Intermittence" is selected, following controls are performed:
 - 1) If the thermostat is turned OFF during the heating operation, the indoor unit moves to the hot control and turns OFF the indoor fan if the heat exchanger thermistors (both ThI-R1 and R2) detect 25°C or lower.
 - 2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes. In the meantime the louver is controlled at level.
 - 3) After operating at ULo for 2 minutes, the indoor fan moves to the state of 1) above.
 - 4) If the thermostat is turned ON, it moves to the hot start control.
 - 5) When the heating thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.
 - The remote control uses the operation data display function to display temperatures and updates values of temperature even when the indoor fan is turned OFF.
 - 6) When the defrosting starts while the heating thermostat is turned OFF or the thermostat is turned OFF during defrosting, the indoor fan is turned OFF. (Hot keep or hot start control takes priority.) However, the suction temperature is updated at every 7-minute.
 - 7) When the heating thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.
- (v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF.

(d) Fan control during cooling thermostat OFF

- (i) Following fan controls during the cooling thermostat OFF can be selected with the indoor function setting of the wired remote control.
 - 1) Low fan speed, 2) Set fan speed (Factory default), 3) Intermittence, 4) Fan OFF
- (ii) When the "Low fan speed" is selected, the following taps are used for the indoor fans.
 - · For DC motor: ULo tap
- (iii) When the "Set fan speed" is selected, it is operated with the set fan speed also in the thermostat OFF condition.
- (iv) If the "Intermittence" is selected, following controls are performed:
 - 1) If the thermostat is turned OFF during the cooling operation, the indoor unit fan motor stope.
 - 2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes. In the meantime the louver is controlled at level.
 - 3) After operating at ULo for 2 minutes, the indoor fan moves to the state of a) above.
 - 4) If the thermostat is turned ON, the fan starts operation at set fan speed.
 - 5) When the cooling thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.
 - By using operation data display function at wireless remote control, the tempenature as displayad and the value is updated including the fan stops.
 - 6) When the cooling thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.
- (v) When the "Fan OFF" is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF.

(9) Filter sign

As the operation time (Total ON time of ON/OFF switch) accumulates to 180 hours (1), "FILTER CLEANING" is displayed on the remote control. (This is displayed when the unit is in trouble and under the centralized control, regardless of ON/OFF)

Note (1) Time setting for the filter sign can be made as shown below using the indoor function of wired remote control "FILTER SIGN SET". (It is set at 1 at the shipping from factory.)

Filter sign setting	Function
TYPE 1	Setting time: 180 hrs (Factory default)
TYPE 2	Setting time: 600 hrs
TYPE 3	Setting time: 1,000 hrs
TYPE 4	Setting time: 1,000 hrs (Unit stop) (2)

⁽²⁾ After the setting time has elapsed, the "FILTER CLEANING" is displayed and, after operating for 24 hours further (counted also during the stop), the unit stops.

(10) Compressor inching prevention control

(a) 3-minute timer

When the compressor has been stopped by the thermostat, remote control operation switch or anomalous condition, its restart will be inhibited for 3 minutes. However, the 3-minute timer is invalidated at the power on the electric power source for the unit.

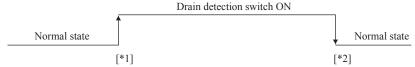
- (b) 3-minute forced operation timer
 - (i) Compressor will not stop for 3 minutes after the compressor ON. However, it stops immediately when the unit is stopped by means of the ON/OFF switch or by when the thermister turned OFF the change of operation mode.
 - (ii) If the thermostat is turned OFF during the forced operation control of heating compressor, the louver position (with the auto swing) is returned to the level position.
 - Note (1) The compressor stops when it has entered the protective control.

(11) Drain pump control

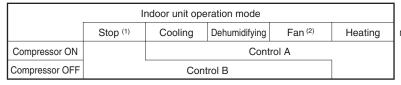
- (a) This control is operated when the inverter frequency is other than 0 Hz during the cooling operation and automatic cooling and dehumidifying operations.
- (b) Drain pump ON condition continues for 5 minutes even when it enters the OFF range according to (i) above after turning the drain pump ON, and then stops. The 5-minute delay continues also in the event of anomalous stop.
- (c) The drain pump is operated with the 5-minute delay operation when the compressor is changed from ON to OFF.
- (d) Even in conditions other than the above (such as heating, fan, stop, cooling thermostat OFF), the drain pump control is performed by the drain detection.
- (e) Following settings can be made using the indoor function setting of the wired remote control.
 - (i) 🗱 (Standard (in cooling & dry)): Drain pump is run during cooling and dry.
 - (ii) 攀合部()禁 [Operate in standard & heating]: Drain pump is run during cooling, dry and heating.
 - (iii) 攀合副原副[Operate in heating & fan]: Drain pump is run during cooling, dry, heating and fan.

(12) Drain motor (DM) control

(a) Drain detection switch is turned ON or OFF with the float switch (FS) and the timer.



- [*1] Drain detection switch is turned "ON" when the float switch "Open" is detected for 3 seconds continuously in the drain detectable space.
- [*2] Drain detection switch is turned "OFF" when the float switch "Close" is detected for 10 seconds continuously.
- (i) It detects always from 30 seconds after turning the power ON.
 - 1) There is no detection of anomalous draining for 10 seconds after turning the drain pump OFF.
 - 2) Turning the drain detection switch "ON" causes to turn ON the drain pump forcibly.
 - 3) Turning the drain detection switch "OFF" releases the forced drain pump ON condition.
- (b) Indoor unit performs the control A or B depending on each operating condition.



Note (1) Including the stop from the cooling, dehumidifying, fan and heating, and the anomalous stop (2) Including the "Fan" operation according to the mismatch of operation modes

(i) Control A

- 1) If the float switch detects any anomalous draining condition, the unit stops with the anomalous stop (displays E9) and the drain pump starts. After detecting the anomalous condition, the drain motor continues to be ON.
- 2) It keeps operating while the float switch is detecting the anomalous condition.

(ii) Control B

If the float switch detects any anomalous drain condition, the drain motor is turned ON for 5 minutes, and at 10 seconds after the drain motor OFF it checks the float switch. If it is normal, the unit is stopped under the normal mode or, if there is any anomalous condition, E9 is displayed and the drain motor is turned ON. (The ON condition is maintained during the drain detection.)

(13) Operation check/drain pump test run operation mode

- (a) If the power is turned on by the dip switch (SW7-1) on the indoor PCB when electric power source is supplied, it enters the mode of operation check/drain pump test run. It is ineffective (prohibited) to change the switch after turning power on.
- (b) When the communication with the remote control has been established within 60 seconds after turning power on by the dip switch (SW7-1) ON, it enters the operation check mode. Unless the remote control communication is established, it enters the drain pump test run mode.
 - Note (1) To select the drain pump test run mode, disconnect the remote control connector (CNB) on the indoor PCB to shut down the remote control communication.

(c) Operation check mode

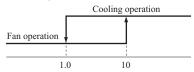
There is no communication with the outdoor unit but it allows performing operation in respective modes by operating the remote control.

(d) Drain pump test run mode

As the drain pump test run is established, the drain pump only operates and during the operation protective functions by the microcomputer of indoor unit become ineffective.

(14) Cooling, dehumidifying frost protection

(a) To prevent frosting during cooling mode or dehumidifying mode operation, the of compressor speed is reduced if the indoor heat exchanger temperature (detected with Thi-R) drops to 1.0 °C or lower at 4 minutes after the start of compressor operation. If the indoor unit heat exchanger temperature is 1.0 °C or lower after 1 minutes, the compressor speed is reduced further. If it becomes 2.5 °C or higher, the control terminates. When the indoor heat exchanger temperature has become as show below after reducing the compressor speed, it is switched to the fan operation. For the selection of indoor fan speed, refer to item 2).



Indoor heat exchanger temperature (°C)

(b) Selection of indoor fan speed

If it enters the frost prevention control during cooling operation (excluding dehumidifying), the indoor unit fan speed is switched.

- (i) When the indoor return air detection temperature (detected with Thi-A) is 23°C or higher and the indoor heat exchanger temperature (detected with Thi-R) detects the compressor frequency drop start temperature A°C+1°C, of indoor unit fan speed is increased by 20rpm.
- (ii) If the phenomenon of (i) above is detected again after the acceleration of indoor unit fan, indoor unit fan speed is increased further by 20rpm.

Note (1) Indoor unit fan speed can be increased by up to 2 taps.

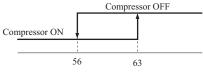
• Compressor frequency drop start temperature

Symbol Item Symbol	A
Temperature - Low (Factory default)	1.0
Temperature - High	2.5

Note (1) Frost prevention temperature setting can be selected with the indoor unit function setting of the wired remote control.

(15) Heating overload protection

(a) If the indoor heat exchanger temperature (detected with Thi-R) at 63°C or higher is detected for 2 seconds continuously, the compressor stops. When the compressor is restarted after a 3-minute delay, if a temperature at 63°C or higher is detected for 2 seconds continuously within 60 minutes after initial detection and if this is detected 5 times consecutively, the compressor stops with the anomalous stop (E8). Anomalous stop occurs also when the indoor heat exchanger temperature at 63°C or higher is detected for 6 minutes continuously.



Indoor heat exchanger temperature (°C)

(b) Indoor unit fan speed selection

If, after second detection of heating overload protection up to fourth, the indoor fan is set at Me and Lo taps when the compressor is turned ON, the indoor fan speed is increased by 1 tap.

(16) Anomalous fan motor

- (a) After starting the fan motor, if the fan motor speed is 200rpm or less is detected for 30 seconds continuously and 4 times within 60 minutes, then fan motor stops with the anomalous stop (E16).
- (b) If the fan motor fails to reach at -500 rpm less than the required speed, it stops with the anomalous stop (E20).

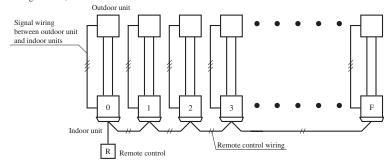
(17) Plural unit control – Control of 16 units group by one remote control

(a) Function

One remote control switch can control a group of multiple number of unit (Max. 16 indoor units). "Operation mode" which is set by the remote control switch can operate or stop all units in the group one after another in the order of unit No.⁽¹⁾. Thermostat and protective function of each unit function independently.

Notes (1) Unit No. is set by SW2 on the indoor unit control PCB. Unit No. setting by SW2 is necessary for the indoor unit only.

SW2: For setting of 0 - 9, A - F



(2) Unit No. may be set at random unless duplicated, it should be better to set orderly like 0, 1, 2..., F to avoid mistake.

(b) Display to the remote control

- (i) Center or each remote control basis, heating preparation: the youngest unit No. among the operating units in the remote mode (or the center mode unless the remote mode is available) is displayed.
- (ii) Inspection display, filter sign: Any of unit that starts initially is displayed.
- (iii) Confirmation of connected units
 - 1) In case of RC-E5 remote control

Pressing "AIR CON No." button on the remote control displays the indoor unit address. If "▲" "▼" button is pressed at the next, it is displayed orderly starting from the unit of youngest No.

2) In case of RC-EX1A remote control

If you touch the buttons in the order of "Menu" → "Next" → "Service & Maintenance" → "IU address" on the TOP screen of remote control, the indoor units which are connected are displayed.

(iv) In case of anomaly

- 1) If any anomaly occurs on a unit in a group (a protective function operates), that unit stops with the anomalous stop but any other normal units continue to run as they are.
- 2) Signal wiring procedure Signal wiring between indoor and outdoor units should be made on each unit same as the normal wiring. For the group control, lay connect with sires wiring between rooms using terminal blocks (X, Y) of remote control. Connect the remote control communication wire separately from the power supply wire or wires of other electric devices (AC220V or higher).

(18) High ceiling control

When sufficient air flow rate cannot be obtained from the indoor unit which is installed at a room with high ceiling, the air flow rate can be increased by changing the fan tap. To change the fan tap, use the indoor unit function "FAN SPEED SET" on the wired remote control.

Fan tap		Indoor unit airflow setting					
		Sall - Sal - Sal - Sal	8a11 - 8a10 - 8a00	8:41 - 8:40	35 and - 35 and		
FAN SPEED SET	STANDARD	PHi - Hi - Me - Lo	Hi - Me - Lo	Hi - Lo	Hi - Me		
	HIGH SPEED1, 2	PHi - PHi - Hi - Me	PHi - Hi - Me	PHi - Me	PHi - Hi		

Notes (1) Factory default is Standard.

- (2) At the hot-start and heating thermostat OFF, or other, the indoor unit fan is operated at the low speed tap of each setting.
- (3) This function is not able to be set with wireless remote controls or simple remote control (RCH-E3)

(19) Abnormal temperature thermistor (return air/indoor heat exchanger) wire/short-circuit detection

(a) Broken wire detection

When the return air temperature thermistor detects -20°C or lower or the heat exchanger temperature thermistor detect -40°C or lower for 5 seconds continuously, the compressor stops. After a 3-minute delay, the compressor restarts but, if it is detected again within 60 minutes after the initial detection for 6 minutes continuously, stops again (the return air temperature thermistor: E7, the heat exchanger temperature thermistor: E6).

(b) Short-circuit detection

If the heat exchanger temperature thermistor detects 70°C or higher for 5 seconds continuously at 2 minutes and 20 seconds after the compressor ON during cooling operation, the compressor stops (E6).

(20) External input/output control (CnT or CnTA)

Be sure to connect the wired remote control to the indoor unit. Without wired remote control remote operation by CnT is not possible to perform.

·CnTA \cdot CnT ①Operation output (CnT-2: XR1) CnTA Blue ②Heating output (CnT-3: XR2) (3) Thermostat ON output (CnT-4: XR3) Note (1) CnTA function can be (4)Error output (CnT-5: XR4) changed by RC-EX1A. **5** Remote operation input (CnT-6: Volt-free contact)

■ Priority order for combinations of CnT and CnTA input.

			CnTA						
		① Operation stop level	② Operation stop pulse	③ Operation permission/prohibition	4 Operation permission/prohibition pulse	⑤ Cooling/heating selection level	6 Cooling/heating selection pulse		
	① Operation stop level	CnT ①	CnT ①	CnT ① +CnTA ②	CnT ①	CnT ① /CnTA ⑤	CnT ① /CnTA ⑥		
	② Operation stop pulse	CnT ②	CnT ②	CnT ② +CnTA ③	CnT ②	CnT ② /CnTA ⑤	CnT ② /CnTA ⑥		
CnT	③ Operation permission/prohibition level	CnT ③ >CnTA ①	CnT ③ >CnTA ②	CnT ③ +CnTA ③	CnT ③	CnT ③ /CnTA ⑤	CnT ③ /CnTA ⑥		
Cni	Operation permission/prohibition pulse	CnT 4	CnT 4	CnT 4 +CnTA 3 **	CnT 4	CnT 4 /CnTA 5	CnT 4 /CnTA 6		
	(5) Cooling/heating selection level	CnT ⑤ /CnTA ①	CnT ⑤ /CnTA ②	CnT 5 /CnTA 3 **	CnT (5) /CnTA (4)	CnT ⑤	CnT ⑤		
	(6) Cooling/heating selection pulse	CnT 6 /CnTA 1	CnT 6 /CnTA 2	CnT 6 /CnTA 3	CnT 6 /CnTA 4	CnT 6	CnT 6		

Note (1) Following operation commands are accepted when the operation prohibition is set with CnTA as indicated with *.

Individual operation command from remote control, test run command from outdoor unit and operation command from optional device, CNT input.

Reference: Explanation on the codes and the combinations of codes in the table above

- In case of CnT "Number", the CnT "Number" is adopted and CnTA is invalidated.
- In case of CnTA "Number", the CnTA "Number" is adopted and CnT is invalidated.
- In case of CnT "Number"/CnTA "Number", the CnT "Number" and the CnTA "Number" become independent functions each other.
- In case of CnT "Number" + CnTA "Number", the CnT "Number" and the CnTA "Number" become competing functions each other.
- In case of CnT "Number" > CnTA "Number", the function of CnT "Number" supersedes that of CnTA "Number". In case of CnT "Number" < CnTA "Number", the function of CnTA "Number" supersedes that of CnT "Number". (The "Number" above means ① - ⑥ in the table.)

Output for external control (remote display)

Following output connectors (CnT) are provided on the indoor control PCB for monitoring operation status.

- **Operation output:** Outputs DC12V signal for driving relay during operation
- **2 Heating output:** Outputs DC12V signal for driving relay during heating operation
- **Thermostat ON output:** Outputs DC12V signal for driving relay when compressor is operating.
- **Error output:** Outputs DC12V signal for driving relay when anomalous condition occurs.

(b) Remote operation input

Remote operation input connector (CnT-6 or CnTA) is provided on the indoor control PCB.

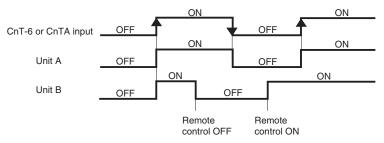
However remote operation by CnT-6 or CnTA is not effective, when "Center mode" is selected by center controller.

In case of plural unit (twin, triple, double twin), remote operation input to CnT-6 or CnTA on the slave indoor unit is invalid

Only the "LEVEL INPUT" is acceptable for external input, however when the indoor function setting of "Level input (Factory default)" or "Pulse input" is selected by the function for "External input" of the wired remote control, operation status will be changed as follows.

In case of "Level input" setting (Factory default)

Input signal to CnT-6 or CnTA is OFF→ON unit ON Input signal to CnT-6 or CnTA is ON→OFF unit OFF Operation is not inverted.

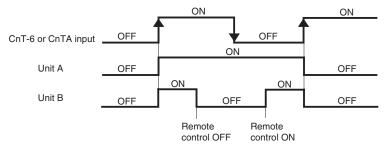


Note: The latest operation has priority

It is available to operate/stop by remote control or center control

(ii) In case of "Pulse input" setting (Local setting)

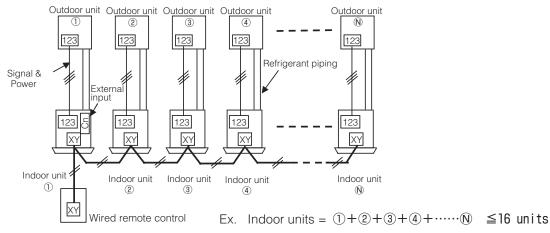
It is effective only when the input signal to CnT-6 or CnTA is changed OFF→ON, and at that time unit operation [ON/ OFF] is inverted.



(c) Remote operation

(i) In case of multiple units (Max. 16 indoor units group) are connected to one wired remote control

When the indoor function setting of wired remote control for "External control set" is changed from "Individual (Factory default)" to "For all units", all units connected in one wired remote control system can be controlled by external operation input.



	Individual operation	n (Factory default)	All units operation (Local setting)		
	ON	OFF	ON	OFF	
CnT-6 or CnTA	Only the unit directly connected to the remote control can be operated.	Only the unit directly connected to the remote control can be stopped opeartion.	All units in one remote control system can be operated.	All units in one remote control system can be stopped operation.	
	Unit ① only	Unit ① only	Units ① – 🕥	Units ① – 🕥	

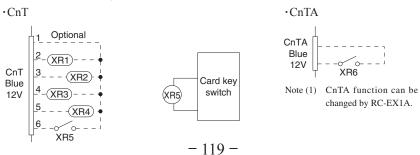
When more than one indoor unit (Max. 16 indoor units) are connected in one wired remote control system:

- (1) With the factory default, external input to CnT-6 or CnTA is effective for only the unit ①.
- (2) When setting "For all unit" (Local setting), all units in one remote control system can be controlled by external input to CnT-6 or CnTA on the indoor unit ①.
- (3) External input to CnT-6 or CnTA on the other indoor unit than the unit ① is not effective.

(21) Operation permission/prohibition

(In case of adopting card key switches or commercially available timers)

When the indoor function setting of wired remote control for "Operation permission/prohibition" is changed from "Invalid (Factory default)" to "Valid", following control becomes effective.



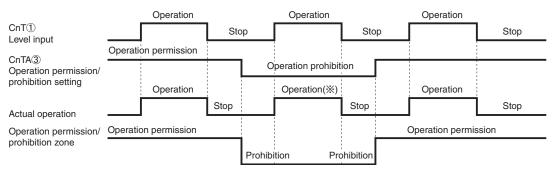
	Normal operation (Factory default)		Operation permission/prohibition mode "Valid" (Local setting)		
CuT (an	ON	OFF	ON	OFF	
CnT-6 or CnTA	Operation	Stop	Operation permission*1	Operation prohibition (Unit stops)	

*1 Only the "LEVEL INPUT" is acceptable for external input, however when the indoor function setting of "Level input (Factory default)" or "Pulse input" is selected by the function for "External input" of the wired remote control, operation status will be changed as follows.

In case of "Level input" setting	In case of "Pulse input" setting
Unit operation from the wired remote control becomes available*(1)	Unit starts operation *(2)

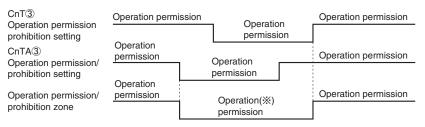
- *(1) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Level input (Factory default)";
 - ① When card key switch is ON (CnT-6 or CnTA ON: Operation permission), start/stop operation of the unit from the wired remote control becomes available.
 - ② When card key switch is OFF (CnT-6 or CnTA OFF: Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.
- *(2) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Pulse input (Local setting)";
 - ① When card key switch is ON (Operation permission), the unit starts operation in conjunction with ON signal. and also start/stop operation of the unit from the wired remote control becomes available.
 - ② When card key switch is OFF (Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.
- (3) This function is invalid only at "Center mode" setting done by central control.

(a) In case of CnT ① Operation stop level > CnTA ③ Operation permission/prohibition level



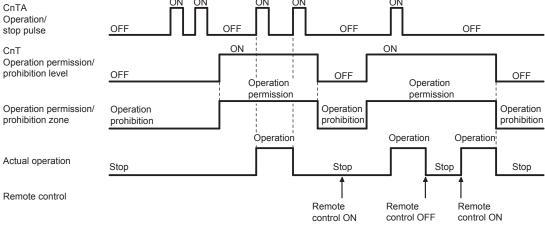
(*) CnT level input supersedes CnTA operation prohibition.

(b) In case of CnT 3 Operation permission/prohibition level + CnTA 3 Operation permission/prohibition level



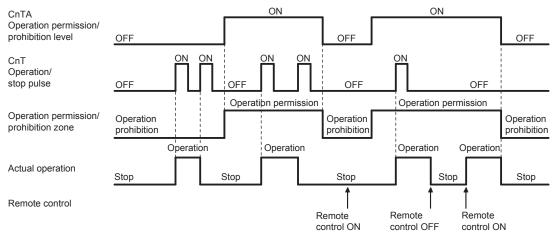
(*) Operation prohibition zone is determined by the OR judgment between CnT Operation prohibition zone and CnTA Operation prohibition zone.

(c) In case of CnT ③ Operation permission/prohibition level > CnTA ② Operation/stop pulse



Note (1) If it is prohibited by CnT, all "Operation" and "Stop" commands are not accepted.

(d) In case of CnT 2 Operation/stop pulse + CnTA 3 Operation permission/prohibition level



(22) Selection of cooling/heating external input function

- (a) When "External input 1 setting: Cooling/heating" is set for the indoor unit function from remote control, the cooling or heating is selected with CnT-6 or CnTA.
- (b) When the External input 1 method selection: Level input is set for the indoor unit function:
 - · CnT-6 or CnTA: OPEN → Cooling operation mode
 - · CnT-6 or CnTA: CLOSE → Heating operation mode
- (c) When the External input 1 method selection: Pulse input is set for the indoor unit function:

 If the external input is changed OPEN → CLOSE, operation modes are inverted (Cooling → Heating or Heating → Cooling).
- (d) If the cooling/heating selection signal is given by the external input, the operation mode is transmitted to the remote control

■ Selection of cooling/heating external input function

External input selection	External input method		Operation
		External terminal input (CnT or CnTA)	OFF ON OFF ON OFF Cooling zone, Heating zone, Cooling zone, Heating zone, Cooling zone, Heating zone,
	(5) Level	Cooling/heating	Cooling Heating Cooling
External input salaction		Cooling/heating (Competitive)	Cooling Heating Cooling Auto, cooling, dry mode command † † Heating, auto, heating mode command from remote control
External input selection Cooling/heating selection	⑥ Pulse	External terminal input (CnT or CnTA)	OFF Heating zone The sering "Cooling-phasing selection", the cooling-phasing is selected by the current operation mode. Daring heating: Set at the heating zone (cooling prohibition zone). Daring cooling, day, and and fan mode Set at cooling zone theating prohibition zone).
		Cooling/heating	Auto Cooling Cooling
		Cooling/heating (Competitive)	Auto Cooling Cooling Set "Cooling 1 Auto, cooling, dry mode command 1 Auto, heating mode

Notes (1) Regarding the priority order for combinations of CnT and CnTA, refer to Page 118.

(23) Fan control at heating startup

(a) Start conditions

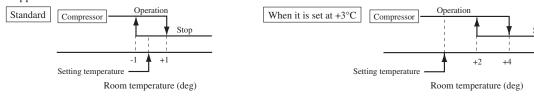
At the start of heating operation, if the difference of setting temperature and return air temperature is 5°C or higher after the end of hot start control, this control is performed.

- (b) Contents of control
 - (i) Sampling is made at each minute and, when the indoor unit heat exchanger temperature (detected with Thi-R) is 37°C or higher, present number of revolutions of indoor unit fan speed is increased by 10min⁻¹.
 - (ii) If the indoor unit heat exchanger temperature drops below 37°C at next sampling, present number of revolutions of indoor unit fan speed is reduced by 10min⁻¹.
- (c) End conditions

Indoor fan speed is reduced to the setting airflow volume when the compressor OFF is established and at 30 minutes after the start of heating operation.

(24) Room temperature detection temperature compensation during heating

With the standard specification, the compressor is turned ON/OFF with the thermostat setting temperature. When the thermostat is likely to turn OFF earlier because the unit is installed at the ceiling where warm air tends to accumulate, the setting can be changed with the wired remote control indoor unit function "*SP OFFSET". The compressor and the heater are turned ON/OFF at one of the setting temperature +3, +2 or +1°C in order to improve the feeling of heating. The setting temperature, however, has the upper limit of 30°C.



(25) Return air temperature compensation

This is the function to compensate the deviation between the detection temperature by the return air temperature thermistor and the measured temperature after installing the unit.

(a) It is adjustable in the unit of 0.5°C with the wired remote control indoor unit function "RETURN AIR TEMP".

(b) Compensated temperature is transmitted to the remote control and the compressor to control them.

Note (1) The detection temperature compensation is effective on the indoor unit thermistor only

(26) High power operation (RC-EX1A only)

It operates at with the set temp. fixed at 16°C for cooling, 30°C for heating and maximum indoor fan speed for 15 minutes maximum.

(27) Energy-saving operation (RC-EX1A only)

It operates with the setting temperature fixed at 28°C for cooling, 22°C for heating or 25°C for auto. (Maximum capacity is restricted at 80%.)

(28) Warm-up control (RC-EX1A only)

Operation will be started 5 to 60 minutes before use according to the forecast made by the microcomputer which calculates when the operation should be started in order to warm up the indoor temperature near the setting temperature at the setting time of operation start.

(29) Home leave mode (RC-EX1A only)

When the unit is not used for a long period of time, the room temperature is maintained at a moderate leval, avoiding extremely hot or cool temperature.

- (a) Cooling or heating is operated according to the outdoor temperature (factory setting 35°C for cooling, 0°C for heating) and the set temp. (factory setting 33°C for cooling, 10°C for heating)
- (b) Set temp and indoor fan speed can be set by RC-EX1A.

(30) Auto temp. setting (RC-EX1A only)

Setting temperature is adjusted automatically at the adequate temperature the center set temp. is 24°C by correcting the outdoor air temperature.

(31) Fan circulator operation (RC-EX1A only)

When the fan is used for circulation, the unit is operated as follows depending on the setting with the remote control.

- (a) If the invalid is selected with the remote control, the fan is operated continuously during the fan operation. (mormal fan mode)
- (b) If the valid is selected with the remote control, the fan is operated or stopped when on the difference of the remote control temperature sensor and the indoor unit return air temperature sensor becomes bigger than 3°C.

(32) The operation judgment is executed every 5 minutes (RC-EX1A only)

Setting temperature Ts is changed according to outdoor temperature

This control is valid with cooling and heating mode. (NOT auto mode)

- (a) Operate 5 minutes forcedly.
- (b) Setting temperature is adjusted every 10 minutes.
 - (i) Cooling mode.
 - Ts = outdoor temperature offset value
 - (ii) Heating mode.
 - Ts = outdoor temperature offset value
- (c) If the return air temperature lower than 18°C or return air temperature becomes lower than 25°C, unit goes thermo OFF.

(33) Auto fan speed control (RC-EX1A only)

In order to reach the room temperature to the set temperature as quickly as possible, the airflow rate is increased when the set temperature of thermostat differs largely from the return air temperature. According to temperature difference be tureen set temperature and return air temperature, indoor fan tap are controlled automalically.

- Auto 1: Changes the indoor unit fan tap within the range of $Hi \leftrightarrow Me \leftrightarrow Lo$.
- Auto 2: Changes the indoor unit fan tap within the range of PHi \leftrightarrow Hi \leftrightarrow Me \leftrightarrow Lo.

(34) IU overload alarm (RC-EX1A only)

When the indoor air temperature becomes higher or lower than the temperature set with the remote control by more than 5 to 10°C at 30 minutes after starting operation, the signal is transmitted to the external output (CNT). Receipt of the signal by the external output is indicated by lighting an LED or other prepared onsite.

10.4 Operation control function by the outdoor control

(1) Determination of compressor speed (frequency)

Required frequency

(a) Cooling/dehumidifying operation

Unit: rps

Model		71	100	125	140	160
Max. required	Usual operation	88	75<90>	95	95	120
frequency	Silent mode, outdoor temperature $\leq 15^{\circ}$ C	80	60	60	70	80
Min. required frequency		20	20	20	20	30

Note (1) Value in < > is for the FDC100VN model.

(b) Heating operation

Unit: rps

Model		71	100	125	140	160
Max. required	Usual operation	112	120<90>	120	120	120
frequency	Silent mode	90	60	70	70	80
Min. required frequency		20	20	20	20	30

Note (1) Value in <> is for the FDC100VN model.

- (c) If the indoor unit fan speed becomes "Me" or "Lo", Max required frequency goes down accordingly depending on indoor unit model.
- (d) Max. required frequency under high outdoor air temperature in cooling mode

 Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

	Model	71	100	125	140	160
Max. required	Outdoor air temperature is 40°C or higher	76	75	75	75	98
frequency	Outdoor air temperature is 46°C or higher	62	70<75>	70	70	66

Note (1) Value in <> is for the FDC100VN model.

(e) Max. required frequency under outdoor air temperature in heating mode

Maximum required frequency is selected according to the outdoor air temperature (Tho-A).

