

MODEL

PEFY-AF1200CFMR

PEFY-AF1200CFM

CMB-P106NU-G

CMB-P108NU-G

PURY-P120TKMU / YKMU-A(-BS)

PUHY-P120TKMU / YKMU-A(-BS)

DATA BOOK

Safety Precautions

Read before installation and performing electrical work

- Thoroughly read the following safety precautions prior to installation.
- Observe these safety precautions for your safety.
- This equipment may have adverse effects on the equipment on the same power supply system.
- Contact the local power authority before connecting to the system.

Symbol explanations



WARNING

This symbol indicates that failure to follow the instructions exactly as stated poses the risk of serious injury or death.



CAUTION

This symbol indicates that failure to follow the instructions exactly as stated poses the risk of serious injury or damage to the unit.



Indicates an action that must be avoided.



Indicates important instructions.



Indicates a parts that requires grounding.



Indicates that caution must be taken with rotating parts. (This symbol is on the main unit label.) <Color: Yellow>



Indicates that the parts that are marked with this symbol pose a risk of electric shock. (This symbol is on the main unit label.) <Color: Yellow>



WARNING

Carefully read the labels affixed to the main unit.



WARNING

Ask your dealer or a qualified technician to install the unit.

Improper installation by the user may result in water leakage, electric shock, or fire.

Properly install the unit on a surface that can withstand its weight.

Unit installed on an unstable surface may fall and cause injury.

Only use specified cables. Securely connect each cable so that the terminals do not carry the weight of the cable.

Improperly connected cables may produce heat and start a fire.

Take appropriate safety measures against wind gusts and earthquakes to prevent the unit from toppling over.

Improper installation may cause the unit to topple over and cause injury or damage to the unit.

Only use accessories (i.e., air cleaners, humidifiers, electric heaters) recommended by Mitsubishi Electric.

Do not make any modifications or alterations to the unit. Consult your dealer for repair.

Improper repair may result in water leakage, electric shock, or fire.

Do not touch the heat exchanger fins with bare hands.

The fins are sharp and pose a risk of cuts.

In the event of a refrigerant leak, thoroughly ventilate the room.

If gaseous refrigerant leaks out and comes in contact with an open flame, toxic gases will be generated.

Properly install the unit according to the instructions in the Installation Manual.

Improper installation may result in water leakage, electric shock, or fire.

Have all electrical work performed by an authorized electrician according to the local regulations and the instructions in this manual. Use a dedicated circuit.

Insufficient power supply capacity or improper installation of the unit may result in malfunctions of the unit, electric shock, or fire.

WARNING

Keep electrical parts away from water.

Wet electrical parts pose a risk of electric shock, smoke, or fire.

Securely attach the control box cover.

If the cover is not installed properly, dust or water may infiltrate and pose a risk of electric shock, smoke, or fire.

Only use the type of refrigerant that is indicated on the unit when installing or relocating the unit.

Infiltration of any other types of refrigerant or air into the unit may adversely affect the refrigerant cycle and may cause the pipes to burst or explode.

When installing the unit in a small space, take appropriate precautions to prevent leaked refrigerant from reaching the limiting concentration.

Leaked refrigerant gas will displace oxygen and may cause oxygen starvation. Consult your dealer before installing the unit.

Consult your dealer or a qualified technician when moving or reinstalling the unit.

Improper installation may result in water leakage, electric shock, or fire.

After completing the service work, check for a refrigerant leak.

If leaked refrigerant is exposed to a heat source, such as a fan heater, stove, or electric grill, toxic gases will be generated.

Do not try to defeat the safety features of the unit.

Forced operation of the pressure switch or the temperature switch by defeating the safety features for these devices, or the use of accessories other than the ones that are recommended by Mitsubishi Electric may result in smoke, fire, or explosion.

Consult your dealer for proper disposal method.

Do not use a leak detection additive.

Precautions for handling units for use with R410A

CAUTION

Do not use the existing refrigerant piping.

A large amount of chlorine that may be contained in the residual refrigerant and refrigerator oil in the existing piping may cause the refrigerator oil in the new unit to deteriorate.

Use refrigerant piping materials made of phosphorus deoxidized copper. Keep the inner and outer surfaces of the pipes clean and free of such contaminants as sulfur, oxides, dust, dirt, shaving particles, oil, and moisture.

Contaminants in the refrigerant piping may cause the refrigerator oil to deteriorate.

Store the piping materials indoors, and keep both ends of the pipes sealed until immediately before brazing. (Keep elbows and other joints wrapped in plastic.)

Infiltration of dust, dirt, or water into the refrigerant system may cause the refrigerator oil to deteriorate or cause the compressor to malfunction.

Use a small amount of ester oil, ether oil, or alkyl benzene to coat flares and flanges.

Infiltration of a large amount of mineral oil may cause the refrigerator oil to deteriorate.

Charge the system with refrigerant in the liquid phase.

If gaseous refrigerant is drawn out of the cylinder first, the composition of the remaining refrigerant in the cylinder will change and become unsuitable for use.

Only use R410A.

The use of other types of refrigerant that contain chloride may cause the refrigerator oil to deteriorate.

Use a vacuum pump with a check valve.

If a vacuum pump that is not equipped with a check valve is used, the vacuum pump oil may flow into the refrigerant cycle and cause the refrigerator oil to deteriorate.

Prepare tools for exclusive use with R 410A. Do not use the following tools if they have been used with the conventional refrigerant: gauge manifold, charging hose, gas leak detector, check valve, refrigerant charge base, vacuum gauge, and refrigerant recovery equipment.

If the refrigerant or the refrigerator oil that may be left on these tools are mixed in with R410A, it may cause the refrigerator oil in the new system to deteriorate.

Infiltration of water may cause the refrigerator oil to deteriorate. Leak detectors for conventional refrigerants will not detect an R410A leak because R410A is free of chlorine.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of the refrigerant in the cylinder will change and become unsuitable for use.

Exercise special care when handling tools for use with R410A.

Infiltration of dust, dirt, or water into the refrigerant system may cause the refrigerator oil to deteriorate.

Before installation the unit

CAUTION

Do not install the unit where combustible gas may leak.
--

If the gas leaks and accumulates around the unit, an explosion may result.
--

Do not use the air conditioner where food, pets, plants, precision instruments, or artwork are kept.

The quality of the food, etc. may deteriorate.
--

Do not use the air conditioner in special environments.
--

Oil, steam, sulfuric smoke, etc. can significantly reduce the performance of the air conditioner or damage its parts.

When installing the unit in a hospital, communication station, or similar place, provide sufficient protection against noise.
--

The inverter equipment, private power generator, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate erroneously, or fail to operate. On the other hand, the air conditioner may affect such equipment by creating noise that disturbs medical treatment or image broadcasting.

Do not install the unit on a structure that may cause leakage.

When the room humidity exceeds 80 % or when the drain pipe is clogged, condensation may drip from the indoor unit. Perform collective drainage work together with the outdoor unit, as required.
--

The indoor models should be installed more than 2.5 m [9 ft] from floor.

Before installation (moved) electrical work

CAUTION

Ground the unit.

Do not connect the ground wire to gas or water pipes, lightning rods, or telephone ground lines. Improper grounding may result in electric shock.

Install the power cable so that tension is not applied to the cable.

Tension may cause the cable to break and generate heat and cause a fire.

Install a leak circuit breaker, as required.

If a leak circuit breaker is not installed, electric shock may result.

Use power line cables of sufficient current carrying capacity and rating.

Cables that are too small may leak, generate heat, and cause a fire.

Use only a circuit breaker and fuse of the specified capacity.

A fuse or circuit breaker of a larger capacity or a steel or copper wire may result in a general unit failure or fire.

Do not wash the air conditioner units.

Washing them may cause an electric shock.

When handling units, always wear protective gloves to protect your hands from metal parts and high-temperature parts.

Be careful that the installation base is not damaged by long use.

If the damage is left uncorrected, the unit may fall and cause personal injury or property damage.

Install the drain piping according to this Installation Manual to ensure proper drainage. Wrap thermal insulation around the pipes to prevent condensation.

Improper drain piping may cause water leakage and damage to furniture and other possessions.

Be very careful about product transportation.

- ♦One person should not carry the product if it weighs more than 20 kg [45LBS].
- ♦Some products use polypropylene bands for packaging. Do not use any polypropylene bands for a means of transportation. It is dangerous.
- ♦Do not touch the heat exchanger fins. Doing so may cut your fingers.
- ♦When transporting the outdoor unit, suspend it at the specified positions on the unit base. Also support the outdoor unit at four points so that it cannot slip sideways.

Safely dispose of the packing materials.

- ♦Packing materials, such as nails and other metal or wooden parts, may cause stabs or other injuries.
- ♦Tear apart and throw away plastic packaging bags so that children will not play with them. If children play with a plastic bag which was not torn apart, they face the risk of suffocation.

Before the test run

CAUTION

Turn on the power at least 12 hours before starting operation.

Starting operation immediately after turning on the main power switch can result in severe damage to internal parts. Keep the power switch turned on during the operational season.

Do not touch the switches with wet fingers.
--

Touching a switch with wet fingers can cause electric shock.
--

Do not touch the refrigerant pipes during and immediately after operation.

During and immediately after operation, the refrigerant pipes may be hot and may be cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes.

Do not operate the air conditioner with the panels and guards removed.

Rotating, hot, or high-voltage parts can cause injuries.
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Do not turn off the power immediately after stopping operation.
--

Always wait at least five minutes before turning off the power. Otherwise, water leakage and trouble may occur.

Do not operate the unit without the air filter.
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Dust particles may build up in the system and cause malfunctions.

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I | General Equipment Descriptions (PEFY-AF1200CFMR)

1. Unit configuration table

Model	PEFY-AF1200CFMR
Outdoor unit	PURY-P120TKMU-A(-BS)
	PURY-P120YKMU-A(-BS)
BC controller	CMB-P106NU-G
	CMB-P108NU-G

2. Operable temperature range

	Cooling	Heating
Indoor unit inlet air temperature	50 to 95°F W.B. (109°F D.B.) 10 to 35°C W.B. (43°C D.B.)	-4 to 60°F W.B. -20 to 15.5°C W.B.
Outdoor unit inlet air temperature	50 to 109°F D.B. 10 to 43°C D.B.	-4 to 60°F D.B. -20 to 15.5°C D.B.

II Product Specifications (PEFY-AF1200CFMR)

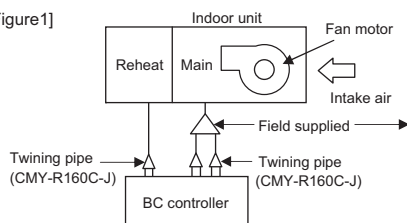
1. Specifications

(1) Indoor unit

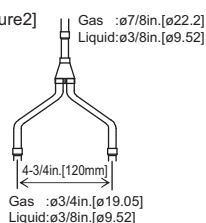
Model			PEFY-AF1200CFMR
Power source			1-phase 208/230V 60Hz
Cooling capacity (Nominal)		BTU / h	112,000
		kW	32.8
	Power input	kW	0.66/0.78
	Current input	A	3.19/3.45
Heating capacity (Nominal)		BTU / h	61,400
		kW	18
	Power input	kW	0.66/0.78
	Current input	A	3.19/3.45
Reheat capacity (Nominal)		BTU / h	24,200
		kW	7.1
External finish			Galvanized
External dimension H x W x D	in.	18-9/16 x 49-1/4 x 55-1/8	
	mm	470 x 1,250 x 1,400	
Net weight	lbs (kg)	309 (140)	
Heat exchanger			Cross fin (Aluminium fin and copper tube)
FAN	Type x Quantity		Sirocco fan x 2
	External static press	in.WG	0.28-0.48-0.80 (208V)
		Pa	70-120-200
		in.WG	0.52-0.72-0.96 (230V)
		Pa	130-180-240
	Motor type		Single phase induction motor
	Motor output	kW	0.62/0.74
	Driving mechanism		Direct-driven
	Airflow rate	cfm	1,200
		m ³ / min	34
		L / s	566
Sound pressure level (Low-Mid-High) (measured in anechoic room)		dB <A>	36-38-41 (208V)
		dB <A>	39-41-43 (230V)
		dB <A>	-
Insulation material			Polyethylene foam, Polyurethane foam, Polystyren foam
Air filter			Field supply
Protection device			Fuse
Refrigerant control device			LEV
Connectable outdoor unit			PURY-P120TKMU-A(-BS), PURY-P120YKMU-A(-BS)
Diameter of refrigerant pipe (O.D.)	Liquid (R410A)	in. (mm)	3/8 (9.52) Brazed
	Gas (R410A)	in. (mm)	7/8 (22.2) Brazed
Diameter of drain pipe		in. (mm)	O.D. 1-1/4(32) x 2

- Note :**
- Standard capacities are the maximum capacities that are obtained in the following conditions:
Air conditions : cooling : indoor 87°FDB/80°F WB (30.5°CDB/26.7°CWB) outdoor 87°FDB (30.5°CDB) heating : indoor 32°FDB (0°CDB) outdoor 32°FDB (0°CDB)/28°FDB (-2°CWB), Connected outdoor unit is PURY-P120TKMU/YKMU-A(-BS)
Piping length : 24.6 feet (7.5m) Height difference : 0 feet (0m)
 - This value shows the data per unit.
 - Sound pressure level is the data that was obtained in anechoic room by the following conditions:
The measuring point is 4.9feet (1.5m) from the bottom of the unit that has 6.6feet (2m) outlet duct and 6.6feet (2m) intake duct.
 - When combining the drain pipes, ensure that collected pipes are 3-15/16inch(10cm) lower than the unit body's drain port.
 - Install BC controller in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors.
(For use in quiet environments with low background noise, position the BC controller at least 16.4feet(5m) away from any indoor units.)
 - When connecting the indoor unit to the BC controller, the optional twinning pipe shall be installed.
(Refer to Figure1, Figure2, and Table1)
 - The choice of indoor unit operation mode is limited to auto mode.

[Figure1]



[Figure2]



[Table1]

Number of connection pipe of BC

Outdoor model	Main	Reheat
PURY-P120TKMU/YKMU-A(-BS)	4	2

(2) BC controller

Model			CMB-P106NU-G		CMB-P108NU-G	
Number of branch			6		8	
Power source			1-phase 208/230V			
			60Hz	-	60Hz	-
Power input (208/230)	Cooling	kW	0.086	-	0.112	-
	Heating		0.040	-	0.053	-
Current (208/230)	Cooling	A	0.41/0.37	-	0.54/0.49	-
	Heating		0.19/0.17	-	0.25/0.23	-
External finish			Galvanized steel plate (Lower part drain pan :Pre-coated galvanized sheets + powder coating)			
Connectable outdoor unit			PURY-P120TKMU-A(-BS), PURY-P120YKMU-A(-BS)			
Indoor unit capacity connectable to 1 branch		kW	Model P54 or smaller (Use optional joint pipe combing 2 branches when the total unit capacity exceeds P55.) (Use the reducer (standard accessory) when the indoor unit Model 18 or smaller is connected.)			
External dimension H x W x D		in. (mm)	11-3/16 x 25-17/32 x 17-1/32 (284 x 648 x 432)			
Refrigerant piping diameter	Connectable outdoor unit capacity		To outdoor unit			
			High press. pipe		Low press. pipe	
	to P120		3/4 (19.05)		1-1/8 (28.58)	
	in. (mm) O.D.		Braze		Braze	
			To indoor unit			
			Liquid pipe		Gas pipe	
		in. (mm) O.D.	3/8 (9.52) Flare (1/4 (6.35) with attached reducer used.)		5/8 (15.88) Flare (1/2 (12.7) with attached reducer used, 3/4 (19.05) and 7/8 (22.2) with optional joint pipe used.)	
Field drain pipe size		in. (mm) O.D.	1-1/4 (32)		1-1/4 (32)	
Net weight		lbs (kg)	76 (34)		84 (38)	
Accessories			Drain Connection pipe(with flexible hose and insulation) Reducer		Drain Connection pipe(with flexible hose and insulation) Reducer	
Remark						
Note: 1. Works not included : Installation/foundation work, electrical connection work, duct work, insulation work, power source switch, and other items are not specified in this specifications. 2. The equipment is for R410A refrigerant. 3. Install this product in a location where noise (refrigerant noise) emitted by the unit will not disturb the neighbors. (For use in quiet environments with low background noise, position the BC CONTROLLER at least 5m away from any indoor units.) 4. The data presented is based on a specific combination.						

(3) Outdoor unit

Outdoor Model			PURY-P120TKMU-A (-BS)		
Indoor Model			Non-Ducted		Ducted
Power source			3-phase 3-wire 208-230 V ±10% 60 Hz		
Cooling capacity (Nominal)	*1	BTU/h	120,000		
		kW	35.2		
	(208-230)	Power input	kW	9.44	
		Current input	A	29.1-26.3	
	(Rated)	BTU/h	114,000		
		kW	33.4		
	(208-230)	Power input	kW	8.78	8.71
		Current input	A	27.0-24.4	26.8-24.2
Heating capacity (Nominal)	*2	BTU/h	135,000		
		kW	39.6		
	(208-230)	Power input	kW	10.86	
		Current input	A	33.4-30.2	
	(Rated)	BTU/h	129,000		
		kW	37.8		
	(208-230)	Power input	kW	9.98	10.13
		Current input	A	30.7-27.8	31.2-28.2
Indoor unit	Total capacity		50~150% of outdoor unit capacity		
	Model/Quantity		P06~P96/1~30		
Sound pressure level (measured in anechoic room)		dB <A>	60.0		
Refrigerant	High pressure	in. (mm)	3/4 (19.05) Brazed		
piping diameter	Low pressure	in. (mm)	1-1/8 (28.58) Brazed		
Minimum Circuit Ampacity		A	45-42		
Maximum Overcurrent Protection		A	74-68		
FAN	Type x Quantity		Propeller fan x 2		
	Airflow rate	cfm	11,300		
		m³/min	320		
		L/s	5,330		
	Control, Driving mechanism		Inverter-control, Brushless DC motor		
	Motor output		kW	0.92+0.92	
	*3 External static press.		0 in.WG (0 Pa)		
Compressor	Type x Quantity		Inverter scroll hermetic compressor x 1		
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION		
	Starting method		Inverter		
	Motor output		kW	8.2	
	Case heater		kW	-	
	Lubricant		MEL32		
External finish			Pre-coated galvanized steel sheet (+powder coating for -BS type) <MUNSELL 5Y 8/1>		
External dimension H x W x D		in.	64-31/32 x 68-29/32 x 29-5/32		
		mm	1,650 x 1,750 x 740		
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)		
	Inverter circuit (COMP./FAN)		Over-current protection		
	Fan motor		Thermal switch		
Refrigerant	Type x original charge		R410A x 26 lbs + 1 oz (11.8 kg)		
		Control	Indoor LEV and BC controller		
Net weight		lbs (kg)	715 (324)		
Heat exchanger			Salt-resistant cross fin & copper tube		
HIC circuit (HIC: Heat Inter-Changer)			-		
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle)		
Drawing	External		KD94R360		
	Wiring		KE94C650		
Standard attachment	Document		Installation Manual		
	Accessory		Details refer to External Drw		
Optional parts			joint: CMY-Y102SS-G2,CMY-Y102LS-G2,CMY-R160C-J BC controller: CMB-P104,105,106,108,1010,1013,1016NU-G Main BC controller: CMB-P108,1010,1013,1016NU-GA,1016NU-HA Sub BC controller: CMB-P104,108NU-GB,CMB-P1016NU-HB		
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.		

Notes:

- Cooling conditions (Test conditions are based on AHRI 1230)
Indoor: 80°F D.B./67°F W.B. (26.7°C D.B./19.4°C W.B.), Outdoor: 95°F D.B. (35°C D.B.)
- Heating conditions (Test conditions are based on AHRI 1230)
Indoor: 70°F D.B. (21.1°C D.B.), Outdoor: 47°F D.B./43°F W.B. (8.3°C D.B./6.1°C W.B.)
- External static pressure option is available (0.12 in.WG, 0.24 in.WG/30 Pa, 60 Pa).

* Due to continuing improvement, above specifications may be subject to change without notice.

Unit converter

BTU/h	=kW x 3.412
cfm	=m ³ /min x 35.31
lbs	=kg /0.4536

*Above specification data is subject to rounding variation.

Outdoor Model			PURY-P120YKMU-A (-BS)	
Indoor Model			Non-Ducted	Ducted
Power source			3-phase 3-wire 460 V ±10% 60 Hz	
Cooling capacity (Nominal)	*1	BTU/h	120,000	
		kW	35.2	
	(460)	Power input	9.44	
		Current input	13.1	
	(Rated)	BTU/h	114,000	
		kW	33.4	
	(460)	Power input	8.78	8.71
		Current input	12.2	12.1
Heating capacity (Nominal)	*2	BTU/h	135,000	
		kW	39.6	
	(460)	Power input	10.86	
		Current input	15.1	
	(Rated)	BTU/h	129,000	
		kW	37.8	
	(460)	Power input	9.98	10.13
		Current input	13.9	14.1
Indoor unit	Total capacity		50~150% of outdoor unit capacity	
	Model/Quantity		P06~P96/1~30	
Sound pressure level (measured in anechoic room)		dB <A>	60.0	
Refrigerant piping diameter	High pressure		in. (mm)	
	Low pressure		in. (mm)	
Minimum Circuit Ampacity		A	21	
Maximum Overcurrent Protection		A	34	
FAN	Type x Quantity		Propeller fan x 2	
	Airflow rate	cfm	11,300	
		m³/min	320	
		L/s	5,330	
	Control, Driving mechanism		Inverter-control, Brushless DC motor	
	Motor output		kW	
	*3	External static press.		0 in.WG (0 Pa)
Compressor	Type x Quantity		Inverter scroll hermetic compressor x 1	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output		kW	
	Case heater		kW	
	Lubricant		MEL32	
External finish			Pre-coated galvanized steel sheet (+powder coating for -BS type) <MUNSELL 5Y 8/1>	
External dimension H x W x D		in.	64-31/32 x 68-29/32 x 29-5/32	
		mm	1,650 x 1,750 x 740	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP./FAN)		Over-current protection	
	Fan motor		Thermal switch	
Refrigerant	Type x original charge		R410A x 26 lbs + 1 oz (11.8 kg)	
	Control		Indoor LEV and BC controller	
Net weight		lbs (kg)	743 (337)	
Heat exchanger			Salt-resistant cross fin & copper tube	
HIC circuit (HIC: Heat Inter-Changer)			-	
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle)	
Drawing	External		KD94R362	
	Wiring		KE94C644	
Standard attachment	Document		Installation Manual	
	Accessory		Details refer to External Drw	
Optional parts			joint: CMY-Y102SS-G2,CMY-Y102LS-G2,CMY-R160C-J BC controller: CMB-P104,105,106,108,1010,1013,1016NU-G Main BC controller: CMB-P108,1010,1013,1016NU-GA,1016NU-HA Sub BC controller: CMB-P104,108NU-GB,CMB-P1016NU-HB	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.	

Notes:

- Cooling conditions (Test conditions are based on AHRI 1230)
Indoor: 80°F D.B./67°F W.B. (26.7°C D.B./19.4°C W.B.), Outdoor: 95°F D.B. (35°C D.B.)
- Heating conditions (Test conditions are based on AHRI 1230)
Indoor: 70°F D.B. (21.1°C D.B.), Outdoor: 47°F D.B./43°F W.B. (8.3°C D.B./6.1°C W.B.)
- External static pressure option is available (0.12 in.WG, 0.24 in.WG/30 Pa, 60 Pa).

Unit converter

BTU/h	=kW x 3.412
cfm	=m ³ /min x 35.31
lbs	=kg /0.4536

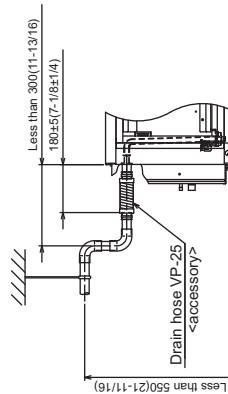
*Above specification data is subject to rounding variation.

* Due to continuing improvement, above specifications may be subject to change without notice.

(1) Indoor unit

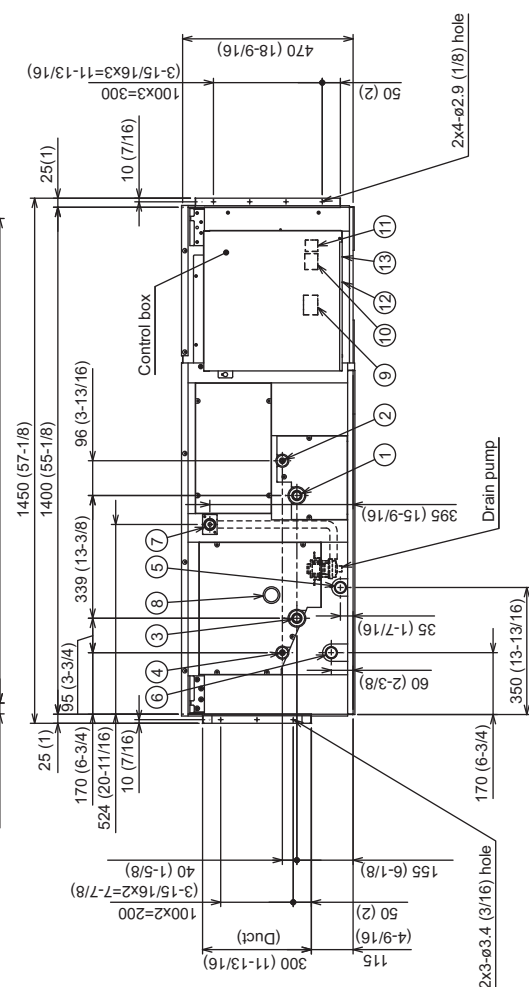
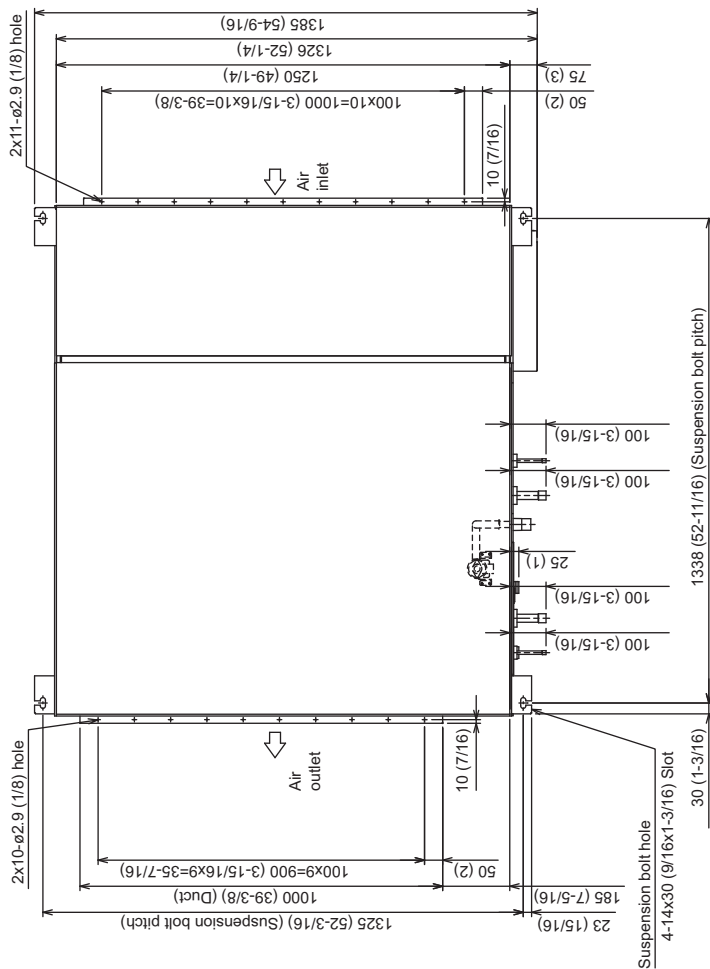
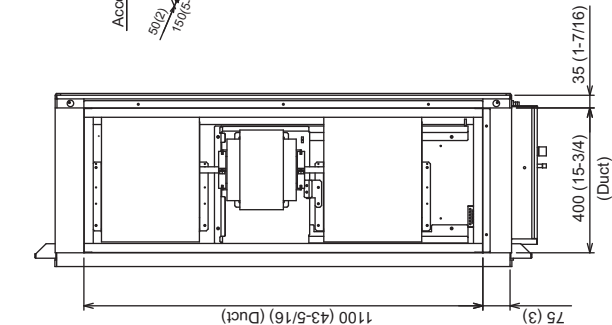
Technical drawing of a mobile office unit, showing dimensions and labels. The drawing includes the following dimensions and labels:

- Overall length: 1070(42-3/16)
- Overall width: 560(20)
- Overall height: 1560(53-1/16)
- Internal width: 500(17)
- Internal height: 600(23-5/8)
- Internal length: 1100(43-5/16)
- Internal width (lower): 150(5-15/16)
- Internal height (lower): 50(2)
- Labels: "Access door" and "Note2"



1. Use M10 screw for the suspension bolt (field supply).
2. Keep the service space for the maintenance at the bottom.

- | | | |
|----|---|-------|
| 1 | Refrigerant piping brazing connection (Main Coil:gas) | ..... |
| 2 | Refrigerant piping brazing connection (Main Coil:liquid) | ..... |
| 3 | Refrigerant piping brazing connection (Reheat Coil:gas) | ..... |
| 4 | Refrigerant piping brazing connection (Reheat Coil:liquid) | ..... |
| 5 | Drain pipe (O.D.ø32 (1-1/4)) (Spontaneous draining) | ..... |
| 6 | Drain pipe (O.D.ø32 (1-1/4)) (Emergency draining) | ..... |
| 7 | Drain pipe (O.D.ø32 (1-1/4)) | ..... |
| 8 | Water filling port | ..... |
| 9 | Terminal block (Power source) | ..... |
| 10 | Terminal block (Indoor/outdoor connecting) | ..... |
| 11 | Terminal block (Remote controller transmission) | ..... |
| 12 | Knockout hole ø22 (1-1/8)(Power source wiring) | ..... |
| 13 | Knockout hole ø22 (1-1/8) (Remote controller transmission wiring) | ..... |



① Gas pipe	② Liquid pipe	③ Gas pipe	④ Liquid pipe
ø22.2 (7/8)	ø9.52 (3/8)	ø22.2 (7/8)	ø9.52 (3/8)

CMB-P106NU-G
CMB-P108NU-G

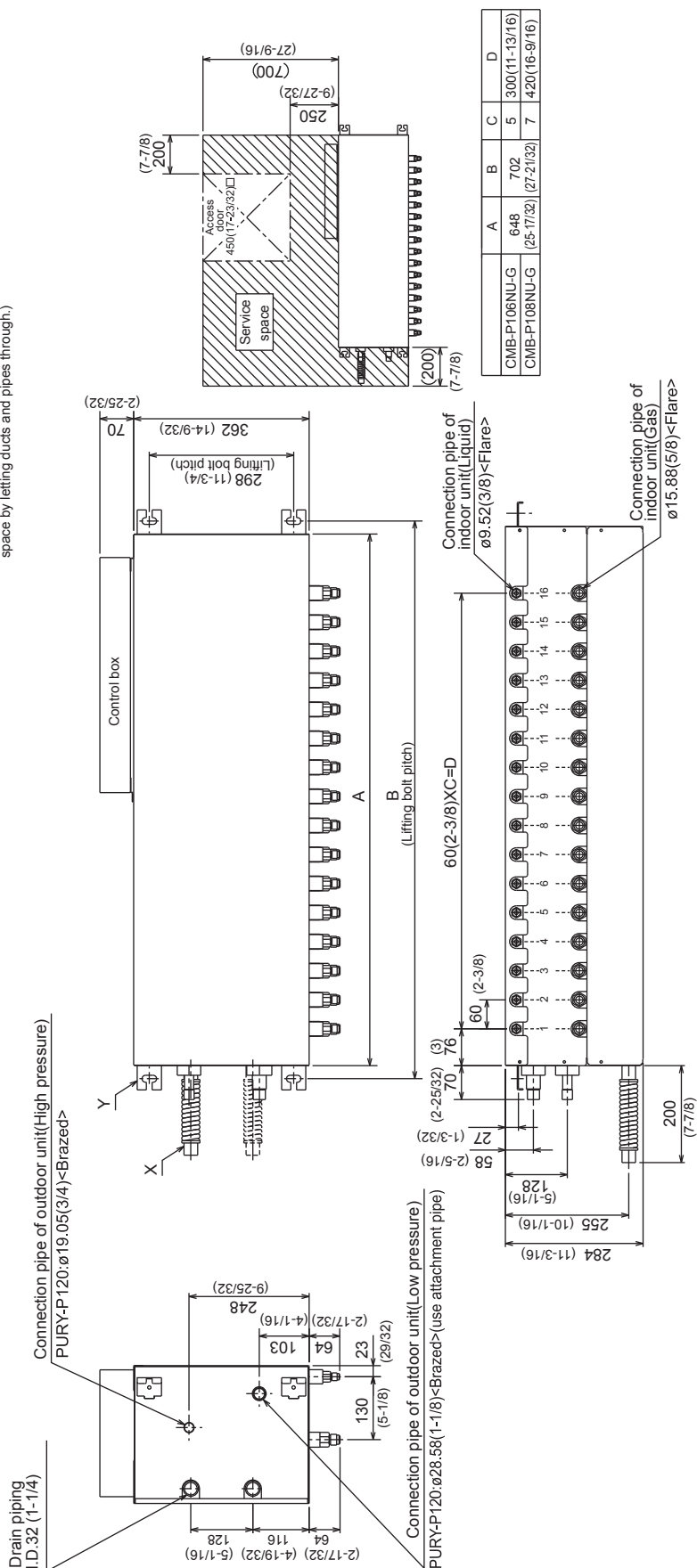
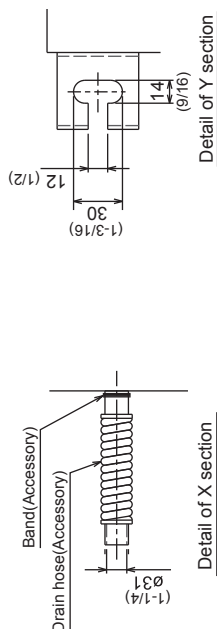
<Accessories>

Refrigerant<Low pressure>	conn.pipe	2pcs.
Refrigerant<High pressure>	conn.pipe	1pc.
Reducer<Large Small>		Quantity for all connections
• Drain hose		1pc.
• Hose band		1pc.
• Tie band		1pc.

Note1. Suspension bolt(Ø10), washer(M10), and nut(M10) prepare in the field.

2. Take notice of service space as follows.

(Please give attention not to occupy service space by letting ducts and pipes through.)



	A	B	C	D
CMB-P106NU-G	648 (25-17/32)	702 (27-21/32)	5	300(11-13/16)
CMB-P108NU-G			7	420(16-9/16)

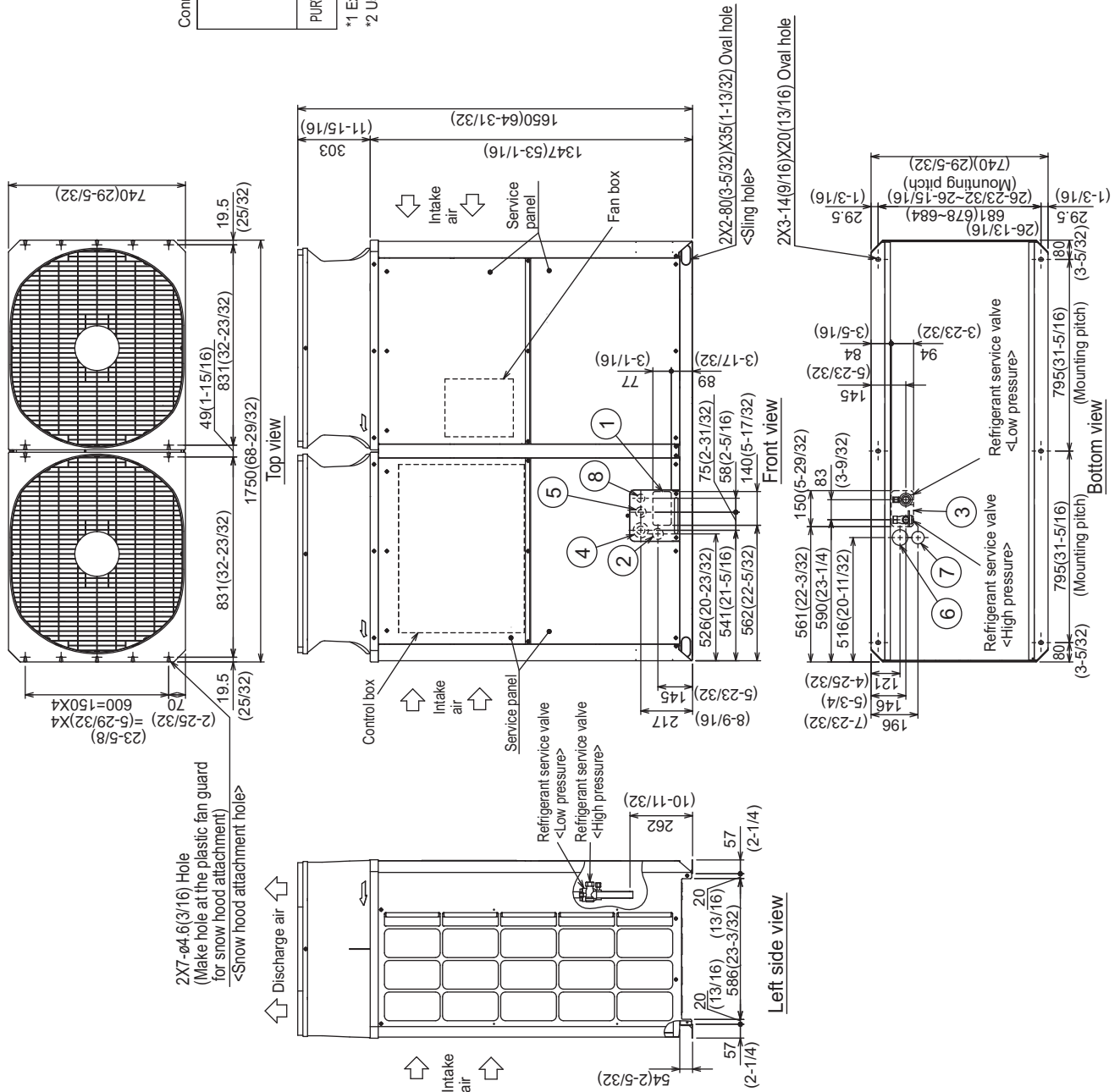
(3) Outdoor unit
PURY-P120TKMU-A(-BS)

Note 1. Please refer to the next page for information regarding necessary spacing around the unit and foundation work.
2. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

Connecting pipe specifications				
Model	Refrigerant pipe		Diameter	
	High pressure	Low pressure	High pressure	Low pressure
PURY-P120TKMU	ø19.05 Braze (3/4) *2	ø28.58 Braze (1-1/8) *1	ø25.4 (1)	ø28.58 (1-1/8)

*1 Expand the on-site piping and connect to the refrigerant service valve piping.
*2 Use the pipe joint(field supply) and connect to the refrigerant service valve piping.