Unit: rps

	Model	71	100	125	140	160
Max. required frequency	Outdoor air temperature is 18°C or higher	76	75<60>	80	85	80

Note (1) Value in < > is for the FDC100VN model.

- (f) Selection of max. required frequency by heat exchanger temperature
 - (i) Maximum required frequency is selected according to the outdoor unit heat exchanger temperature (Tho-R) during cooling/dehumidifying or according to the indoor unit heat exchanger temperature (Thi-R) during heating mode.
 - (ii) When there are 3 indoor unit heat exchanger temperatures (Thi-R), whichever the highest applies,

Unit: rps

	Model		71	100	125	140	160
Max. required	Cooling/ dehumidifying	Outdoor unit heat exchanger temperature is 56(61)°C or higher	60	75<90>	95	95	120
frequency	Heating	Indoor unit heat exchanger temperature is 56(61)°C or higher	60	100<90>	100	100	120

Notes (1) Value in () is for the 71 model.

- (2) Value in <> is for the FDC100VN model.
- (g) When any of the controls from (a) to (f) above may duplicate, whichever the smallest value among duplicated controls is taken as the maximum required frequency.
- (h) During heating, it is operated with the maximum required frequency until the indoor unit heat exchanger temperature becomes 40°C or higher.

(2) Compressor start control

- (a) Compressor starts upon receipt of the thermostat ON signal from the indoor unit.
- (b) However, at initial start after turning the power supply breaker, it may enter the standby state for maximum 30 minutes ("B PREPARATION" is displayed on the remote control) in order to prevent the oil loss in the compressor. If the cooling/dehumidifying/heating operation is selected from the remote control when the outdoor unit is in the standby

state, "PREPARATION" is displayed for 3 seconds on the remote control.

(3) Compressor soft start control

(a) Compressor protection start I

[Control condition] Normally, the compressor operation frequency is raised in this start pattern.

- [Control contents] 1) Starts with the compressor's target frequency at **A** rps.
 - However, when the ambient air temperature (Tho-A) is 35°C or higher during cooling/ dehumidifying or the indoor return air temperature (ThI-A) is 25°C or higher during heating, it starts at C rps.
 - 2) At 30 seconds after the start of compressor, its target frequency changes to **B** rps and the compressor is operated for 2 - 4 minutes with its operation frequency fixed at **B** rps.

Model	Operation mode	A rps	B rps	C rps
71	Cooling/Dehumidifying	42	42	40
/1	Heating	62	62	40
100	Cooling/Dehumidifying	55	55	30
100	Heating	55	55	30
125, 140	Cooling/Dehumidifying	45	45	25
123, 140	Heating	45	45	25
160	Cooling/Dehumidifying	55	55	30
100	Heating	55	55	30

(b) Compressor protection start III

[Control condition] Number of compressor starts is only 1 counted after the power supply breaker ON.

[Control contents] Operates by selecting one of following start patterns according to the operation mode and the outdoor air temperature (Tho-A).

(i) Low frequency operation control during cooling/dehumidifying

[Control condition] Upon establishing the conditions of compressor protection start III, the low frequency operation control is performed during cooling/dehumidifying.

[Control contents]

- 1) Starts with the compressor's target frequency at A rps. When the outdoor air temperature (Tho-A) is 35°C or higher, it starts at **C** rps.
- 2) At 30 seconds after the compressor start, the compressor's target frequency is changed to B rps and the compressor's operation frequency is fixed for 10 minutes.

Model	Operation mode	A rps	B rps	C rps
71	Cooling/Dehumidifying	42	42	40
100	Cooling/Dehumidifying	55	55	30
125, 140	Cooling/Dehumidifying	45	45	25
160	Cooling/Dehumidifying	55	30	30

(ii) Low frequency operation control during heating

[Control condition] When the conditions of compressor protection start III are established and one of following conditions

- 1) and 2) is satisfied, the low number of revolutions operation control is performed during heating.
- 1) At 30 minutes or more after turning the power supply breaker on
- 2) Compressor underneath temperature (Tho-H) is 4°C or higher and the difference from the outdoor air temperature (Tho-A) becomes 4°C or higher. [160 model only]

[Control contents]

- 1) Starts the compressor with its target frequency at A rps. However, when the indoor unit return air temperature (ThI-A) is 25°C or higher, it start at **C** rps.
- 2) At 30 seconds after the start of compressor, the compressor's target frequency is changed to **B** rps and the compressor's operation frequency is fixed for 10 minutes.

Model	Operation mode	A rps	B rps	C rps
71	Heating	42	42	40
100	Heating	55	55	30
125, 140	Heating	45	45	25
160	Heating	55	30	30

(4) Outdoor unit fan control

(a) Outdoor unit fan tap and fan motor speed

Unit: min-1

Model	Mode		Fan motor tap					
		① speed	② speed	3 speed	4 speed	⑤ speed	6 speed	⑦ speed
71	Cooling/Dehumidifying	200	400	600	710	810	850	950
	Heating	200	400	600	710	810	850	950
		① speed	② speed	3 speed	4 speed	⑤ speed	6 speed	⑦ speed
100	Cooling/Dehumidifying	200	350	600	740	820	870	950<910>
	Heating	200	350	600	740	820	870	950<910>
		① speed	② speed	3 speed	4 speed	⑤ speed	6 speed	7 speed
125, 140	Cooling/Dehumidifying	200	370	560	640	745	870	910
	Heating	200	370	560	640	800	870	910
		① speed	② speed	3 speed	4 speed	⑤ speed	6 speed	⑦ speed
160	Cooling/Dehumidifying	200	370	600	820	850	910	950
	Heating	200	370	600	820	850	910	950

Note (1) Values in <> are for the FDC100VN model.

(b) Fan tap control during Cooling/Defumidifying operation

Fan taps are selected depending on the outdoor unit heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A). Note (1) It is detected by Tho-R1 or R2, whichever the higher.

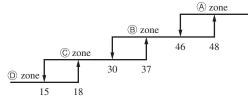
• Silent mode only

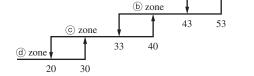
		(A) zone	® zone	© zone	© zone
(a)	zone	Tap 5(6)	Tap 5(6)	Tap 5(6)	Tap 4
(b)	zone	Tap 5(6)	Tap 5(6)	Tap 4(6)	Tap 3
©	zone	Tap 4	Tap 4	Tap 3	Tap 2
(d)	zone	Tap 3	Tap 3	Tap 2	Tap 1

(A) zone ® zone © zone © zone Tap 5 Tap 5 Tap 5 Tap 4 a zone Tap 5 Tap 5 Tap 3 **b** zone Tap 3 Tap 4 Tap 3 Tap 3 Tap 2 © zone d) zone Tap 3 Tap 3 Tap 2 Tap 1

a zone

Note (1) Value in () is for the 71 model.





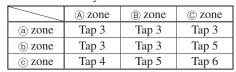
Outdoor air temp. (°C)

Outdoor unit heat exchanger temp. (°C)

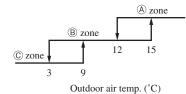
(c) Fan tap control during heating operation

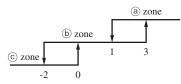
Fan taps are selected depending on the outdoor unit heat exchanger temperature (Tho-R1, R2) and the outdoor air temperature (Tho-A). Note (1) It is detected by Tho-R1 or R2, whichever the lower. • Silent mode only

	(A) zone	® zone	© zone
a zone	Tap 3	Tap 3	Tap 4
(b) zone	Tap 3	Tap 4(5)	Tap 5
© zone	Tap 4	Tap 5	Tap 6



Note (1) Value in () is for the 71 model.



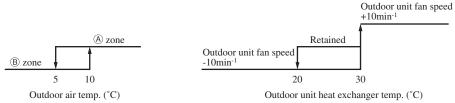


Outdoor unit heat exchanger temp. (°C)

(d) Outdoor unit fan control at cooling low outdoor air

i) When all the following conditions are established after the start of compressor, the following control is implemented. If the outdoor air temperature (Tho-A) is in the zone (a) in the cooling/dehumidifying mode, it has elapsed 20 seconds from the start of outdoor unit fan and the outdoor unit fan is at the tap 1 speed, the outdoor unit fan speed is controlled according to the outdoor unit heat exchanger temperature (Tho-R1, R2).

Note (1) It is detected with Tho-R1 or R2, whichever the higher.



- (ii) The outdoor unit heat exchanger temperature is detected always and, when the number of revolutions of the outdoor fan speed has been increased or decreased, there is no change of fan speed for 20 seconds.
- (iii) Rage of the outdoor unit fan speed under this control is as follows.
 - 1) Lower limit: 130rpm
 - 2) Upper limit: 500rpm
- (iv) As any of the following conditions is established, this control terminates.
 - 1) When the outdoor air temperature is in the zone (A) and the outdoor unit heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
 - When the outdoor fan speed is 500rpm and the outdoor unit heat exchanger temperature at 30°C or higher is established for 40 seconds or more continuously.
 - 3) When the outdoor unit heat changer temperature at 45°C or higher is established for 40 seconds or more.

(e) Outdoor unit fan control by the power transistor radiator fin temperature

When all the following conditions are established later than 3 minutes after the start of compressor, the following control is implemented.

- (i) Cooling/dehumidifying
 - 1) Outdoor air temperature Tho-A \geq 33°C
 - 2) Compressor's actual frequency $\geq \mathbf{A}$ rps
 - 3) Power transistor radiator fin temperature $\geq \mathbf{C}$ °C
- (ii) Heating
 - 1) Outdoor air temperature Tho-A $\geq 16^{\circ}$ C
 - 2) Compressor's actual frequency \geq **B** rps
 - 3) Power transistor radiator fin temperature $\geq \mathbf{C}$ °C
- (iii) Control contents
 - 1) Raises the outdoor unit fan tap by 1 tap.
 - 2) When the sampling is for 60 minutes and the value of power transistor radiator fin temperature (Tho-P) is as follows
 - a) When the power transistor radiator fin temperature (Tho-P) \geq **C** °C, the outdoor unit fan tap is raised by 1 speed further.
 - b) When \mathbf{C} °C > power transistor radiator fin temperature (Tho-P) $\geq \mathbf{D}$ °C, present outdoor unit fan tap is maintained
 - c) When the power transistor radiator fin temperature (Tho-P) \geq **D** °C, the outdoor unit fan tap is dropped by 1 speed.

(iv) Ending conditions

When the operation under the condition of item (iii), c) above and with the outdoor unit fan tap, which is determined by the item (b) is detected 2 times consecutively.

· Compressor's frequency and power transistor radiator fin temperature

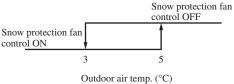
Item Model	Α	В	С	D
71	60	70	80	75
100	85	85	72	68
125, 140	65	65	72	68
160	70	70	80	75

(f) Caution at the outdoor unit fan start control (FDCA160 model only)

When the outdoor unit fan is running at 400min⁻¹ before operating the compressor, it may operate with the compressor only, without starting up the outdoor fan This is normal.

(g) Snow protection fan control

If the dip switch (SW3-2) on the outdoor unit control PCB is turned ON, the outdoor unit fan is operated for 30 seconds at 4 tap speed once in every 10 minutes depending on the outdoor air temperature (detected with Tho-A) in the stop mode or anomalous stop mode.



Defrosting (5)

Defrosting start conditions

If all of the following defrosting conditions A or conditions B are met, the defrosting operation starts.

(i) Defrosting conditions A

- 1) Cumulative compressor operation time after the end of defrosting has elapsed 37 [45] minutes, and the cumulative compressor operation time after the start of heating operation (remote control ON) has elapsed 30 minutes.
- After 5 minutes from the compressor ON
- After 5 minutes from the start of outdoor unit fan
- After satisfying all above conditions, if temperatures of the outdoor unit heat exchanger temperature thermistor (Tho-R1, R2) and the outdoor air temperature thermistor (Tho-A) become lower than the defrosting start temperature as shown Model 71 by the right figure for 15 seconds continuously, or the suction gas saturation temperature (SST) and the outdoor air temperature (Tho-A), which are obtained from the value detected by the low pressure sensor (LPT) stay for 3 minutes within the range below the defrosting operation start temperature as shown by the right figure. However, it excludes for 10 minutes after the start of compressor and the outdoor air temperature is as shown by the lower figure.



Outdoor air temp. (°C) Note (1) Figures in [] are for 71 model.

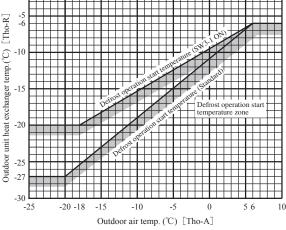
(ii) Defrosting conditions B

- 1) When previous defrosting end condition is the time out of defrosting operation and it is in the heating operation after the cumulative compressor operation time after the end of defrosting has become 30 minutes.
- After 5 minutes from the start of compressor
- After 5 minutes from the start of outdoor unit fan

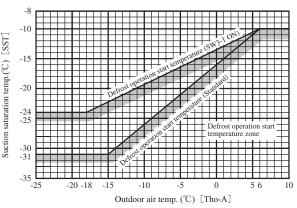
(b) Defrosting end conditions

When any of the following conditions is satisfied, the defrosting end operation starts.

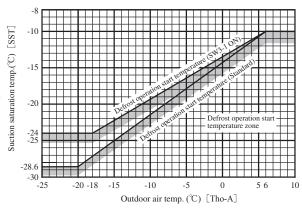
[Tho-R]



Model 71-160



Model 100-160



- When it has elapsed 8 minutes and 20 seconds after the start of defrosting. (After 10 minutes and 20 seconds for 71 and 160 model)
- When the outdoor unit heat exchanger temperatures (Tho-R1, R2), whichever the lower, becomes 12°C or higher for 10 seconds continuously.

(c) Switching of defrosting control with SW3-1

- (i) If SW3-1 on the outdoor unit control PCB is turned to ON, it becomes easier to enter the defrosting operation. Use this when installing a unit at snowing regions.
- (ii) Control contents
 - 1) It allows entering the defrosting operation under the defrosting condition A when the cumulative heating operation time becomes 30 minutes. It is 37 [45] minutes at SW3-1 OFF (Factory default).
 - 2) It allows entering the defrosting operation under the defrosting condition B when the cumulative heating operation time becomes 25 minutes. It is 30 minutes at SW3-1 OFF (Factory default).
 - 3) It allows the defrosting operation with the outdoor unit heat exchanger temperature (Tho-R) and suction pressure saturation temperature (SST) being higher than normal.

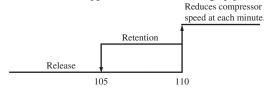
 Note (1) Figures in [] are for 71 model.

(6) Protective control/anomalous stop control by compressor's number of revolutions

(a) Compressor discharge pipe temperature protection

(i) Protective control

As the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of discharge pipe temperature.



Discharge pipe temperature (°C)

- (ii) Anomalous stop control
 - 1) If the discharge pipe temperature (detected with Tho-D) exceeds the setting value, the compressor stops.
 - 2) When it is detected 2 times within 60 minutes or after continuous 60 minutes, including the stop of compressor, E36 is displayed on the remote control and it enters the anomalous stop mode.



Discharge pipe temperature (°C)

(iii) Reset of anomalous stop mode

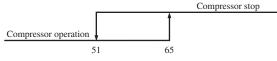
As it drops to the reset value of 85(90)°C or lower for 45 minutes continuously, it becomes possible to restart from the remote control.

(b) Cooling high pressure protection

- (i) Protective control
 - 1) When the outdoor air temperature (Tho-A) is 40°C or higher and the outdoor unit heat exchanger temperature (Tho-R) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of high pressure.
 - 2) Control value A is updated to an optimum value automatically according to the operating conditions.



- (ii) Anomalous stop control
 - 1) As the outdoor unit heat exchanger temperature (Tho-R) exceeds the setting value, the compressor stops.
 - 2) If it is detected 5 times within 60 minutes or 65°C or higher continues for 60 minutes, including the stop of compressor, E35 is displayed on the remote control and it enters the anomalous stop mode.



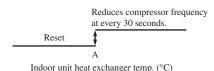
Outdoor unit heat exchanger temp. (°C)

(iii) Reset of anomalous stop mode

As it reaches the reset value of 51°C or lower, it becomes possible to restart from the remote control.

(c) Heating high pressure protection

- (i) Protective control
 - 1) As the indoor unit heat exchanger temperature (Thi-R) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of high pressure.
 - 2) Control value A is updated to an optimum value automatically according to the operating conditions.

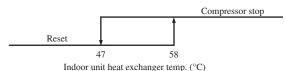


	Existing piping adaptation switch: SW5-1 (SW8-1: 71 model)				
Model	OFF (Shipping)	ON			
	Control value A (°C)				
71, 160	52-58	16 50			
100-140	48-54	46-52			

Note (1) Adaptation to existing piping is at ON.

- (ii) Anomalous stop control
 - Operation control function by the indoor unit controller See the heating overload protection, page 116.
- (iii) Adaptation to existing piping, stop control

If the existing piping adaptation switch, SW5-1 (SW8-1: 71 model), is turned ON, the compressor stops to protect existing piping when the indoor unit heat exchanger temperature (Thi-R) exceeds the setting value.



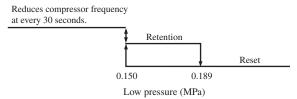
(d) Anomaly detection control by the high pressure switch (63H1)

- (i) If the pressure rises and operates the high pressure switch (opens at 4.15MPa/closes at 3.15MPa), the compressor stops.
- (ii) Under any of the following conditions, E40 is displayed and it enters the anomalous stop mode.
 - 1) When it occurs 5 times within 60 minutes that pressure rises and the compressor is stopped by 63H1.
 - 2) When 63H1 has been in the open state for 60 minutes continuously, including the stop of compressor.

(e) Low pressure control

(i) Protective control

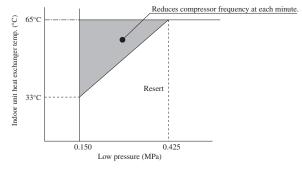
If the value detected by the low pressure sensor (LPT) exceeds the setting value, the compressor speed (frequency) is controlled to restrain the drop of pressure.



- (ii) Anomalous stop control
 - 1) When a value detected by the low pressure sensor (LPT) satisfies any of the following conditions, the compressor stops to run for its protection.
 - a) When the low pressure drops to 0.079MPa or under for 15 seconds continuously.
 - b) At 10 minutes after the start of compressor, the suction overheat becomes 30°C and the low pressure becomes 0.15MPa or under for 60 seconds continuously.
 - 2) E49 is displayed under any of the following conditions and it enters the anomalous stop mode.
 - a) When the low pressure drops 3 times within 60 minutes and the compressor stops under any of the above conditions.
 - b) When a value detected with the low pressure sensor becomes 0.079MPa or under for 5 minutes, including the stop of compressor.
 - 3) However, when the control condition 1). a) is established during the compressor protection start III, E49 is displayed at initial stop and it enters the anomalous stop mode.

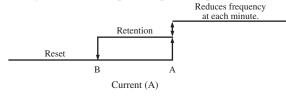
(f) Compressor pressure ratio protection control (Model 100 - 160 only)

- (i) During heating operation, if the indoor unit heat exchanger temperature (Thi-R) and low pressure sensor (LPT) exceed the setting values at 10 minutes after the start of compressor, the compressor speed (frequency) is controlled to protect the compressor.
- (ii) This control is not performed during the outdoor fan ON and for 10 minutes from the start of outdoor unit fan.
- (iii) This control is not performed during defrosting operation and at 10 minutes after the reset of defrosting operation.
- (iv) When there are 3 indoor unit heat exchanger temperatures (Thi-R), the highest temperature is detected.



(g) Over-current protection current safe controls I, II

Detecting the outdoor unit inverter input (primary) current and the output (secondary) current, if the current values exceed setting values, the compressor speed (frequency) is controlled to protect the inverter.



(Fig. C) The control value "A" and the reset value vary depending on the compressor speed.

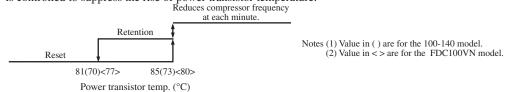
A)	24	_									7
lve (22						Con	trol s	 /alve	 A -	+
t va	20	\vdash				X	Com	101			┨
rese	18					***	·				1
ol or	16 14		— <u>F</u>	Reset	valv	e B/		::			
Control or reset valve (A)	12		0 6		100	0 0	0 1/	20. 1	10.1	20.	.]
O	4				0 8 or spe				10 1 (rp		130

Model		Coo	ling	Heating		
		Control value A	Reset value B	Control value A	Reset value B	
	71	15.0	14.0	16.0	15.0	
Primary	100	23.0	22.0	23.0	22.0	
current side	125, 140	23.0	22.0	25.0	24.0	
	160	20.0	19.0	20.0	19.0	
	71	13.0	12.0	13.0	12.0	
Secandary	100	Fig.C	Fig.C	Fig.C	Fig.C	
current side	125, 140	Fig.C	Fig.C	Fig.C	Fig.C	
	160		Not impl	lemented		

(h) Power transistor temperature protection

(i) Protective control

If the power transistor temperature (detected with TIP) exceeds the setting value, the compressor speed (frequency) is controlled to suppress the rise of power transistor temperature.



- (ii) Anomalous stop control (160 model only)
 - 1) If the power transistor temperature rises further, the protective switch in the power transistor operates to protect the compressor and the power transistor.
 - 2) Under any of the following condition, E41 is displayed and it enters the anomalous stop mode.
 - a) When the protective switch in the power transistor operates 5 times within 60 minutes and the compressor stops.

(i) Anomalous power transistor current

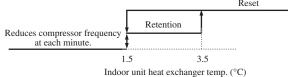
- (i) Prevents over-current on the inverter. If the current value in the power transistor exceeds the setting value, the compressor stops.
- (ii) If the current value in the power transistor exceeds the specified value and the compressor stops 4 times within 30 minutes, E42 is displayed on the remote control and it enters the anomalous stop mode.

(j) Anomalous inverter PCB

If the power transistor detects any anomaly for 15 minutes, including the stop of compressor, E51 is displayed on the remote control and it enters the anomalous stop mode.

(k) Anti-frost control by the compressor frequency control

- (i) If the indoor unit heat exchanger temperature (detected with Thi-R) exceeds the setting value at 4 minutes after the start of compressor, the compressor speed (frequency) is controlled to initiate the anti-frost control of indoor unit heat exchanger.
- (ii) When there are 3 indoor unit heat exchanger temperatures (Thi-R), the lowest temperature is detected.



(iii) Regarding the anti-frost control by the operation stop, refer to the operation control function by the indoor unit controller and the cooling, dehumidifying frost prevention of page 116.

(I) Dewing prevention control

[Control condition] During cooling and dehumidifying operation, if all the following conditions are established, the compressor speed (frequency) is reduced to prevent dewing and water splash.

- ① Cooling electronic expansion valve aperture (EEVC) is 500 pulses.
- 2 Suction overheat is 10°C or higher.
- ③Compressor speed (frequency) is **A** rps or higher.

[Control contents]

- 1 When the suction overheat is 10°C or higher, the compressor speed (frequency) is reduced at each 1 minute.
- ② Compressor speed (frequency) does not rise till the cooling expansion valve becomes 460 pulses.
- 3 This control takes A rps as its lower limit so that compressor speed is not controlled when it is less than A rps.

Model	A rps
71	42
100-160	60

(m) Refrigerant quantity shortage protection

Under the compressor protection start III control during cooling and dehumidifying operations, the following control is performed by detecting the indoor unit heat exchanger temperature (Thi-R) and the indoor unit return air temperature (Thi-A).

[Control condition] When the state that the indoor unit heat exchanger temperature (Thi-R) does not become lower than the indoor unit return air temperature (Thi-A) by 4°C or more continues for 1 minute.

[Control contents] It judges that the flowing of refrigerant in to the indoor unit is insufficient so that the compressor is stopped and E57 is displayed on the remote control.

(n) Broken wire detection on temperature thermistor and low pressure sensor

(i) Outdoor unit heat exchanger thermistor, outdoor air thermistor and low pressure sensor

If the following is detected for 5 second continuously within 2 minutes to 2 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note (1) During defrosting and for 3 minutes after the end of defrosting, it is not detected.

- Outdoor unit heat exchanger thermistor: -50°C or lower
- Outdoor air temperature thermistor: -45°C or lower
- Low pressure sensor: 0V or under or 4.0V or over
- (ii) Discharge pipe temperature thermistor, suction pipe temperature thermistor and underneath temperature thermistor. If the following is detected for 5 second continuously within 10 minutes to 10 minutes and 20 seconds after the compressor ON, the compressor stops. After a delay of 3 minutes, it restarts but, if the same is detected repeatedly 3 times within 40 minutes, the compressor stops with the anomalous stop.

Note (1) During defrosting and for 3 minutes after the end of defrosting, it is not detected.

- Discharge pipe temperature thermistor: -10°C or lower
- Suction pipe temperature thermistor: -50°C or lower
- Underneath temperature thermistor: -50°C or lower (160 model only)

(o) Fan motor error

- (i) If the fan speed of 100rpm or under is detected for 30 second continuously under the outdoor unit fan control (with the operation command of fan tap at ① speed or higher), the compressor stops.
- (ii) When the fan motor speed drops to 100rpm or under 5 times within 60 minutes and the compressor stops, it enters the anomalous stop mode with E48 displayed on the remote control.

(p) Anomalous stop by the compressor start stop

- (i) When it fails to shift to the compressor DC motor's rotor position defection operation at 5 seconds after establishing the compressor start condition, the compressor stops temporarily and restarts 3 minutes later.
- (ii) If it fails to shift to the position detection operation again at second time, it judges the anomalous compressor start and stops the compressor by the anomalous stop (E59).

(q) Anomalous compressor rotor lock (160 model only)

After shifting to the compressor rotor's position detection operation, if fails again to detect the rotor position, the compressor stops.

Compressor restarts 3 minutes later but, if it is operated 4 times within 15 minutes, the anomalous stop (E60) occurs.

(7) Silent mode

- (a) As "Silent mode start" signal is received from the remote control, it operates by dropping the outdoor unit fan tap and the compressor speed (frequency).
- (b) For details, refer to items (1) and (4) above.

(8) Test run

(a) It is possible to operate from the outdoor unit using the dip switch on the outdoor unit control PCB.

CM/2 2	ON	SW3-4	OFF	Cooling test run
SW3-3 (SW5-3)	ON	(SW5-4)	ON	Heating test run
(3 ** 3-3)	OFF	N	Normal and end	of test run

Make sure to turn SW3-3 (SW5-3) to OFF after the end of operation.

Note (1) Value in () is for the 71 model.

(b) Test run control

- (i) Operation is performed at the maximum compressor speed (frequency), which is determined for each model.
- (ii) Each protective control and error detection control are effective.
- (iii) If SW3-4 (SW5-4) is switched during test run, the compressor is stoped for once by the stop control and the cooling/heating operation is switched.

Note (1) Value in () is for the 71 model.

(iv) Setting and display of remote control during test run

Item Mode	Contents of remote control setting/display
Cooling test run	Setting temperature of cooling is 5°C.
Heating test run	Setting temperature of heating (preparation) is 30°C.

(9) Pump-down control

Turning ON the pump-down switch SW1 (SW9) for 2 seconds during the operation stop or anomalous stop (excluding the thermostat OFF), the pump-down operation is performed. (This is invalid when the indoor unit is operating. This is effective even when the indoor unit is stopped by the anomalous stop or the power supply is turned OFF.)

Note (1) Value in () are for the 71 model.

(a) Control contents

- (i) Close the service valve at the liquid side. (It is left open at the gas side.)
- (ii) Compressor is started with the target speed (frequency) at 71:62, 100 · 160:55, 125 · 140:45 rps in the cooling mode.
- (iii) Red and green lamps (LED) flash continuously on the outdoor unit control PCB.
- (iv) Each of protection and error detection controls, excluding the low pressure control, anti-frost control and dewing prevention control, is effective.
- (v) Outdoor unit fan is controlled as usual.
- (vi) Electronic expansion valve is fully opened.

(b) Control ending conditions

Stop control is initiated depending on any of the following conditions.

- (i) Low pressure of 0.087MPa or lower is detected for 5 seconds continuously.
 - 1) Red LED: Light, Green LED: Flashing, Remote control: Displays stop.
 - 2) It is possible to restart when the low pressure is 0.087MPa or higher.
 - 3) Electronic expansion valve (cooling/heating) is kept fully open.
- (ii) Stop by the error detection control
 - 1) Red LED: Flashing, Green LED: Flashing
 - 2) Restart is prohibited. To return to normal operation, reset the power supply.
 - 3) Electronic expansion valve (cooling/heating) is left fully open.
- (iii) When the cumulative operation time of compressor under the pump-down control becomes 5 minutes.
 - 1) Red LED: OFF, Green LED: Flashing, Remote control: Stop
 - 2) It is possible to pump-down again.
 - 3) Electronic expansion valve (cooling/heating) is left fully open.

Note (1) After the stop of compressor, close the service valve at the gas side.

Caution: Since pressing the pump-down switch cancels communications with the indoor unit, the indoor unit and the remote control display "Transmission error – E5". This is normal.

(10) Base heater ON/OFF output control (option)

(a) Base heater ON conditions

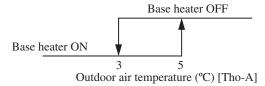
When all of following conditions are met, the base heater is turned ON.

- · Outdoor air temperature (detected with Tho-A) is 3°C or lower.
- · In the heating mode
- · When the compressor is turned ON

(b) Base heater OFF conditions

When either one of following conditions is met, the base heater is turned OFF.