Unit : mm(in.)

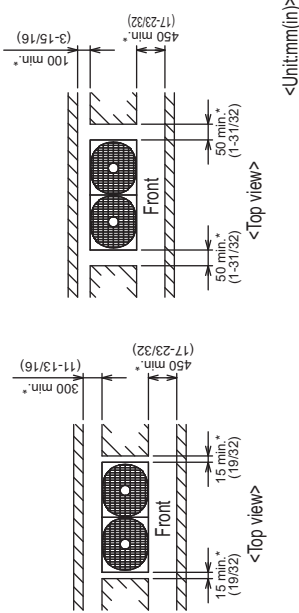


NO.	Usage	Specifications
①	Front through hole	140 x 77 Knockout hole (5-17/32) (3-1/16)
②	Front through hole (Uses when twinning kit (optional parts) is mounted.)	ø45 Knockout hole (1-25/32)
③	Bottom through hole	150 x 94 Knockout hole (5-29/32) (3-23/32)
④	Front through hole	ø62.7 or ø34.5 Knockout hole (2-15/32) (1-3/8)
⑤	Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑥	Bottom through hole	ø65 Knockout hole (2-9/16)
⑦	Bottom through hole	ø52 Knockout hole (2-1/16)
⑧	For transmission cables	ø34 Knockout hole (1-11/32)

1.Required space around the unit

●In case of single installation

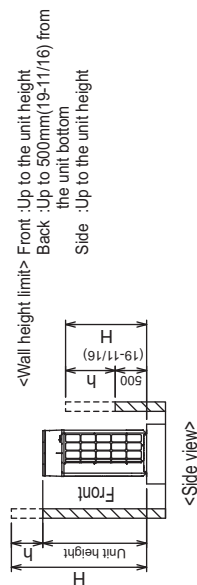
- ① Secure enough space around the unit as shown in the figure below.
- With a space of at least 300mm(11-3/16) to the wall on the back of the unit



<Top view>

<Side view>

- ② When the height of the walls on the front, back or on the sides<H> exceeds the wall height limit as defined below add the height that exceeds the height limit <h> to the figures that are marked with an asterisk.



<Side view>

2.Foundation work

- ① Take into consideration the surface strength, water drainage route, piping route and wiring route when preparing the installation site.
- ② Note that the drain water comes out of the unit during operation. > Build the foundation in such way that the corner of the installation leg is securely supported as shown in the right figure. (Fig.A)
- When using a rubber isolating cushion, please ensure it is large enough to cover the entire width of each of the unit's legs.
- ③ The protrusion length of the anchor bolt must not exceed 30mm(1-3/16). (Fig.A)
- ④ Use four fixing plates as shown in the right figure <field supply required> when using post-installed anchor bolts. (Fig.B)
- ⑤ To prevent small animals and water and snow from entering the unit and damaging its parts, close the gap around the edges of through holes for pipes and wires with filler plates <field supply required>.
- ⑥ When the pipes or cables are routed at the bottom of the unit, make sure that the through hole at the base of the unit does not get blocked with the installation base.
- ⑦ Refer to the Installation Manual when installing units on an installation base.

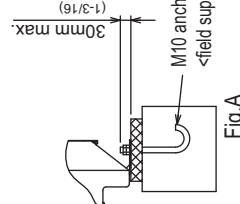


Fig.A

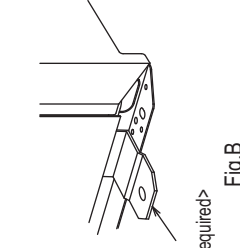
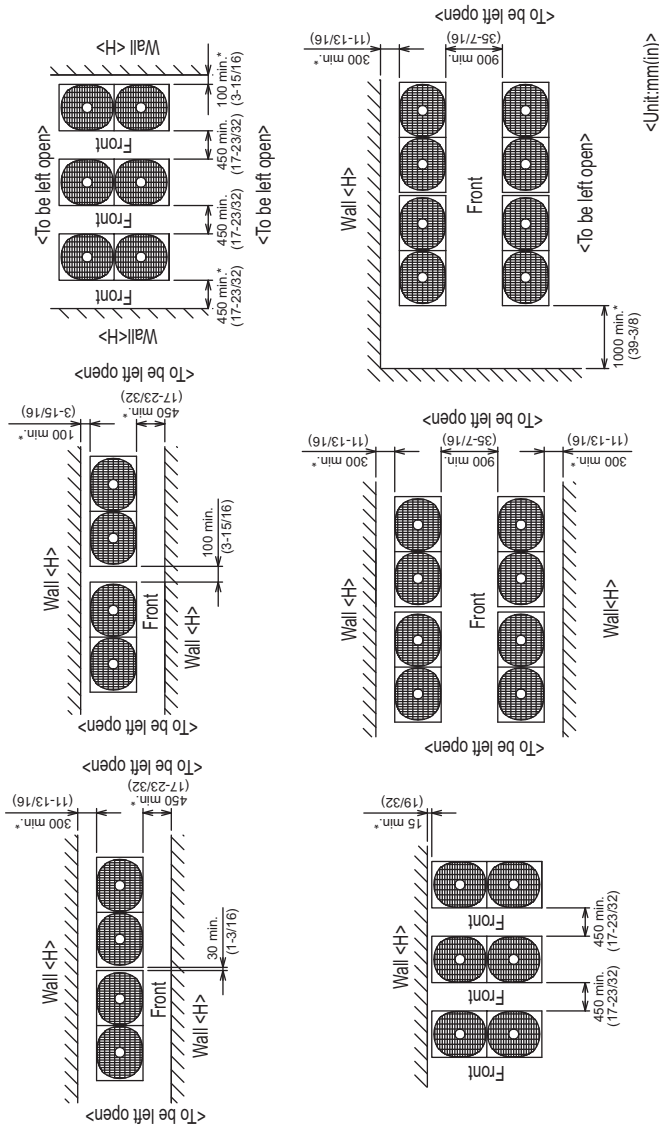


Fig.B

●In case of collective installation

- ① When multiple units are installed adjacent to each other, secure enough space to allow for air circulation and walkway between groups of units as shown in the figures below.
- ② At least two sides must be left open.
- ③ As with the single installation, add the height that exceeds the height limit<h> to the figures that are marked with an asterisk.
- ④ If there is a wall at both the front and the rear of the unit, install up to three units consecutively in the side direction and provide a space of 1000mm or more as inlet space/ passage space for each three units.



<Unit:mm(in)>

Note 1. Please refer to the next page for information regarding necessary spacing around the unit and foundation work.

2. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C (248°F).

Note 1. Please refer to the next page for information regarding necessary spacing around the unit and foundation work.

2. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C/248°F.

Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
PUR-P120Y/KMU	ø19.05 Brazed (3/4) *2	ø28.58 Brazed (1-1/8) *1	ø25.4 (1)	ø28.58 (1-1/8)

*1 Expand the on-site piping and connect to the refrigerant service valve piping.
*2 Use the pipe joint(field supply) and connect to the refrigerant service valve piping.

NO.	Usage	Specifications
①	Front through hole	140 x 77 Knockout hole (5-17/32)(3-1/16)
②	For pipes Front through hole (Uses when winning kit (optional parts is mounted.)	ø45 Knockout hole (1-25/32)
③	Bottom through hole	150 x 94 Knockout hole (5-29/32)(3-23/32)
④	Front through hole	ø62.7 or ø34.5 Knockout hole (2-15/32) (1-3/8)
⑤	Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑥	For wires Bottom through hole	ø65 Knockout hole (2-9/16)
⑦	Bottom through hole	ø52 Knockout hole (2-1/16)
⑧	For transmission cables Front through hole	ø34 Knockout hole (1 11/32)

Top view

2X7-φ4, 6(3/16) Hole
(Make hole at the plastic fan guard
for snow hood attachment)
<Snow hood attachment hole>

740(29-5/32) 19.5 (25/32)
831(32-23/32) 1750(68-29/32)
49(1-15/16)
19.5 (25/32)
70 (2-5/8)
600=(5-29/32)X4
(2-25/32)

Front view

303 (11-15/16) 1347(53-1/16) 1650(64-31/32)
Intake air Service panel Fan box
2X2-80(3-5/32)X35(1-1/4) <Sling hole>
2X3-14(9/16)X20(13/16)
29.5 (1-3/16)
(26-23/32-26-15/16)
681(678-684)
(740)(29-5/32)
(26-13/16)
(3-23/32)
84 (3-5/16)
145 (5-23/32)
94 (3-9/32)
83 (5-29/32)
150(5-29/32)
561(22-3/32)
590(23-1/4)
516(20-11/32)
121 (4-25/32)
146 (5-3/4)
196 (7-23/32)
145 (8-9/16)
217 (5-23/32)
145 (5-23/32)
526(20-23/32)
541(21-5/16)
562(22-5/32)
140(5-17/32)
58(2-5/16)
75(2-31/32)
89 (3-17/32)
77 (3-1/16)
1
5
8
4
2
3
6
7
Refrigerant service valve <Low pressure>
Refrigerant service valve <High pressure>
Transformer box
Control box
Intake air Service panel
Discharge air

Left side view

54(2-5/32) 57 (2-1/4) 20 (13/16) 586(23-3/32) 20 (13/16) 262 (10-11/32) 57 (2-1/4)

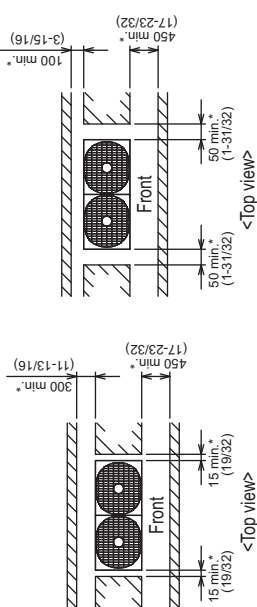
Bottom view

29.5 (1-3/16) 180 (3-5/32) 795(31-5/16) (Mounting pitch)
(3-5/32)
(740)(29-5/32)
(26-23/32-26-15/16)
681(678-684)
(26-13/16)
(3-23/32)
84 (3-5/16)
145 (5-23/32)
94 (3-9/32)
83 (5-29/32)
150(5-29/32)
561(22-3/32)
590(23-1/4)
516(20-11/32)
121 (4-25/32)
146 (5-3/4)
196 (7-23/32)
145 (8-9/16)
217 (5-23/32)
145 (5-23/32)
526(20-23/32)
541(21-5/16)
562(22-5/32)
140(5-17/32)
58(2-5/16)
75(2-31/32)
89 (3-17/32)
77 (3-1/16)
1
5
8
4
2
3
6
7
Refrigerant service valve <Low pressure>
Refrigerant service valve <High pressure>
Transformer box
Control box
Intake air Service panel
Discharge air

1.Required space around the unit

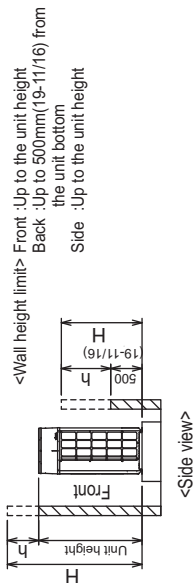
●In case of single installation

- ① Secure enough space around the unit as shown in the figure below.
- With a space of at least 300mm(11-13/16) to the wall on the back of the unit



<Unit:mm(in)>

- ② When the height of the walls on the front,back or on the sides<H> exceeds the wall height limit as defined below add the height that exceeds the height limit <h> to the figures that are marked with an asterisk.

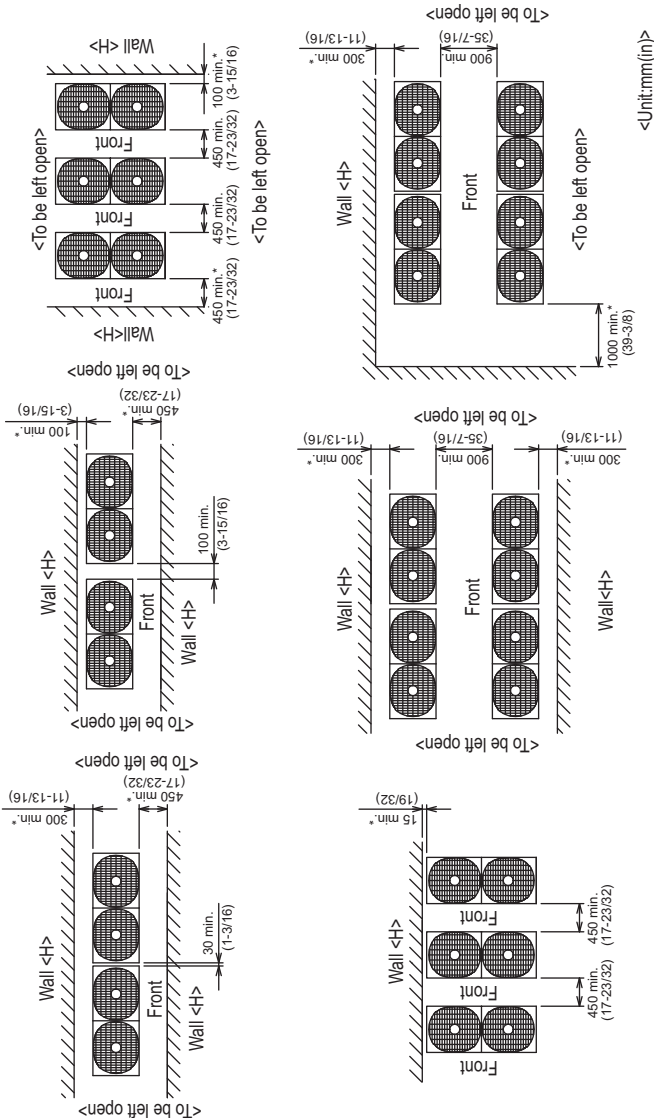


2.Foundation work

- ① Take into consideration the surface strength, water drainage route, piping route, and wiring route when preparing the installation site.
<Note that the drain water comes out of the unit during operation.>
- ② Build the foundation in such way that the corner of the installation leg is securely supported as shown in the right figure (Fig.A)
When using a rubber isolating cushion, please ensure it is large enough to cover the entire width of each of the unit's legs.
- ③ The protrusion length of the anchor bolt must not exceed 30mm(1-3/16).(Fig.A)
- ④ Use four fixing plates as shown in the right figure <field supply required> when using post-installed anchor bolts.(Fig.B)
- ⑤ To prevent small animals and water and snow from entering the unit and damaging its parts, close the gap around the edges of through holes for pipes and wires with filler plates <field supply required>.
- ⑥ When the pipes or cables are routed at the bottom of the unit, make sure that the through hole at the base of the unit does not get blocked with the installation base.
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- ① When multiple units are installed adjacent to each other, secure enough space to allow for air circulation and walkway between groups of units as shown in the figures below.
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<Unit:mm(in)>

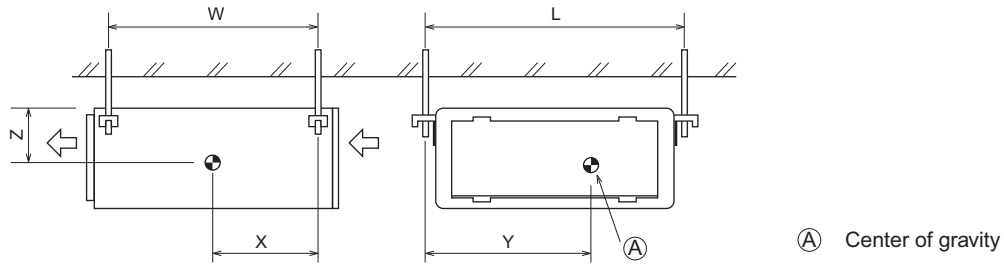


Fig.B

Fig.A

3. Center of Gravity

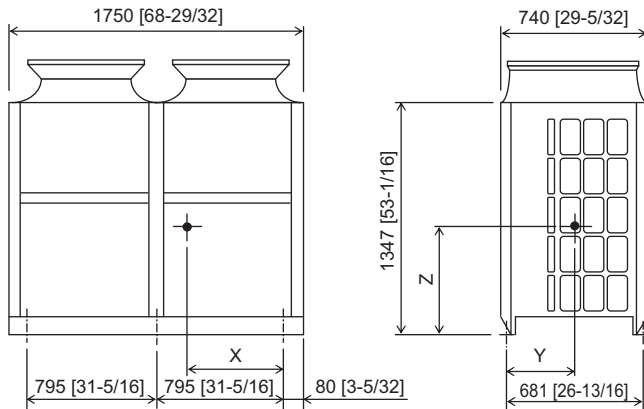
(1) Indoor unit



Unit: mm[in.]

Model name	W	L	X	Y	Z	Product Weight (kg [lbs])
PEFY-AF1200CFMR	1338 [52-11/16]	1325 [52-3/16]	730 [28-3/4]	675 [26-5/8]	240 [9-1/2]	140 [309]

(2) Outdoor unit



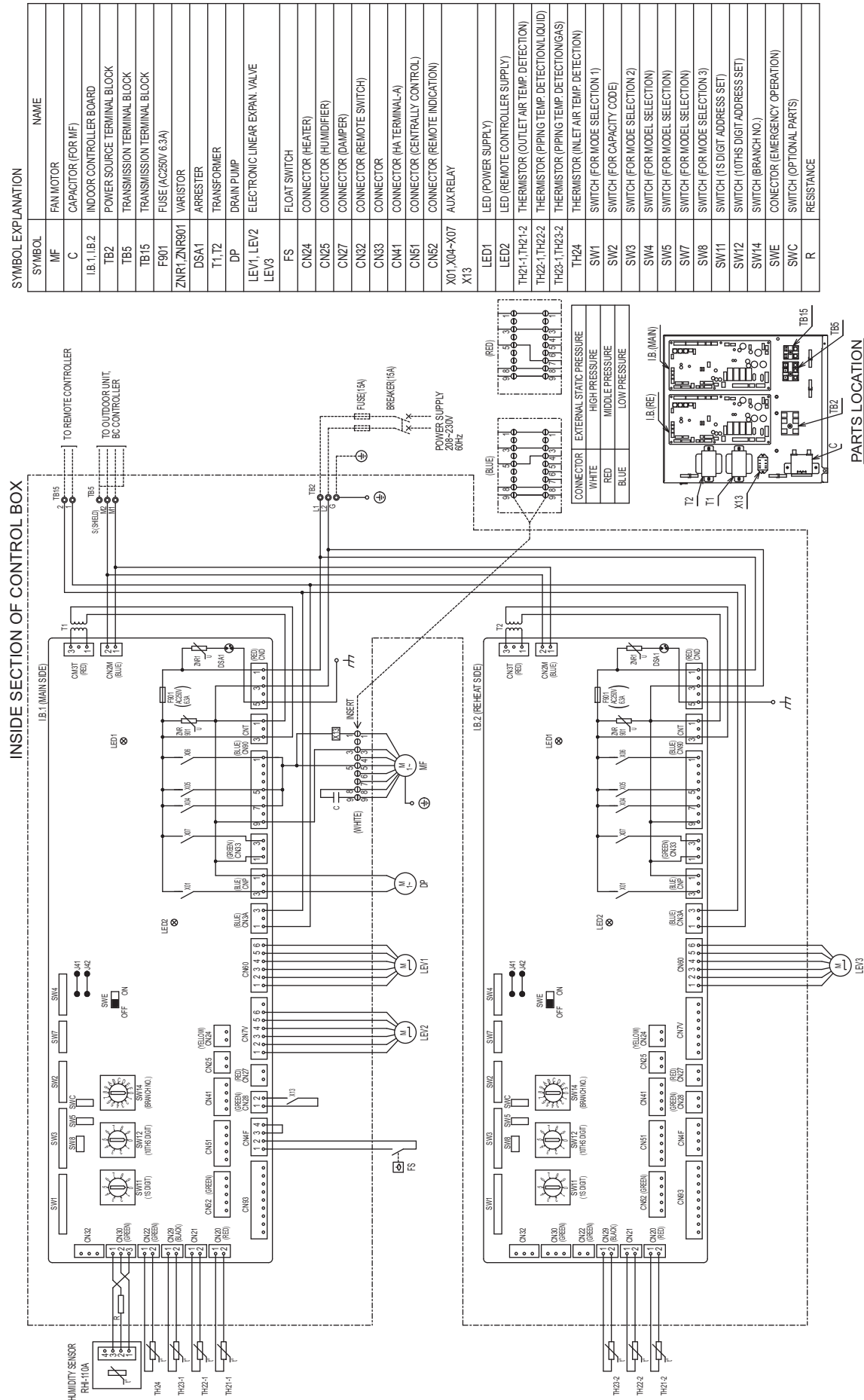
Unit: mm[in.]

Model name	X	Y	Z
PURY-P120TKMU-A	702[27-21/32]	327 [12-7/8]	657[25-7/8]
PURY-P120YKMU-A	735[28-15/16]	318 [12-17/32]	643[25-11/32]

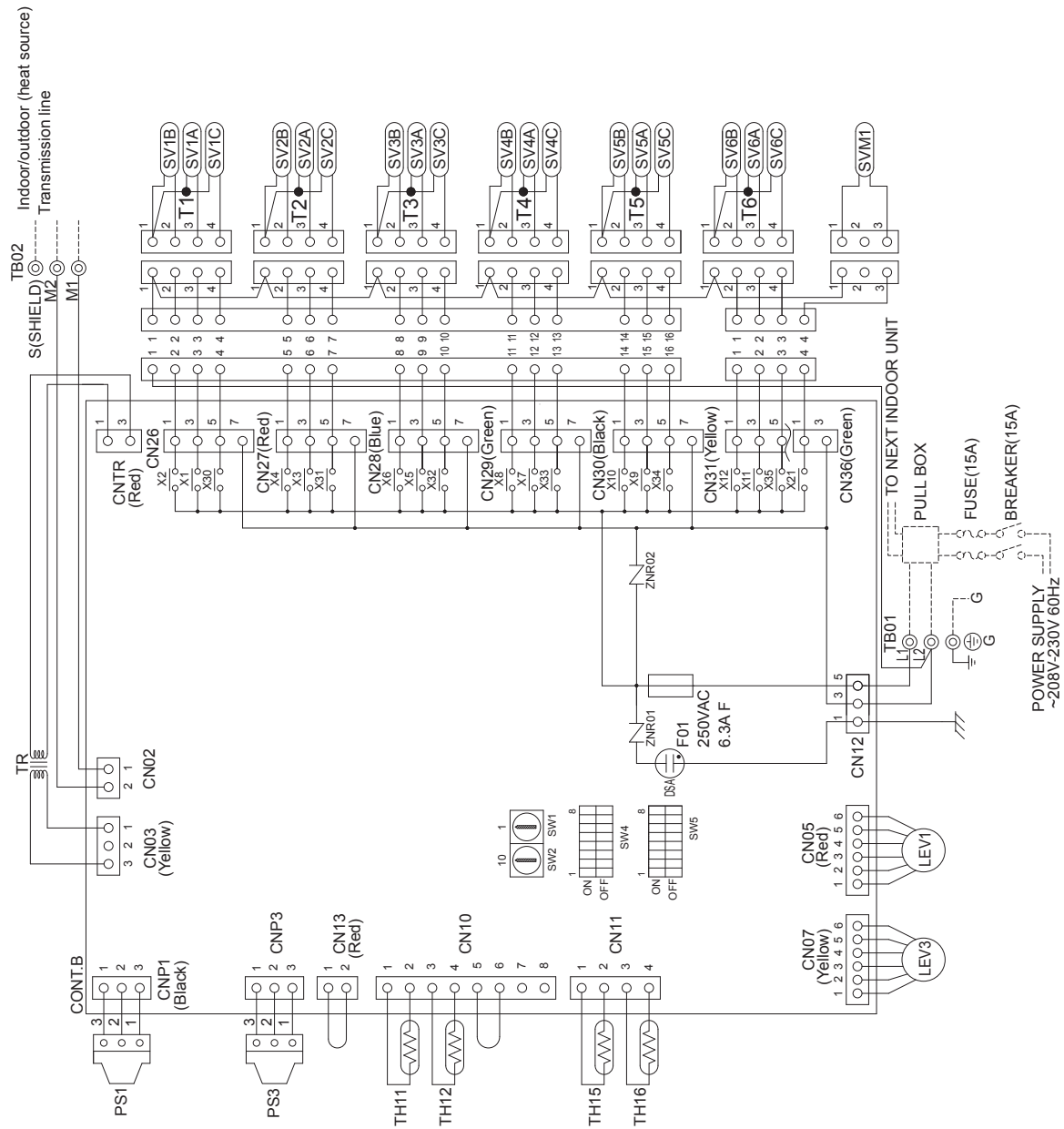
4. Electrical Wiring Diagrams

(1) Indoor unit

PEFY-AF1200CFMR



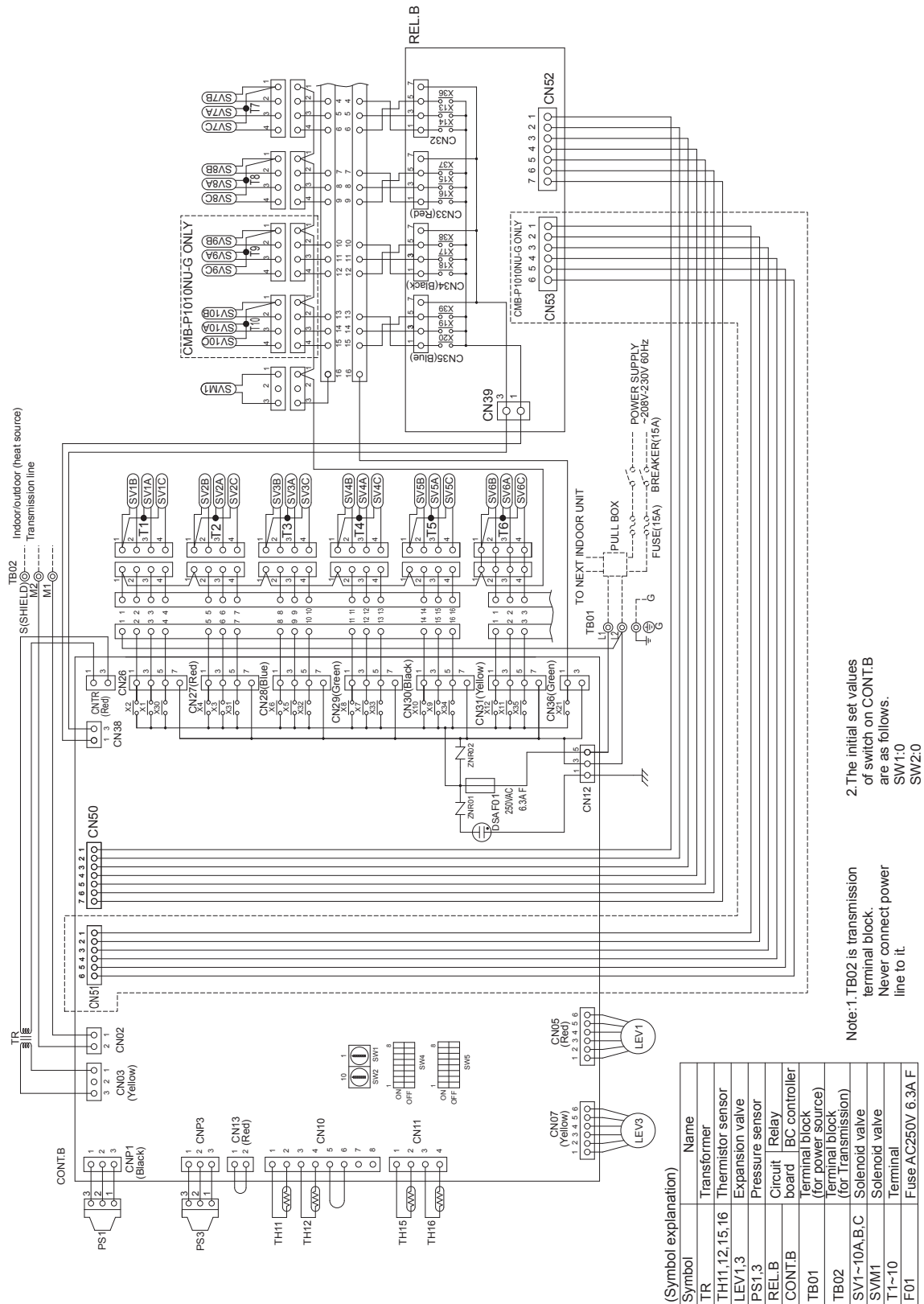
(2) BC controller
CMB-P106NU-G



(Symbol explanation)

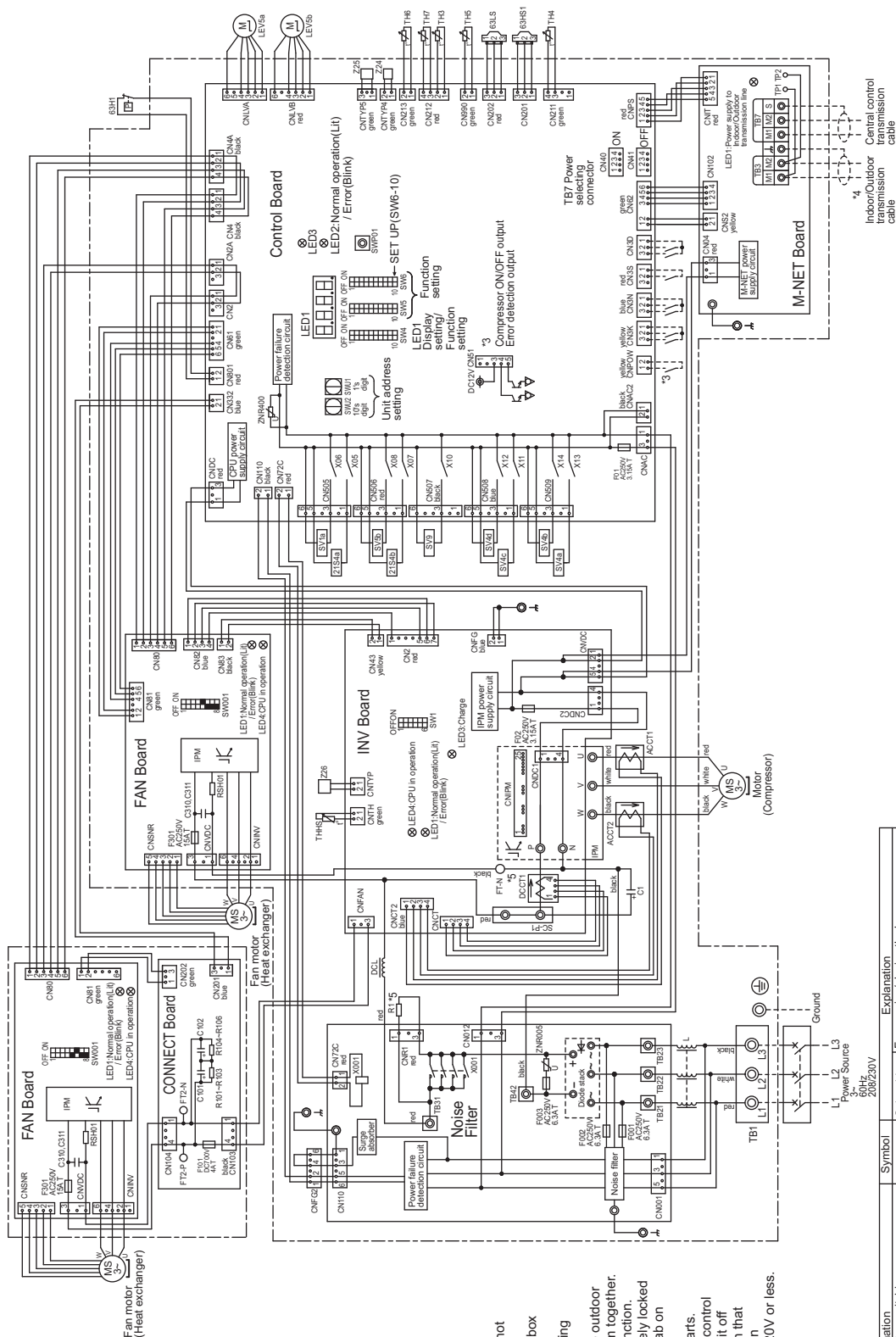
Symbol	Name
TR	Transformer
TH11,12,15,16	Thermistor sensor
LEV1,3	Expansion valve
PS1,3	Pressure sensor
CONT.B	Circuit board
TB01	Terminal block (for power source)
TB02	Terminal block (for Transmission)
SV1~6A,B,C	Solenoid valve
SVM1	Solenoid valve
T1~6	Terminal
F01	Fuse AC250V 6.3A F

Note:1. TB02 is transmission terminal block.
 Never connect power line to it.
 2. The initial set values of switch on CONT.B are as follows.
 SW1:0
 SW2:0



(3) Outdoor unit

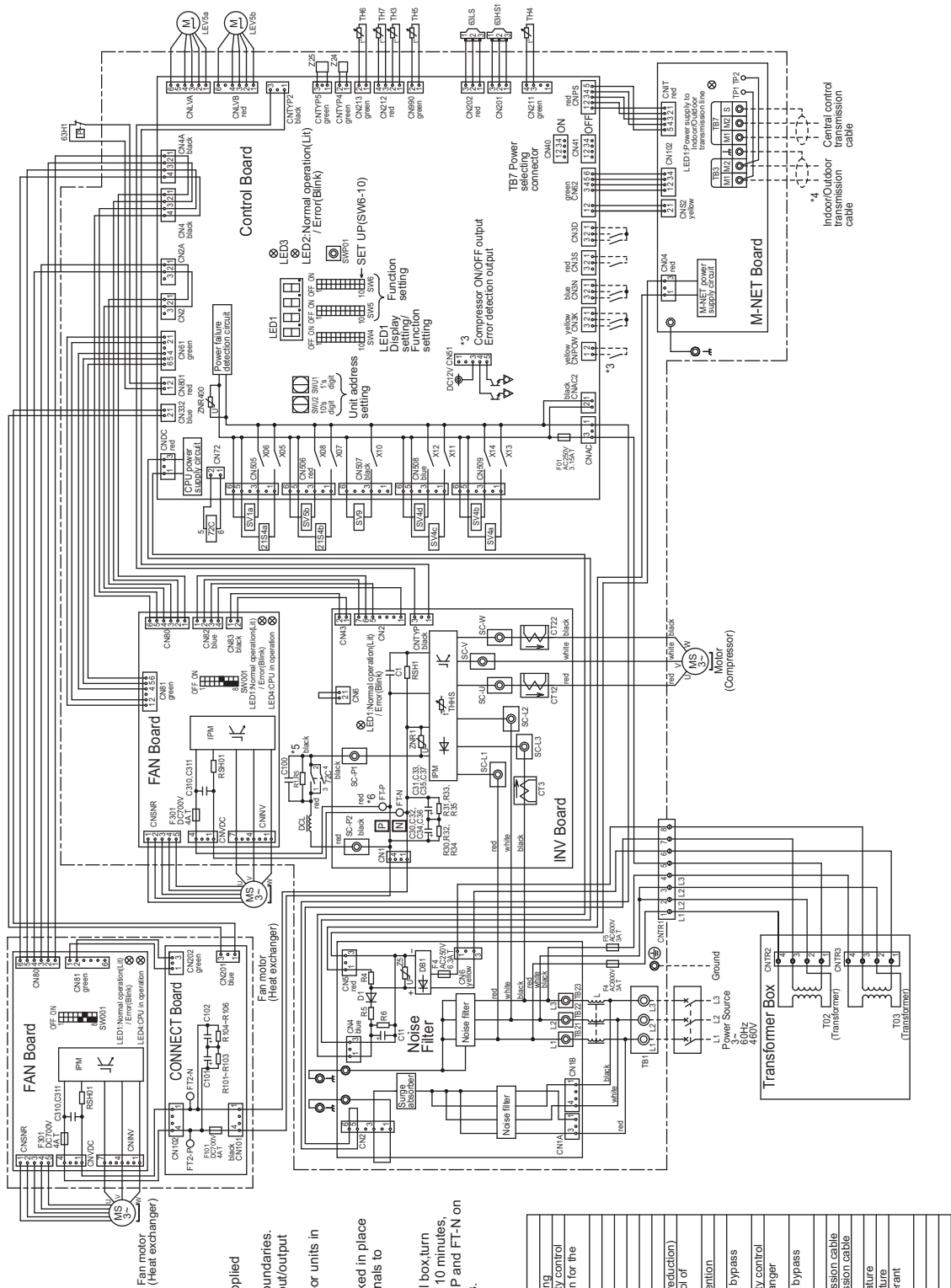
PURY-P120TKMU-A(-BS)



<Symbol explanation>

Symbol	Explanation	Symbol	Explanation
21S4a	4-way valve	SV1a	Solenoid valve
21S4b	Cooling/Heating switching	SV4a,b,c,d	For opening/closing the bypass circuit under the O/S
63H1	High pressure protection for the solenoid valve	SV5b	Heat exchanger capacity control
63HS1	Pressure sensor	SV9	For opening/closing the bypass circuit
63LS	Low pressure sensor		
X001	Magnetic relay (inverter main circuit)/2C		
ACCT1.2	Current sensor(AC)	TB1	Terminal block
C1	Capacitor (inverter main circuit)	TB3	Indoor/Outdoor transmission cable
DCCT1	Current sensor(DC)	TB7	Central control transmission cable
DCL	DC reactor	TH3	Pipe temperature
L	Choke coil (for high frequency noise reduction)	TH4	Discharge pipe temperature
LEV5a,b	Linear expansion valve (for the control of evaporating temperature)	TH5	ACC inlet pipe temperature
TH6	Subcooled liquid refrigerant temperature	TH7	O/A temperature
R1	Resistor	THHS	IPW temperature
RS-H01	For inrush current prevention	Z24,Z5,Z6	Function setting connector
	For current detection		

- *1. Single-dotted lines indicate wiring not supplied with the unit.
- *2. Dot-dash lines indicate the control box boundaries.
- *3. Refer to the Data book for connecting input/output signal connectors.
- *4. Daisy-chain terminals (TB3) on the outdoor units in the same refrigerant system together.
- *5. Faston terminals have a locking function. Make sure the terminals are securely locked in place after insertion. Press the tab on the terminals to removed them.
- *6. Control box houses high-voltage parts. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the voltage at both ends of the main capacitor (C1) has dropped to DC20V or less.