- · Outdoor air temperature (detected with Tho-A) is 5°C or higher.
- · When the compressor stop has been detected for 30 minutes continuously
- · In the cooling or dehumidifying mode



11 MAINTENANCE DATA

11.1 Diagnosing of microcomputer circuit

(1) Selfdiagnosis function

(a) Check Indicator Table

Whether a failure exists or not on the indoor unit and outdoor unit can be know by the contents of remote control error code, indoor/outdoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

(i) Indoor unit

Remote	control	Indoor co	ntrol PCB	Outdoor c	ontrol PCB	Landin of			Deference	
Error code	Red LED	Red LED	Green	Red LED	Green	Location of trouble	Description of trouble	Repair method	Reference page	
		Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	_	Normal operation	_	_	
		Stays OFF	Stays OFF	2 times flash	Stays OFF	Indoor unit power supply	Power OFF, broken wire/blown fuse, broken transformer wire	Repair	166	
No-indication	Stays OFF	*	Keeps		Keeps	Remote control wires	Poor connection, breakage of remote control wire * For wire breaking at power ON, the LED is OFF.	Repair		
		3 times flash	flashing	Stays OFF	flashing	Remote control	Defective remote control PCB	Replacement of remote control	167	
®WAI1 INSPEC		Stays OFF	Keeps flashing	2 times flash	Keeps flashing	Indoor-outdoor units connection wire	Poor connection, breakage of indoor-outdoor units connection wire	Repair	168-172	
						Remote control	Improper setting of master and slave by remote control			
_ ,			*			Remote control wires (Noise)	Poor connection of remote control signal wire (White) *For wire breaking at power ON, the LED is OFF Intrusion of noise in remote control wire	Repair	ir	
ΕI		Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	Remote control indoor control PCB	*• Defective remote control or indoor control PCB (defective communication circuit)?	Replacement of remote control or PCB	174	
		2 times flash	Keeps flashing	2 times flash	Keeps flashing	Indoor-outdoor units connection wire	Poor connection of wire between indoor-outdoor units during operation (disconnection, loose connection) Anomalous communication between indoor-outdoor units by noise, etc.	Repair		
E5		2 times	Keeps	Stavs OFF	Keeps	(Noise)	CPU-runaway on outdoor control PCB	Power reset or Repair		
		flash	flashing	Stays Of F	flashing	Outdoor control PCB	*• Occurrence of defective outdoor control PCB on the way of power supply (defective communication circuit)?	Replacement of PCB	175	
		2 times flash	Keeps flashing	Stays OFF	Stays OFF	Outdoor control PCB	Defective outdoor control PCB on the way of power supply	Replacement		
		110311	Hashing			Fuse	Blown fuse			
E5		1 time flash	Keeps	Stays OFF	Keeps	Indoor heat exchanger tempera- ture thermistor	Defective indoor heat exchanger temperature thermistor (defective element, broken wire, short-circuit) Poor contact of temperature thermistor connector		176	
		i time nasn	flashing	Stays Of F	flashing	Indoor control PCB	* Defective indoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB	170	
<u></u>			Keeps		Keeps	Indoor return air temperature therm-	Defective indoor return air temperature thermistor (defective element, broken wire, short-circuit)	Replacement, repair of temperature		
L 1		1 time flash	flashing	Stays OFF	flashing	istor	Poor contact of temperature thermistor connector	thermistor Papleoament of	177	
	Keeps					Indoor control PCB Installation or oper-	*- Defective indoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB		
$rac{1}{2}$	flashing					ating condition Indoor heat	Heating over-load (Anomalously high indoor heat exchanger temperature)	Repair Replacement of		
E8		1 time flash	Keeps flashing	Stays OFF	Keeps flashing	exchanger tempera- ture thermistor	Defective indoor heat exchanger temperature thermistor (short-circuit)	temperature therm- istor	178	
						Indoor control PCB	*- Defective indoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB		
						Drain trouble	Defective drain pump (DM), broken drain pump wire, disconnected connector	Replacement, repair of DM		
E91		1 time flash	Keeps	Stave OFF	Keeps	Float switch	Anomalous float switch operation (malfunction)	Repair	179	
			flashing	Indoor control PCB	*- Defective indoor control PCB (Defective float switch input circuit) *- Defective indoor control PCB (Defective DM drive output circuit)?	Replacement of PCB	1//			
						Option	Defective optional parts (At optional anomalous input setting)	Repair		
E 10		Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	Number of con- nected indoor units	When multi-unit control by remote control is performed, the number of units is over	Repair	180	
E 16		1 time flash	Keeps	Stays OFF	Keeps	Fan motor	Defective fan motor	Replacement, repair	181	
		110311	flashing	Juny 3 () 1 1	flashing	Indoor power PCB	Defective indoor power PCB	Replacement	101	
E 19		1 time flash	Keeps flashing	Stays OFF	Keeps flashing	Indoor control PCB	Improper operation mode setting	Repair	182	
באט		1 time flash	Keeps	Stays OFF	Keeps	Fan motor	Indoor fan motor rotation speed anomaly	Replacement, repair	183	
			flashing	-	flashing	Indoor power PCB	Defective indoor power PCB	Replacement	.55	
E 19 E 20 E 28		Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	Remote control temperature therm- istor	Broken wire of remote control temperature thermistor	Repair	184	

Note (1) Normal indicator lamp (Indoor, outdoor units: Green) extinguishes (or lights continuously) only when CPU is anomalous. It keeps flashing in any trouble other than anomalous CPU.

^{(2) *} mark in the Description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

(ii) Outdoor unit

Remote c	ontrol	Indoor co	ntrol PCB	Outdoor co	ontrol PCB	Outdoor inventer PCB					, I
Error code	Red LED	Red LED	Green LED (1)	Red LED	Green LED (1)	Yellow LED (3)or Red LED (4)	Green LED (2)	Location of trouble	Description of trouble	Repair method	Reference page
								Installation or operating condition	Higher outdoor heat exchanger temperature	Repair	
E35		Stays OFF	Keeps flashing	1 time flash	Keeps flashing			Outdoor heat exchanger temperature thermistor	Defective outdoor heat exchanger temperature thermistor	Replacement of temperature thermistor	185
								Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB	
								Installation or operating condition	Higher discharge temperature	Repair	
E36		Stays OFF	Keeps flashing	1 time flash	Keeps flashing			Discharge pipe temperature thermistor	Defective discharge pipe temperature thermistor	Replacement, repair of temperature thermistor	186
			0		0			Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB	
C 27		Ct OFF	Keeps	1	Keeps	Keeps		Outdoor heat exchanger temperature thermistor	Defective outdoor heat exchanger temperature thermistor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	107
E37		Stays OFF	flashing	1 time flash	flashing	flashing		Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB	187
E 38		Storio OEE	Keeps	1 time flesh	Keeps			Outdoor air temperature thermistor	Defective Outdoor air temperature thermistor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	188
		Stays OFF	flashing	1 time flash	flashing			Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB	100
E39		Stays OFF	Keeps	1 time flash	Keeps			Discharge pipe temperature thermistor	Defective discharge pipe temperature thermistor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	189
		Stays OFT	flashing	1 unic nasii	flashing			Outdoor control PCB	*• Defective outdoor control PCB (Defective temperature thermistor input circuit)?	Replacement of PCB	109
E40		Stays OFF	Keeps	1 time flash	Keeps			Installation or operating condition	• Rising high pressure (Operation of 63H1) • Service valve closing operation	Repair	190
			flashing		flashing	2.: 2.1		Outdoor control PCB	*• Defective outdoor control PCB (Defective 63H input circuit)?	Replacement of PCB	
E41		Stays OFF	Keeps flashing	1 time flash	Keeps flashing	2 times flash or 6 times flash		Inverter PCB or radiator fin	Power transistor overheat	Replacement of PCB or Repair	191•192
E42		Storio OEE	Keeps	1 time flesh	Keeps	1 time flash		Outdoor control PCB compressor	Current cut (Anomalous compressor over-current)	Replacement of PCB	193•194
		Stays OFF	flashing	1 time flash	flashing	5 times flash		Installation or operating condition	Service valve closing operation	Repair	193*194
E45	Keeps flashing	Stays OFF	Keeps	1 time flash	Keeps	Keeps	Keeps flashing	Outdoor control PCB	Anomalous outdoor control PCB communication	Service valve opening check	195
	moning		flashing		flashing	flashing	moning	Inverter PCB	Anomalous inverter PCB communication	Replacement of PCB	
ЕЧП		Stays OFF	Keeps flashing	1 time flash	Keeps flashing	7 times flash		Inverter PCB activefilter	Defective outdoor inverter PCB Defective active filter of control. (Model FDC 71 only)	Replacement	196
E48		Stays OFF	Keeps	1 time flash	Keeps			Outdoor fan motor	Anomalous outdoor fan motor	Replacement, repair	197
			flashing		flashing			Outdoor control PCB Installation or operating	*• Defective outdoor control PCB (Defective motor input circuit)?	Replacement of PCB	
			V		V	Keeps flashing		condition	Service valve closing operation	Repair	
E49		Stays OFF	Keeps flashing	1 time flash	Keeps flashing			Low pressure sensor	Anomalous low pressure, broken wire of low pressure sensor or poor connector connection	Replacement, repair of sensor	198•199
								Outdoor control PCB	*• Defective outdoor control PCB (Defective sensor input circuit)?	Replacement of control PCB	
E5 1		Stays OFF	Keeps flashing	1 time flash	Keeps flashing	2 times flash or 6 times flash		Inverter PCB	Anomalous inverter PCB	Replacement of PCB	200
E53		Stays OFF	Keeps	1 time flesh	Keeps			Suction pipe temperature thermistor	Defective suction pipe temperature thermistor, broken wire or poor connector connection	Replacement, repair of temperature thermistor	201
C J J		Stays OFF	flashing	1 time flash	flashing			Outdoor control PCB	*• Defective outdoor PCB (Defective thermistor input circuit)?	Replacement of control PCB	201
E54		Stays OFF	Keeps	1 time flash	Keeps			Low pressure sensor	Defective low pressure sensor	Replacement of sensor	202
'		Stays Of 1	flashing	1 time masii	flashing	Keeps		Outdoor control PCB	Defective outdoor control PCB (Defective sensor input circuit)?	Replacement of control PCB	202
E55		Stays OFF	Keeps	1 time flash	Keeps	flashing		Compressor underneath temperature thermistor	Defective compressor underneath temperature thermistor (Model FDCA160 only)	Replacement of temperature thermistor	203
		,. 011	flashing	AMOII	flashing			Outdoor control PCB	Defective outdoor control PCB (Defective thermistor input circuit)? (Model FDCA160 only)	Replacement of control PCB	
F 57		Stays OFF	Keeps	1 time flash	Keeps			Operation status	Shortage in refrigerant quantity	Repair Service valve opening	204
<u> '</u>			flashing		flashing	Stays OFF or		Installation status	Service valve closing operation	check	
E57 E59 E60		Stays OFF	Keeps flashing	5 times flash	Keeps flashing	4 times flash		Compressor inverter PCB	Anomalous compressor startup	Replacement	205•206
		Stays OFF	Keeps flashing	1 time flash	Keeps flashing	Keeps flashing		Compressor	Anomalous compressor rotor position detection (Model FDCA160 only) dentify the cause definitely, and, if the trouble is repaire	Replacement	207

Note (1) * mark in the Description of trouble means that, in ordinary diagnosis, it cannot identify the cause definitely, and, if the trouble is repaired by replacing the part, it is judged consequently that the replaced part was defective.

- (2) This LED is installed on models FDCA160VS
- (3) This LED is installed on models FDC71-140VNX,100VN
- (4) This LED is installed on models FDCA160VS

(iii) Option control in-use

Remo	te control	Indoor unit	control PCB	Outdoor unit control PCB		Description of trouble	Repair method
Error code	Red LED	Red LED	Green LED	Red LED	Green LED	Description of trouble	
E 75	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Keeps flashing	Communication error (Defective communication circuit on the main unit of SC-SL2N-E or SC-SL3N-E) ete.	Replacement

(iv) Display sequence of error codes or inspection indicator lamps

■ Occurrence of one kind of error

Displays are shown respectively according to errors.

■ Occurrence of plural kinds of error

Section	Category of display
Error code on remote control	Displays the error of higher priority (When plural errors are persisting)
Red LED on indoor control PCB	E 1×E5>····×E 10×E35 >·····E60
Red LED on outdoor control PCB	• Displays the present errors. (When a new error has occurred after the former error was reset.)

■ Error detecting timing

Section	Error description	Error code	Error detecting timing
	Drain trouble (Float switch activated)	E9	Whenever float switch is activated after 30 second had past since power ON.
	Communication error at initial operation	""WAIT"	No communication between indoor and outdoor units is established at initial operation.
	Remote control communication circuit error	ΕI	Communication between indoor unit and remote control is interrupted for mote than 2 minutes continuously after initial communication was established.
Indoor	Communication error during operation	E5	Communication between indoor and outdoor units is interrupted for mote than 2 minutes continuously after initial communication was established.
	Excessive number of connected indoor units by controlling with one remote control	E 10	Whenever excessively connected indoor units is detected after power ON.
	Return air temperature thermistor anomaly	Ε'n	-20°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature.
	Indoor heat exchanger temperature thermistor anomaly	E6	-40°C or lower is detected for 5 seconds continuously within 60 minutes after initial detection of this anomalous temperature. Or 70°C or higher is detected for 5 seconds continuously.
	Outdoor air temperature thermistor anomaly	E 38	-45°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature. Or -45°C or higher is detected for 5 seconds continuously within 20 seconds after compressor ON.
	Outdoor heat exchanger temperature thermistor anomaly	E37	-50°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature. Or -50°C or lower is detected for 5 seconds continuously within 20 seconds after compressor ON.
Outdoor	Discharge pipe temperature thermistor anomaly	E39	-10°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.
	Suction pipe temperature thermistor anomaly	E53	-50°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.
	Low pressure sensor anomaly	E54	0V or lower or 4.0V or higher is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous pressure.
	Underneath temperature thermistor anomaly	E55	-50°C or lower is detected for 5 seconds continuously 3 times within 40 minutes after initial detection of this anomalous temperature.

■ Error log and reset

Error indicator	Memorized error log	Reset	
Remote control display	Higher priority error is memorized.	• Stop the unit by pressing the ON/OFF	
Red LED on indoor control PCB	Not memorized.	switch of remote control. If the unit has recovered from anomaly, it can be operated.	
Red LED on outdoor control PCB	Memorizes a mode of higher priority.		

■ Resetting the error log

- Resetting the memorized error log in the remote control

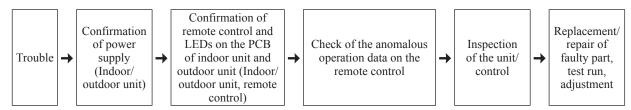
 Holding down "CHECK" button, press "TIMER" button to reset the error log memorized in the remote control.
- Resetting the memorized error log

The remote control transmits error log erase command to the indoor unit when "VENTI" button is pressed while holding down "CHECK" button.

Receiving the command, the indoor unit erase the log and answer the status of no error.

(2) Troubleshooting procedure

When any trouble has occurred, inspect as follows. Details of respective inspection method will be described on later pages.



(3) Troubleshooting at the indoor unit

With the troubleshooting, find out any defective part by checking the voltage (AC, DC), resistance, etc. at respective connectors at around the indoor PCB, according to the inspection display or operation status of unit (the compressor does not run, fan does not run, the 4-way valve does not switch, etc.), and replace or repair in the unit of following part.

(a) Replacement part related to indoor PCB's

Control PCB, power supply PCB, temperature thermistor (return air, indoor heat exchanger), remote control switch, limit switch, transformer and fuse

Note (1) With regard to parts of high voltage circuits and refrigeration cycle, judge it according to ordinary inspection methods.

(b) Instruction of how to replace indoor control PCB

SAFETY PRECAUTIONS Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the replacement in order to protect yourself. • The precautionary items mentioned below are distinguished into two levels, WARNING and CAUTION. Both mentions the important items to protect your health and safety so strictly follow them by any means. Wrong installation might cause serious consequences depending on circumstances. After completing the replacement, do commissioning to confirm there are no anomaly WARNING Replacement should be performed by the specialist. If you replace the PCB by yourself, it may lead to serious trouble such as electric shock or fire. Replace the PCB correctly according to these instructions. Improper replacement may cause electric shock or fire. Shut off the power before electrical wiring work. Replacement during the applying the current would cause the electric shock, unit failure or improper running. It would cause the damage of connected equipment such as fan motor, etc. Fasten the wiring to the terminal securely, and hold the cable securely so as not to apply unexpected stress on the terminal. Loose connections or hold could result in abnormal heat generation or fire. Check the connection of wiring to PCB correctly before turning on the power, after replacement. Defectiveness of replacement may cause electric shock or fire CAUTION Λ In connecting connector onto the PCB, connect not to deform the PCB. It may cause breakage or malfunction. Insert connecter securely, and hook stopper. It may cause fire or improper running. Bundle the cables together so as not to be pinched or be tensioned. It may cause malfunction or electric shock for disconnection or deformation.

(i) Control PCB PSB012D990B

Replace and set up the PCB according to this instruction.

1) Set to an appropriate address and function using switch on PCB.

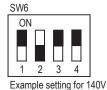
Select the same setting with the removed PCB.

item	switch	Content of control		
Address	SW2	Plural indoor units control by 1 remote control		
Test run	SW7-1	OFF	Normal	
restruit	3007-1	ON	Operation check/drain motor tes	

2) Set to an appropriate capacity using the model selector switch(SW6).

Select the same capacity with the PCB removed from the unit.

SW6	-1	-2	-3	-4
71V	0	-	-	0
100V	0	0	_	0
125V	_	_	0	0
140V	0	_	0	0
160V	0	0	0	0



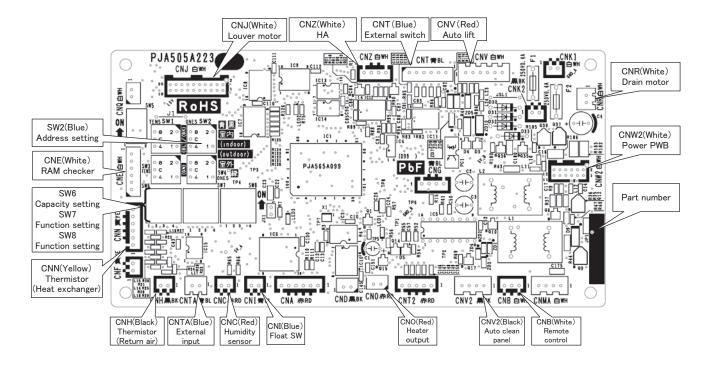
O:ON -:OFF

3) Replace the PCB

- a) Exchange PCB after detaching all connectors connected with the PCB.
- b) Fix the PCB so as not to pitch the wiring.
- c) Connect connectors to the PCB. Match the wiring connector to the connector color on the PCB and connect it.

4) Control PCB

Parts mounting are different by the kind of PCB.



(ii) Power PCB

This PCB is a general PCB. Replace the PCB according to this instruction.

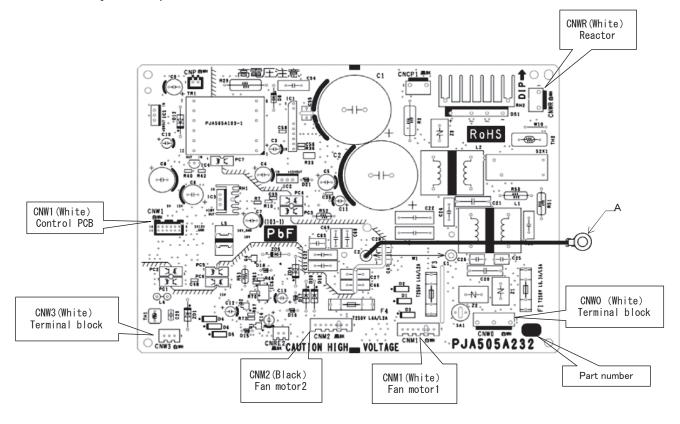
PSC012D021

1) Replace the PCB

- a) Unscrew terminal(Arrow A) of the "E2" wiring(yellow/green) that is connected to PCB.
- b) Replace the PCB only after all the wirings connected to the connector are removed.
- c) Fix the board such that it will not pinch any of the wires.
 d) Reconnect the wirings to the PCB. Wiring connector color should match with the color of connector of the PCB.
 e) Screw back the terminal(Arrow A) of the "E2" wiring, that was removed in 1.

2) Power PCB

Parts mounting are different by the kind of PCB.



(iii) Motor PCB (FDUA100, 125, 140, 160 only)

PSC012D022

This PCB is a general PCB. Replace the PCB according to this instruction.

1) Replace the PCB

- a)Take off the connection of connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the controller's radiation heat fins.
- b) Before installing the power transistor on the new PCB. apply uniformly a bundled of silicon grease first on the surface of power transistor.

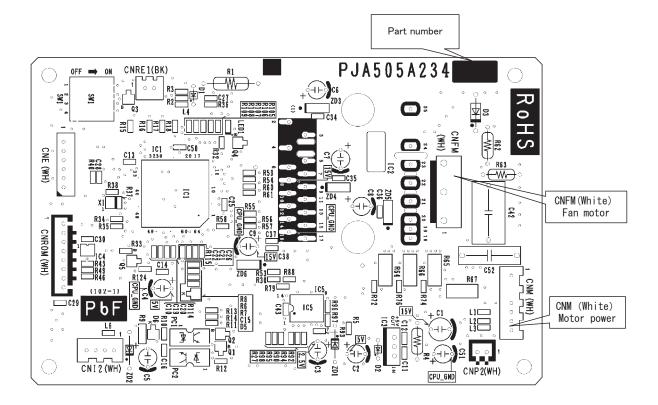
 Make sure it is applied to prevent damage on power transistor, and install the PCB not to pinch the wirings.
- c) Tighten the screw of power transistor and reconnect the wirings to the PCB.

 Confirm the connection and don't use soldering in the connection. <u>Tighten properly the power transistor with a screw and make sure there is no slack.</u>

 Power transistor can be damage if not properly tighten. (Recommended power transistor tightening torque:0.59~0.78N·m)

2) Fan motor control PCB

Parts mounting are different by the kind of PCB.



●DIP switch setting list

Switches	Description		D	efault setting	Remarks
SW2	Address No. setting at plural indoor units control by 1 R/C		0		0-F
SW5-1	Reserved		OFF		Keep OFF
SW5-2	Reserved		OFF		Keep OFF
SW6-1					See table 1
SW6-2	Model selection		As per model		
SW6-3					
SW6-4]				
SW7-1	Test run, Drain motor	Normal*/Test run	OFF	Normal	
SW7-2	Reserved		OFF		keep OFF
SW7-3	Powerful mode	Valid*/Invalid	ON	Valid	
SW7-4	Reserved		OFF		keep OFF
SW8-1	Reserved		OFF		keep OFF
SW8-2	Reserved		OFF		keep OFF
SW8-3	Reserved		OFF		keep OFF
SW8-4	Setting of the External static pressure	Normal*/Range expand	OFF	Normal	
JSL1	Superlink terminal spare Normal*/switch to spare		With		

^{*} Default setting

Table 1: Indoor unit model selection with SW6-1-SW6-4

0: OFF 1:ON

	71V	100V	125V	140V	160V
SW6-1	1	1	0	1	1
SW6-2	0	1	0	0	1
SW6-3	0	0	1	1	1
SW6-4	1	1	1	1	1

(4) Troubleshooting at the outdoor unit

When troubleshooting the outdoor unit, firstly assess the overview of malfunction and try to presume the cause and the faulty part by checking the error cord dispalyed on the remote control and flashing pattern of indicator lamps (Red LED and Green LED), and then proceed further inspection and remedy it.

Self-diagnosis system by microcomputor on indoor and outdoor PCB can assist to find the cause of malfunction smoothly by making a diagnosis of not only the anomaly of microcomutor, but also the anomaly in power supply system, installation space, overload resulting from improper charging amount of refrigerant and etc.

Unless the power is reset, the error log is saved in memory and the inspection indicator lamps on outdoor PCB keep flashing after automatical recovering from malfunction.

After automatical recovering from malfunction, if any another error mode which has a higher priority than the previous error saved in memory occurs, it is overwritten in memory and is displayed.

[Reset of power supply]

Be sure to avoid electrical shock, when replacing or checking the outdoor control PCB, because some voltage is still retained in the electrolytic capacitor on the PCB even after shutting down tne power supply to the outdoor unit.

Be sure to start repairing work, after confirming that the Green LED on the PCB has been extiguished for more than 10 seconds after more than 3 minutes had been passed since power shut down, and reconfirming that voltage has been discharged sufficiently by measuring the voltage (DC) between both terminals of electrolytic capacitor (C58) (Measurment of voltage may be disturbed by the moisture-proof coating. In such case, remove the coating and measure it by taking care of avoiding electrical shock)

(a) Module of part to be replaced for outdoor unit control

Outdoor control PCB, Inverter PCB, Temperature thermistor (of outdoor heat exchanger, discharge pipe, outdoor air, IPM and suction pipe), Fuses (for power supply and control PCB), Noise filter, Capacitor, Reactor and Transformer

(b) Replacement procedure of outdoor control PCB

Precautions for Safety

Since the following precaution is the important contents for safety, be sure to observe them.
 WARNING and CAUTION are described as follows:

∴WARNING

Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.

∴ CAUTION

Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

! WARNING

- Securely replace the PCB according to this procedure.
 If the PCB is incorrectly replaced, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before replacing the PCB. The PCB replacement under current-carrying will cause an electric shock or fire.
- After finishing the PCB replacement, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly replaced, it will cause an electric shock or fire.

∴ CAUTION

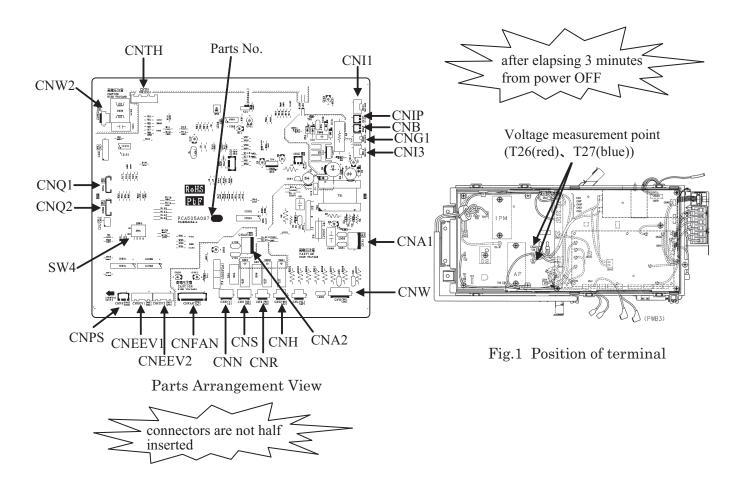
Band the wiring so as not to tense because it will cause an electric shock.

(i) Model FDC71VNX

PCA012D021C

- 1) Replace the PCB after elapsing 3 minutes from power OFF.

 (Be sure to measure voltage (DC) between T26 and T27 on inverter PCB, and check that the voltage is discharged sufficiently(10V or less).(Refer to Fig.1))
- 2) Disconnect the connectors from the control PCB.
- 3) Match the switches setting (SW4) with the former PCB.
- 4) Connect the connectors to the control PCB.(Confirm the connectors are not half inserted.)

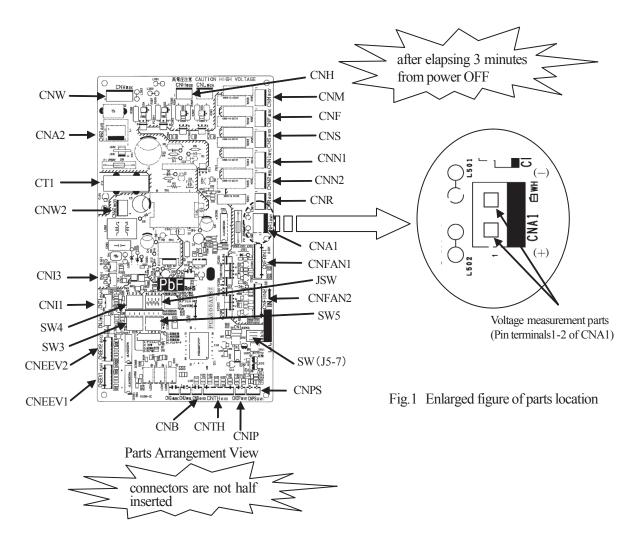


(ii) Models FDC100VNX, 125VNX, 140VNX, 100VN

2)

PCA012D024FA

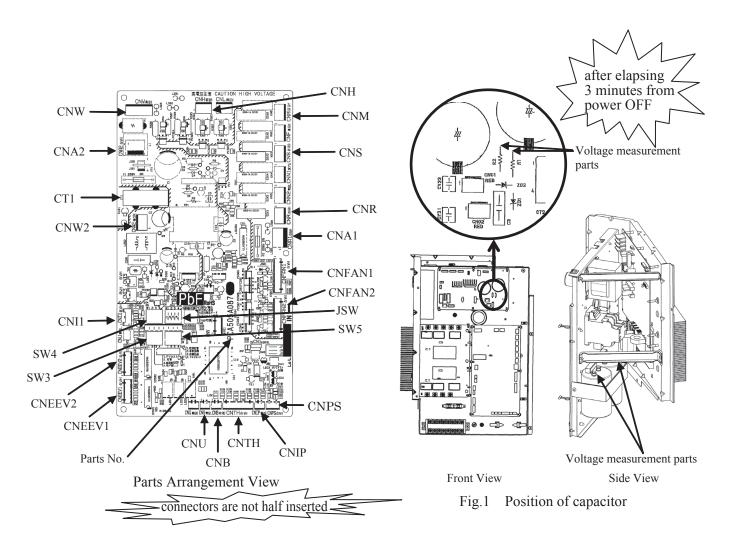
- 1) Replace the PCB after elapsing 3 minutes from power OFF.
 - Measurement was done on both ends of connector(CNA1) during measurement, the voltage(DC) might charged the electrolytic capacitor, be sure that the voltage is discharged sufficiently. (Refer to Fig.1)
- 3) Disconnect the connectors from the control PCB.
- 4) Disconnect the white or blue wiring passing through CT1 on the PCB before replacing the PCB.
- 5) Match the setting switches (SW3-5, JSW, SW(J5-7)) with the former PCB.
- 6) Tighten up a screw after passing white or blue wiring through CT1 of the changed.
- 7) Please connect the connectors with the same place. (Confirm the **connectors are not half inserted**.)



(iii) Model FDCA160VS

PCA012D017F

- Replace the PCB <u>after elapsing 3 minutes from power OFF</u>.
 (<u>Be sure to measure the voltage (DC) of two places</u> (1.Resistor on PCB at the front of controller 2.Both capacitor terminals located in back of controller), and <u>check that the voltage is discharged sufficiently</u>. (Refer to Fig.1))
- 2) Disconnect the connectors from the control PCB.
- 3) Disconnect the blue wiring passing through CT1 on the substrate before replacing the PCB.
- 4) Match the setting switches (SW3-5,JSW) with the former PCB.
- 5) Tighten up a screw after passing blue wiring through CT1 of the changed.
- 6) Connect the connectors to the control PCB. (Confirm the connectors are not half inserted)



(c) Outdoor inverter PCB replacement procedure

CAUTION

Precautions for Safety

Since the following precaution is the important contents for safety, be sure to observe them.
 WARNING and CAUTION are described as follows:

■ WARNING and CACTION are described as follows.

■ WARNING Indicates an imminently hazardous situation which will result in death or serious

injury if proper safety procedures and instructions are not adhered to.

Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

♠ WARNING

- Securely replace the PCB according to this procedure.
 If the PCB is incorrectly replaced, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before replacing the PCB. The PCB replacement under current-carrying will cause an electric shock or fire.
- After finishing the PCB replacement, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly replaced, it will cause an electric shock or fire.

♠ CAUTION

Band the wiring so as not to tense because it will cause an electric shock.

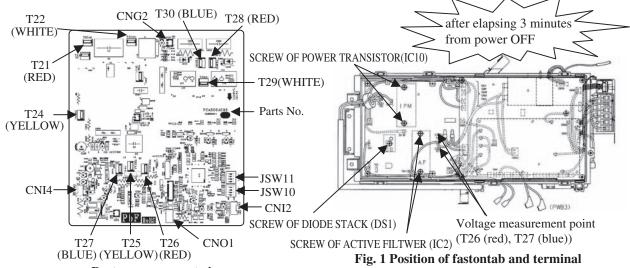
Replace the inverter PCB according to the following procedure.