- *1. Single-dotted lines indicate wiring not supplied with the unit.
- *2. Dot-dash lines indicate the control box boundaries.
- *3. Refer to the Data book for connecting input/output signal connectors.
- *4. Daisy-chain terminals (TB3) on the outdoor units in the same refrigerant system together.
- *5. Faston terminals have a locking function. Make sure the terminals are securely locked in place after insertion. Press the tab on the terminals to removed them.
- *6. Control box houses high-voltage parts. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the voltage between FT-P and FT-N on INV Board has dropped to DC20V or less.

<Symbol explanation>

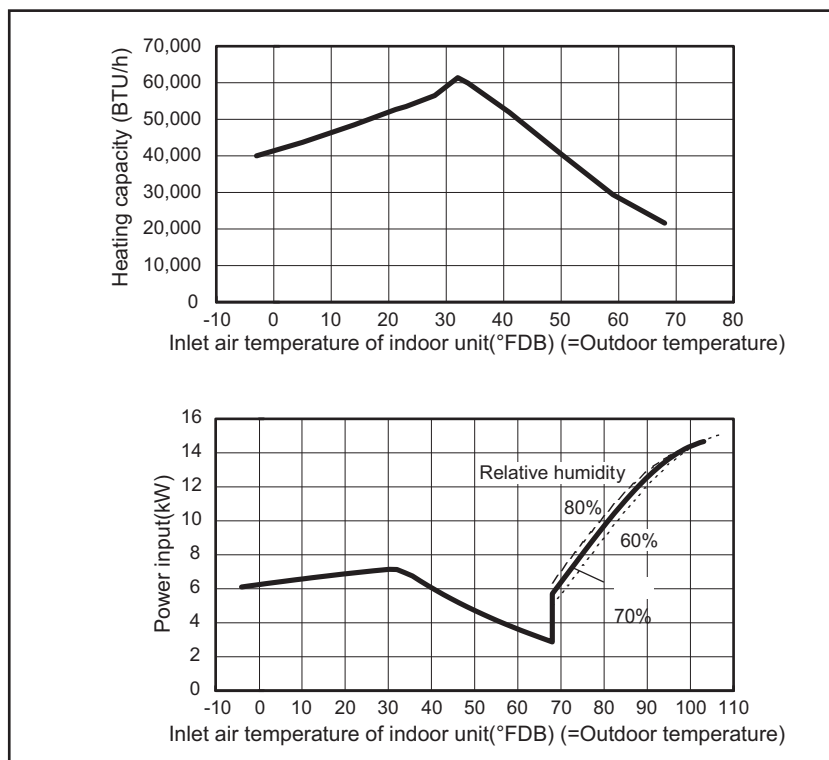
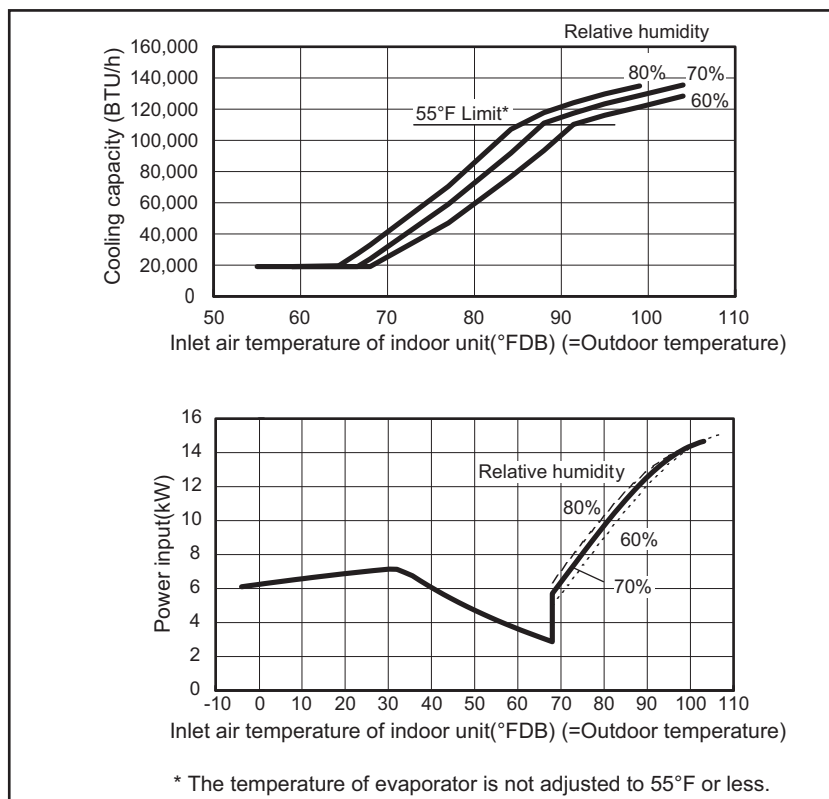
Symbol	Explanation
21S4a	4-way valve
21S4b	Cooling/Heating switching
63H1	Heat exchanger capacity control
63H1	Pressure switch
63H1	High pressure protection for the outdoor unit
63LS	Pressure sensor
63LS	Discharge pressure
72C	Low pressure
C30-C37	Magnetic relay (inverter main circuit)
CT12/22/31	Capacitor (inverter main circuit)
DC	DC reactor
L	Choke coil (for high frequency noise reduction)
R1.5	Resistor (for the control of evaporating temperature)
RS401/RS41	For inrush current prevention
SV1a	For current detection
SV4a,b,c,d	For opening/closing the bypass circuit under the O/S
SV5b	Heat exchanger capacity control
SV9	Outdoor unit heat exchanger capacity control
SV9	For opening/closing the bypass circuit
TB1	Power supply
TB3	Terminal block
TB7	Indoor/Outdoor transmission cable
TB3	Central control transmission cable
TH3	Thermistor
TH3	Discharge pipe temperature
TH4	ACC inlet pipe temperature
TH5	Subcooled liquid refrigerant temperature
TH6	O/A temperature
TH7	IPM temperature
THHS	Function setting connector
Z24,Z5	

III Product Data (PEFY-AF1200CFMR)

1. Capacity tables

(1) Correction by temperature

CITY MULTI could have varied capacity at different designing temperature. Using the nominal cooling/heating capacity value and the ratio below, the capacity can be observed at various temperature.



(2) Cooling capacity with PURY-P120TKMU/YKMU-A(-BS)

PEFY-AF1200CFMR

CA : Capacity SHC : Sensible Heat Capacity

Outdoor air temperature		Humidity											
°FDB	°CDB	60%				70%				80%			
		CA(kW)	SHC(kW)	CA(BTU/h)	SHC(BTU/h)	CA(kW)	SHC(kW)	CA(BTU/h)	SHC(BTU/h)	CA(kW)	SHC(kW)	CA(BTU/h)	SHC(BTU/h)
104	40	37.6	13.0	128,400	44,300	39.7	11.1	135,500	37,800	-	-	-	-
99	37	35.6	13.6	121,400	46,400	37.8	11.9	128,800	40,500	39.5	10.4	134,900	35,300
95	35	34.0	13.9	116,100	47,300	36.2	12.4	123,400	42,100	38.1	10.9	129,800	37,200
88	31	27.4	12.8	93,500	43,700	32.6	12.8	111,100	43,700	34.5	11.7	117,800	39,800
77	25	13.8	8.6	47,000	29,300	17.3	8.6	59,100	29,300	20.7	8.6	70,500	29,200
68	20	5.6	5.5	19,100	18,700	7.1	5.1	24,000	17,200	9.7	5.1	32,900	17,300
59	15	5.6	5.5	19,100	18,600	5.6	4.5	19,100	15,500	5.6	3.7	19,100	12,700
55	13	5.6	5.5	19,100	18,600	5.6	4.6	19,100	15,600	5.6	3.8	19,100	13,100

This table shows the capacity in case that the target outlet air temperature of the evaporator is 55°F.
Outdoor air temperature means Inlet air temperature of indoor unit in the table above.

(3) Heating capacity with PURY-P120TKMU/YKMU-A(-BS)

PEFY-AF1200CFMR

SHC : Sensible Heat Capacity

Outdoor air temperature				SHC (Set=63°F*)		SHC (Set=73°F*)		SHC (Set=83°F*)	
°FDB	°CDB	°FWB	°CWB	BTU/h	kW	BTU/h	kW	BTU/h	kW
-3	-19.5	-4	-20	40,000	11.7	40,000	11.7	40,000	11.7
5	-15	4	-16	43,700	12.8	43,700	12.8	43,700	12.8
14	-10	12	-11	48,500	14.2	48,500	14.2	48,500	14.2
23	-5	21	-6	50,200	14.7	53,500	15.7	53,500	15.7
32	0	29	-2	38,800	11.4	51,400	15.1	61,400	18.0
41	5	37	3	27,600	8.1	40,100	11.8	51,900	15.2
50	10	45	7	21,600	6.3	28,800	8.5	40,500	11.9
59	15	54	12	21,600	6.3	21,600	6.3	29,400	8.6
68	20	62	17	0	0.0	21,600	6.3	21,600	6.3

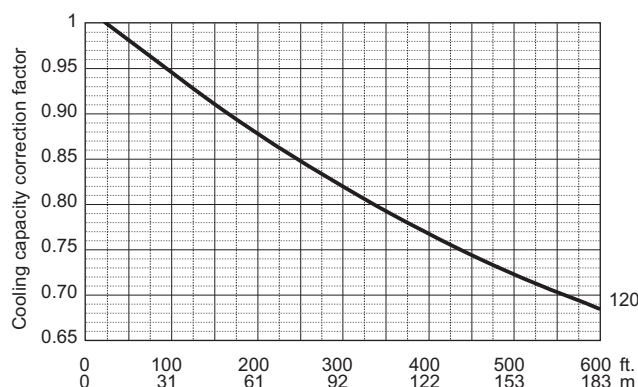
*There are times when the temperature of supply air does not reach the setting temperature in the low outdoor air temperature.
Outdoor air temperature means Inlet air temperature of indoor unit in the table above.

(4) Correction by refrigerant piping length

CITY MULTI system can extend the piping flexibly within its limitation for the actual situation. Yet, a decrease of cooling/heating capacity could happen correspondently. Using following correction factor according to the equivalent length of the piping shown at (4)-1 and (4)-2, the capacity can be observed. (4)-3 shows how to obtain the equivalent length of piping.

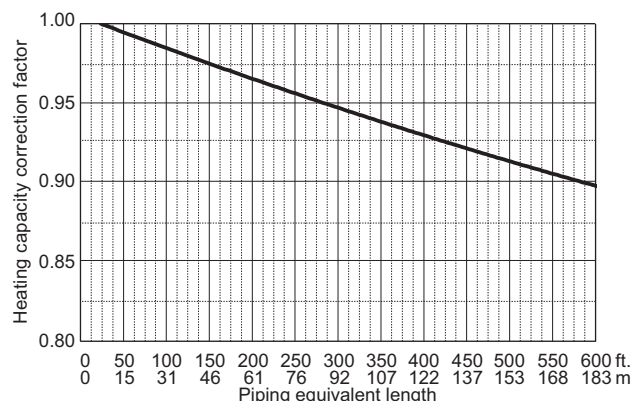
(4)-1. Cooling capacity correction

PURY-P120TKMU/YKMU-A(-BS)



(4)-2. Heating capacity correction

PURY-P120TKMU/YKMU-A(-BS)



(4)-3. How to obtain the equivalent length of piping

PURY-P120TKMU/YKMU-A(-BS)

Equivalent length = (Actual piping length to the farthest indoor unit) + (1.64 x number of bent on the piping) ft.

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.50 x number of bent on the piping) m

(5) Correction at frosting and defrosting

Due to frosting at the outdoor heat exchanger and the automatic defrosting operation, the heating capacity of the outdoor unit should be considered by multiplying the correction factor shown in the table below.

Table of correction factor at frosting and defrosting

Outdoor inlet air temp. °C	6	4	2	1	0	-2	-4	-6	-8	-10	-20
Outdoor inlet air temp. °F	43	39	36	34	32	28	25	21	18	14	-4
PURY-P120TKMU/YKMU-A(-BS)	1.00	0.93	0.85	0.83	0.84	0.86	0.90	0.90	0.92	0.95	0.95

* The correction factors in the table above are used for a full-load and above.

Use the formula below to calculate the correction factor to use for a partial load.

Correction factor for partial load : K

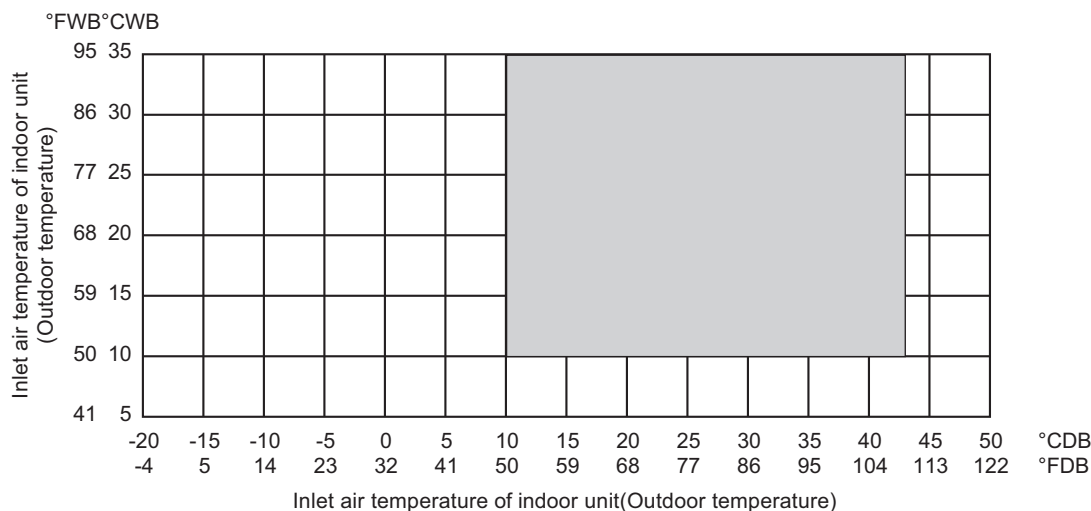
Correction factor for a full load and above : K₀

Partial load factor : A

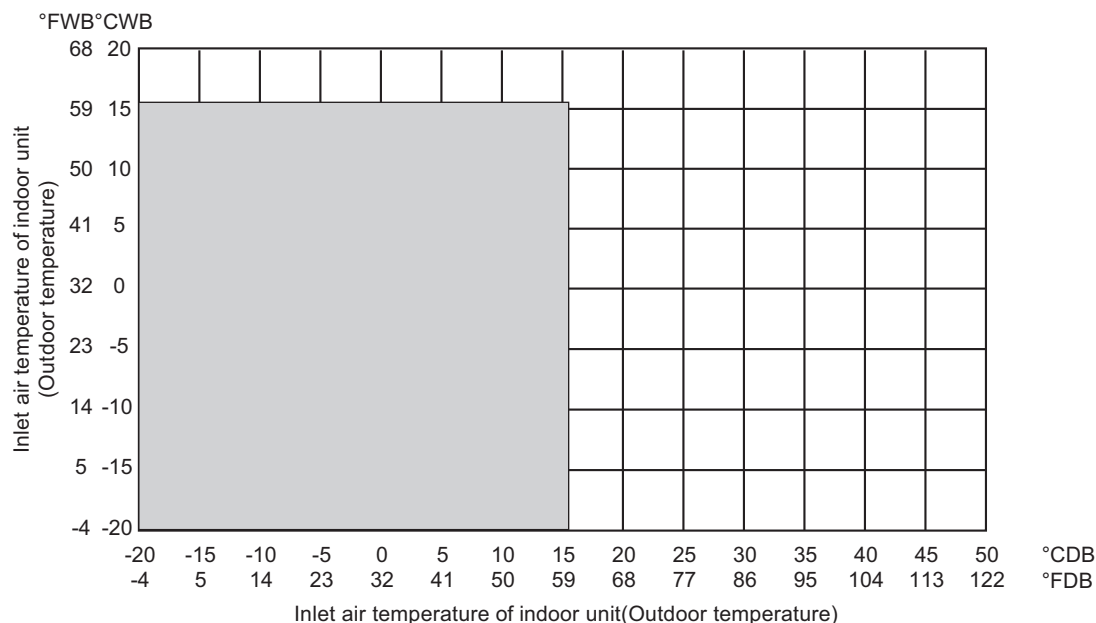
$$K = 1 - (1 - K_0) \times A$$

(6) Temp. range of running

Cooling



Heating

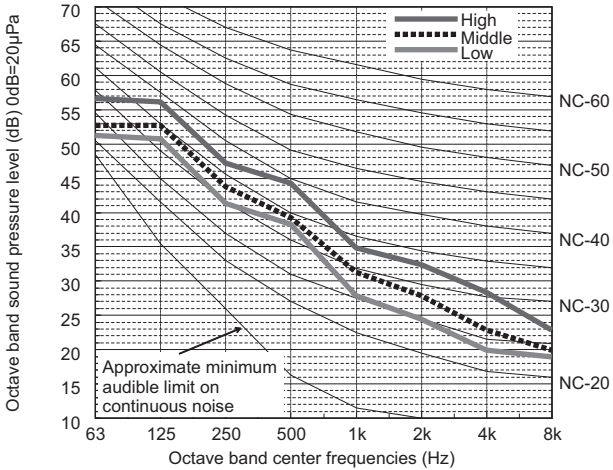
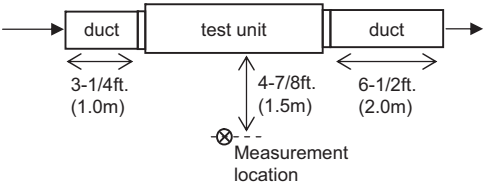


2. Sound levels

(1) Indoor unit

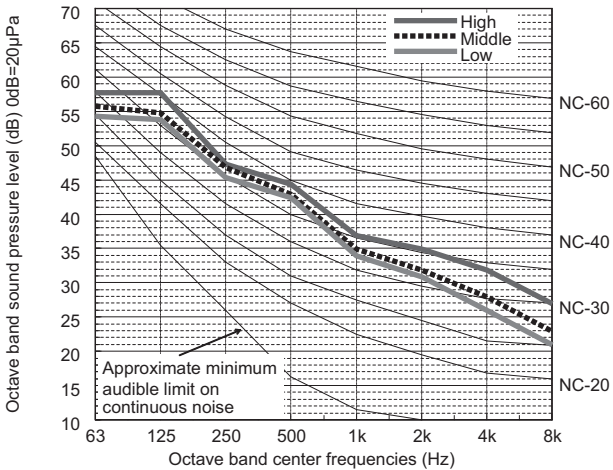
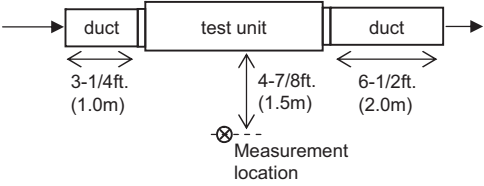
PEFY-AF1200CFMR

Power source : Single phase 208V 60Hz
External static pressure[in.WG]([Pa])
High : 0.80(200)
Middle : 0.48(120)
Low : 0.28(70)



Condition (External static pressure)	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
High	57.0	56.5	47.5	44.5	35.0	32.5	28.5	23.0	46.0
Middle	53.0	53.0	44.0	39.5	31.5	28.0	23.0	20.0	42.0
Low	51.5	51.0	41.5	38.5	28.0	24.5	20.0	19.0	40.0