(i) Model FDC71VNX

1) Replace the PCB after elapsing 3 minutes from power OFF.

PCA012D022G

- (Be sure to measure voltage (DC) between T26 and T27 on inverter PCB, and check that the voltage is discharged sufficiently (10V or less). (Refer to Fig.1))
- 2) Take off the connection of inverter PCB terminal and connector, and remove the screw of power transistor (IC10), active filter (IC2), and diode stack (DS1) then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins. (Refer to Fig.1 and Parts arrangement view)
- 3) Refer to table 1 for the setting of switch (JSW10, 11) of new PCB.
- 4) Before installing the power transistor (IC10), active filter (IC2), and diode stack (DS1) on the new PCB, apply silicon grease equally to the their surface. (Make full use of the silicon grease.) They may be damaged unless they apply it.
- Tighten the screw of power transistor (IC10), active filter (IC2), and diode stack (DS1) on inverter PCB and connect terminal and connector. Confirm the connection and there is not the half insertion. Tighten properly power transistor, (IC10) active filter (IC2), and diode stack (DS1) with a screw and make sure there is no slack. They can be damage if not properly tighten. (Recommended tightening torque: power transistor (IC10)1.2±0.1 and active filter (IC2)0.98±0.1, diode stack(DS1) 0.5±0.1 Unit N·m



Parts arrangement view

Table. 1 Switch setting

Connectors are not half inserted JSW10 -2 OFF -3 OFF -4 OFF JSW11 -2 ON -3 ON -4 ON			-1	OFF		-1	ON
one and inserted -3 OFF -3 ON		ICW10	-2	OFF	ICW/11	-2	ON
-4 OFF -4 ON	> not half inserted	JS W 10	-3	OFF	J3 W 11	-3	ON
			-4	OFF		-4	ON

(ii) Models FDC100VNX, 125VNX, 140VNX, 100VN

PCA012D025D

- Replace the PCB <u>after elapsing 3 minutes from power OFF</u>.
 (Be sure to measure voltage (DC) on both capacitor terminals located in controller back, and <u>check that the voltage is discharged sufficiently</u>.(Refer to Fig.1))
- 2) Take off the connection of inverter PCB terminal block connector and remove the screw of power transistor then remove the PCB. Wipe off the silicon grease neatly on the control's radiation heat fins.
- 3) Match the setting switches (JSW10,11) of new PCB with the former PCB.
- 4) Before installing the power transistor on the new PCB, Apply uniformly a bundled of silicon grease first on the surface of power transistor. Make sure it is applied to prevent damage on power transistor.
- 5) Tighten the screw of power transistor on inverter PCB and connect the terminal block. Confirm the connection and don't use soldering in the connection. Tighten properly the power transistor with a screw and make sure there is no slack. Power transistor can be damage if not properly tighten. (Recommended power transistor tightening torque: 0.98~1.47N·m)

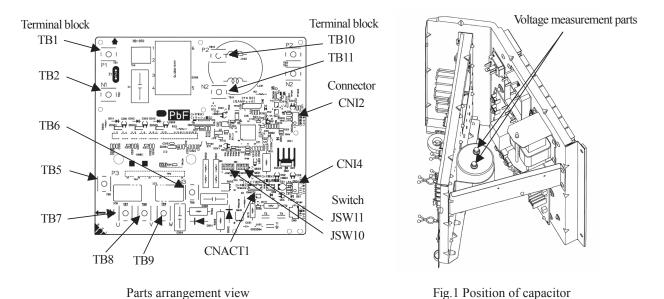


Table. 1 Switch setting

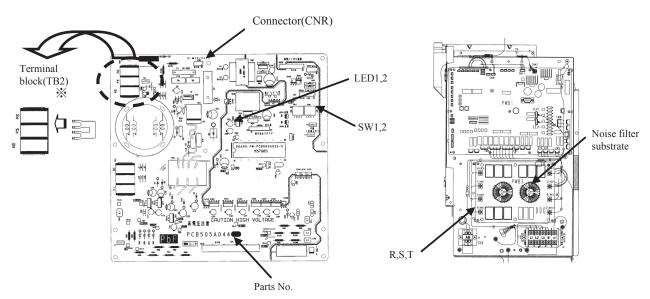
JSW10	-1	OFF	JSW11	-1	OFF
	-2	OFF		-2	OFF
	-3	OFF		-3	ON
	-4	OFF		-4	ON

(iii) Model FDCA160VS

PCB012D007C♠

- 1) Replace the inverter PCB after 10 minutes from power OFF. (Be sure to check that LED (LED1,2) of the inverter PCB put out the lights. It measures that the voltage (AC) between terminals (R,S,T) on the noise filter PCB (see Fig 1) is discharged sufficiently.)
- 2) Remove the terminal on the terminal block (TB2) of the inverter PCB and the connector (CNR) of replace the PCB.
- 3) Make set switch (SW1,2) as shown in Table 1.
- 4) Connect the terminal of terminal block and the connector to the inverter PCB.
 - *Remove the short bar form the PCB before the replacement.

Connect it with P2-P3 pins of PCB after the replacement.



Parts Arrangement View (the inverter PCB)

Fig. 1 The front of control

Table.1 Switch setting

In case of one substrate.

SW1-1	OFF
5 W 1-1	011
SW1-2	OFF
SW1-3	OFF
SW1-4	OFF
SW2-1	ON
SW2-2	OFF
SW2-3	OFF
SW2-4	OFF

DIP switch setting list (Outdoor unit)

(1) Control PCB

Model FDC71VNX

Switches	Description		Default setting		Remarks
SW3-1	Defrost condition	Normal*/Cold region	OFF	Normal	
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	
SW3-3	Model selection	Cooling only/Heat pump*	OFF	Heat pump	Keep OFF
SW3-4	Defrost prohibition time	ON: 37min*/OFF: 45min	ON	37min.	
SW4-1	Model selection	Domestic/Overseas*	ON	Overseas	Keep ON
SW4-2	Model selection	3-phase/Single phase*	ON	Single phase	Keep ON
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Reserved		OFF		Keep OFF
SW5-1	Model selection		OFF		Keep OFF
SW5-2	Model selection		OFF		Keep OFF
SW5-3	Test run SW	Normal*/Test run	OFF	Normal	
SW5-4	Test run mode	Cooling*/Heating	OFF	Cooling	
SW7-1	Reserved		OFF		Keep OFF
SW7-2	Reserved		OFF		Keep OFF
SW7-3	Reserved		OFF		Keep OFF
SW8-1	Reserved		OFF		Keep OFF
SW8-2	Reserved		OFF		Keep OFF
SW8-3	Reserved		OFF		Keep OFF
SW9	Pump down operation	Normal*/Pump down	OFF	Normal	

Models FDC100,125,140VNX,100VN,FDCA160VS

Switches	Description		Default setting		Remarks
SW1	Pump down operation	Normal*/Pump down	OFF	Normal	
JSW1-1					
JSW1-2	Model selection		As per	model	See table 1
JSW1-3	Model selection		As per model		See table 1
JSW1-4					
SW3-1	Defrost condition	Normal*/Cold region	OFF	Normal	
SW3-2	Snow protection control	Normal*/Snow protection	OFF	Normal	
SW3-3	Test run SW	Normal*/Test run	OFF	Normal	
SW3-4	Test run mode	Cooling*/Heating	OFF	Cooling	
SW4-1	Model selection	Domestic/Overseas*	ON	Overseas	See table 1
SW4-2	Model selection	3-phase/Single phase	As per	model	See table 1
SW4-3	Reserved		OFF		Keep OFF
SW4-4	Reserved		OFF		Keep OFF
SW5-1	Reserved		OFF		Keep OFF
SW5-2	Reserved		OFF		Keep OFF
SW5-3	Reserved		OFF		Keep OFF
SW5-4	Reserved		OFF		Keep OFF

* Default setting

Table 1: Outdoor unit model selection with JSW1-1-JSW1-4 and SW4-1-SW4-2

			0: OF	F 1:ON
	100V	125V	140V	160V
JSW1-1	0	1	0	0
JSW1-2	0	0	1	0
JSW1-3	0	0	0	1
JSW1-4	0	0	0	0
SW4-1	1	1	1	1
SW4-2*	1	1	1	0

^{*} Single phase: ON

(2) Inverter PCB

Switches	71V	100, 125, 140V
JSW10-1	OFF	OFF
JSW10-2	OFF	OFF
JSW10-3	OFF	OFF
JSW10-4	OFF *	OFF*
JSW11-1	ON	OFF
JSW11-2	ON	OFF
JSW11-3	ON	ON
JSW11-4	ON	ON

Switches	160V
SW1-1	OFF
SW1-2	OFF
SW1-3	OFF
SW1-4	OFF
SW2-1	ON
SW2-2	OFF
SW2-3	OFF
SW2-4	OFF

^{*} When checking inverter PCB of FDC71, 100, 125, 140 models with inverter checker, turn JSW10-4 ON. (Regarding the checking method of inverter PCB with inverter checker, refer to page 154 for details)

Check of anomalous operation data with the remote control

(a) In case of RC-E5 remote control

Operation data can be checked with remote control unit operation.

- (i) Press the CHECK button.
 - The display change "OPER DATA
- (ii) Press the (SET) button while "OPER DATA T" is displayed.
- (iii) When only one indoor unit is connected to remote control, "DATA LOADING" is displayed (blinking indication during data loading).

Next, operation data of the indoor unit will be displayed. Skip to step ?.

(iv) When plural indoor units is connected, the smallest address number of indoor unit among all connected indoor unit is displayed.

" ♦ SELECT I/U" (blinking 1 seconds) → " I/U000 blinking.

- (v) Select the indoor unit number you would like to have data displayed with the | \bullet | button.
- (vi) Determine the indoor unit number with the (SET) button. (The indoor unit number changes from blinking indication to continuous indication)
 - " I/U000" (The address of selected indoor unit is blinking for 2 seconds.)

1

"DATA LOADING" (A blinking indication appears while data loaded.) Next, the operation data of the indoor unit is indicated.

(vii) Upon operation of the ▲ | ▼ button, the current operation data is displayed in order from data number 01.

The items displayed are in the above table.

- *Depending on models, the items that do not have corresponding data are not displayed.
- (viii) To display the data of a different indoor unit, press the AIR CON NO. button, which allows you to go back to the indoor unit selection screen.
- (ix) Pressing the ON/OFF button will stop displaying data.

Pressing the (RESET) button during remote control unit operation will undo your last operation and allow you to go back to the previous screen.

Number

01

02

03

04

SET TEMP

RETURN AIR.

■SENSOR.

Olf two (2) remote controls are connected to one (1) inside unit, only the master control is available for trial operation and confirmation of operation data. (The slave remote control is not available.)

Details of Compressor protection status No. 33

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.129, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.129, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.131, (6).(g)
"4"	High pressure protection control	P.129, (6).(b).(i), P.130, (6).(c).(i)
"5"	High pressure anomaly	P.129, (6).(b).(ii)
"6"	Low pressure protection control	P.130, (6).(e).(i)
"7"	Low pressure anomaly	P.130, (6).(e).(ii)
"8"	Anti-frost prevention control	P.131, (6).(k)
"9"	Current cut	P.131, (6).(g)
"10"	Power transistor protection control	P.131, (6).(h)
"11"	Power transistor anomaly (Overheat)	P.131, (6).(i)
"12"	Compression ratio control	P.130, (6).(f)
"13"	Spare	
"14"	Dewing prevention control	P.132, (6).(l)
"15"	Current safe control of inverter secondary current	P.131, (6).(g)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.132, (6).(p)

THI-R1__t 05 (Indoor Heat Exchanger Thermistor / U Bend) THI-R2. (Indoor Heat Exchanger Thermistor /Capillary) 06 THI-R3_ 07 (Indoor Heat Exchanger Thermistor /Gas Header) 08 I/U FANSPEED (Indoor Unit Fan Speed) 09 Demand. (Frequency Requirements) 10 answer. Ηz (Response Frequency) (Pulse of Indoor Unit Expansion Value) 11 I/U EEV TOTAL I/U RUN 12 H (Total Running Hours of The Indoor Unit) 21 OUTDOOR (Outdoor Air Temperature) 22 THO-R1. (Outdoor Heat Exchanger Thermistor) Ő. THO-R2 23 (Outdoor Heat Exchanger Thermistor) 24 COMP _Hz (Compressor Frequency) 25 HP .MPa (High Pressure) ΙP 26 _MPa (Low Pressure) 27 Td Ő. (Discharge Pipe Temperature) COMP BOTTOM 28 (Comp Bottom Temperature) 29 .amp (Current) 30 TARGET SH (Target Super Heat) SH_ 31 (Super Heat) TDSH. (Discharge Pipe Super Heat) 32 PROTECTION No., 33 (Protection State No. of The Compressor) 34 O/UFANSPEED. (Outdoor Unit Fan Speed) 35 63H1 (63H1 On/Off) DEFROST (Defrost Control On/Off) 36 TOTAL COMP RUN H (Total Running Hours of The Compressor) 37 O/U EEV 1 38 (Pulse of The Outdoor Unit Expansion Valve EEVC) 39 -0/U EEV2 (Pulse of The Outdoor Unit Expansion Valve EEVH)

Data Item

(Operation Mode)

(Set Temperature)

(Return Air Temperature)

(Remote Control Thermistor Tempeature)

- Note(1) Operation data display on the remote control.
- Data is dispalyed until canceling the protection control.
 In case of multiple protections controlled, only the younger No. is displayed Note(2) Common item
 - ① In heating mode.

During protection control by the command signal for reducing compressor frequency from indoor unit, No. "4" is displayed.

② In cooling and dehumidifying mode.

During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

(b) In case of RC-EX1A remote control

[Operating procedure]

- (i) On the TOP screen, touch the buttons in the order of "Menu" → "Next" → "Service & Maintenance" → "Service password" → "Set" → "Error display" → "Error history".
- (ii) When only one indoor unit is connected to the remote control, followings will be displayed.
 - 1. When there is any anomaly: "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly. Contents of display
 - · Error code
 - · Number and data item
 - 2. When there is no anomaly: "No anomaly" is displayed, and this mode is terminated.
- (iii) When two or more indoor units are connected to the remote control, followings will be displayed.
 - 1. When there is any anomaly: If the unit having anomaly is selected on the "Select IU" screen, "Loading. Wait a while" is displayed, followed by the operation data at the occurrence of anomaly.

Contents of display

- · Indoor unit No.
- · Error code
- · Number and data item
- 2. When there is no anomaly: "No anomaly" is displayed, ant this mode is terminated.

Note (1) When the number of connected units cannot be shown in a page, select "Next".

- (iv) If you press [RUN/STOP] button, the display returns to the TOP screen.
 - O If you touch "Back" button on the way of setting, the display returns to the last precious screen.

Note (1) When two remote controls are used to control indoor units, the check of anomaly operation data can be made on the master remote control only. (It cannot be operated from the slave remote control.)

■ Anomaly operation data (Corresponding data may not be provided depending on models. Such items will not be displayed.)

Number		Data Item
01	**	(Operation Mode)
02	SET TEMPb	(Set Temperature)
03	RETURN AIRた	(Return Air Temperature)
04	回SENSORた	(Remote Control Thermistor Tempeature)
05	THI-R1t	(Indoor Heat Exchanger Thermistor / U Bend)
06	THI-R2c	(Indoor Heat Exchanger Thermistor /Capillary)
07	THI-R3c	(Indoor Heat Exchanger Thermistor /Gas Header)
08	I/U FANSPEED	(Indoor Unit Fan Speed)
09	DEMANDHz	(Frequency Requirements)
10	ANSWERHz	(Response Frequency)
11	I/U EEVP	(Pulse of Indoor Unit Expansion Value)
12	TOTAL I/U RUN	$_{ m H}$ (Total Running Hours of The Indoor Unit)
21	OUTDOORზ	(Outdoor Air Temperature)
22	THO-R1c	(Outdoor Heat Exchanger Thermistor)
23	THO-R2c	(Outdoor Heat Exchanger Thermistor)
24	COMPHz	(Compressor Frequency)
25	HPMPa	(High Pressure)
26	LPMPa	(Low Pressure)
27	Tdb	(Discharge Pipe Temperature)
28	COMP BOTTOM_t	(Comp Bottom Temperature)
29	CTAMP	(Current)
30	TARGET SH	(Target Super Heat)
31	SHt	(Super Heat)
32	TDSHc	(Discharge Pipe Super Heat)
33	PROTECTION No	(Protection State No. of The Compressor)
34	O/U FANSPEED	(Outdoor Unit Fan Speed)
35	63H1	(63H1 On/Off)
36	DEFROST	(Defrost Control On/Off)
37	TOTAL COMP RUN_	H (Total Running Hours of The Compressor)
38	0/U EEV1P	(Pulse of The Outdoor Unit Expansion Valve EEVC)
39	0/U E EV2P	(Pulse of The Outdoor Unit Expansion Valve EEVH)

Details of Compressor protection status No. 33

No.	Contents of display	Reference page
"0"	Normal	
"1"	Discharge pipe temperature protection control	P.129, (6).(a).(i)
"2"	Discharge pipe temperature anomaly	P.129, (6).(a).(ii)
"3"	Current safe control of inverter primary current	P.131, (6).(g)
"4"	High pressure protection control	P.129, (6).(b).(i), P.130, (6).(c).(i)
"5"	High pressure anomaly	P.129, (6).(b).(ii)
"6"	Low pressure protection control	P.130, (6).(e).(i)
"7"	Low pressure anomaly	P.130, (6).(e).(ii)
"8"	Anti-frost prevention control	P.131, (6).(k)
"9"	Current cut	P.131, (6).(g)
"10"	Power transistor protection control	P.131, (6).(h)
"11"	Power transistor anomaly (Overheat)	P.131, (6).(i)
"12"	Compression ratio control	P.130, (6).(f)
"13"	Spare	
"14"	Dewing prevention control	P.132, (6).(l)
"15"	Current safe control of inverter secondary current	P.131, (6).(g)
"16"	Stop by compressor rotor lock	
"17"	Stop by compressor startup failure	P.132, (6).(p)

Note(1) Operation data display on the remote control.

Data is dispalyed until canceling the protection control.

In case of multiple protections controlled, only the younger No. is displayed. Note(2) Common item

① In heating mode.

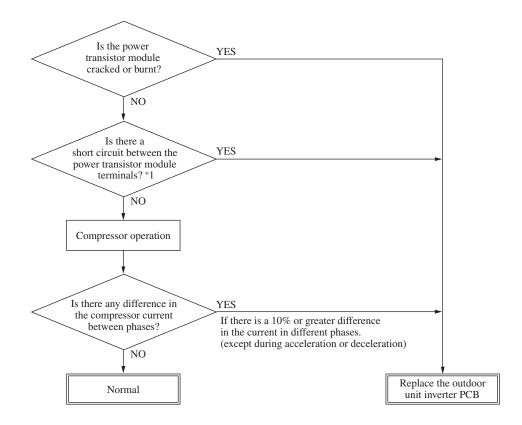
During protection control by the command signal for reducing compressor

frequency from indoor unit, No. "4" is displayed.

② In cooling and dehumidifying mode.

During protection control by the command signal for reducing compressor frequency from indoor unit, No. "8" is displayed.

(6) Power transistor module (including the driver PCB) inspection procedure



*1 Power transistor module terminal short circuit check procedure

Disconnect the compressor wiring, then conduct a short circuit check.

P-U, P-V, P-W

N-U, N-V, N-W

Check between the P-N terminals.

Bring the tester probes in contact with the following places on each te rminal.

P: Power transistor P terminal,

N: Power transistor N terminal,

U: End of red harness to compressor

V: End of white harness to compressor

W: End of black or blue harness to compressor

Check for a power transistor short circuit.

- When you do not have a diagnostic checker for judging if the inverter is defective, measure between the terminals of the power transistor parts, judge whether the power transistor is defective or not.
- Disconnect the compressor, then measure with the control incorporated.

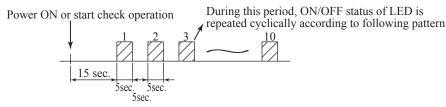
Tes	ster	N	formal values (5	2)	
Terminal (+)	Terminal (-)	Model 71	Model 100, 125, 140	Model 160	
P	N	0 ~	Approx. 1 M	Scores of M	
N	P	(Numerical value rises.)	Approx. 300~400	A few of M	
P	U	Several M			
P	V	(Numerical	0	Scores of M	
P	W	value rises.)			
N	U				
N	V	Approx. 650 k	Approx. 1.2 M	Humdreds of K	
N	W				
U	P	Approx. 670 k			
V	P	Approx. 4.4 M	Approx. 1.3 M	Humdreds of K	
W	P	Approx. 4.4 M			
U	N	Approx. 650 k			
V	N	Approx. 4.8 M	0	Scores of M	
W	N	Approx. 4.9 M			

If the measured values range from $0 \sim$ several kW, there is a possibility that the elements are damaged, so replace the power transistor parts.

(7) Inverter checker for diagnosis of inverter output

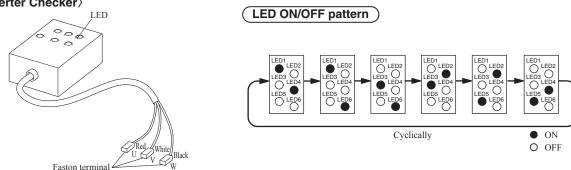
- Checking method
 - (a) Setup procedure of checker.
 - (i) Power OFF (Turn off the breaker).
 - (ii) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.
 - (iii) Connect the wires U (Red), V (White) and W (Black) of checker to the terminal of disconnected wires (U, V, W) from compressor respectively.
 - (b) Operation for judgment.
 - (i) Power ON after JSW10-4 on outdoor inverter PCB was turned ON.(In case of FDC71-140) *In case of FDCA160VS, Start test operation on cooling or heating mode after power ON.
 - (ii) After 15 seconds since power has turned ON(or In case FDCA160VS after the test operation started), LED start ON/OFF for 5 seconds cyclically and it repeats 10 times.
 - (iii) Check ON/OFF status of 6 LED's on the checker.
 - (iv) Judge the PCB by ON/OFF status of 6 LED's on the checker.

ON/OFF status of LED	If all of LED are ON/OFF according to following pattern	If all of LED stay OFF or some of LED are ON/OFF
Inverter PCB	Normal	Anomalous

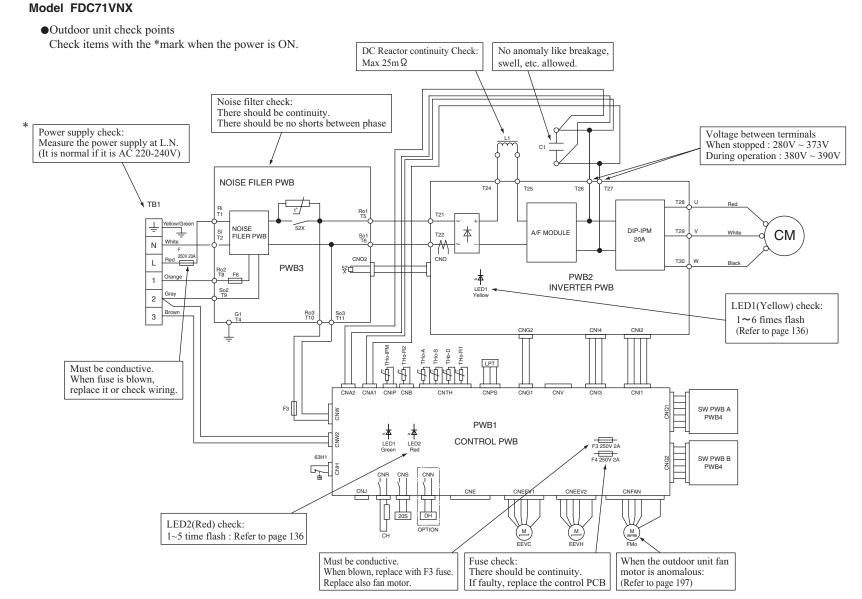


(v) Be sure to turn off JSW10-4 on outdoor inverter PCB, after finishing the check operation.(In case of FDC71-140)

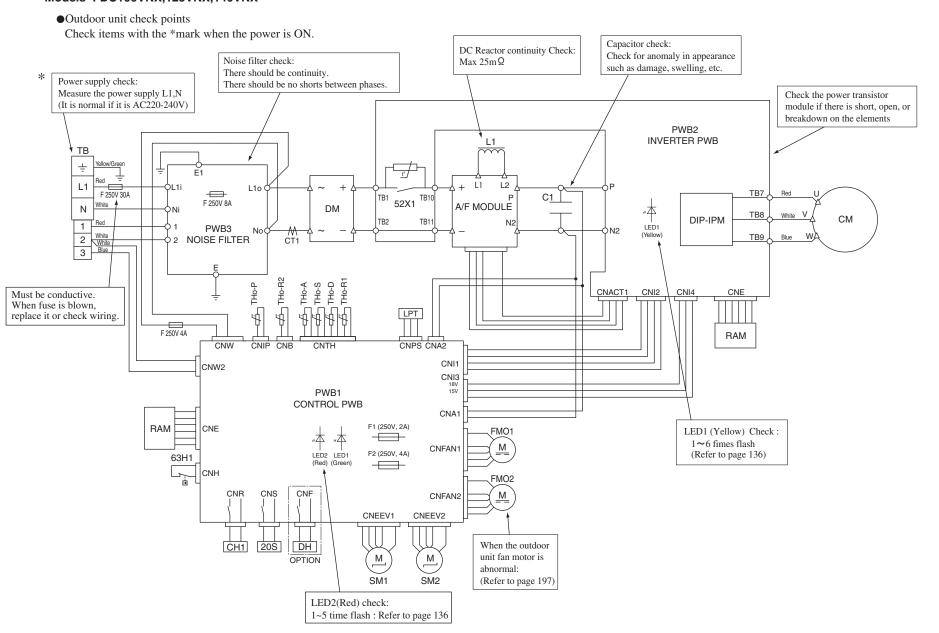
(Inverter Checker)



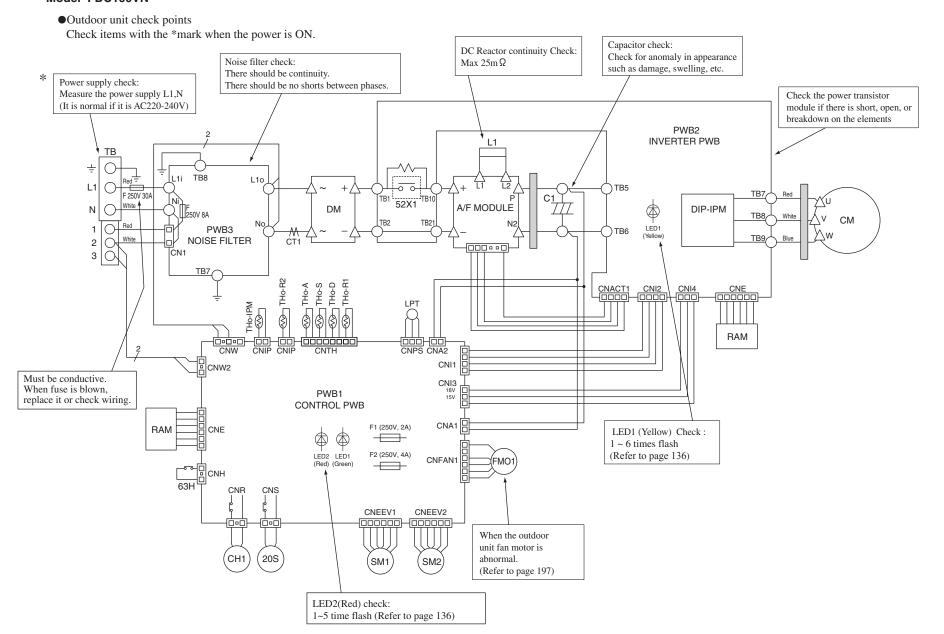
Connect to the terminal of the wires which are disconnected from compressor.



Models FDC100VNX,125VNX,140VNX

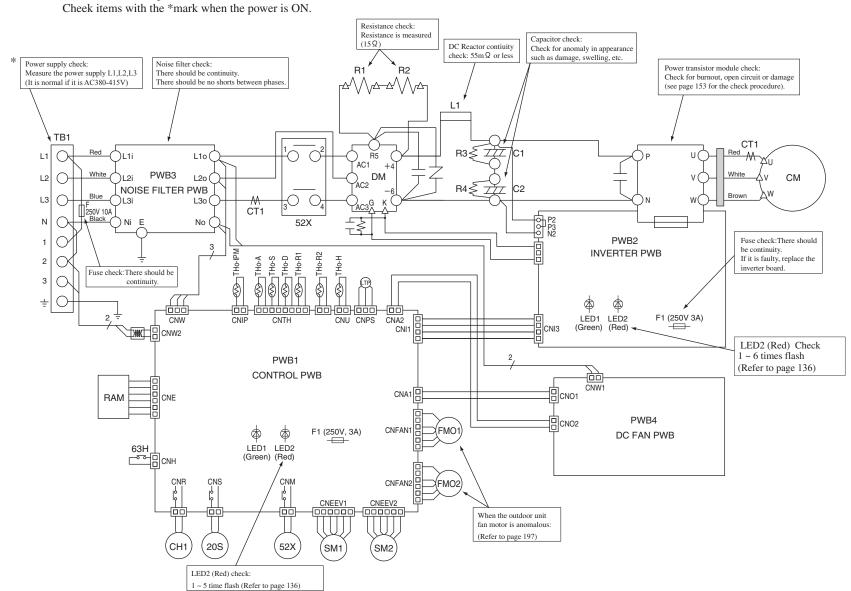


Model FDC100VN



Model FDCA160VS

Outdoor unit check points



11.2 Troubleshooting flow (1) List of troubles

Remote control display	Description of trouble	Reference page
None	Operates but does not cool.	160
None	Operates but does not heat.	161
None	Earth leakage breaker activated	162
None	Excessive noise/vibration (1/3)	163
None	Excessive noise/vibration (2/3)	164
None	Excessive noise/vibration (3/3)	165
None	Power supply system error (Power supply to indoor control PCB)	166
None	Power supply system error (Power supply to remote control)	167
INSPECT I/U	INSPECT I/U (When 1 or 2 remote controls are connected)	168
INSPECT I/U	INSPECT I/U (Connection of 3 units or more remote controls)	169
®WAIT®	Communication error at initial operation	170-172
None	No display	173
E1	Remote control communication circuit error	174
E5	Communication error during operation	175
E6	Indoor heat exchanger temperature thermistor anomaly	176
E7	Return air temperature thermistor anomaly	177
E8	Heating overload operation	178
E9	Drain trouble	179
E10	Excessive number of connected indoor units (more than 17 units) by controlling with one remote control	180
E16	Indoor fan motor anomaly	181
E19	Indoor unit operation check, drain motor check setting error	182
E20	Indoor fan motor rotation speed anomaly	183
E28	Remote control temperature thermistor anomaly	184
E35	Cooling overload operation	185
E36	Discharge pipe temperature error	186
E37	Outdoor heat exchanger temperature thermistor anomaly	187
E38	Outdoor air temperature thermistor anomaly	188
E39	Discharge pipe temperature thermistor anomaly	189
E40	High pressure error (63H1 activated)	190
E41	Power transistor overheat	191 • 192
E42	Current cut	193 • 194
E45	Communication error between inverter PCB and outdoor control PCB	195
E47	Inverter PCB A/F module anomaly (Model FDC71 only)	196
E48	Outdoor fan motor anomaly	197
E49	Low pressure error or low pressure sensor anomaly	198•199
E51	Inverter and fan motor anomaly	200
E53	Suction pipe temperature thermistor anomaly	201
E54	Low pressure sensor anomaly	202
E55	Uuderneath temperature thermistor anomaly (Model FDCA160 only)	203
E57	Insufficient refrigerant amount or detection of service valve closure	204
E59	Compressor startup failure	205 • 206
E60	Anomalous compressor rotor lock (Model FDCA160 only)	207

(2) Troubleshooting

					<u></u>
	Error code	LED	Green	Red	Content
	Remote control: None	Indoor	Keeps flashing	Stays OFF	Operates but does not cool
		Outdoor	Keeps flashing	Stays OFF	Operates but does not coor
1					

1. Applicable model

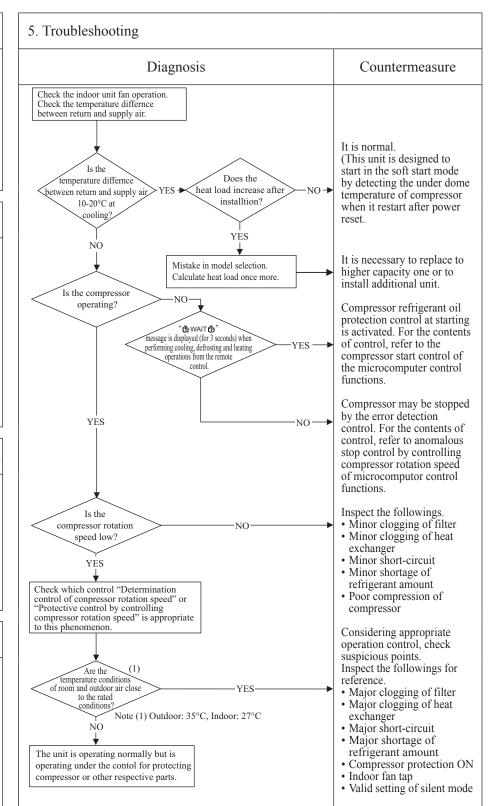
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Poor compression of compressor
- Faulty expansion valve operation



Error code LED Green Red Content	
Remote control: None Indoor Keeps flashing Stays OFF Operates but does not h	•at
Outdoor Keeps flashing Stays OFF Stays OFF	/ai

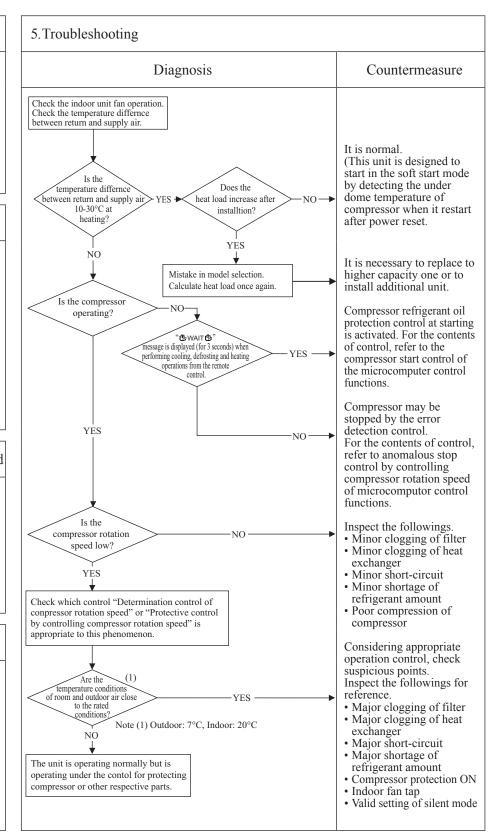
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Faulty 4-way valve operation
- Poor compression of compressor
- Faulty expansion valve operation



Error code Remote control: None LED Green Red Indoor Stays OFF Stays OFF To attle location and activated decrease the control of the contro						(A)
Remote control: None Indoor Stays OFF Stays OFF Stays OFF Stays OFF	Error code	LED	Green	Red	Content	
The state of the s	Remote control: None	Indoor	Stays OFF	Stays OFF	Earth leakage breaker activated	
Outdoor Stays OFF Stays OFF Stays OFF		Outdoor	Stays OFF	Stays OFF	Latin leakage bleaker activated	

5. Troubleshooting 1. Applicable model All models Diagnosis Countermeasure Are OK the insulation resistance and Replace compressor.* NO coil resistance of compressor? YĖS 2. Error detection method Is insulation of respective harnesses OK? Secure insulation NO Is any harness bitten between resistance. pannel and casing YES Check the outdoor unit grounding wire/earth leakage breaker. Check of the outdoor unit grounding wire/earth leakage breaker 3. Condition of Error displayed ① Run an independent grounding wire from the grounding screw of outdoor unit to the grounding terminal on the distribution panel. (Do not connect to another grounding wire.) 2 In order to prevent malfunction of the earth leakage breaker itself, confirm that it is conformed to higher harmonic regulation. * Insulation resistance of compressor · Immediately after installation or when the unit has been left for long time without power supply, the insulation resistance may drop to a few $M\Omega$ because of refrigerant migrated in the compressor. When the earth breaker is activated at lower insulation resistance, check the following points. ① 6 hours after power ON, check if the insulation resistance 4. Presumable cause recovers to normal. When power ON, crankcase heater heat up compressor and evaporate the refrigerant migrated in the compressor. · Defective compressor 2 Check if the earth leakage breaker is conformed to higher • Noise harmonic regulation or not. Since the unit is equipped with inverter, it is necessary to use components conformed to higher harmonic regulation in order to prevent malfunction of earth leakage breaker.

						ī
	Error code	LED	Green	Red	Content	
	Remote control: None	Indoor	_	_	Excessive noise/vibration (1/3)	
		Outdoor	_	_	Lacessive horse, violation (1/3)	
П						_

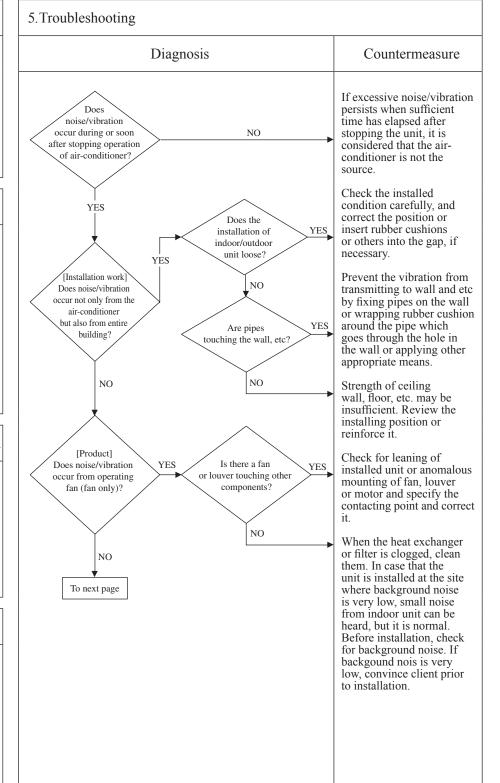
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- ① Improper installation work
 - Improper anti-vibration work at instllation
 - · Insufficient strength of mounting face
- Defective product Before/after shipping from factory
- ③ Improper adjustment during commissioning
 - Excess/shortage of refrigerant, etc.



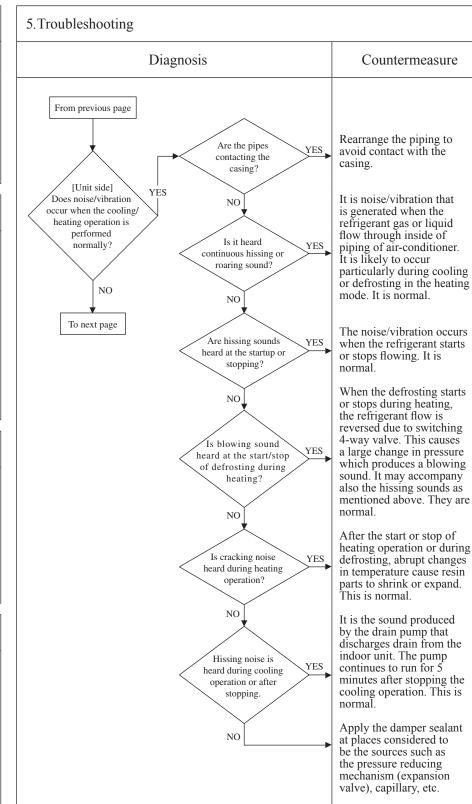
LED Green Red Content Remote control: None Indoor - -					(
Remote control: None Indoor Evangaires maiga/vibration (2/2)	Error code	LED	Green	Red	Content
The state of the s	Remote control: None	Indoor	-	_	Excessive noise/vibration (2/3)
Outdoor Discontinuing (2/3)		Outdoor	_	_	L'Accessive noise/violation (2/3)

1.Applicable model All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause



				<u> </u>
Error code	LED	Green	Red	Content
Remote control: None	Indoor	_	_	Excessive noise/vibration (3/3)
	Outdoor	-	_	Excessive horse, violation (5/5)

1. Applicable model 5. Troubleshooting All models Diagnosis Countermeasure From previous page If insufficient cooling/ heating problem happens due to anomalous operating conditions at cooling/ heating, followings are Adjustment during commissioning Does noise/vibration occur when the cooling/heating operation is in 2. Error detection method anomalous condition? suspicious. Overcharge of refrigerantInsufficient charge of YES refrigerant • Intrusion of air, nitrogen, etc. In such occasion, it is necessary to recover refrigerant, vacuum-dry and recharge refrigerant. * Since there could be many causes of noise/ vibration, the above do not cover all. In such case, check the conditions when, where, 3. Condition of Error displayed how the noise/vibration occurs according to following check point. • Indoor/outdoor unit • Cooling/heating/fan mode • Startup/stop/during operation • Operating condition (Indoor/outdoor temperatures, pressure) • Time it occurred • Operation data retained by the remote control 4. Presumable cause such as compressor rotation speed, heat exchanger temperature, EEV opening degree, etc. • Tone (If available, record the noise) • Any other anomalies

					<u> </u>
9	Error code	LED	Green	Red	Content Power supply system error
	Remote control: None	Indoor	Stays OFF	Stays OFF	(Downer supply to indeer control DCD)
		Outdoor	Stays OFF	2 times flash	(Power supply to indoor control PCB)

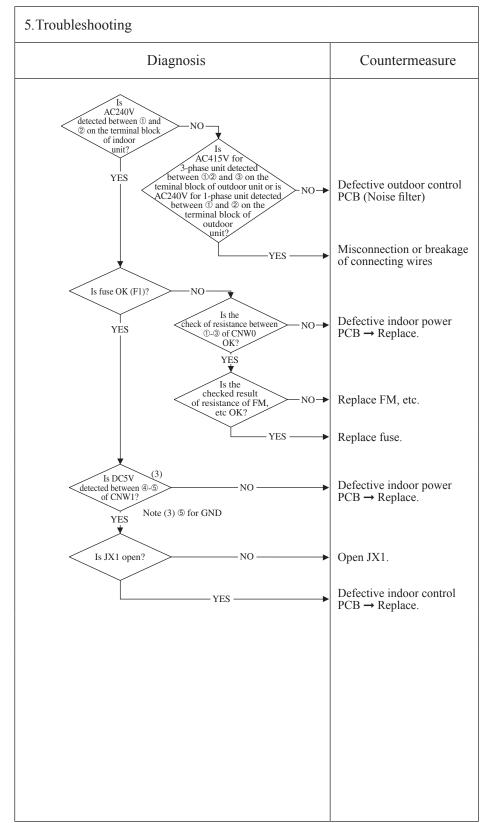
1.Applicable model All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Misconnection or breakage of connecting wires
- · Blown fuse
- Faulty transformer
- Faulty indoor control or power PCB
- Broken harness
- Faulty outdoor control PCB (Noise filter)



					<u> </u>
(1	Error code	LED	Green	Red	Content Down supply system error
	Remote control: None	Indoor	Keeps flashing	Stays OFF	Power supply system error (Power supply to remote control)
		Outdoor	Keeps flashing	2 times flash	(I ower supply to remote control)
			•		

1.Applicable model 5. Troubleshooting All models Diagnosis Countermeasure Isn't there any loose connection of remote Correct. YES control wires? NO 2. Error detection method Isn't remote control wire broken or Replace wires. YES short-circuited? NO Disconnect remote control wires. Is DC15V or higher detected between X-Y Replace remote control. of indoor unit terminal block? 3. Condition of Error displayed ΝO Is DC180V between ①-② of CNW1? Defective indoor power PCB→Replace. YES Defective indoor control PCB→Replace. 4. Presumable cause • Remote control wire breakage/short-circuit • Defective remote control

Note:

Malfunction by noise
Faulty indoor power PCB

• Faulty indoor control PCB

Broken harness

					9
(1	Error code	LED	Green	Red	Content
	Remote control: INSPECT I/U	Indoor	Keeps flashing	Stays OFF	11 (81 2 6 1 1) 6
		Outdoor	Keeps flashing	2 times flash	(When 1 or 2 remote controls are connected)

All models

2. Error detection method

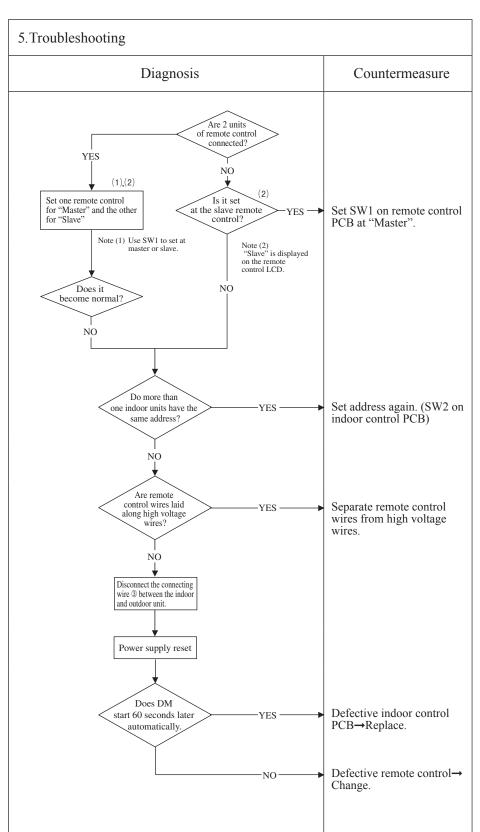
Communication between indoor unit and remote control is disabled for more than 30 minutes after the power on.

3. Condition of Error displayed

Same as above

4. Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor control PCB



Note: If any error is detected 30 minutes after displaying "WAIT "on the remote control, the display changes to "INSPECT I/U".

					9
(1	Error code	LED	Green	Red	Content
	Remote control: INSPECT I/U	Indoor	Keeps flashing	Stays OFF	11 (81 = 61 1) 6
		Outdoor	Keeps flashing	2 times flash	(Connection of 3 units or more remote control)

All models

2. Error detection method

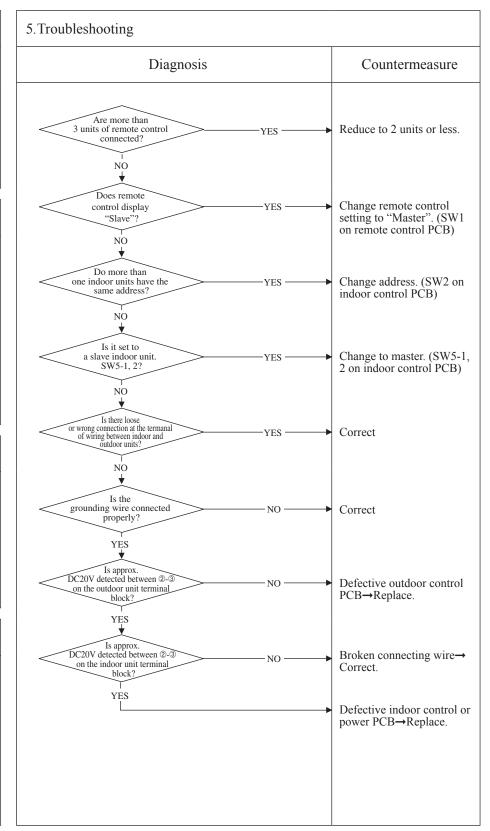
Indoor unit cannot communicate for more than 30 minutes after the power on with remote control.

3. Condition of Error displayed

Same as above

4. Presumable cause

- Improper setting
- Surrounding environment
- Defective remote control communication circuit
- Faulty indoor control or power PCB
- Faulty outdoor control PCB



Note: If any error is detected 30 minutes after displaying "WAIT "on the remote control, the display changes to "INSPECT I/U".

					1	9
Error code	LED	Green	Red	Content	Communication error at	
Remote control: @WAIT@	Indoor	Keeps flashing	Stays OFF		initial operation (1/3)	
	Outdoor	Keeps flashing	2 times flash		ilitiai operation (1/3)	
						_

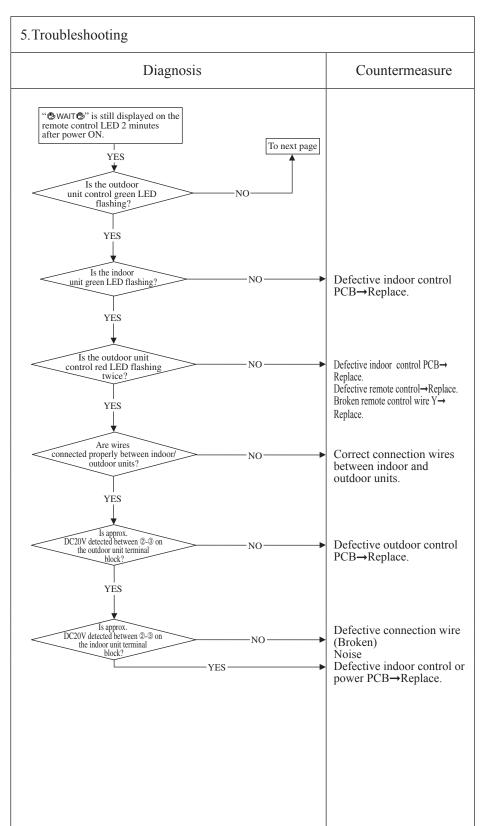
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Faulty indoor control or power PCB
- Defective remote control
- Broken remote control wire
- Faulty outdoor control PCB
- Broken connection wires



							_(1)
P Er	rror code	LED	Green	Red	Content	Communication error at	
Re	emote control: WAIT	Indoor	Keeps flashing	Stays OFF			
		Outdoor	Keeps flashing	2 times flash		ilitiai operation (2/3)	
	emote control:	Indoor	Keeps flashing	Stays OFF		Communication error initial operation (2/	

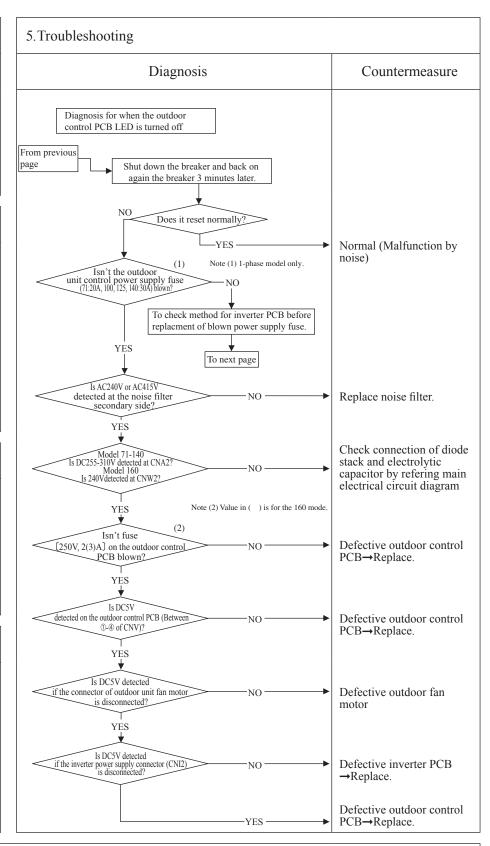
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- · Faulty noise filter
- Faulty indoor control PCB
- Faulty outdoor control PCB
- Faulty inverter PCBFaulty fan motor



						A
Error code	LED	Green	Red	Content	Communication error at	
Remote control: WAIT	Indoor	Keeps flashing	Stays OFF		initial operation (3/3)	
	Outdoor	Keeps flashing	2 times flash		ilitiai operation (3/3)	
	•	•		•		_

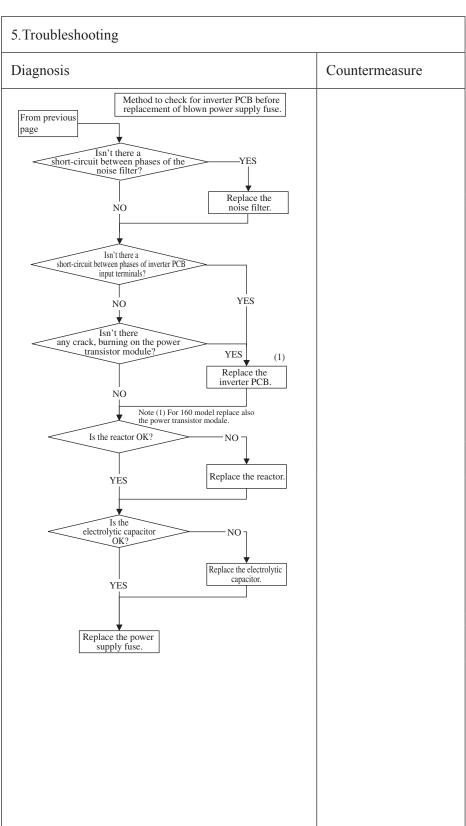
All models

2. Error detection method

3. Condition of Error displayed

4. Presumable cause

- Blown fuse
- Faulty noise filter
- Faulty inverter PCB
- Faulty reactorFaulty electrolytic capacitor



Content
No display
1 to display
Con

1. Applicable model 5. Troubleshooting All models Diagnosis Countermeasure Remote control does not display anything after the power on. ls DC10V or higher detected at remote control connection terminals? Defective remote control YES -NO 2. Error detection method Is DC10V or higher detected on remote control wires if the remote control is removed? YES -Defective remote control Are wires connected properly between the indoor/outdoor units? Defective connecting wire. Defective remote control YES wire (Short-circuit, etc.) NO Defective indoor control PCB→Replace. 3. Condition of Error displayed 4. Presumable cause • Faulty indoor control PCB

Note:

Defective remote controlBroken remote control wire

				(4)
Error code	LED	Green	Red	Content
Remote control: E1	Indoor	Keeps flashing	Stays OFF	Remote control
	Outdoor	Keeps flashing	Stays OFF	communication circuit error
		•		

Turn SW7-1 to OFF. → ON

between indoor/outdoor units.

Power reset

ΝO

1. Applicable model

All models

2. Error detection method

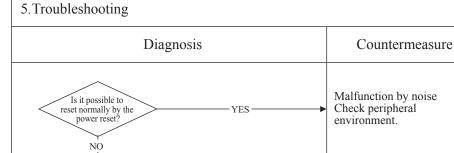
When normal communication between the remote control and the indoor unit is interrupted for more than 2 minutes. (Detectable only with the remote control)

3. Condition of Error displayed

Same as above

4. Presumable cause

- Defective communication circuit between remote control-indoor unit
- · Noise
- Defective remote controlFaulty indoor control PCB





Defective remote control → Replace. Note (2) Does the remote control still display " WAIT " even after 3 minutes?

Note: If the indoor unit cannot communicate normally with the remote control for 180 seconds, the indoor unit PCB starts to reset automatically.

				9
Error code	LED	Green	Red	Content
Remote control: E5	Indoor	Keeps flashing	2 times flash	Communication error during operation
	Outdoor	Keeps flashing	See below	Communication error during operation

1.Applicable model All models

2. Error detection method

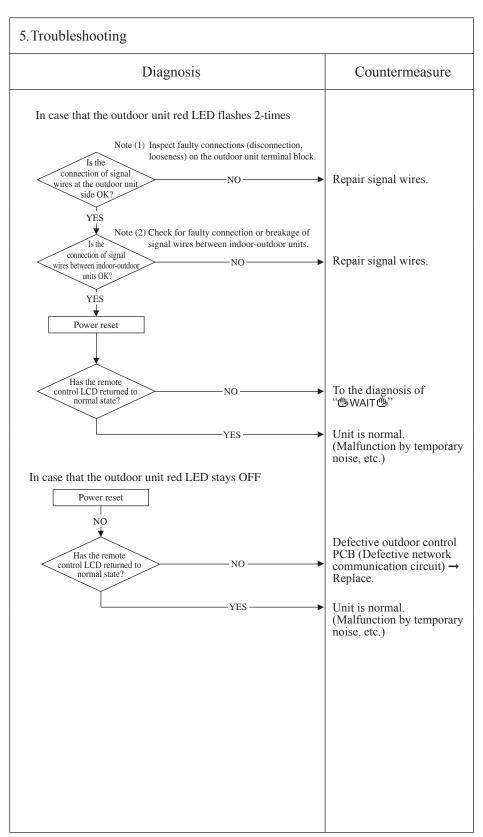
When normal communication between indoor and outdoor unit is interrupted for more than 2 minutes.

3. Condition of Error displayed

Same as above is detected during operation.

4. Presumable cause

- Unit No. setting error
- Broken remote control wire
- Faulty remote control wire connection
- Faulty outdoor control PCB



Note: Pressing the pump-down switch cancels communications between indoor and outdoor unit so that "communication error-E5" is displayed on indoor unit and remote control, but it is normal.

Error code LED Green Red Content Indoor heat exchanger	<u>(4)</u>
Indoor heat evenander	
Remote control: E6 Indoor Recept administration	1
Outdoor Keeps flashing Stays OFF temperature thermistor anomaly	aly

All models

2. Error detection method

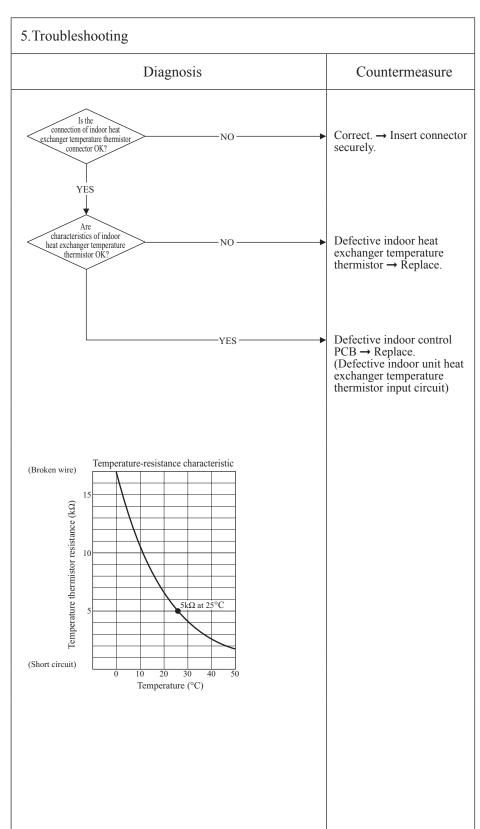
Anomalously low temperature or high temperature (resistance) is detected on the indoor heat exchanger thermistor (ThI-R1, R2 or R3).

3. Condition of Error displayed

- When the temperature thermistor detects -40°C or lower for 5 seconds continuously, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection
- detection.
 Or if 70°C or higher is detected for 5 seconds continuously.

4. Presumable cause

- Defective indoor heat exchanger thermistor connector
- Indoor heat exchanger temperature thermistor anomaly
- Faulty indoor control PCB



							9
4	Error code	LED	Green	Red	Content	D	
	Remote control: E7	Indoor	Keeps flashing	1 time flash		Return air temperature	
		Outdoor	Keeps flashing	Stays OFF		thermistor anomaly	

All models

2. Error detection method

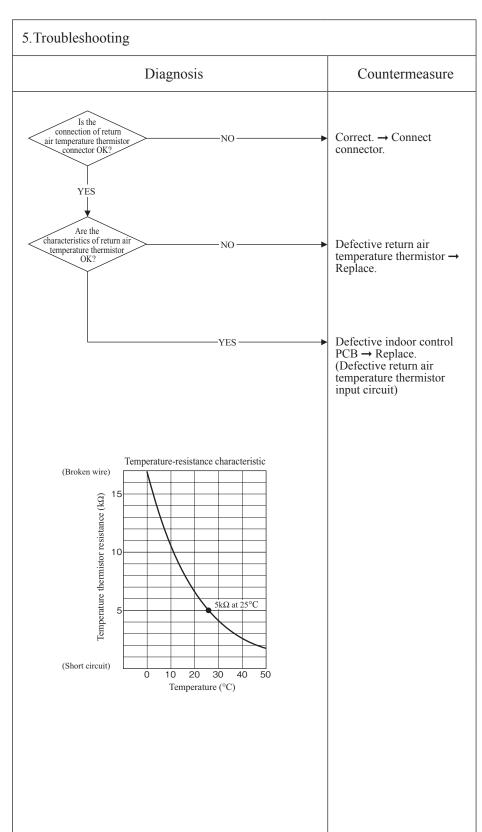
Anomalously low temperature or high temperature (resistance) is detected by indoor return air temperature thermistor (ThI-A)

3. Condition of Error displayed

• When the temperature thermistor detects -20°C or lower for 5 seconds continuously, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Defective return air temperature thermistor connector
- Defective return air temperature thermistor
- Faulty indoor control PCB



					D
Error code	LED	Green	Red	Content	
Remote control: E8	Indoor	Keeps flashing	1 time flash	Heating overload operation	
	Outdoor	Keeps flashing	Stays OFF	Treating overload operation	
					-

All models

2. Error detection method

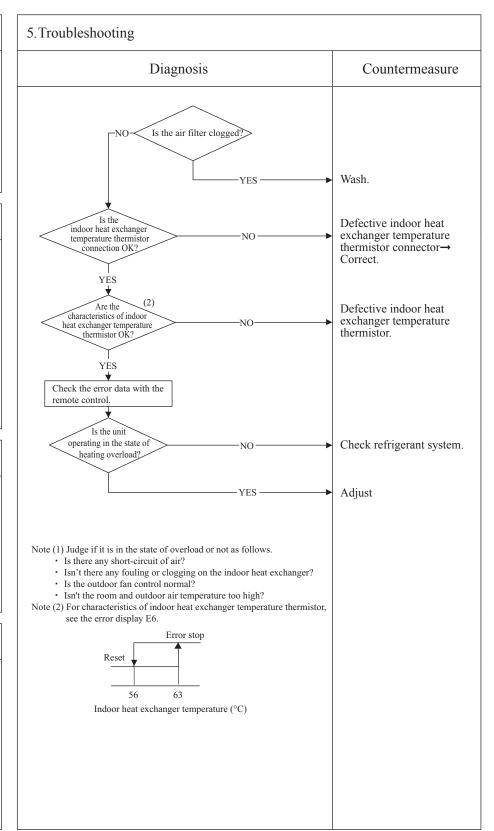
Indoor heat exchanger temperature thermistor (ThI-R1, R2, R3)

3. Condition of Error displayed

When it is detected 5 times within 60 minutes from initial detection or when the overload condition is detected for 6 minutes continuously.