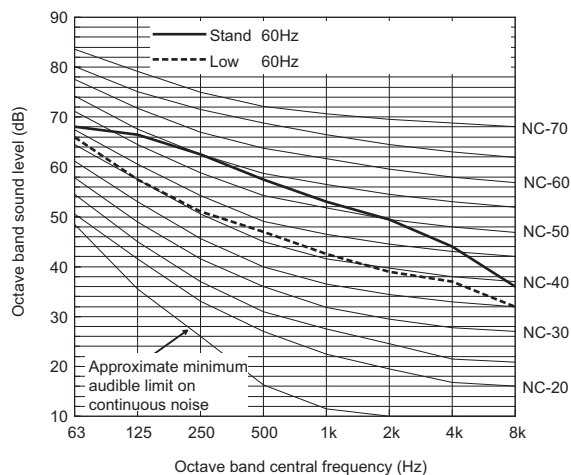
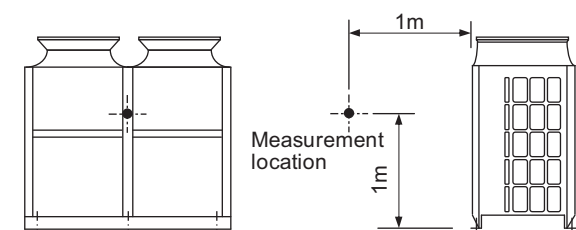
Power source : Single phase 230V 60Hz
External static pressure[in.WG]([Pa])
High : 0.96(240)
Middle : 0.72(180)
Low : 0.52(130)



Condition (External static pressure)	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
High	58.0	58.0	47.5	44.5	37.0	35.0	32.0	27.0	47.0
Middle	56.0	55.0	47.0	43.0	35.0	32.0	28.0	23.0	45.0
Low	54.5	54.0	45.5	42.5	34.0	31.0	26.0	21.0	44.0

(2) Outdoor unit

PURY-P120TKMU/YKMU-A(-BS)



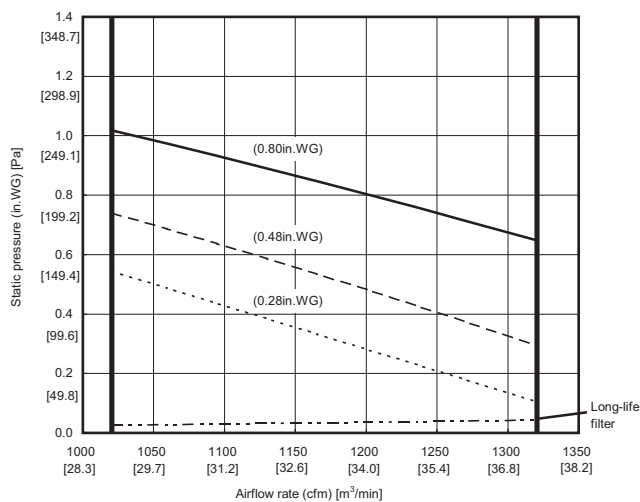
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Standard	60Hz	68.0	66.5	62.5	57.5	53.0	49.5	44.0	36.0	60.0
Low noise mode	60Hz	66.0	57.5	51.0	47.0	42.5	39.0	37.0	32.0	50.0

When Low noise mode is set, the A/C system's capacity is limited. The system could return to normal operation from Low noise mode automatically in the case that the operation condition is severe.

3. Fan characteristics curves

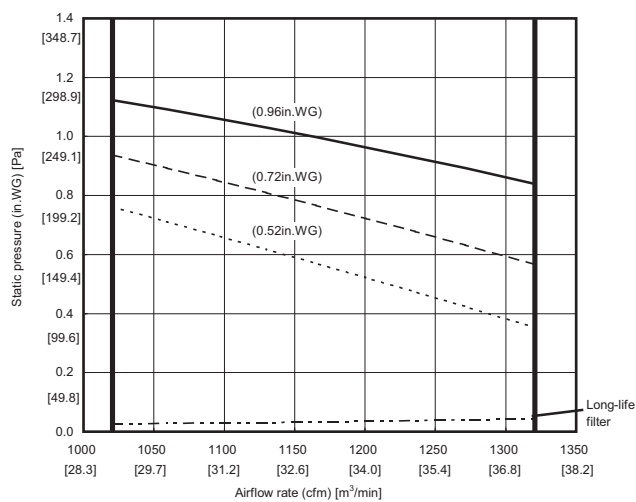
PEFY-AF1200CFMR

External static pressure : 0.80, 0.48, 0.28 (in.WG), 200, 120, 70 [Pa]
Power source : 208V / 60Hz



PEFY-AF1200CFMR

External static pressure : 0.96, 0.72, 0.52 (in.WG), 240, 180, 130 [Pa]
Power source : 230V / 60Hz



IV Piping Design (PEFY-AF1200CFMR)

1. R410A piping material

Refrigerant pipe for CITY MULTI shall be made of phosphorus deoxidized copper, and has two types.

A. Type-O : Soft copper pipe (annealed copper pipe), can be easily bent with human's hand.

B. Type-1/2H pipe : Hard copper pipe (Straight pipe), being stronger than Type-O pipe of the same radial thickness.

The maximum operation pressure of R410A air conditioner is 4.30 MPa . The refrigerant piping should ensure the safety under the maximum operation pressure. MITSUBISHI ELECTRIC recommends pipe size as [Table 1-1], or You shall follow the local industrial standard. Pipes of radial thickness 0.7mm or less shall not be used.

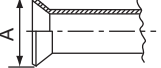
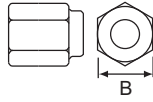
[Table 1-1] Copper pipe size and radial thickness for R410A CITY MULTI.

Size (mm)	Size (inch)	Radial thickness (mm)	Pipe type
ø6.35	ø1/4"	0.8	Type-O
ø9.52	ø3/8"	0.8	Type-O
ø12.7	ø1/2"	0.8	Type-O
ø15.88	ø5/8"	1.0	Type-O
ø19.05	ø3/4"	1.2	Type-O
ø19.05	ø3/4"	1.0	Type-1/2H or H
ø22.2	ø7/8"	1.0	Type-1/2H or H
ø25.4	ø1"	1.0	Type-1/2H or H
ø28.58	ø1-1/8"	1.0	Type-1/2H or H
ø31.75	ø1-1/4"	1.1	Type-1/2H or H
ø34.93	ø1-3/8"	1.2	Type-1/2H or H
ø41.28	ø1-5/8"	1.4	Type-1/2H or H

* For pipe sized ø19.05 (3/4") for R410A air conditioner, choice of pipe type is up to you.

Flare

Due to the relative higher operation pressure of R410A compared to R22, the flare connection should follow dimensions mentioned below so as to achieve enough the air-tightness.

Flare pipe	Pipe size	A (For R410A) (mm[in.])	Flare nut	Pipe size	B (For R410A) (mm[in.])
	ø6.35 [1/4"]	9.1		ø6.35 [1/4"]	17.0
	ø9.52 [3/8"]	13.2		ø9.52 [3/8"]	22.0
	ø12.70 [1/2"]	16.6		ø12.70 [1/2"]	26.0
	ø15.88 [5/8"]	19.7		ø15.88 [5/8"]	29.0
	ø19.05 [3/4"]	24.0		ø19.05 [3/4"]	36.0

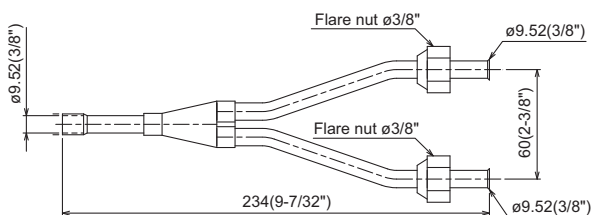
2. Piping design

(1) PURY-P120TKMU/YKMU-A(-BS) + PEFY-AF1200CFMR

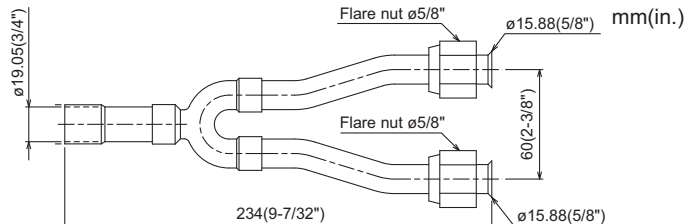
Note

1. Use the optionally available twinning pipe (CMY-R160C-J) and filed supplied twinning pipe to connect between the BC controller and indoor units.
2. As bents cause pressure loss on transportation of refrigerant, fewer bents design is better;
Piping length needs to consider the actual length and equivalent length which bents are counted.
Equivalent piping length (m)
=Actual piping length+"M" x Quantity of bent.
3. Set DIP-SW 6-2 to ON of BC controller. (SW4-6=OFF)

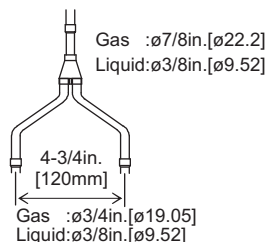
[Fig.(1)-1] Twinning pipe (CMY-R160C-J)
Liquid side



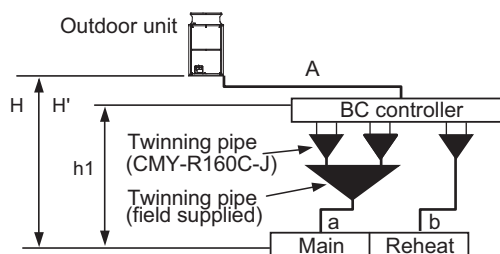
Gas side



[Fig.(1)-2] Twinning pipe (field supplied)



[Fig.(1)-3] Piping scheme



[Table (1)-1] Piping length limitation

Item	Piping in the figure	Max. length	Max. equivalent length
Total piping length	A+a+b	*1	-
Farthest IU from OU	A+a	165 [541]	190 [623]
Distance between OU and BC	A	110 [360] *1	110 [360] *1
Farthest IU from BC controller	a	40 [131] *2	40 [131] *2
Height between OU and IU (OU above IU)	H	50 [164]	-
Height between OU and IU (OU under IU)	H'	40 [131]	-
Height between IU and BC	h1	15 [49] (10 [32]) *3	-

OU : Outdoor Unit ; IU : Indoor Unit ; BC : BC controller

*1. Please refer to [Fig.(1)-5]

*2. Farthest Indoor from BC controller "a" can exceed 40m(131ft.) till 60m(197ft.) if no Indoor sized P72, P96 connected. Details refer to [Fig.(1)-4]

*3. Distance of Indoor from BC must be less than 10m(33ft.), if any.

[Table (1)-2] Bends equivalent length "M"

Outdoor Model	M (m/bends [ft./bends])
PURY-P120TKMU/YKMU-A(-BS)	0.50 [1.64]

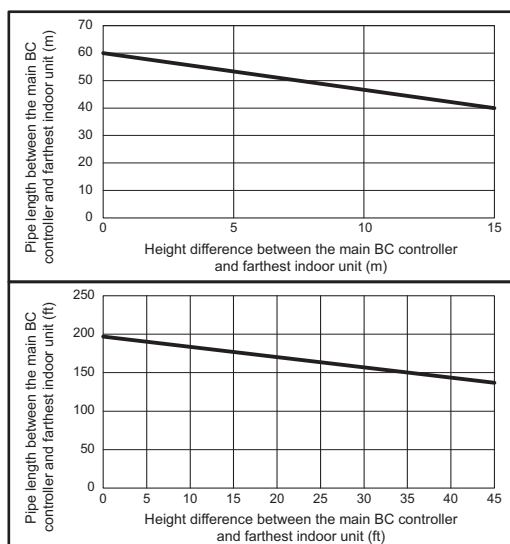
[Table (1)-3] Piping "A" size selection rule

Outdoor Model	Pipe(High pressure)	Pipe(Low pressure)
PURY-P120TKMU/YKMU-A(-BS)	ø19.05 [3/4"]	ø28.58 [1-1/8"]

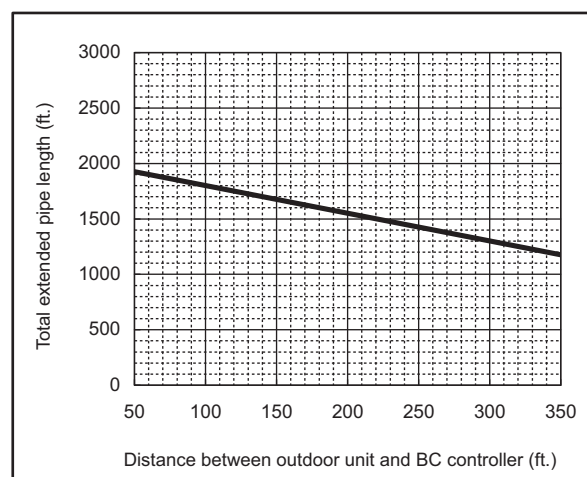
[Table (1)-4] Piping "a", "b", "c", "d" size selection rule

Indoor Unit size	Pipe(Liquid)	Pipe(Gas)
Main, Reheat	ø9.52 [3/8"]	ø22.20 [7/8"]

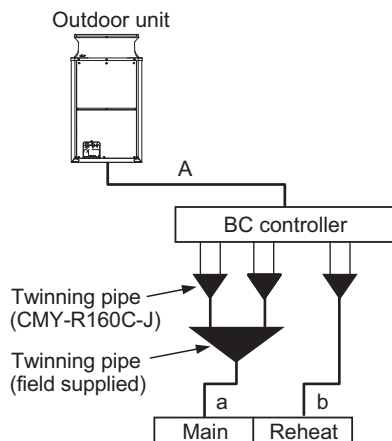
[Fig.(1)-4] Piping length and height between IU and BC controller



[Fig.(1)-5] Total piping length restrictions
PURY-P120TKMU/YKMU-A(-BS)



(2) Calculation of additional refrigerant to be charged



•Amount of additional refrigerant to be charged

- Refrigerant for extended pipes (field piping) is not factory-charged to the outdoor unit. Add an appropriate amount of refrigerant for each pipes on site.
- Record the size of each high pressure pipe and liquid pipe, and the amount of refrigerant that was charged on the outdoor unit for future reference.

•Calculating the amount of additional refrigerant to be charged

- The amount of refrigerant to be charged is calculated with the size of the on-site-installed high pressure pipes and liquid pipes, and their length.
- Calculate the amount of refrigerant to be charged according to the formula below.
- Round up the calculation result to the nearest 0.1kg. (i.e., 12.38kg[435.1oz] = 12.4 kg[436oz])

<Amount of additional refrigerant to be charged>

•Calculating the amount of additional refrigerant to be charged

Additional refrigerant charge	=	High pressure pipe size Total length of ø 19.05mm[3/4 in]	+	Liquid Piping size Total length of ø 9.52mm[3/8 in]	+
(kg)[oz]		(m) × 0.16(kg/m) (ft) × 1.73(oz/ft)		(m) × 0.06(kg/m) (ft) × 0.65(oz/ft)	

Total Outdoor Unit Model Name	Charged amount per BC controller (Standard / Main)	+	Connected Indoor Units	Charged amount
PURY-P120TKMU/YKMU-A(-BS)	4.5 kg[160oz]		PEFY-AF1200CFMR	3.0 kg [106 oz]

•Amount of factory charged refrigerant

Outdoor unit Model	Charged amount
PURY-P120TKMU/YKMU-A(-BS)	11.8 kg[416oz]

•Sample calculation

A :	ø19.05 [3/4"]	40m [131ft.]
a :	ø9.52 [3/8"]	18m [59ft.]
b :	ø9.52 [3/8"]	18m [59ft.]

Total length for each pipe size :	ø19.05	A = 40m [131ft.]
	ø9.52	a + b = 36m [118ft.]

Therefore, additional refrigerant charge	= 40 × 0.16 + 36 × 0.06 + 4.5 + 3.0
(kg)	= 16.06kg
	≒ 16.1kg

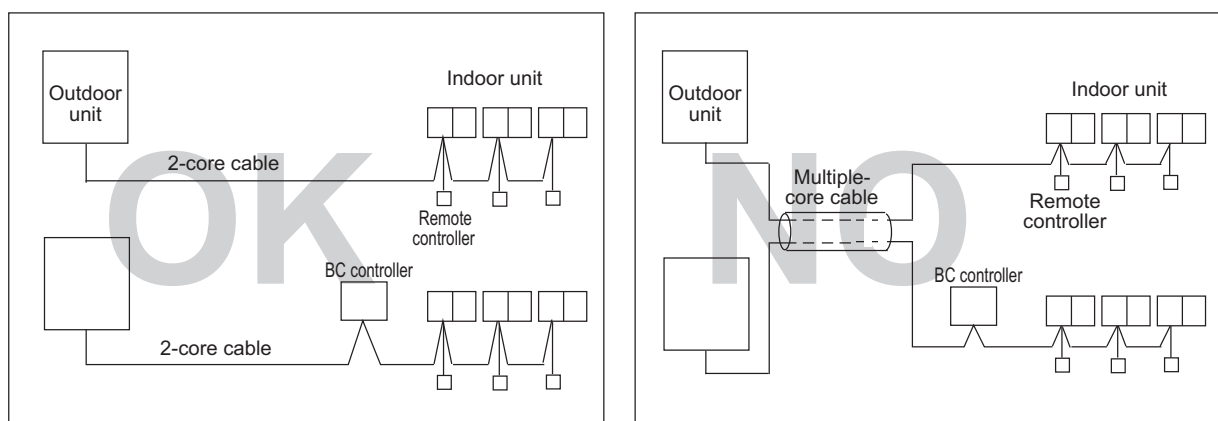
or	
Therefore, additional refrigerant charge	= 131 × 1.73 + 118 × 0.65 + 160 + 106
(oz)	= 569.33oz
	≒ 570oz

V Wiring Design (PEFY-AF1200CFMR)

1. Electrical work

(1) General cautions

- 1) Follow ordinance of your governmental organization for technical standard related to electrical equipment, wiring regulations, and guidance of each electric power company.
- 2) Wiring for control (hereinafter referred to as transmission cable) shall be (50mm or more) apart from power source wiring so that it is not influenced by electric noise from power source wiring. (Do not insert transmission cable and power source wire in the same conduit.)
- 3) Be sure to provide designated grounding work to outdoor unit.
- 4) Give some allowance to wiring for electrical part box of indoor and outdoor units, because the box is sometimes removed at the time of service work.
- 5) Never connect 380~415V(220~240V) power source to terminal block of transmission cable. If connected, electrical parts will be burnt out.
- 6) Use 2-core shield cable for transmission cable. If transmission cables of different systems are wired with the same multiple-core cable, the resultant poor transmitting and receiving will cause erroneous operations.