4. Presumable cause

- · Clogged air filter
- Defective indoor heat exchanger temperature thermistor connector
- Defective indoor heat exchanger temperature thermistor
- Anomalous refrigerant system



Note: During heating operation; After starting compressor, compressor rotation speed is decreased by detecting indoor heat exchanger temperature (ThI-R) in order to control high pressure.

						<u> </u>
9	Error code	LED	Green	Red	Content	
	Remote control: E9	Indoor	Keeps flashing	1 time flash	Drain trouble	
		Outdoor	Keeps flashing	Stays OFF		
	Remote control: E9	Indoor	Keeps flashing	1 time flash	Drain trouble	

All models

2. Error detection method

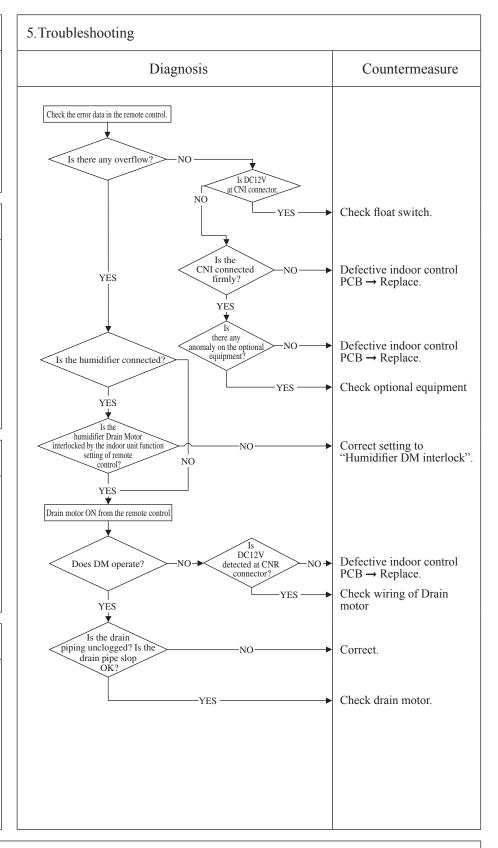
Float switch is activated

3. Condition of Error displayed

If the float switch OPEN is detected for 3 seconds continuously or if float switch connector or wire is disconnected.

4. Presumable cause

- Defective indoor control PCB
- Float switch setting error
- Humidifier DM interlock setting error
- Optional equipment setting error
- Drain piping error
- Defective drain motor
- Disconnection of drain motor wiring



Note: When this error occurred at power ON, disconnection of wire or connector of the float switch is suspected. Check and correct it (or replace it, if necessary).

	_	ı			
Error code	LED	Green	Red	Content Excessive num	
Remote control: E10	Indoor	Keeps flashing	Stays OFF	indoor units (me	ore than 17 units)
	Outdoor	Keeps flashing	Stays OFF	by controlling with	n one remoto control
) 					
1.Applicable model	5. Tro	ublesho	oting		
All models			-	Diagnosis	Countermeasure
		ndoor units c	ore than 17 onnected to ore e control?	NO NO	Defective remote control → Replace.
2.Error detection method				YES —	Reduce to 16 or less units.
When it detects more than 17 of indoor units connected to one remote contorl 3. Condition of Error displayed Same as above					
4. Presumable cause • Excessive number of indoor units connected • Defective remote control					

						Ω
	Error code	LED	Green	Red	Content	
	Remote control: E16	Indoor	Keeps flashing	1 time flash	Indoor fan motor anomaly	
		Outdoor	Keeps flashing	Stays OFF	-	
- 1						

1. Applicable model

All models

2. Error detection method

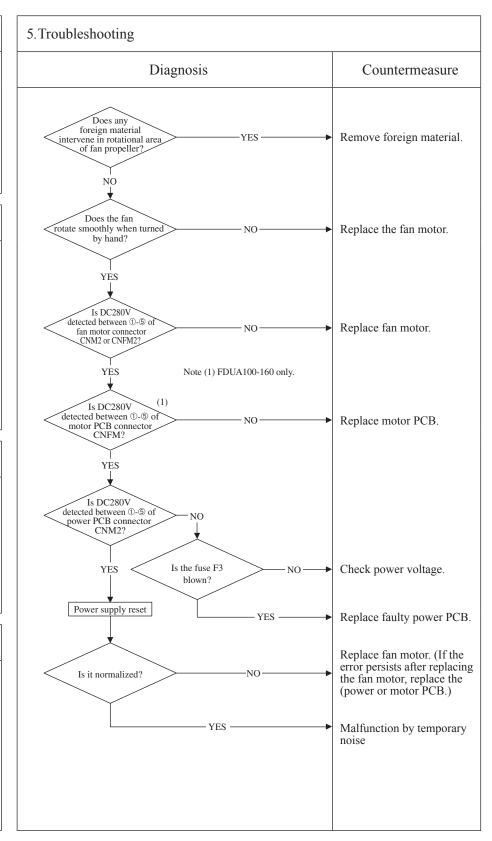
Detected by rotation speed of indoor fan motor

3. Condition of Error displayed

- When actual rotation speed of indoor fan motor drops to lower than 200rpm for 30 seconds continuously, the compressor and the indoor fan motor stop.
- After 2-seconds, it starts again automatically, but if this error occurs 4 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective power PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on power or motor PCB
- Blown fuse
- External noise, surge
- Dofective motor PCB



LED Green Red Indoor Keeps flashing 1 time flash Outdoor Keeps flashing Stays OFF Indoor unit operation check setting 1. Applicable model 5. Troubleshooting 5. Troubleshoo	
1.Applicable model 5.Troubleshooting	
1.Applicable model 5.Troubleshooting	
All models Diagnosis Count	termeasure
2. Error detection method After indoor operation check. On the indoor control PCB (Defector PCB ON? PCB ON? Turn SW7-1	ndoor control ctive SW7) 1 on the indoor 3 OFF and reset
3. Condition of Error displayed	
Same as above	
4. Presumable cause Mistake in SW7-1 setting (Due to forgetting to turn OFF SW7-1 after indoor operation check)	

				<u></u>
Error code	LED	Green	Red	Content Indoor fan motor rotation
Remote control: E20	Indoor	Keeps flashing	1 time flash	
	Outdoor	Keeps flashing	Stays OFF	speed anomaly
		Remote control: E20 Indoor	Remote control: E20 Indoor Keeps flashing	Effor code

1. Applicable model

All models

2. Error detection method

Detected by rotation speed of indoor fan motor

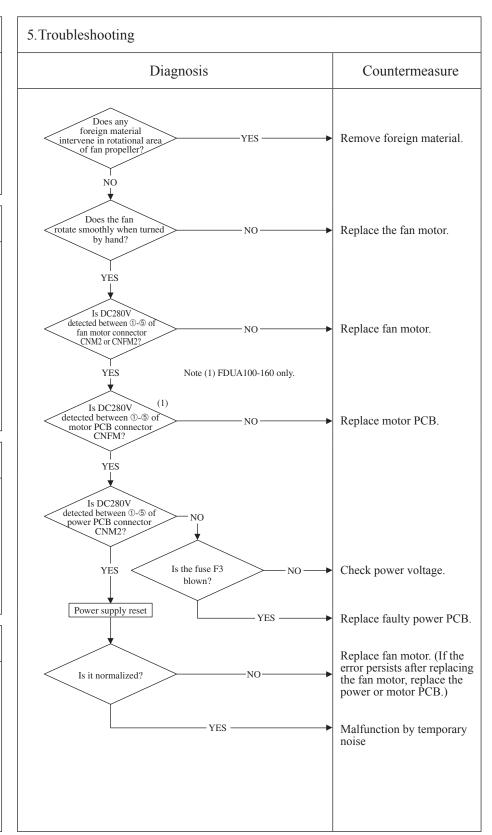
3. Condition of Error displayed

When the actual fan rotation speed does not reach to the speed of [required speed -500rpm] after 2 minutes have been elapsed since the fan motor rotation speed command was output, the unit stops by detecting indoor fan motor anomaly.

4. Presumable cause

- Defective power PCB
- Foreign material at rotational area of fan propeller

 • Defective fan motor
- Dust on power or motor PCB
- Blown fuse
- External noise, surge
- Defective motor PCB



					<u> </u>
(1	Error code	LED	Green	Red	Content
	Remote control: E28	Indoor	Keeps flashing	Stays OFF	
		Outdoor	Keeps flashing	Stays OFF	temperature thermistor anomaly

1. Applicable model

All models

2. Error detection method

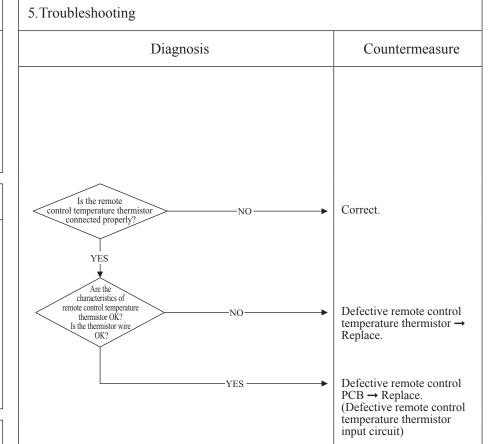
Detection of anomalously low temperature (resistance) of remote control temperature thermistor (Thc)

3. Condition of Error displayed

When the temperature thermistor detects -50°C or lower for 5 seconds continuously, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this error occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Faulty connection of remote control temperature thermistor
- Defective remote control temperature thermistor
- Defective remote control PCB



Resistance-temperature characteristics of remote control temperature thermistor (ThC)

Temperature (°C)	Resistance value ($k\Omega$)	Temperature (°C)	Resistance value (kΩ)
0	65	30	16
1	62	32	15
2	59	34	14
4	53	36	13
6	48	38	12
8	44	40	11
10	40	42	9.9
12	36	44	9.2
14	33	46	8.5
16	30	48	7.8
18	27	50	7.3
20	25	52	6.7
22	23	54	6.3
24	21	56	5.8
26	19	58	5.4
28	18	60	5.0

Note: After 10 seconds has passed since remote control thermistor was switched from valid to invalid, E28 will not be displayed even if the thermistor harness is disconnected. At same time the thermistor, which is effective, is switched from remote control thermistor to indoor return air temperature thermistor. Even though the remote control thermistor is set to be Effective, the return air temperature displayed on remote control for checking still shows the value detected by indoor return air temperature thermistor, not by remote control temperature thermistor.

Q	E 1	LED	Green	Red
		Indoor control PCB	Keeps flashing	Stays OFF
	Remote control: E35	Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Yellow LED or Red LED	Green LED
		PCB	Keeps flashing	Keeps flashing

Cooling overload operation

1. Applicable model

All models

2. Error detection method

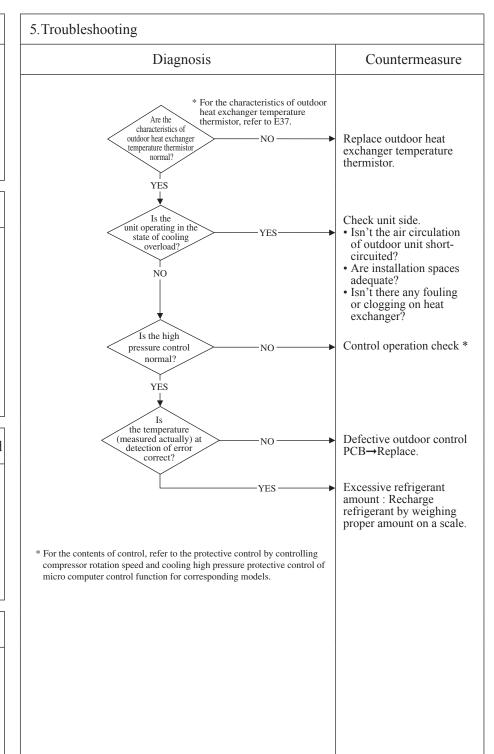
For the error detection method, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of micro computer control function for corresponding models.

3. Condition of Error displayed

When outdoor heat exchanger temperature anomaly is detected 5 times within 60 minutes or this anomalous state is detected 60 minutes continuously including compressor stop.

4. Presumable cause

- Defective outdoor heat exchanger temperature thermistor
- Defective outdoor control
- Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- Fouling, clogging of heat exchanger
- Excessive refrigerant amount



Ø	E 1	LED	Green	Red
		Indoor control PCB	Keeps flashing	Stays OFF
	Remote control: E36	Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Yellow LED or Red LED	Green LED
		PCB	Keeps flashing	Keeps flashing

Discharge pipe temperature error

1. Applicable model

All models

2. Error detection method

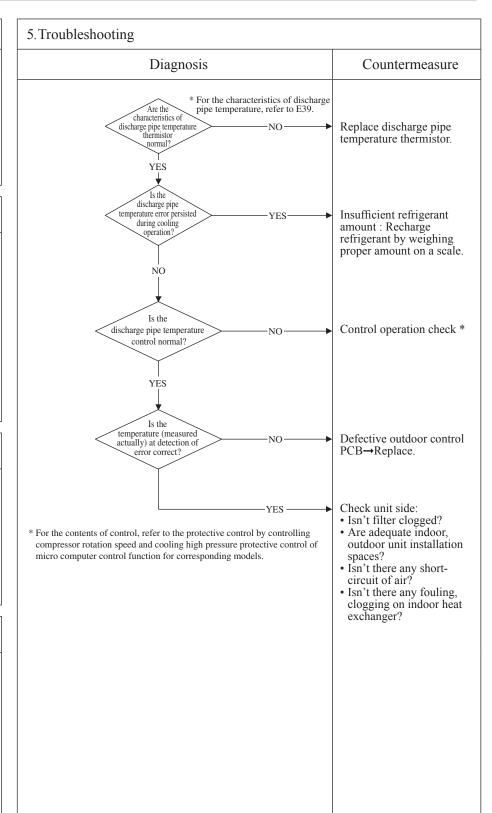
For the error detection method, refer to the protective control by controlling compressor rotation speed and cooling high pressure protective control of micro computer control function for corresponding models.

3. Condition of Error displayed

When discharge pipe temperature anomaly is detected 2 times within 60 minutes or this anomalous state is detected 60 minutes continuously including compressor stop.

4. Presumable cause

- Defective outdoor control **PCB**
- Defective discharge pipe temperature thermistor
- Clogged filter
 Indoor, outdoor unit installation spaces
- Short-circuit of air on indoor, outdoor units
- · Fouling, clogging of heat exchanger



\int	п 1	LED	Green	Red
		Indoor control PCB	Keeps flashing	Stays OFF
	Remote control: E37	Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Yellow LED or Red LED	Green LED
		PCB		Keeps flashing

Outdoor heat exchanger temperature themistor anomaly

1. Applicable model

All models

2. Error detection method

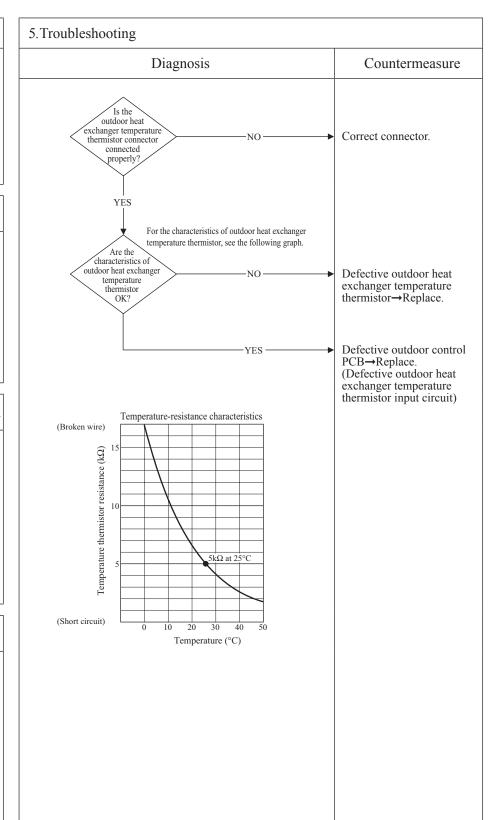
Detection of anomalously low temperature (resistance) on the outdoor heat exchanger temperature thermistor

3. Condition of Error displayed

- When the temperature thermistor detects -50°C or lower for 20 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
- When -50°C or lower is detected for 5 seconds continuously within 20 second after compressor ON.

4. Presumable cause

- Defective outdoor control PCB
- Broken thermistor harness or temperature sensing section
- Disconnected wire connection (connector)



Ø		LED	Green	Red
		Indoor control PCB	Keeps flashing	Stays OFF
	Remote control: E38	Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Yellow LED or Red LED	Green LED
		PCB	Keeps flashing	Keeps flashing

Outdoor air temperature thermistor anomaly

1. Applicable model

All models

2. Error detection method

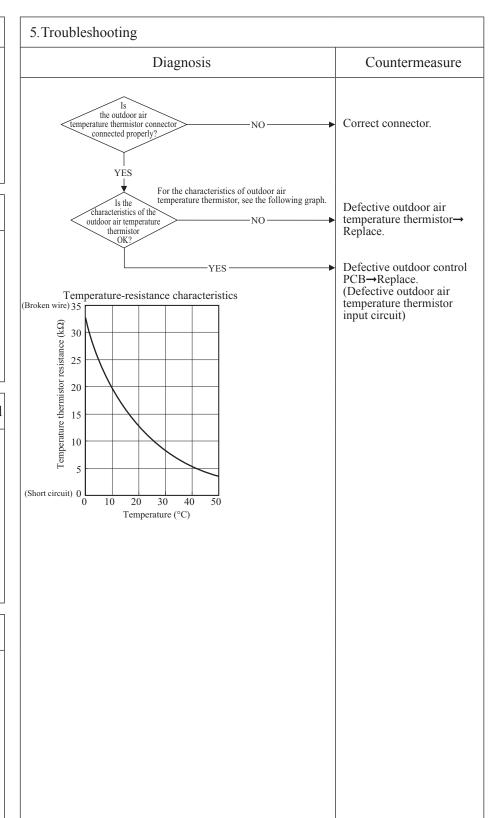
Detection of anomalously low temperature (resistance) on outdoor air temperature thermistor

3. Condition of Error displayed

- When the temperature thermistor detects -45°C or lower for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.
- When -45°C or lower is detected for 5 seconds continuously within 20 second after compressor ON.

4. Presumable cause

- Defective outdoor control PCB
- Broken thermistor harness or temperature sensing section (Check molding.)
- Disconnected wire connection (connector)



(A	Б 1	LED	Green	Red
			Indoor control PCB	Keeps flashing	Stays OFF
		Remote control: E39	Outdoor control PCB	Keeps flashing	1 time flash
			Outdoor inverter	Yellow LED or Red LED	Green LED
I			PCB	Keeps flashing	Keeps flashing

Discharge pipe temperature thermistor anomaly

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) on the discharge pipe temperature thermistor

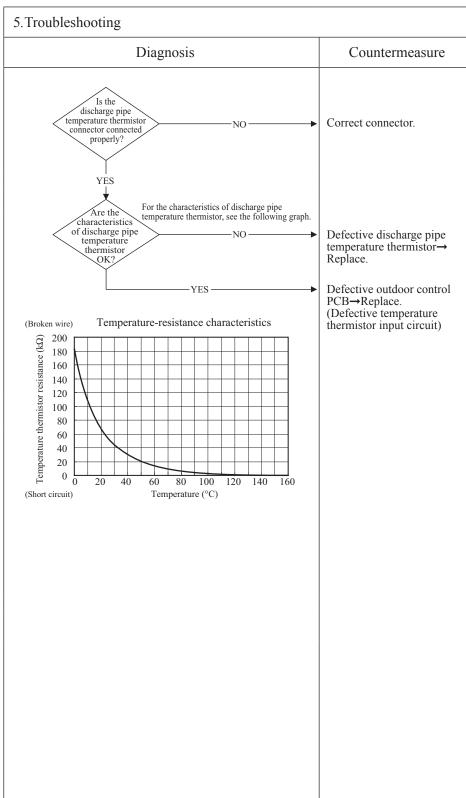
3. Condition of Error displayed

When the temperature thermistor detects -10°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after the compressor ON, the compressor stops. After 3-minutes delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes.

4. Presumable cause

- Defective outdoor control PCB
- Broken thermistor harness or temperature sensing section (Check molding)
- (Check molding.)

 Disconnected wire connection (connector)



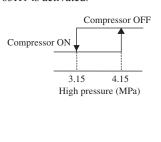
					(
$\overline{\rho}$	Г. 1	LED	Green	Red	Combont
ا		Indoor control PCB	Keeps flashing	Stays OFF	Content
	Remote control: E40	Outdoor control PCB	Keeps flashing	1 time flash	High pressure error
		Outdoor miverter	Yellow LED or Red LED	Green LED	
		PCB	Keeps flashing	Keeps flashing	g (OSIII delivated)

1.Applicable model

All models

2. Error detection method

When the high pressure switch 63H1 is activated.

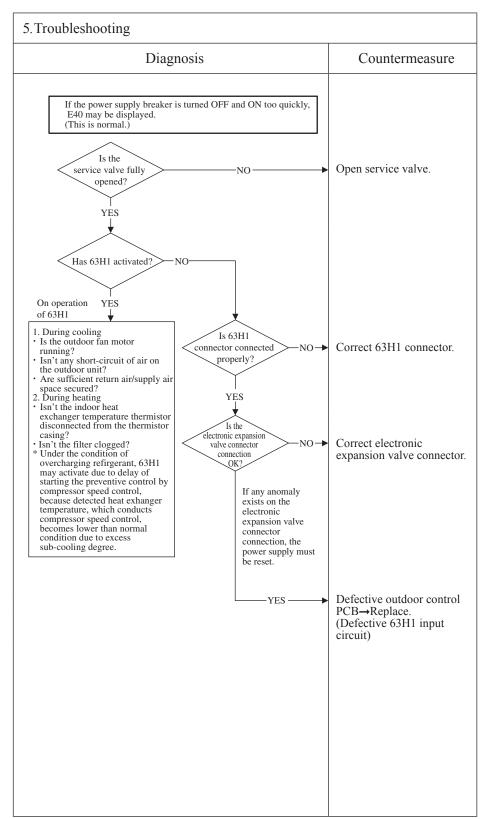


3. Condition of Error displayed

If 63H1 turns OFF (opened), the compressor stops. After 3-minutes delay, the compressor restarts. If this anomaly occurs 5 times within 60 minutes or continues for 60 minutes continuously.

4. Presumable cause

- Short circuit of air flow, disturbance of air flow and clogging filter at outdoor heat exchanger/Breakdown of fan motor
- Defective outdoor control PCB
- Defective 63H1 connector
- Defective electronic expansion valve connector
- Closed service valve
- Mixing of non-condensing gas (nitrogen, etc.)



Note: In the protective control range for compressor startup (initial startup after power ON), even if 63H1 is activated only once (63H1turns OFF), immediately the error is displayed.

					9
		LED	Green	Red	
	Error code	Indoor control PCB	Keeps flashing	Stays OFF	Content
	Remote control: E41	Outdoor control PCB	Keeps flashing	1 time flash	Power transistor overheat(1/2)
		Outdoor inverter	Yellow L	ED	(Models FDC71-140)
		PCB 6 times flas		ash)
ı					

1. Applicable model

Models FDC71-140

2. Error detection method

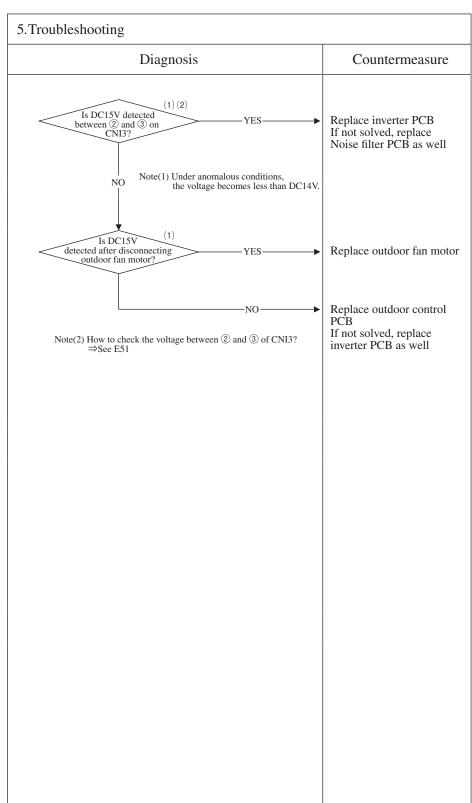
When less than DC14V of the output voltage is detected between ② and ③ on CNI3, E41 is displayed. (See "Note" mentioned below)

3. Condition of Error displayed

Seme as above.

4. Presumable cause

- Inverter PCB anomaly
- Outdoor fan motor anomaly
- Outdoor control PCB anomaly
- Noise filter PCB anomaly



Note: The "Single phase models" of inverter PAC have no function to output the signal for the power transistor overheat. However since the power source for the power transistor and the outdoor fan motor is in the same line, when the anomaly of the outdoor fan motor occurs, E41 is displayed.

Ø	п 1	LED	Green	Red
	Remote control: E41	Indoor control PCB	Keeps flashing	Stays OFF
		Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Red LED	Green LED
		PCB	2 times flash	Keeps flashing

Power transistor overheat(2/2)
(Model FDCA160 only)

1. Applicable model

Model FDCA160

2. Error detection method

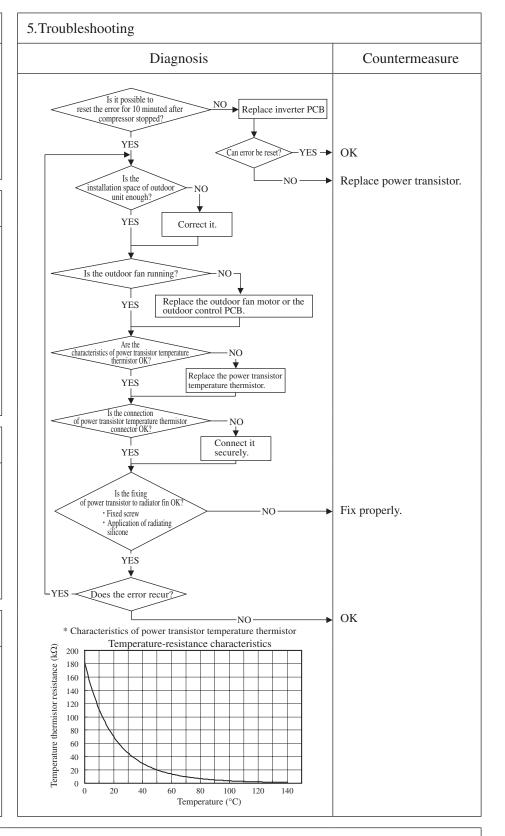
When anomalously high temperature is detected by power transistor temperature thermistor (Tho-P1)

3. Condition of Error displayed

Anomalously high temperature of power transistor is detected 5 times within 60 minutes.

4. Presumable cause

- Inverter PCB anomaly
- Outdoor fan motor anomaly
- Improperly fixing of power transistor to radiator fin
- Power transistor temperature thermistor anomaly
- Inadequate installation space of outdoor unit



					9
\mathcal{C}		LED	Green	Red	
	I .	Indoor control PCB	Keeps flashing	Stays OFF	Content
	Remote control: E42	Outdoor control PCB	Keeps flashing	1 time flash	
		Outdoor inverter	Yellow LED or Red LED	Green LED	Current cut (1/2)
		l BCD	1 time flash or 5 times flash	Keeps flashing	

1. Applicable model

All models

2. Error detection method

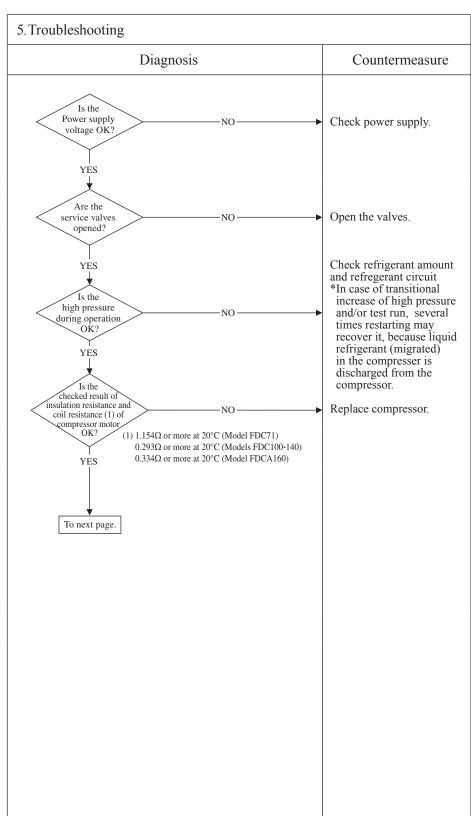
In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.

3. Condition of Error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minute after the intial detection.

4. Presumable cause

- The valves closed
- Faulty power supply
- Insufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module



				<u> </u>
96	LED	Green	Red	Gtt
Error code	Indoor	Keeps flashing	Stays OFF	Content
Remote control: E42	Outdoor control PCB	Keeps flashing	1 time flash	
	Outdoor inverter	Yellow LED or Red LED	Green LED	Current cut (2/2)
	PCB	1 time flash or 5 times flash	Keeps flashing	

1. Applicable model

All models

2. Error detection method

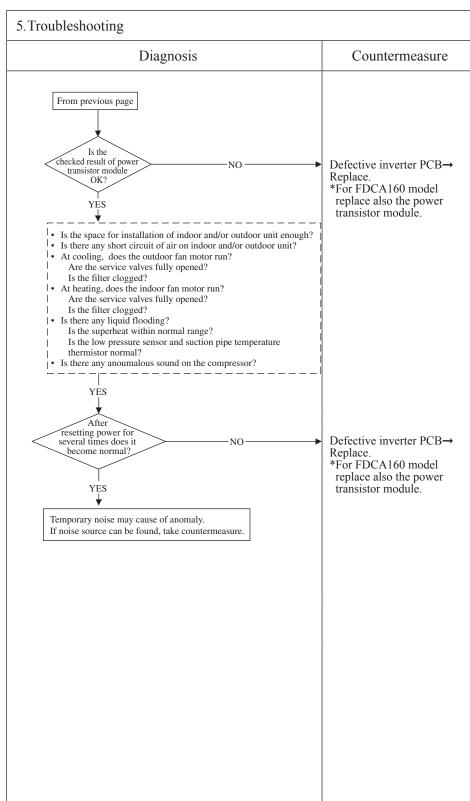
In order to prevent from overcurrent of inverter, if the current exceeds the specifications, it makes the compressor stopping.