(2) Power supply for Indoor unit and Outdoor unit

(2)-1. Electrical characteristics of Indoor unit

•Symbols: MCA:Min.Circuit Amps (=1.25 x FLA) FLA:Full Load Amps IFM:Indoor Fan Motor Output:Fan motor rated output

Model	Indoor Unit				IFM	
	Hz	Volts	Voltage range	MCA(A)	Output(kW)	FLA(A)
PEFY-AF1200CFMR	60Hz	208 / 230V	188 to 253V	3.99 / 4.31	0.62 / 0.74	3.19 / 3.45

(2)-2. Electrical characteristics of BC controller

•Symbols:MCA:Min.Circuit Amps (=1.25 x RLA) FLA:Full Load Amps RLA:Rated Load Amps

Model	Hz	Volts	Voltage range	MCA(A)	FLA(A)	RLA(A)
CMB-P106NU-G	60Hz	208 / 230V	198 to 253V	0.53 / 0.48	15 / 15	0.42 / 0.38
CMB-P108NU-G				0.68 / 0.61	15 / 15	0.54 / 0.49

(2)-3. Electrical characteristics of Outdoor unit at cooling mode

•Symbols:MCA:Min.Circuit Amps SC:Starting Current

Model	Outdoor Units						Compressor		FAN
	Hz	Volts	Voltage range	MCA (A)	Max.Fuse (A)	MCOP (A)	Output (kW)	SC(A)	Output (kW)
PURY-P120TKMU-A(-BS)	60Hz	208 / 230V	188 to 253V	45 / 42	50	74 / 68	8.2	15	0.92+0.92
PURY-P120YKMU-A(-BS)		460V	414 to 506V	21	25	34	8.2	7	0.92+0.92

(2)-4. Power cable specifications

Thickness of wire for main power supply, capacities of the switch and system impedance

3-phase 3-wire , 208/230V , 60Hz	Minimum wire thickness (mm ² /AWG)			Switch(A)		Breaker for wiring (NFB)	Breaker for current leakage
	Main cable	Branch	Ground	Capacity	Fuse		
PURY-P120TKMU-A(-BS)	13.3/6	-	13.3/6	50	50	50	50A 100mA 0.1sec. or less
PEFY-AF1200CFMR	2.1/14	2.1/14	2.1/14	15	15	15	20A 30mA or 100mA 0.1sec. or less

3-phase 3-wire , 460V , 60Hz	Minimum wire thickness (mm ² /AWG)			Switch(A)		Breaker for wiring (NFB)	Breaker for current leakage
	Main cable	Branch	Ground	Capacity	Fuse		
PURY-P120YKMU-A(-BS)	5.3/10	-	5.3/10	25	25	25	25A 30mA or 100mA 0.1sec. or less
PEFY-AF1200CFMR	2.1/14	2.1/14	2.1/14	15	15	15	20A 30mA or 100mA 0.1sec. or less

- 1) Use dedicated power supplies for the outdoor unit and indoor unit. Ensure OC is wired individually.
- 2) Bear in mind ambient conditions (ambient temperature, direct sunlight, rain water, etc.) when proceeding with the wiring and connections.
- 3) The wire size is the minimum value for metal conduit wiring. If the voltage drops, use a wire that is one rank thicker in diameter. Make sure the power-supply voltage does not drop more than 10%.
- 4) Specific wiring requirements should adhere to the wiring regulations of the region.
- 5) Power supply cords of parts of appliances for outdoor use shall not be lighter than polychloroprene sheathed flexible cord (design 245 IEC57). For example, use wiring such as YZW.
- 6) A switch with at least 3 mm [1/8 in.] contact separation in each pole shall be provided by the Air Conditioner installer.

 WARNING

- Be sure to use specified wires for connections and ensure no external force is imparted to terminal connections. If connections are not fixed firmly, heating or fire may result.
- Be sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.

 CAUTION

- A breaker for current leakage must be attached to the power supply. If no earth leakage breaker is installed, it may cause an electric shock.
- Do not use anything other than a breaker and fuse with the correct capacity. Using a fuse or wire of too large capacity may cause malfunction or fire.

The local standards and/or regulations is applicable at a higher priority.

The diagram illustrates the electrical connections between a system controller (SC) and a power supply unit (OU). A dashed line at the top indicates a connection to a system controller, with the note: "<In the case a system controller is connected.>".

System Controller (SC) Connections:

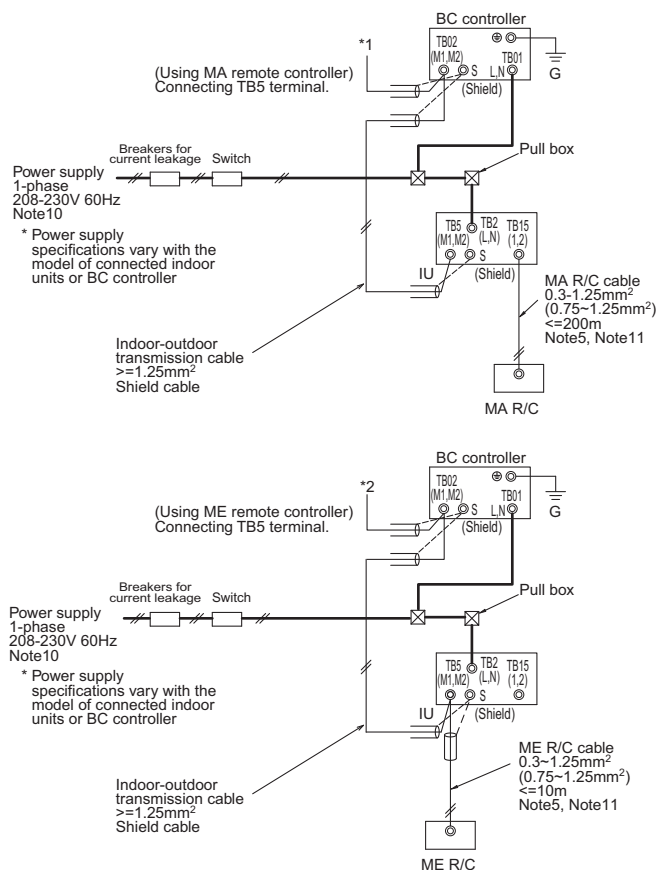
- Note12:** Points to the SC unit.
- Central control transmission cable $\geq 1.25\text{mm}^2$:** Connects the SC to the OU.
- Shield cable (CVVS, CPEVS, MVVS):** Connects the SC to the OU.

Power Supply Unit (OU) Connections:

- Connector CN41~CN40:** Connects the SC to the OU.
- Note4:** Points to the connector area.
- OU:** The main power supply unit.
- To other OU:** A connection point for multiple units.
- Breakers for current leakage:** Located on the input power line.
- Switch:** A manual switch on the input power line.
- Input Power:** Labeled as "Over supply phase 3-wire", "230V 60Hz (TKMU)", and "V 60Hz (YKMU)".
- Grounding:** A ground symbol (G) is shown, with a connection to the bottom of the OU.
- Note3:** Points to the bottom of the OU.
- Output:** Labeled "To *1 or *2", with a connection to the bottom of the OU.

Internal Connections within the OU:

- TB1 (L1, L2, L3):** Main power input terminals.
- TB3 (N1, N2):** Neutral input terminals.
- TB7 (M1, M2):** Motor input terminals.
- TB7 (S):** Switch input terminal.



- Note:
 - 1 The transmission cable is non-polarity double-wire.
 - 2 Symbol © means a screw terminal for wiring.
 - 3 The shield wire of transmission cable should be connected to the grounding terminal at Outdoor unit. All shield wire of M-Net transmission cable among Indoor units should be connected to the S terminal at Indoor unit or all shield wire should be connected together.

The broken line at the scheme means shield wire.
 - 4 When the Outdoor unit connected with system controller, power-supply to TB7 of the outdoor unit(s) is needed. The connector change from CN41 to CN40 at one of the outdoor units will enable the outdoor unit to supply power to TB7, or an extra power supplying unit PAC-SC51KUA should be used. The transmission cable (above 1.25mm², shielded, CVVS/CPEVS/MVVS) among Outdoor units and system controllers is called central control transmission cable. The shield wire of the central control transmission cable must be grounded at the Outdoor unit whose CN41 is changed to CN40.
 - 5 MA R/C transmission cable (0.3-1.25mm²) must be less than 200m in length, while ME R/C transmission cable (0.3-1.25mm²) must be less than 10m in length. But transmission cable to the ME R/C can be extend using a M-NET cable ($\geq 1.25\text{mm}^2$) when the length is counted in the M-Net length. Both Compact MA and ME R/C transmission cables size 0.75-1.25mm² in thickness.
 - 6 MA remote controller and ME remote controller should not be grouped together. When a PAR-30MAA is connected to a group, no other MA remote controllers can be connected to the same group.
 - 7 If using 1 or 2 (main/sub) MA remote controller to control more than 1 Indoor unit, use MA transmission cable to connect all the TB15 terminals of the Indoor units. It is called "Grouping".

If using 1 or 2 (main/sub) ME remote controller control more than 1 indoor unit, set address to Indoor unit and ME remote controller. For the method, refer to V 2. (3) "Address setting".
 - 8 Indoor board consumes power from TB3. The power balance should be considered according to System Design 2-3 "System configuration restrictions".
 - 9 If Transmission booster is needed, be sure to connect the shield wires to the both sides to the booster.
 - 10 The critical current for choosing power source equipment is approximate 1.4 times of total rated current of the Outdoor unit(s) or Indoor unit(s).
 - 11 Numbers shown with () indicates a diameter of the compact remote controller.
 - 12 When System controller (SC) is connected to the system, turn the SW2-1 on.
 - 13 The phases of electricity power must be confirmed to be right used. Phase-reverse, or phase-missing could break the controllers.

Symbol		Model	Breakers for current leakage *1, *2, *4	Switch		Switch*4	Minimum Wire thickness	
				BKC <A>	OCP*3, *4 <A>	(NFB) <A>	Power wire <mm ² /AWG>	G wire <mm ² /AWG>
BKC	Breaker capacity	PURY-P120TKMU	50 A 100 mA 0.1 sec. or less	50	50	50	13.3/6	13.3/6
OCP	Over-current protector	PURY-P120YKMU	25 A 30 mA or 100 mA 0.1 sec. or less	25	25	25	5.3/10	5.3/10
NFB	Non-fuse breaker	*1 The breakers for current leakage should support Inverter circuit. (e.g. Mitsubishi Electric's NV-C series or equivalent).						
OU	Outdoor unit	*2 Breakers for current leakage should combine using of switch.						
IU	Indoor unit	*3 It shows data for B-type fuse of the breaker for current leakage.						
SC	System controller	*4 If a large electric current flows due to malfunction or faulty wiring, earth-leakage breakers on the unit side and on the centralized controller side may both operate.						
MA R/C	MA remote controller	Depending on the importance of the system, separate the power supply system or take protective coordination of breakers.						
ME R/C	ME remote controller							

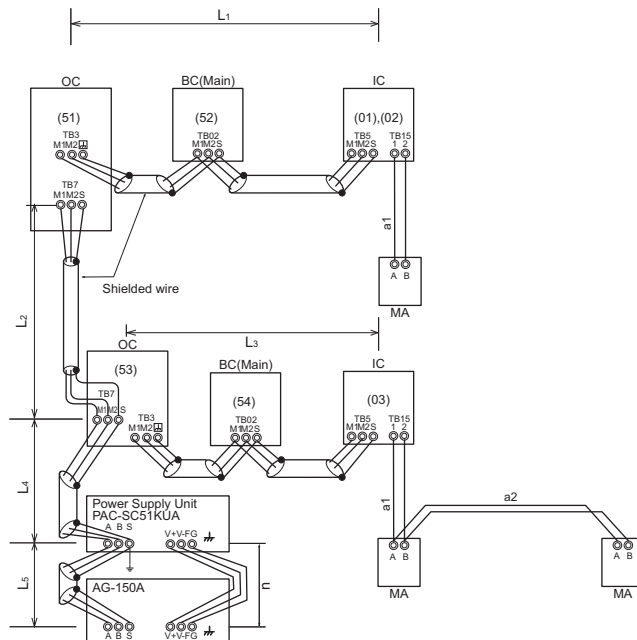
2. M-NET control

(1) Transmission cable length limitation

(1)-1. Using MA Remote controller

Long transmission cable causes voltage down, therefore, the length limitation should be obeyed to secure proper transmission.

Max. length via Outdoor (M-NET cable)	$L1+L2+L3, L1+L2+L4+L5, L3+L4+L5$	$\leq 500\text{m}[1640\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length to Outdoor (M-NET cable)	$L1, L3, L4, L2+L4, L5$	$\leq 200\text{m}[656\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length from MA to Indoor	$a1+a2$	$\leq 200\text{m}[656\text{ft.}]$	$0.3-1.25\text{mm}^2$ [AWG22-16]
24VDC to AG-150A	n	$\leq 50\text{m}[164\text{ft.}]$	$0.75-2.0\text{mm}^2$ [AWG18-14]



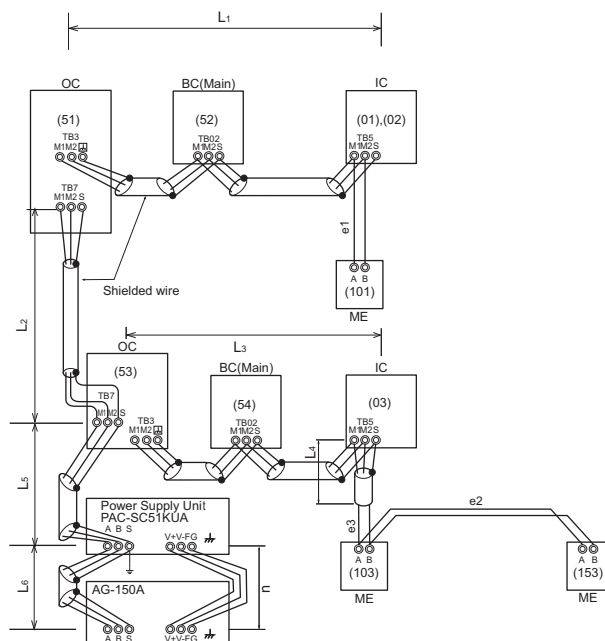
OC : Outdoor unit controller; IC: Indoor unit controller; MA: MA remote controller

(1)-2. Using ME Remote controller

Long transmission cable causes voltage down, therefore, the length limitation should be obeyed to secure proper transmission.

Max. length via Outdoor (M-NET cable)	$L1+L2+L3, L1+L2+L5+L6, L1+L2+L3+L4, L3+L5+L6$	$\leq 500\text{m}[1640\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length to Outdoor (M-NET cable)	$L1, L3, L5, L2+L5, L6, L3+L4$	$\leq 200\text{m}[656\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length from ME to Indoor	$e1, e2, e3$	$\leq 10\text{m}[32\text{ft.}]^*1$	$0.3-1.25\text{mm}^2$ [AWG22-16] *1
24VDC to AG-150A	n	$\leq 50\text{m}[164\text{ft.}]$	$0.75-2.0\text{mm}^2$ [AWG18-14]

*1. If the length from ME to Indoor exceed 10m, use 1.25mm^2 [AWG16] shielded cable, but the total length should be counted into Max. length via Outdoor.



OC : Outdoor unit controller; IC: Indoor unit controller; ME: ME remote controller

(2) Transmission cable specifications

System configuration	For a single-refrigerant system		
Transmission cable length	Less than 120 m [394 ft]		More than 120 m [394 ft]
Facility example (for electrical noise judgment)	Residence or independent store without electrical noise	Building, clinic, hospital or communications station without electrical noise supposedly generated from inverter equipment, private power generator, high-frequency medical equipment, radio-used communications equipment and so on	All facilities
Types of transmission cables	VCTF, VCTFK, CVV, CVS, VVR, VVF, VCT or shielding wire CVVS or CPEVS	Shielding wire CVVS or CPEVS	
Length	Less than 120 m [394 ft]		Less than 200 m [656 ft]

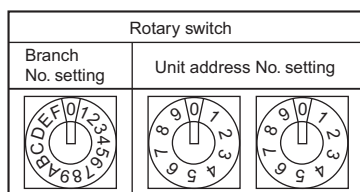
	MA remote controller	M-NET remote controller
Types of cables	Sheathed 2-core cable (unshielded) CVV	Sheathed 2-core cable (unshielded) CVV
Cable diameter	0.3 to 1.25 mm ² [AWG22 to 16]	0.3 to 1.25 mm ² [AWG22 to 16]
Length	Less than 200 m [656 ft]	Add any portion in excess of 10 m [32 ft] to within the longest allowable transmission cable length 200 m [656 ft] (Shielding portion is more than 1.25 mm ² [AWG16])

CVVS,MVVS : PVC insulated PVC jacketed shielded control cable
CPEVS : PE insulated PVC jacketed shielded communication cable
CVV : PVC insulated PVC sheathed control cable

(3) Address setting

(3)-1. Switch operation

In order to constitute CITY MULTI in a complete system, switch operation for setting the unit address No. and connection No. is required.



1) Address No. of outdoor unit, indoor unit and remote controller.

The address No. is set at the address setting board.

In the case of R2 system, it is necessary to set the same No. at the branch No. switch of indoor unit as that of the BC controller connected. (When connecting two or more branches, use the lowest branch No.)

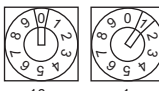
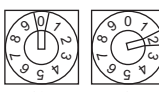
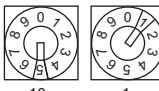
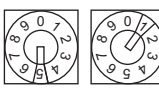
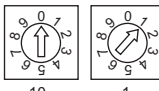
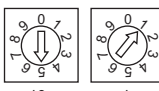
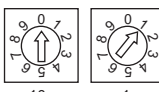
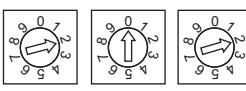
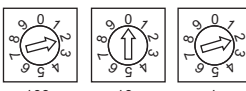
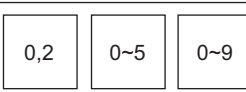
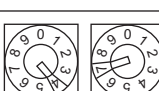
2) Caution for switch operations

- Do not use the same port number for both the main and reheat units. Assign different port numbers to each of them.
- Be sure to shut off power source before switch setting. If operated with power source on, switch can not operate properly.
- No units with identical unit address shall exist in one whole air conditioner system. If set erroneously, the system can not operate.

3) MA remote controller

- When connecting only one remote controller to one group, it is always the main remote controller. When connecting two remote controllers to one group, set one remote controller as the main remote controller and the other as the sub remote controller.
- The factory setting is "Main".
- Refer to the "Instruction Book" that came with the MA remote controller for how to set the switches.

(3)-2. Rule of setting address

Unit		Address setting	Example		Note
Indoor unit		01 ~ 50	Main  Reheat 		Use the most recent address within the same group of indoor units. Different address settings are required for the main and reheat units. Assign an address to the reheat unit that equals the address of the main unit plus 1.
Outdoor unit		51 ~ 99, 100 (Note1)			The smallest address of indoor unit in same refrigerant system + 50 Assign sequential address numbers to the outdoor units in one refrigerant circuit system. OC and OS are automatically detected. (Note 2) * Please reset one of them to an address between 51 and 99 when two addresses overlap. * The address automatically becomes "100" if it is set as "01~ 50"
BC controller		52 ~ 99, 100			The address of outdoor unit + 1 * Please reset one of them to an address between 51 and 99 when two addresses overlap. * The address automatically becomes "100" if it is set as "01~ 50"
Local remote controller	ME, LOSSNAY Remote controller (Main)	101 ~ 150	1 Fixed		The smallest address of indoor unit in the group + 100 * The place of "100" is fixed to "1"
	ME, LOSSNAY Remote controller (Sub)	151 ~ 199, 200	1 Fixed		The address of main remote controller + 50 * The address automatically becomes "200" if it is set as "00"
System controller	Group remote controller	201 ~ 250	2 Fixed		The smallest group No. to be managed + 200
	System remote controller	000, 201 ~ 250			
	ON/OFF remote controller	000, 201 ~ 250			The smallest group No. to be managed + 200 * The smallest group No. to be managed is changeable.
	AG-150A G-50A GB-50A	000, 201 ~ 250			
	LMAP03U	201 ~ 250	2 Fixed		

Note1: To set the address to "100", set it to "50"

Note2: Outdoor units OC and OS in one refrigerant circuit system are automatically detected.

OC and OS are ranked in descending order of capacity. If units are the same capacity, they are ranked in ascending order of their address.

(3)-3. System examples

Factory setting

Original switch setting of the outdoors, indoors, controllers and LMAP at shipment is as follows.