3. Condition of Error displayed

- If the output current of inveter exceeds the specifications, it makes the compressor stopping.
- After 3-minute delay, the compressor restarts, but if this amonaly occurs 4 times within 30 minute after the intial detection.

4. Presumable cause

- Defective outdoor control PCB
- Defective inverter PCB
- Faulty power supplyInsufficient refrigerant amount
- Faulty compressor
- Faulty power transistor module



Ø	E 1	LED	Green	Red
		Indoor control PCB	Keeps flashing	Stays OFF
	Remote control: E45	Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Yellow LED or Red LED	Green LED
		PCB	Keeps flashing	Keeps flashing

Communication error between inverter PCB and outdoor control PCB

1. Applicable model

All models

2. Error detection method

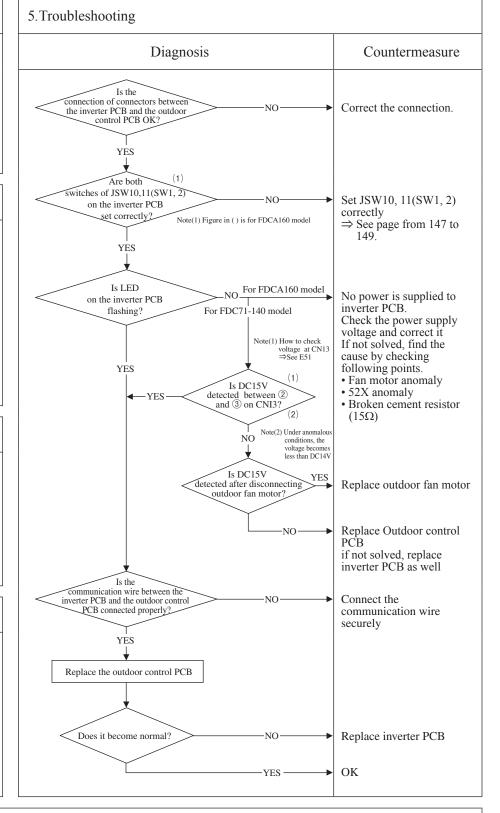
When the communication between inverter PCB and outdoor control PCB is not established.

3. Condition of Error displayed

Same as above.

4. Presumable cause

- Inverter PCB anomaly
- Anomalous connection of connector between the outdoor control PCB and inverter PCB
- Outdoor control PCB anomaly
- Outdoor fan motor anomaly



Ú		LED	Green	Red	
	Error code	Indoor	Keeps flashing	Stays off	Content
	Remote control: E47	Outdoor control PCB	Keeps flashing	1 time flash	Inverter PCE
		Outdoor Inverter	Yellow L	ED	(Mod
		PCB	7 times flashing		

Inverter PCB A/F module anomaly (Model FDC71VNX)

1. Applicable model

Model FDC71 only

2. Error detection method

In order to prevent from overcurrent of A/F, if the current exceeds the specifications, it makes the compressor stopping.

3. Condition of error displayed

• If the output current of A/F exceeds the specifications, it makes the compressor stopping.

4. Presumable cause

• Defective inverter PCB

5. Troubleshooting	
Diagnosis	Countermeasure
Is the Power supply voltage OK?	Check power supply.
Is the checked results of insulation resistance and coil resistance (1) of compressor motor OK? (1) 1.154Ω or more at 20°C	Replace compressor.
YES	Defective outdoor Inverter PCB→Replace.

Note:			

Ø		LED	Green	Red
		Indoor control PCB	Keeps flashing	Stays OFF
		Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Yellow LED or Red LED	Green LED
		PCB	Keeps flashing	Keeps flashing

Outdoor fan motor anomaly

1. Applicable model

All models

2. Error detection method

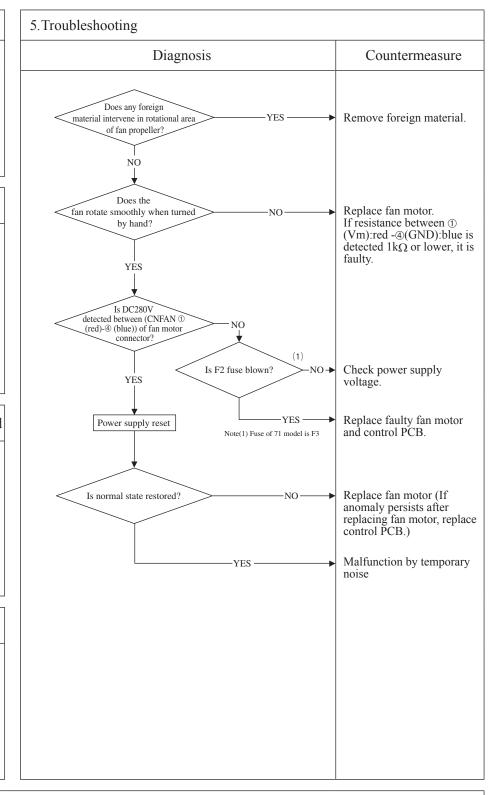
Detected by rotation speed of outdoor fan motor

3. Condition of Error displayed

When actual rotation speed of outdoor fan motor (FMo1) drops to 100rpm or lower for 30 minutes continuously, the compressor and the outdoor fan motor stop. After 3-minutes delay, it starts again automatically, but if this anomaly occurs 5 times within 60 minutes after the initial detection.

4. Presumable cause

- Defective outdoor control PCB
- Foreign material at rotational area of fan propeller
- Defective fan motor
- Dust on outdoor control PCB
- Blow fuse
- · External noise, surge



Note: When E48 error occurs, in almost cases F2 fuse (4A) [71model:F3 fuse (2A)] on the outdoor control PCB is blown. There are a lot of cases that fuse is blown and E48 occurs due to defective fan motor. And even though only the outdoor control PCB (or fuse) is replaced,, another trouble (*1) could occur. Therefore when fuse is blown, check whether the fan motor is OK or not.

After confirming the fan motor normal, check by power ON. (Don't power ON without confirming the fan motor normal.)
*1 The error which does not seem to relate E48 may occur like as "WAIT", Stay OFF of LED on outdoor control PCB, inverter communication error (E45) and etc.

Í	Q	E 1	LED	Green	Red
			Indoor control PCB	Keeps flashing	Stays OFF
		Remote control: E49	Outdoor control PCB	Keeps flashing	1 time flash
			Outdoor inverter	Yellow LED or Red LED	Green LED
			PCB	Keeps flashing	Keeps flashing

Low pressure error or low pressure sensor anomaly (1/2)

Content

1. Applicable model

All models

2. Error detection method

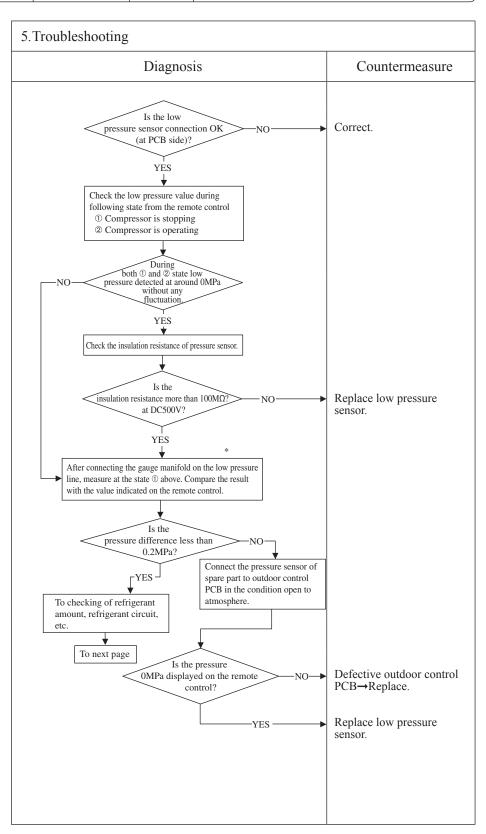
Detected by low pressure drop and suction superheat

3. Condition of Error displayed

- ① When the low pressure sensor detects 0.079MPa or lower for 15 seconds continuously, compressor stops and it restarts automatically after 3-minutes delay. And if this anomaly occurs 3 times within 60 minutes,
- © 10 minutes after the compressor starts, if the low pressure sensor detects 0.15MPa or lower for 60 minutes continuously and compressor suction superheat is detected 30degC or higher for 60 minutes continuously. And if this anomaly occurs 3 times within 60 minutes,
- ③ If low pressure sensor detects 0.079MPa or lower for 5 minutes continuously (including the compressor stop status),

4. Presumable cause

- Defective outdoor control PCB
- Defective low pressure sensor connector
- Defective low pressure sensor
- Defective suction pipe temperature thermistor connector
- Defective suction pipe temperature thermistor



Note: * Connect the gauge manifold to the service valve check joint during cooling, or connect it to the check joint at internal piping of outdoor unit during heating.

9	LED	Green	Red	C
	Indoor control PCB	Keeps flashing	Stays OFF	Content
		Keeps flashing	1 time flash	
	Outdoor inverter	Yellow LED or Red LED	Green LED	low pressure
	PCB	Keeps flashing	Keeps flashing	10 W pressure

Low pressure error or low pressure sensor anomaly (2/2)

Outdoor i PCI	nverter Yellow LED or Red LED Green LED Keeps flashing Keeps flashing Iow pressure ser	nsor anomaly (2/2)
1.Applicable model	5. Troubleshooting	
All models	Diagnosis	Countermeasure
	From previous page.	
2. Error detection method	Is the service valve fully opened? YES Are the	Open fully.
3. Condition of Error displayed	connections of low pressure sensor and suction pipe temperature thermister connector OK? YES	Correct.
	Are the characteristics of low pressure sensor, suction pipe temperature thermistor OK? YES	Defective low pressure sensor, suction pipe temperature thermistor→ Replace.
	Is the low pressure normal during operation?	Charge refrigerant.
	YES	Defective outdoor control PCB→Replace. (Defective low pressure sensor, suction pipe temperature thermistor circuits)
4. Presumable cause		

					(4)
(I		LED	Green	Red	Gtt
		Indoor control PCB	Keeps flashing	Stays OFF	Content
	Remote control: E51	Outdoor control PCB	Keeps flashing	1 time flash	T
		Outdoor inverter	Yellow LED or Red LED	Green LED	Inverter and fan motor anomaly
		PCB	6 times flash or 2 times flash	Keeps flashing	

1. Applicable model

All models

2. Error detection method

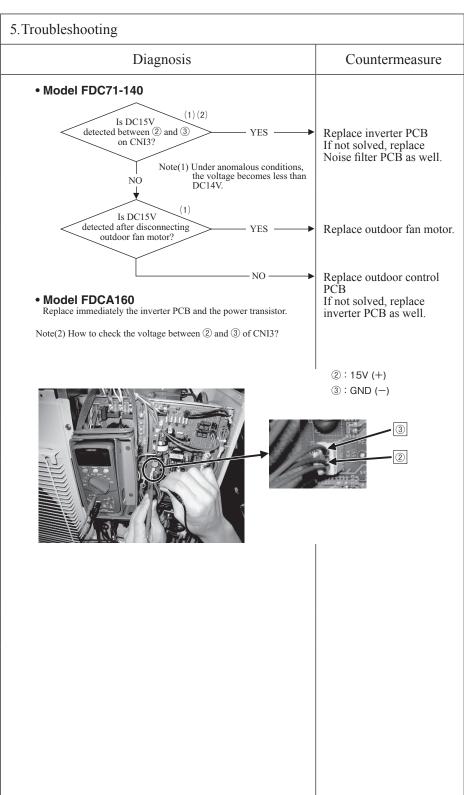
When power transistor anomaly is detected for 15 minutes continuously

3. Condition of Error displayed

Same as above

4. Presumable cause

- Outdoor fan motor anomaly
- Inverter PCB anomaly
- Outdoor control PCB anomaly



Í	Q	E 1	LED	Green	Red
		Error code Remote control: E53	Indoor control PCB	Keeps flashing	Stays OFF
			Outdoor control PCB	Keeps flashing	1 time flash
			Outdoor inverter	Yellow LED or Red LED	Green LED
			PCB	Keeps flashing	Keeps flashing

Suction pipe temperature thermistor anomaly

1. Applicable model

All models

2. Error detection method

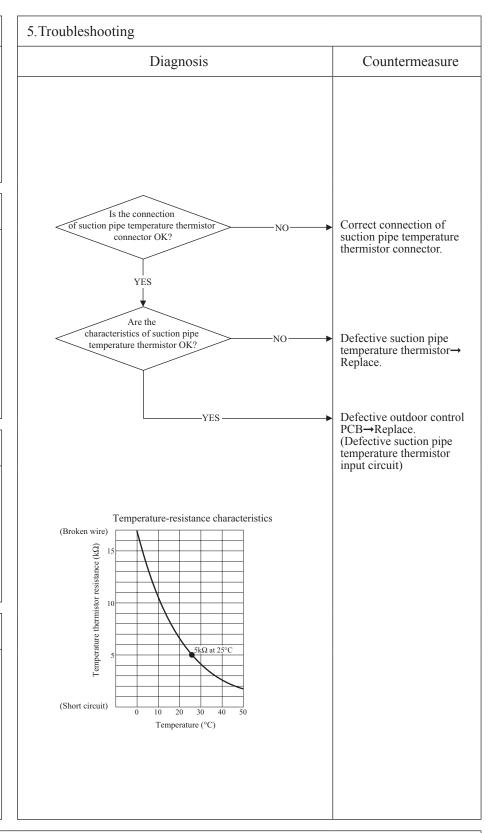
When the suction pipe temperature thermistor detects anomalously low temperature

3. Condition of Error displayed

If the temperature thermistor detects -50°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minutes delay, if this anomaly occurs 3 times within 40 minute.

4. Presumable cause

- Defective suction pipe temperature thermistor connection
- Defective suction pipe temperature thermistor
- Defective outdoor control PCB



	LED	Green	Red	C
	Indoor control PCB	Keeps flashing	Stays OFF	Content
Remote control: E54	Outdoor control PCB	Keeps flashing	1 time flash	
	Outdoor inverter	Yellow LED or Red LED	Green LED	Low pressi
	PCB		Keeps flashing	

Low pressure sensor anomaly

1. Applicable model

All models

2. Error detection method

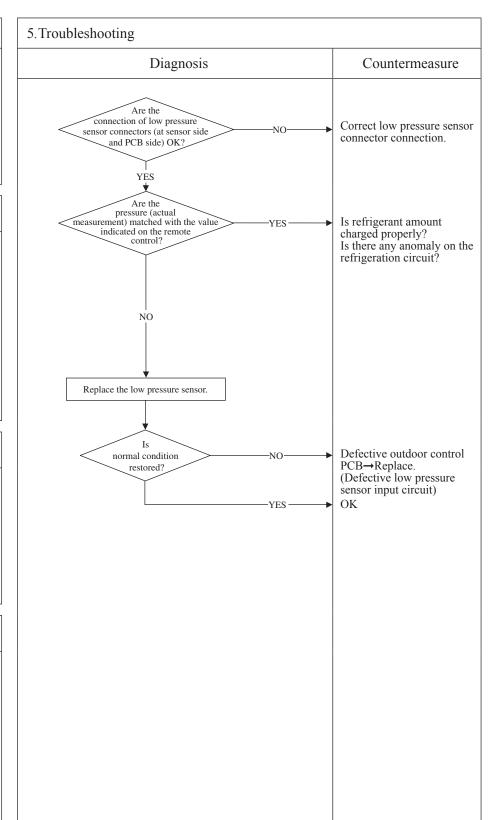
When anomalous voltage (pressure) is detected

3. Condition of Error displayed

If the pressure sensor detects 0V or lower and 4.0V or higher for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minuts delay, if this anomaly occurs 3 times within 40 minutes

4. Presumable cause

- Defective low pressure sensor connection
- Defective low pressure sensor
- Defective outdoor control PCB
- Improper amount of refrigerant
- Anomalous refrigeration



Œ		LED	Green	Red
	Error code	Indoor control PCB	Keeps flashing	Stays OFF
	Remote control: E55	Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Red LED	Green LED
		PCB	Keeps flashing	Keeps flashing

Underneath temperature thermistor anomaly (Model FDCA160 only)

1. Applicable model

Model FDCA160

2. Error detection method

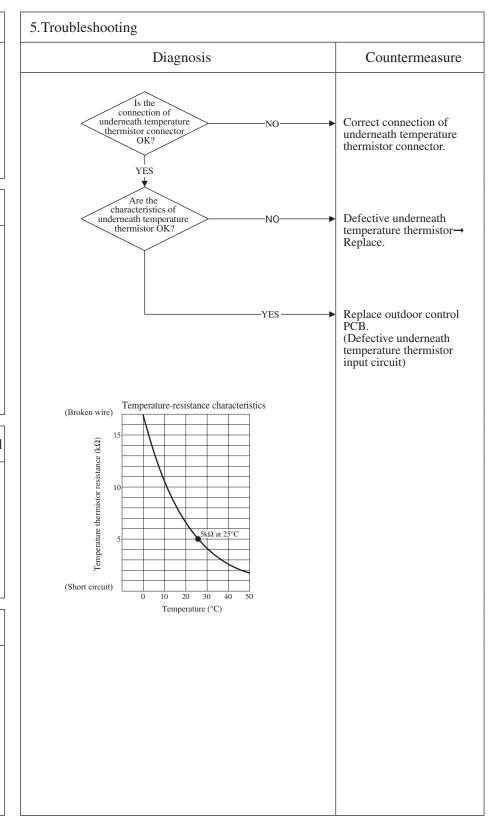
When anoumalous low temperature (resistance) is detected by the underneath temperature thermistor

3. Condition of Error displayed

If the temperature thermistor detcts -50°C or lower for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after compressor ON, the compressor stops. When the compressor is restarted automatically after 3-minutes delay, if this anomaly ocuurs 3 times within 40 minute.

4. Presumable cause

- Defective underneath temperature thermistor connection
- Defective underneath temperature thermistor
- Defective outdoor control PCB



Ø		LED	Green	Red
		Indoor control PCB	Keeps flashing	Stays OFF
	Remote control: E57	Outdoor control PCB	Keeps flashing	1 time flash
		Outdoor inverter	Yellow LED or Red LED	Green LED
		PCB	Keeps flashing	Keeps flashing

Insufficient refrigerant amount or detection of service valve

1.Applicable model

All models

2. Error detection method

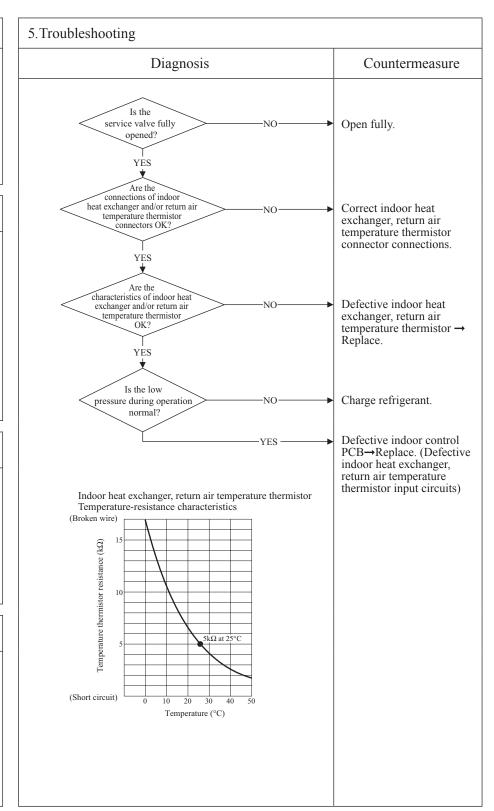
- Judge insufficient refrigerant amount by detecting the temperature differnce between indoor heat exchanger (ThI-R) and indoor return air (ThI-A).
- It detects at initial startup in cooling or dehumidifying mode after power ON.

3. Condition of Error displayed

Anomalous stop at initial detection

4. Presumable cause

- Defective indoor heat exchanger temperature thermistor
- Defective indoor return air temperature thermistor
- Defective indoor control PCB
- Insufficient refregerant amount



Note: Insufficient refrigerant amount preventive control makes compressor stopped, if it judges insufficient refrigerant amount by detecting the temperature difference between indoor heat exchanger (ThI-R) and return air temperature (ThI-A) for 1 minute after compressor ON in cooling or dehumidifying mode and for 9 minutes after compressor ON in heating mode. [in cooling mode: (ThI-A)-(ThI-R)>4degC, in heating mode: (ThI-R)-(ThI-A)<4degC]

	LED	Green	Red	Ctt
	Indoor control PCB	Keeps flashing	Stays OFF	Content
Remote control: E59	Outdoor control PCB	Keeps flashing	5 times flash	
	Outdoor inverter	Yellow LED Red LED	Green LED	Compressor startup failure (1/2)
	DOD I	Stays OFF or 4 times flash		

1. Applicable model

All models

2. Error detection method

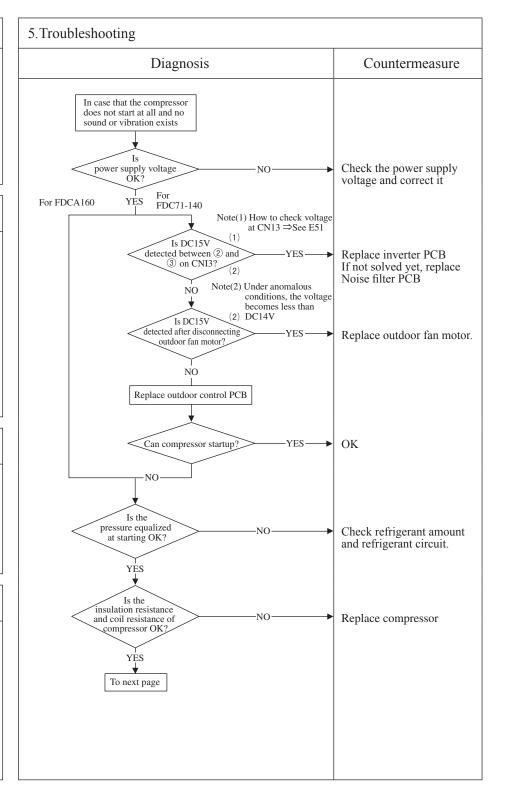
When it fails to change over to the operation for rotor position detection of compressor motor (If the compressor speed cannot increase 11Hz or higher)

3. Condition of Error displayed

If the compressor fails to startup for 20 times (10 patterns x2 times) continuously.

4. Presumable cause

- · Outdoor fan motor anomaly
- · Outdoor control PCB anomaly
- · Inverter PCB anomaly
- · Anomalous power supply voltage
- Insufficient or Excessive refrigerant amount
- · Faulty component for refrigerant circuit
- Compressor anomaly (Motor or bearing)



- institution resistance. The unit is left for long period without power supply or soon after installation, insulation resistance may decrease to several M Ω or lower due to the liquid refrigerant migrated in the refrigerant oil in compressor. If the electric leakage breaker is activated due to low insulation resistance, check followings.

 ① Check whether the insulation resistance can recover or not, after 6 hours has passed since power ON.

 (By energize the crankcase heater, liquid refrigerant migrated in the refrigerant oil in compressor can be evaporated)

 - © Check whether the electric leakage breaker conforms to high-harmonic specifications (As INV PAC units has inverter, in order to prevent from improper operation, be sure to use the breaker of high-harmonic type)

0	Б 1	LED	Green	Red	
	Error code Remote control: E59	Indoor control PCB	Keeps flashing	Stays OFF	Content
		Outdoor control PCB	Keeps flashing	5 times flash	C (2/2)
		Outdoor inverter	Yellow LED Red LED	Green LED	Compressor startup failure (2/2)
			Stays OFF or 4 times flash	Keeps flashing	
l,					

1. Applicable model 5. Troubleshooting All models Diagnosis Countermeasure From previous page YES Is the (inverter PCB anomaly) power transistor Replace inverter PCB module OK? *For FDCA160 model replace power transistor as well. 2. Error detection method YES After power OFF, turn SW10-4 of inverter Is it FDCA160 model? PCB ON and connect the inverter checker. Then power ON again. YES Is the inverter output OK? (Check by inverter Replace inverter PCB NO-*For FDCA160 model checker) Note(1) Several times restarting may recover it, because liquid refrigerant migrated in the compressor could be discharged from the compressor. replace power transistor as well. YES 3. Condition of Error displayed Try to restart several times Replace compressor Does it start? OK -YES-4. Presumable cause

Note:			

1	Ø	п 1	LED	Green	Red
			Indoor control PCB	Keeps flashing	Stays OFF
		Remote control: E60	Outdoor control PCB	Keeps flashing	1 time flash
			Outdoor inverter	Red LED	Green LED
			PCB	Keeps flashing	Keeps flashing

Compressor rotor lock error (Model FDCA160 only)

1. Applicable model

Model FDCA160

2. Error detection method

Compressor rotor position

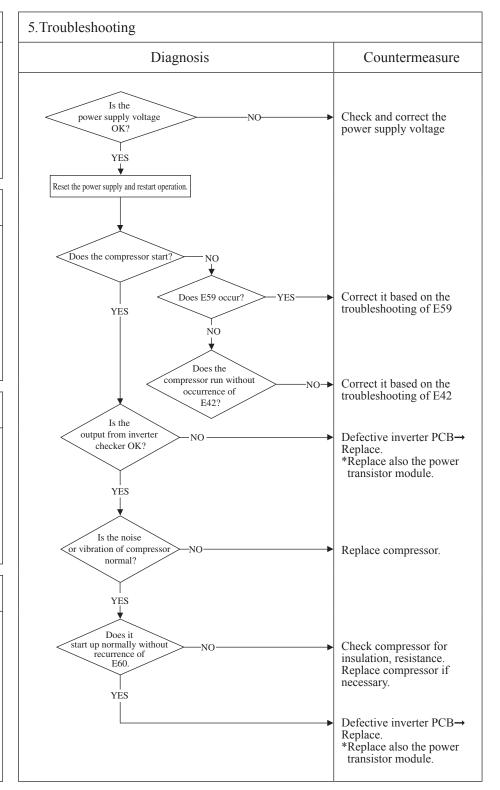
3. Condition of Error displayed

If it fails again to detect the rotor position after shifting to the compressor rotor position detection operation, the compressor stops.

 When it is restart automatically after 3 minutes, it is detected 4 times within 15 minutes.

4. Presumable cause

- Defective outdoor fan motor
- Defective outdoor control
- Defective inverter PCB
- Anomalous power supply voltage
- Improper refrigerant amount and refrigerant circuit
- Defective compressor (motor, bearing)



- institution resistance. The unit is left for long period without power supply or soon after installation, migrated liquid refrigerant may dissolve in the refrigerant oil in the compressor. In such case insulation resistance decreases upto several $M\Omega$ or lower. If the electric leakage breaker is activated due to low insulation resistance, check followings.

 ① Check whether the insulation resistance can recover or not, ater 6 hours has passed since power ON.

 (By energize the crankcase heater, migrated liquid refrigerant in the refrigerant oil in compressor can be evaporated)

 - ② Check whether the electric leakage breake conforms to high-hermonic specifications
 (As units has inverter, in order to prevent from improper operation, be sure to use high-hermonic one.)

12 OPTION PARTS

12.1 Wireless kit (RCN-KIT3-E)

Notes: Following functions of FDUA indoor unit series are not able to be set with this wireless remote control (RCN-KIT3-E)

1. 4-fan speed setting (PHi/Hi/Me/Lo) →3-fan speed setting (Hi/Me/Lo)

Read this manual together with the installation manual attached to

PJZ012D060/A

⚠ 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 supply is turned off when electric wiring work Otherwise, electric shock, malfunction and improper running may occur



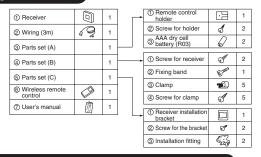
⚠ CAUTION

- DO NOT install the wireless kit at the following places in order to avoid malfunction (8) Places where the receiver is influenced by
- (1)Places exposed to direct sunlight
- (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 devices.
- (6)Uneven surface (7)Places affected by the direct airflow of the
- (10)Places where some object may obstruct the
- communication with the remote control
- DO NOT leave the wireless kit without the cover. In case the cover needs to be detached, protect the receiver with a packaging box or bag in order to keep it away from water and dust.

Attention

- Instruct the customer how to operate it correctly referring to the instruction manual.
 User's manual of a wireless remote control is attached to a indoor unit or a outside unit.
 Read this together with a manual attached to this kit.

1 Accessories Please make sure that you have all of the following accessories.

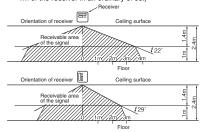


2 Wireless remote control's operable area

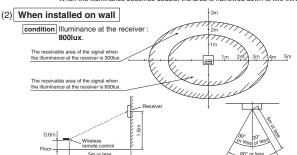
(1) When installed on ceiling

(1) Standard reachable area of the signal

condition Illuminance at the receiver : 300lux (when no lighting is installed within 1m of the receiver in an ordinary of ce.)



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 remote control is operated at 1.1m high under the condition of ceiling height of 2.5m.



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)

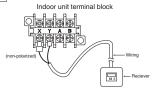
Drill the receiver installation holes with the following dimensions at the ceiling position where wires can be connected.

(A) Direct installation onto the ceiling with wood screws.	88mm(H)×101mm(W)	I	
(B) Installation with enclosed bracket.	108mm(H)×108mm(W)	Щ	<u> </u>
			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.

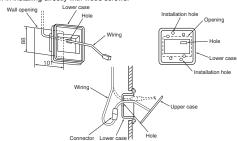


(3) Installation of the receiver

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) or (B) 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.

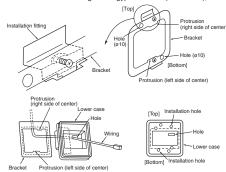


- ①Put through the wiring from the back side to the hole of the lower case. ②Fit the lower case into the ceiling opening. Make sure that the clearance between
- the convex part of the back of the lower case and the ceiling opening must be as equal as possible on both sides.
- 3 Using the two installation holes shown above, fix the lower case onto the ceiling
- with the enclosed wood screws. (The other four holes are not used.)

 (Connect the wiring with the wiring from the upper case by the connector
- Take out the connector to the backside from the hole of the lower case putting through the wiring at ①
- 6Fit 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.



- ①Catch the two protrusion of the enclosed bracket onto the tting as shown above, and temporarily fix with the screws. (The bracket has an up/down and front/back orientation. Con rm the top/bottom protrusion positions and the positional relation of the \varnothing 10 holes on the bracket and the installation hole on the lower case with the above drawing.)
- ②Insert the end of the installation tting 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.)
- ⑤Follow step ① to ⑥ for (A) to complete the installation.

4 Remote control

Installation of the control holder

DO NOT install it on the follow

- 1) Places exposed to direct sunlight
- 2) Places near heat devices
- Places near neat devices
 High armost energiages
 Hot surface or cold surface enough to generate condensation
 Places exposed to oil mist or steam directly
 Uneven surface

Installation tips for the remote control holder

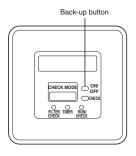
- · Adjust and keep the holder upright.
- . Tighten the screw to the end to avoid scratching the remote control.
- DO NOT attach the holder to plaster wall.

How to insert batteries

- 1 Detach the back lid
- 2 Insert the batteries. (two AAA batteries)
- 3 Reattach the back lid.

5 Cooling test run operation

- •After safety con rmation, turn on the power.
- •Transmit a cooling operation command with wireless remote control, while the backup button on the receiver is pressed.
- •If the backup button 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 by consulting with inspection guides on the wiring diagram of outdoor units.



6 Setting of wireless remote control and receiver

(A) Methods of avoiding the malfunction due to the mixed communication

Do both procedures ① and ②

This setting is to avoid the mixed communication with other household electric appliances or the mixed communication when two receivers are located closely

①Setting change of the wireless remote control

Pressing ACL and AIRFLOW button at the same time or inserting the batteries with pressing AIRFLOW button will customize the signal.

Note *When the batteries are removed, the setting will return to the default setting. Make sure to reset it when the batteries are replaced.

† ●PCB of the receiver

2 Setting the PCB of the receiver

20104 1200 0000 HI MED LO STAN SPEED ON/OFF AIR FLOW 8888 FILTER MODE TEMP

833 64 1 C12 C13 -SW1-1 (Customized signal SW1-4 setting to avoid (Auto restart) mixed communication) SW1-2 setting)

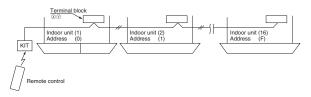
SW1-1	Customized signal setting to avoid mixed communication	ON : Normal OFF : Remote
SW1-2	Receiver master/slave setting	ON : Master OFF : Slave
SW1-4	Auto restart	ON : Valid OFF : Invalid
		: Default setting

(B) Control plural indoor units with one remote control

Up to 16 indoor units can be connected

①Connect the XY terminal with 2-core wire As for the size, refer to the following note.

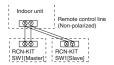
2) For Packaged air conditioner series, set the indoor unit address with SW2 on the indoor unit PCB from [0] to [F] so as not to duplicate Restrictions on the thickness and length of wire (Maximun total extension 600m.) on 600m.)
Within 100m x 0.3 mm²
Within 200m x 0.5 mm²
Within 300m x 0.75mm²
Within 400m x 1.25mm²
Within 600m x 2.0 mm² Standard



③For 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

(C) Master/Slave setting when using plural remote control

Up to two receivers can be installed in one indoor unit group.



Switch	Setting	Function
SW1-2	ON	Master
3VV 1-2	OFF	Slave

(D) Change setting of auto mode operation

Auto mode operation is prohibited to be selected for KX models (except for KXR

Therefore be sure to change setting of remote control to disable the auto mode operation for these models according to the following procedure.

while pressing the MODE button, press the IACL switch, or while pressing the MODE button, insert the batteries to the remote control. Then the auto mode can be invalid. Attention

When the batteries are removed, it is returned to initial setting (Auto mode

Accordingly when replacing the batteries, be sure to perform the above operation

(E) Change setting of fan speed

While pressing the FAN SPEED button, press the ACL switch, or while pressing the FAN SPEED button, insert the batteries to the remote control. Then the fan speed can be changed from 2-speed setting to 3-speed setting.

When changing fan speed setting of remote control, be sure to perform the same fan speed setting as that of the indoor unit model to be used.

When the batteries are removed, it is returned to initial setting (Fan speed setting

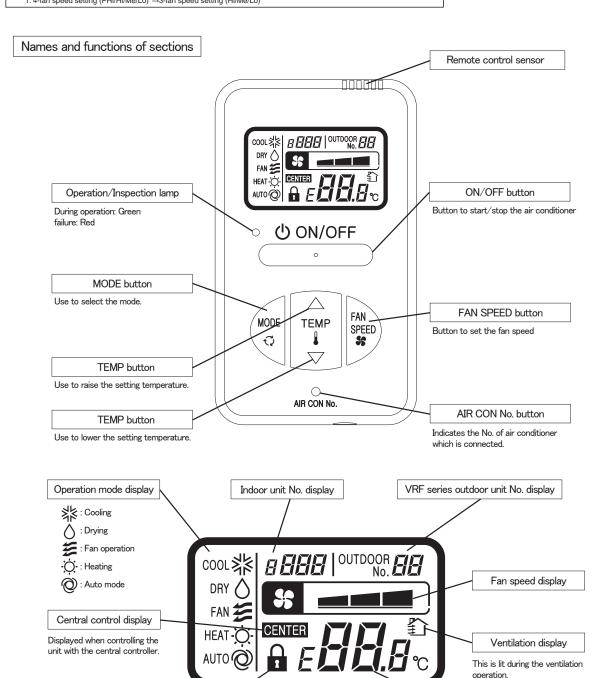
Accordingly when replacing the batteries, be sure to perform the above operation

12.2 Simple wired remote control (RCH-E3)

Notes

Following functions of FDUA indoor unit series are not able to be set with this simple wired remote control (RCH-E3)

1. 4-fan speed setting (PHi/Hi/Me/Lo) →3-fan speed setting (Hi/Me/Lo)



Installation of remote control

pressed.

DO NOT install the remote control at the following places in order to avoid malfunction.

Control disable display

The lamp is lit for 3 seconds

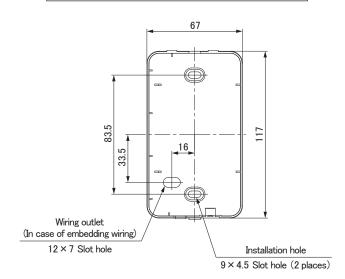
when a disabled button is

- (1) Places exposed to direct sunlight
- (4) Hot surface or cold surface enough to generate condensation
- (2) Places near heat devices
- (5) Places exposed to oil mist or steam directly
- (3) High humidity places
- (6) Uneven surface

Setting TEMP display

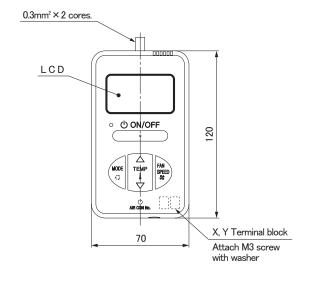
Error code display

Remote control installation dimensions

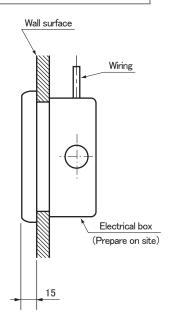


Note: Installation screw for remote control M4 Screw (2 pieces)

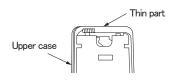
In case of exposing wiring



In case of embedding wiring



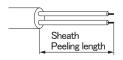
The remote control wiring can be extracted from the upper center. After the thin part in the upper side of the remote control upper case is scraped with a nipper or knife, remove burr with a file.





The peeling length of each wiring is as follows:

X wiring : 160mm Y wiring : 150mm



Unit:mm

Wiring specifications

- (1) Wiring of remote control should use $0.3 \text{mm}^2 \times 2$ core 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 $0.3 \mathrm{mm}^2$ (recommended) to $0.5 \mathrm{mm}^2$.

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.

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

Adapted to RoHS directive

Simple Remote Control Installation Manual

PJZ012D069

Read together with indoor unit's installation manual.

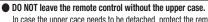
MARNING

- 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 supply 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
- (4) Hot surface or cold surface enough to generate condensation
- (2) Places near heat devices
- (5) Places exposed to oil mist or steam directly
- (3) High humidity places
- (6) Uneven surface



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

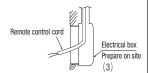
Make certain to remove the screw on the bottom surface of the remote control.



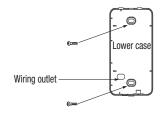
(2) Remove the upper case of the remote control. Insert a flat-blade screwdriver to a concave portion of the bottom surface of the remote control and slightly twist it, and the case is removed.

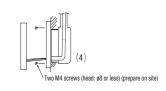


(3) Pre-bury the electrical box and remote control cord.



(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.

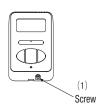




- (5) Connect the remote control cord to the terminal block. Connect the terminals (X and Y) of the remote control and the terminals (X and Y) of the indoor unit. (No polarity of X and Y)
- 6) Mount the upper case for restoring to its former state so as not to crimp the remote control cord, and secure with the removed screw.

In case of exposing cord

 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.

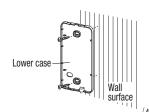


(3) The remote control cord can be extracted from the upper center.

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.

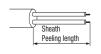


The wiring in the remote control case should be $0.3~\mathrm{mm}^2$ (recommended) to $0.5~\mathrm{mm}^2$ at maximum.

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 $0.3 \text{mm}^2 \times 2$ core 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 0.3mm² (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.

 100 - 200m
 0.5mm² × 2 cores

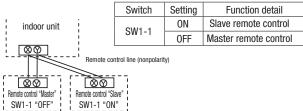
 Under 300m
 0.75mm² × 2 cores

 Under 400m
 1.25mm² × 2 cores

 Under 600m
 2.0mm² × 2 cores

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

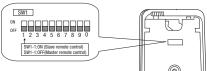
Up to two remote controls can be connected to one unit (or one group) of indoor unit.



(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 thermistor 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.

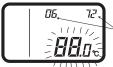


4. The indication when power source is supplied

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.)

- Then, "88.0 °C" blinks on the remote control until the communication between the remote control and the indoor unit is established.
- 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.
- 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.



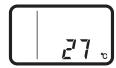
5. Confirmation method for return air temperature

Return air temperature can be confirmed by the remote control operation.

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 thermistor is effective, detected temperature by the remote control thermistor is displayed.

(2) Press **(b) ON/OFF** button.

[In the case that the remote thermistor is ineffective and plural indoor units are connected to one remote control

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.)

Press TEMP△ or TEMP▽ button. Select the indoor unit No.



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").

Press ON/OFF button. End.

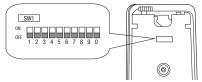
6. Function setting

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 " o", 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
01114	ON	Slave remote control	
SW1-1 OFF		Master remote control	0
SW1-2	ON	Remote control thermistor enabled	
SW1-2	0FF	Remote control thermistor disabled	0
SW1-3	ON	"MODE" button prohibited	
3W1-3	0FF	"MODE" button enabled	0
SW1-4	ON	"ON/OFF" button prohibited	
3W1-4	0FF	"ON/OFF" button enabled	0

Switch No.	Setting	Setting detail	Initial setting
SW1-5		"TEMP" button prohibited	
		"TEMP" button enabled	0
SW1-6	ON	"FAN SPEED" button prohibited	፠ Note 1
SW1-6 OFF		"FAN SPEED" button enabled	፠ Note 1
SW1-7 ON		Auto restart function enabled	
SW1-7	0FF	Auto restart function disabled	0
SW1-8, 9, 0	ON	Not used	
5W1-0, 9, U	0FF	Not used	



- 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	
			01	Fan speed: three steps	፠ Note 1	The fan speed is three steps, * = = - * = .
	01	Indoor unit fan speed	02	Fan speed: two steps (Hi-Lo)	※ Note 1	The fan speed is two steps, * ■■■ - * ■ .
	"	maoor ame lair opood	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.
			01	Remote control thermistor: no offset	0	
	03		02	Remote control thermistor: +3.0 °C		At the time of cooling, in the case of remote control thermistor enabled, offset temperature at +3.0°C.
		Remote control	03	Remote control thermistor: +2.0 °C		At the time of cooling, in the case of remote control thermistor enabled, offset temperature at +2.0°C.
		thermistor at the time of cooling	04	Remote control thermistor: +1.0 °C		At the time of cooling, in the case of remote control thermistor enabled, offset temperature at +1.0°C.
			05	Remote control thermistor: -1.0 °C		At the time of cooling, in the case of remote control thermistor enabled, offset temperature at -1.0°C.
			06	Remote control thermistor: -2.0 °C		At the time of cooling, in the case of remote control thermistor enabled, offset temperature at -2.0°C.
Remote			07	Remote control thermistor: -3.0 °C		At the time of cooling, in the case of remote control thermistor enabled, offsett temperature at -3.0°C.
control			01	Remote control thermistor: no offset	0	
function			02	Remote control thermistor: +3.0 °C		At the time of heating, in the case of remote control thermistor enabled, offset temperature at +3.0°C.
		Remote control	03	Remote control thermistor: +2.0 °C		At the time of heating, in the case of remote control thermistor enabled, offset temperature at +2.0°C.
	04	thermistor at the time	04	Remote control thermistor: +1.0 °C		At the time of heating, in the case of remote control thermistor enabled, offset temperature at +1.0°C.
		of heating	05	Remote control thermistor: -1.0 °C		At the time of heating, in the case of remote control thermistor enabled, offset temperature at -1.0°C.
			06	Remote control thermistor: -2.0 °C		At the time of heating, in the case of remote control thermistor enabled, offset temperature at -2.0°C.
			07	Remote control thermistor: -3.0 °C		At the time of heating, in the case of remote control thermistor enabled, offset temperature at -3.0°C.
			01	No ventilator connection	0	
	05	Ventilation setting	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 serie connecting it to CND of the indoor printed circuit board), the operation of ventilation device is linked with the operation of indoor unit
	00	"Auto" operation	01	"Auto" operation enabled		
	06	setting	02	"Auto" operation disabled	* Note 1	"Auto" operation disabled
		Operation permission/ prohibition	01	Disabled	0	
			02	Enabled		Operation permission/prohibition controller is enabled.
			01	Level input	0	
	08	External input	02	Pulse input		
			01	Standard	Note2	
	09	Fan speed setting	02	High speed 1	Note2	
		,	03	High speed 2	Note2	
			01	No remaining operation	0	After cooling stopped, no fan remaining operation
		Fan remaining	02	0.5 hours		After cooling stopped, fan remaining operation for 0.5 hours
	10	operation at the time	03	1 hour		After cooling stopped, fan remaining operation for 1 hour
		of cooling	04	6 hours		After cooling stopped, fan remaining operation for 6 hours
			01	No remaining operation	0	After heating stopped or after heating thermostat OFF, no fan remaining operation
		Fan remaining	02	0.5 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 0.5 hours
	11	operation at the time	03	2 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 2 hours
Later and		of heating	04	6 hours		After heating stopped or after heating thermostat OFF, fan remaining operation for 6 hours
Indoor unit			01	No offset	0	
function		Setting temperature	02	Setting temperature offset + 3.0 °C	l – ŭ	The setting temperature at the time of heating is offset by +3.0 °C.
	12	offset at the time of	03	Setting temperature offset + 2.0 °C		The setting temperature at the time of heating is offset by +2.0 °C.
		heating	04	Setting temperature offset + 1.0 °C		The setting temperature at the time of heating is offset by +1.0 °C.
			01	Low fan speed	* Note 1	At the time of heating thermostat OFF, operate with low fan speed.
			02	Setting fan speed	74K 14040 1	At the time of heating thermostat OFF, operate with the setting fan speed.
	13	Heating fan control	03	Intermittent operation	* Note 1	At the time of heating thermostat OFF, intermittently operate.
			04	Fan off	X 14010 1	At the time of heating thermostat OFF, a fam 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 thermistor.
			01	No offset	0	and the second of the second o
			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.
	14	Return air temperature	03	· '		
	offset			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.
	1		07	Return air temperature offset -2.0 °C	1	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:

automatically determined as follows:					
Swith No. Function No.	Function		Product model		
	"FAN SPEED"	"FAN SPEED" button prohibited	Product model whose indoor fan speed is only one step		
SW1-6	button	"FAN SPEED" button enabled	Product model whose indoor fan speed is two steps or three steps		
		Fan speed: three steps	Product model whose indoor unit fan speed is three steps		
Remote control function 01	Indoor unit fan	Fan speed: two steps (Hi-Lo)	Product model whose indoor unit fan speed is two steps		
hemote control function of	speed	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	"Auto" operation enabled	Product model where "Auto" mode is selectable		
Remote control function 06	setting	"Auto" operation disabled	Product model without "Auto" mode		
Indoor unit function 13	Heating fan	Low fan speed	Product model except FDUS		
illuoor ullit luliction 13	control	Intermittent operation	FDUS		

Note 2: Fan speed of "High speed" setting

Fan annual autting		Indoor unit fan speed setting	
Fan speed setting	30 mm M - 30 mm - 30 m	% = ■ = % =	\$6 mm M - \$6 mm
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-conditioning, and simultaneously press AIR CON NO. and 7 MODE buttons at the same time for over three seconds.

The function number "01" blinks in the upper right.



Press TEMP△ or TEMP▽ button. Select the function number.

(3) Press MODE button. Decide the function number.

[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 **① MODE** button.

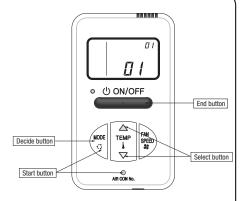
The setting is completed.

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 $\left(5\right)$.



[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 is read)

After that, the current setting number of the selected function number blinks. (Example)

Function number: "07" (lighting) Setting number: "01" (blinking)

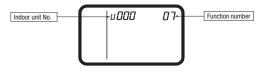


Proceed to (2). [Note]

a. In the case of connecting one remote control to plural indoor units, the display

Indoor unit No. display: "U 000" (blinking)

(Display the lowest number among the connected indoor units.)



b. Press $\boxed{\mathsf{TEMP} \triangle}$ or $\boxed{\mathsf{TEMP} \nabla}$ 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

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).

(5) Press ON/OFF button. The setting is completed.

· Even if 00/00/FF 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 controller, 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 TMODE 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.)

12.3 Safety pan (UA-SP1-E, UA-SP2-E)

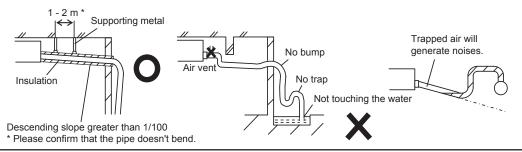
PJZ012D087

This manual contains instructions of installation points for the safety pan manufactured by MHI. Carry out the work following the instructions below.

This manual also contains information on the usage after installation, so keep this manual properly with USER'S MANUAL provided with the indoor unit.

⚠ CAUTION

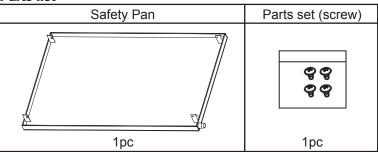
- Do not carry out the work during operation, or there is a danger of being entangled in the rotating parts and getting injured.
- · Be sure to entrust qualified serviceman to performance.
- · Be sure to cut off the power and stop the unit before performing maintenance.
- Be sure to attach the safety pan in conditions with the humidity of greater than 75%.
- 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).
- · 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 safety pan 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.



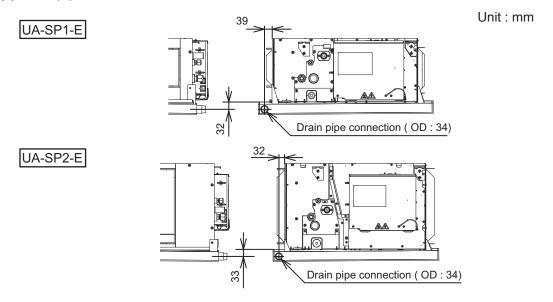
(1) Table of parts No. and corresponding object models

Safety Pan	UA-SP1-E	UA-SP2-E
Inside unit model	FDUA71VF	FDUA100-160VF
	DXU24VF	DXU34-55VF

(2) Parts list



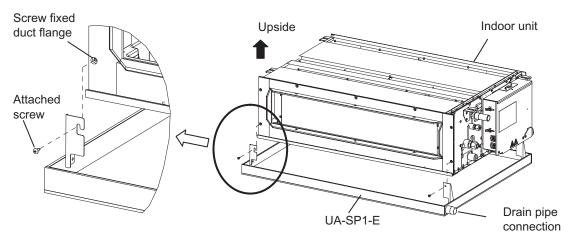
(3) Drain pipe locations



(4) Installation Points

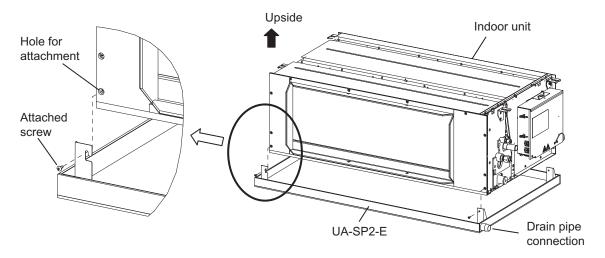
UA-SP1-E

Remove 4 screws and fix the safety pan to same position of removed screws as follow. (4 places)



UA-SP2-E

Fix the safety pan to hole for attachment as follow. (4 places)



12.4 Base heater kit (CW-H-E1)

PCZ012D007A

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 supply when the kit is installed.
- Failure to follow the above will result in serious accident like electrical shock or fire.

AREAS TO BE APPLIED

This kit is to be used in an area where the lowest temperature drops below zero.

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.

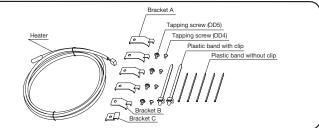
Components

● Heater : 1pc ● Bracket A : 4pcs

Bracket B : 1pcs
Bracket C : 1pcs
Tapping screw (OD5) : 4pcs

• Tapping screw (OD4) : 4pcs
• Plastic band with clip : 2pcs

Plastic band : 5pcs

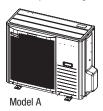


Applicable model

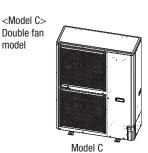
This heater kit is applicable for 3 different models.

<Model A>

Single fan with plastic fan guard model



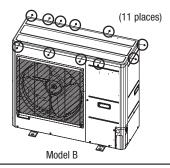


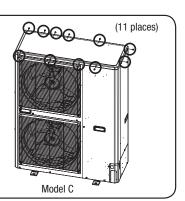


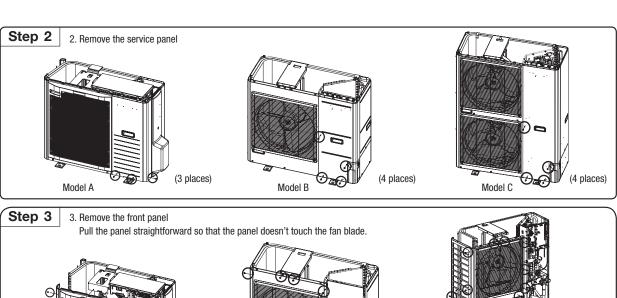
Installation procedure

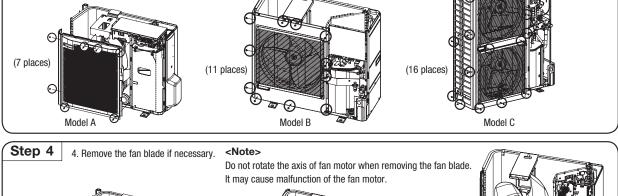
1. Remove the top panel of the outdoor unit (6 places)

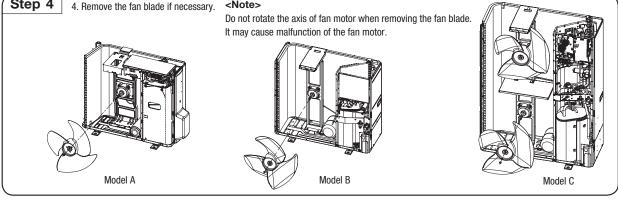
Model A

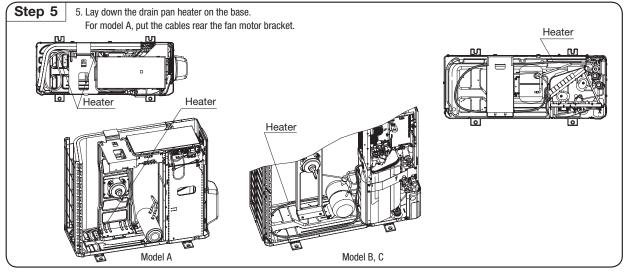






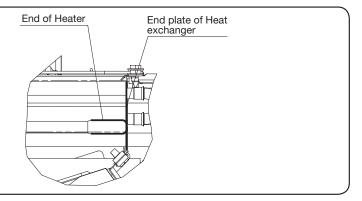






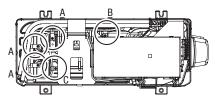
Step 6

6. Put the heater underneath the heat exchanger and align the end of heater with the end plate of heat exchanger.

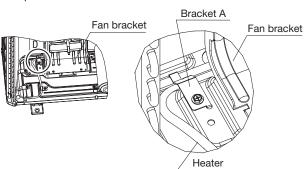


Step 7

7. Fix the heater with brackets.

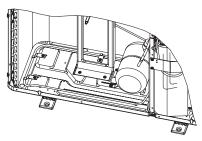


For model A, use 3 pcs of bracket A, 1pc of bracket B and C. Fix bracket A and C with the attached screw (OD4), and fix bracket B with the removed screw which is fastened at the same place.



For model B and C, fix bracket A with the attached screw (OD5).

This bracket is for model B only



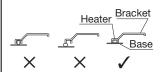
Model A Detail view D Model B, C

<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>

 Fix the heater so that the bracket doesn't pinch the heater as figure shows.



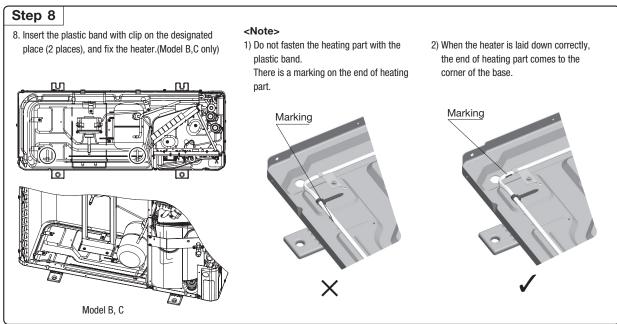
2) Place the heater so as to touch the base completely.

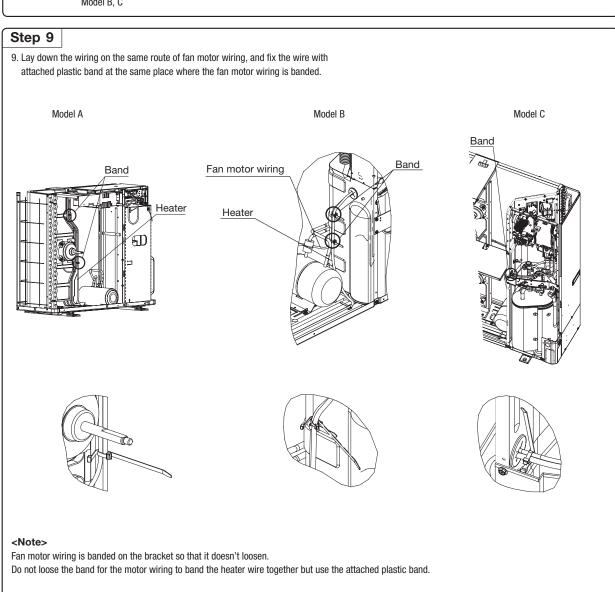


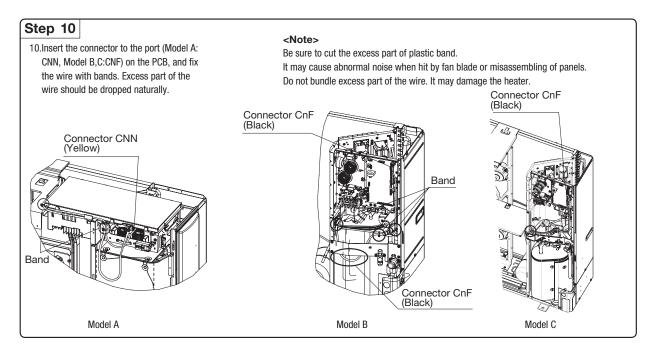
In bending position, twist the heater to make it easier to bend, and get back to be able to fix it

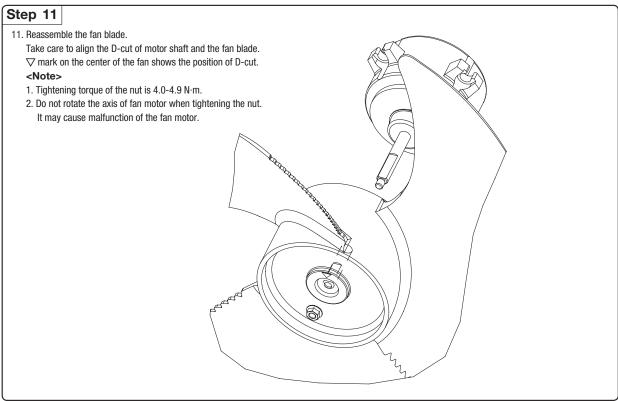


4) Be careful not to be injured by aluminum fin when fixing the heater with screw.



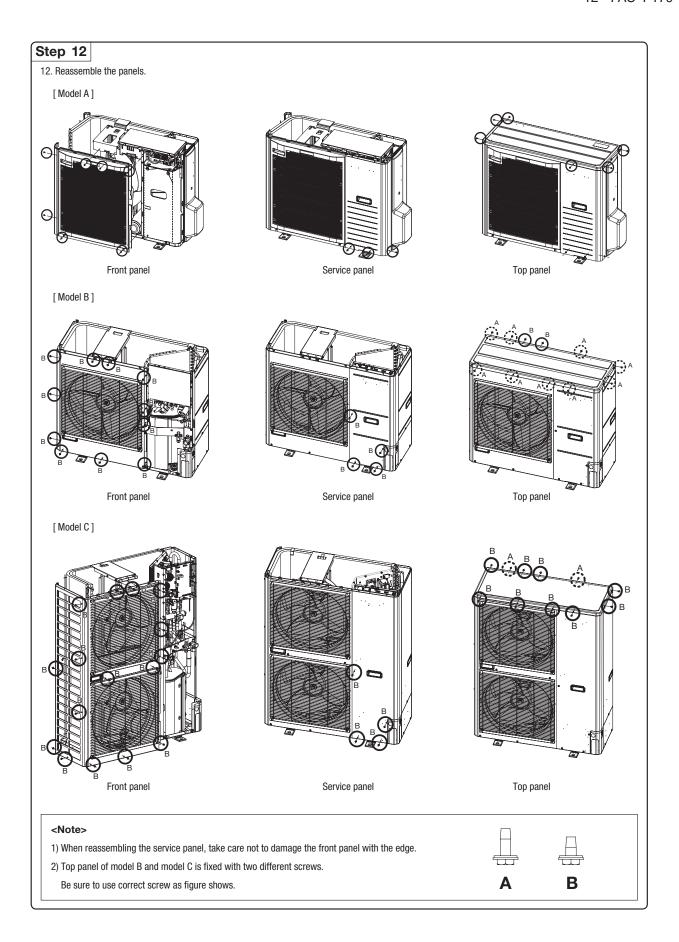






<Note>

- 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.



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