- Outdoor unit : Address: 00, CN41: U (Jumper), DipSW2-1: OFF
- Indoor unit : Address: 00
- BC controller : Address: 00
- Remote controller : Address: 100

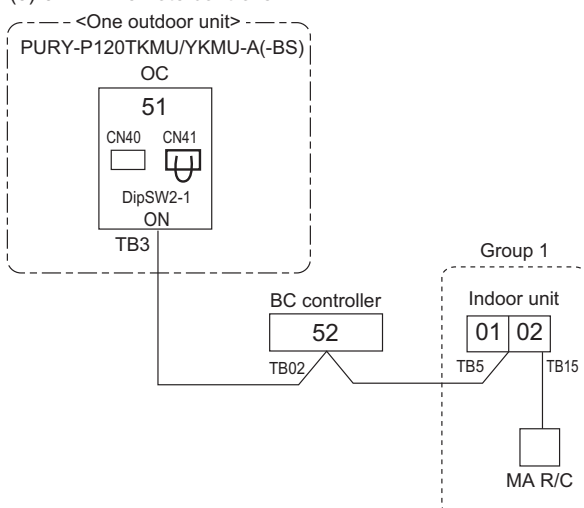
Setting at the site

- DipSW2-1(Outdoor) : When the System Remote Controller is used, all the Dip SW2-1 at the outdoor units should be set to "ON".
- DipSW4-6/2 (BC controller) : Set DipSW to the following table setting.

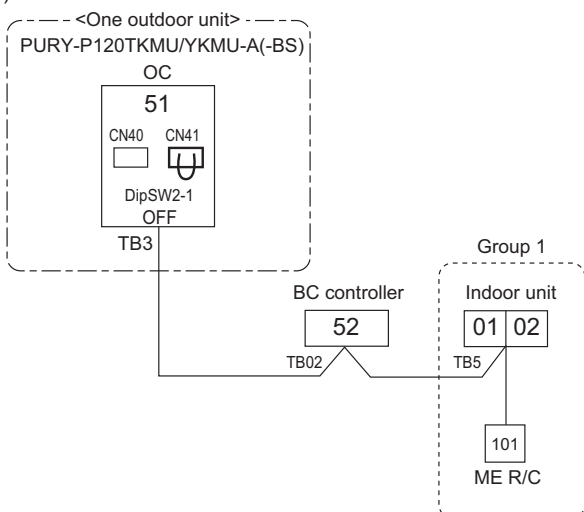
DipSW	Outdoor unit
	PURY-P120TKMU/YKMU-A(-BS)
SW4-6	OFF
SW6-2	ON

- CN40/CN41 : Change jumper from CN41 to CN 40 at outdoor control board will activate central transmission power supply to TB7;
Power supply unit is recommended to use for a system having more than 1 outdoor unit, because the central transmission power supply from TB7 of one of outdoor units is risking that the outdoor unit failure may let down the whole central control system.

(3)-3-1 MA remote controller



(3)-3-2 ME remote controller



VI | General Equipment Descriptions (PEFY-AF1200CFM)

1. Unit configuration table

Model	PEFY-AF1200CFM
Outdoor unit	PUHY-P120TKMU-A(-BS)
	PUHY-P120YKMU-A(-BS)

2. Operable temperature range

	Cooling	Heating
Indoor unit inlet air temperature	50 to 95°F W.B. (109°F D.B.) 10 to 35°C W.B. (43°C D.B.)	-4 to 60°F W.B. -20 to 15.5°C W.B.
Outdoor unit inlet air temperature	23 to 109°F D.B. -5 to 43°C D.B.	-4 to 60°F D.B. -20 to 15.5°C D.B.

VII Product Specifications (PEFY-AF1200CFM)

1. Specifications

(1) Indoor unit

Model			PEFY-AF1200CFM	
Power source			1-phase 208/230V 60Hz	
Cooling capacity (Nominal)	BTU / h		112,000	
	kW		32.8	
	Power input	kW	0.66/0.78	
	Current input	A	3.19/3.45	
Heating capacity (Nominal)	BTU / h		61,400	
	kW		18	
	Power input	kW	0.66/0.78	
	Current input	A	3.19/3.45	
External finish			Galvanized	
External dimension H x W x D	in.		18-9/16 x 49-1/4 x 55-1/8	
	mm		470 x 1,250 x 1,400	
Net weight	lbs (kg)		287 (130)	
Heat exchanger			Cross fin (Aluminium fin and copper tube)	
FAN	Type x Quantity		Sirocco fan x 2	
	External static press	in.WG	0.40-0.60-0.88 (208V)	
		Pa	99.6-149-219	
		in.WG	0.64-0.80-1.04 (230V)	
		Pa	159-199-259	
	Motor type		Single phase induction motor	
	Motor output	kW	0.62/0.74	
	Driving mechanism		Direct-driven	
	Airflow rate	cfm	1,200	
		m ³ / min	34	
		L / s	566	
Sound pressure level (Low-Mid-High) (measured in anechoic room)	dB <A>		36-38-41 (208V)	
	dB <A>		39-41-43 (230V)	
	dB <A>		-	
Insulation material			Polyethylene foam, Polyurethane foam, Polystyren foam	
Air filter			Field supply	
Protection device			Fuse	
Refrigerant control device			LEV	
Connectable outdoor unit			PUHY-P120TKMU-A(-BS), PUHY-P120YKMU-A(-BS)	
Diameter of refrigerant pipe (O.D.)	Liquid*7 (R410A)	in. (mm)	3/8 (9.52) Brazed	
	Gas (R410A)	in. (mm)	7/8 (22.2) Brazed	
Diameter of drain pipe		in. (mm)	O.D. 1-1/4(32) x 2	

- Note :
- Standard capacities are the maximum capacities that are obtained in the following conditions;
Air conditions : cooling : indoor 87°FDB/80°F WB (30.5°CDB/26.7°CWB) outdoor 87°FDB (30.5°CDB) heating : indoor 32°FDB (0°CDB) outdoor 32°FDB (0°CDB)/28°FDB (-2°CWB), Connected outdoor unit is PUHY-P120TKMU/YKMU-A(-BS)
Piping length : 24.6 feet (7.5m) Height difference : 0 feet (0m)
 - This value shows the data per unit.
 - Sound pressure level is the data that was obtained in anechoic room by the following conditions;
The measuring point is 4.9feet (1.5m) from the bottom of the unit that has 6.6feet (2m) outlet duct and 6.6feet (2m) intake duct.
 - When combining the drain pipes, ensure that collected pipes are 3-15/16inch (10cm) lower than the unit body's drain port.
 - The choice of indoor unit operation mode is limited to auto mode.
 - Refer to following table for connecting the indoor unit to the outdoor unit.

Outdoor model	Liquid pipe	Gas pipe
PUHY-P120TKMU/YKMU-A(-BS)	1/2 [ø12.7]	7/8 [ø22.2]

(2) Outdoor unit

Outdoor Model			PUHY-P120TKMU-A (-BS)			
Indoor Model			Non-Ducted		Ducted	
Power source			3-phase 3-wire 208-230 V ±10% 60 Hz			
Cooling capacity (Nominal)	*1	BTU/h	120,000			
		kW	35.2			
	(208-230)	Power input	kW			
		Current input	A			
	(Rated)	BTU/h	114,000			
		kW	33.4			
	(208-230)	Power input	kW		8.56	8.27
		Current input	A		26.4-23.8	25.5-23.0
Heating capacity (Nominal)	*2	BTU/h	135,000			
		kW	39.6			
	(208-230)	Power input	kW			
		Current input	A			
	(Rated)	BTU/h	129,000			
		kW	37.8			
	(208-230)	Power input	kW		9.46	9.57
		Current input	A		29.1-26.3	29.5-26.6
Temp. range of heating	Indoor	D.B.	59~81°F (15~27°C)			
	Outdoor	W.B.	-4~60°F (-20~15.5°C)			
Indoor unit	Total capacity		50~130% of outdoor unit capacity			
	Model/Quantity		P06~P96/1~26			
Sound pressure level (measured in anechoic room)		dB <A>	60.0			
Refrigerant piping diameter	Liquid pipe	in. (mm)	3/8 (9.52) Brazed (1/2 (12.7) Brazed, the farthest pipe length ≥ 40 m)			
	Gas pipe	in. (mm)	1-1/8 (28.58) Brazed			
Minimum Circuit Ampacity		A	45-42			
Maximum Overcurrent Protection		A	73-67			
FAN	Type x Quantity		Propeller fan x 2			
	Airflow rate	cfm	11,300			
		m ³ /min	320			
		L/s	5,330			
		Control, Driving mechanism		Inverter-control, Brushless DC motor		
	Motor output	kW	0.92+0.92			
	*3	External static press.	0 in.WG (0 Pa)			
Compressor	Type x Quantity		Inverter scroll hermetic compressor x 1			
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION			
	Starting method		Inverter			
	Motor output	kW	8.1 x 1			
	Case heater	kW	-			
	Lubricant		MEL32			
External finish			Pre-coated galvanized steel sheet (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>			
External dimension H x W x D		in.	64-31/32 x 68-29/32 x 29-5/32			
		mm	1,650 x 1,750 x 740			
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)			
	Inverter circuit (COMP./FAN)		Over-current protection			
	Fan motor		Thermal switch			
Refrigerant	Type x original charge		R410A x 26 lbs + 1 oz (11.8 kg)			
	Control		LEV and HIC circuit			
Net weight		lbs (kg)	697 (316)			
Heat exchanger			Salt-resistant cross fin & copper tube			
HIC circuit (HIC: Heat Inter-Changer)			Copper pipe, tube-in-tube structure			
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle)			
Drawing	External		KD94R321			
	Wiring		KE94C649			
Standard attachment	Document		Installation Manual			
	Accessory		Details refer to External Drw			
Optional parts			joint: CMY-Y102SS/LS-G2 Header: CMY-Y104/108/1010C-G			
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.			

Notes:

- Cooling conditions (Test conditions are based on AHRI 1230)
Indoor: 80°F D.B./67°F W.B. (26.7°C D.B./19.4°C W.B.), Outdoor: 95°F D.B. (35°C D.B.)
- Heating conditions (Test conditions are based on AHRI 1230)
Indoor: 70°F D.B. (21.1°C D.B.), Outdoor: 47°F D.B./43°F W.B. (8.3°C D.B./6.1°C W.B.)
- External static pressure option is available (0.12 in.WG, 0.24 in.WG/30 Pa, 60 Pa).

Unit converter

BTU/h	=kW x 3.412
cfm	=m ³ /min x 35.31
lbs	=kg /0.4536

* Due to continuing improvement, above specifications may be subject to change without notice.

*Above specification data is subject to rounding variation.

Outdoor Model			PUHY-P120YKMU-A (-BS)	
Indoor Model			Non-Ducted	Ducted
Power source			3-phase 3-wire 460 V ±10% 60 Hz	
Cooling capacity (Nominal)	*1	BTU/h	120,000	
		kW	35.2	
	(460)	Power input	9.09	
		Current input	12.6	
	(Rated)	BTU/h	114,000	
		kW	33.4	
	(460)	Power input	8.56	8.27
		Current input	11.9	11.5
Heating capacity (Nominal)	*2	BTU/h	135,000	
		kW	39.6	
	(460)	Power input	10.28	
		Current input	14.3	
	(Rated)	BTU/h	129,000	
		kW	37.8	
	(460)	Power input	9.46	9.57
		Current input	13.1	13.3
Temp. range of heating	Indoor	D.B. 59~81°F (15~27°C)		
	Outdoor	W.B. -4~60°F (-20~15.5°C)		
Indoor unit	Total capacity		50~130% of outdoor unit capacity	
	Model/Quantity		P06~P96/1~26	
Sound pressure level (measured in anechoic room)		dB <A>	60.0	
Refrigerant piping diameter	Liquid pipe	in. (mm)	3/8 (9.52) Brazed (1/2 (12.7) Brazed, the farthest pipe length >= 40 m)	
	Gas pipe	in. (mm)	1-1/8 (28.58) Brazed	
Minimum Circuit Ampacity		A	20	
Maximum Overcurrent Protection		A	33	
FAN	Type x Quantity		Propeller fan x 2	
	Airflow rate	cfm	11,300	
		m ³ /min	320	
		L/s	5,330	
	Control, Driving mechanism		Inverter-control, Brushless DC motor	
	Motor output	kW	0.92+0.92	
	*3	External static press.	0 in.WG (0 Pa)	
Compressor	Type x Quantity		Inverter scroll hermetic compressor x 1	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	8.1 x 1	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Pre-coated galvanized steel sheet (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	
External dimension H x W x D		in.	64-31/32 x 68-29/32 x 29-5/32	
		mm	1,650 x 1,750 x 740	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP./FAN)		Over-current protection	
	Fan motor		Thermal switch	
Refrigerant	Type x original charge		R410A x 26 lbs + 1 oz (11.8 kg)	
	Control		LEV and HIC circuit	
Net weight		lbs (kg)	726 (329)	
Heat exchanger			Salt-resistant cross fin & copper tube	
HIC circuit (HIC: Heat Inter-Changer)			Copper pipe, tube-in-tube structure	
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle)	
Drawing	External		KD94R324	
	Wiring		KE94C643	
Standard attachment	Document		Installation Manual	
	Accessory		Details refer to External Drw	
Optional parts			joint: CMY-Y102SS/LS-G2 Header: CMY-Y104/108/1010C-G	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual.	

Notes:		Unit converter
1.Cooling conditions (Test conditions are based on AHRI 1230) Indoor: 80°F D.B./67°F W.B. (26.7°C D.B./19.4°C W.B.), Outdoor: 95°F D.B. (35°C D.B.)		BTU/h = kW x 3,412
2.Heating conditions (Test conditions are based on AHRI 1230) Indoor: 70°F D.B. (21.1°C D.B.), Outdoor: 47°F D.B./43°F W.B. (8.3°C D.B./6.1°C W.B.)		cfm = m ³ /min x 35.31
3.External static pressure option is available (0.12 in.WG, 0.24 in.WG/30 Pa, 60 Pa).		lbs = kg /0.4536
* Due to continuing improvement, above specifications may be subject to change without notice.		*Above specification data is subject to rounding variation.

(1) Indoor unit

Technical drawings of the access door for service and maintenance.

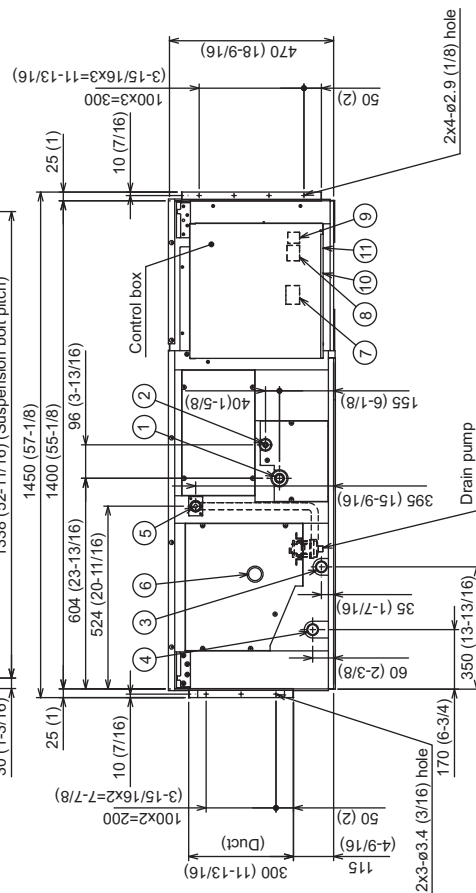
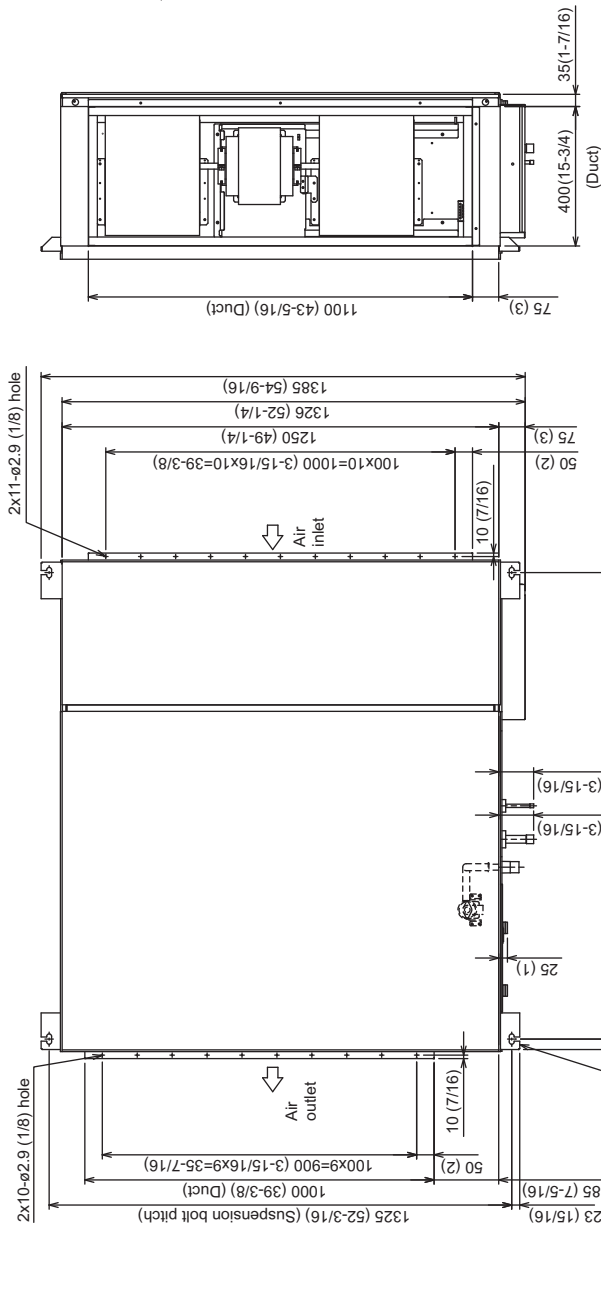
The top drawing is a perspective view showing the door's dimensions: 1070(42-3/16) in width, 600(31-1/2) in depth, and 1580(63-5/16) in height. It also shows internal components like the door handle and latch, and labels "Access door" and "Note 2".

The bottom drawing is a side view showing the door's profile with dimensions: 75(3) in width, 1100(43-5/16) in depth, 400(15-3/4) in height, and 35(1-7/16) in height for the duct. It also shows the door handle and latch mechanism.

Note

1. Use M10 screw for the suspension bolt (field supply).
2. Keep the service space for the maintenance at the bottom.
3. The diameter of piping changes by the connected outdoor unit.
Please connect it by using the attached concentric reducer.

- | | |
|----|---|
| 1 | Refrigerant piping brazing connection (gas)..... |
| 2 | Refrigerant piping brazing connection (liquid)..... |
| 3 | Drain pipe (O.D.ø32(1-1/4)) (Spontaneous draining)..... |
| 4 | Drain pipe (O.D.ø32(1-1/4)) (Emergency draining)..... |
| 5 | Drain pipe (O.D.ø32(1-1/4))..... |
| 6 | Water filling port..... |
| 7 | Terminal block (Power source)..... |
| 8 | Terminal block (Indoor/outdoor connecting)..... |
| 9 | Terminal block (Remote controller transmission)..... |
| 10 | Knockout hole ø22(1-1/8)(Power source wiring)..... |
| 11 | Knockout hole ø22(1-1/8) (Indoor/outdoor connecting wiring
Remote controller transmission wiring)..... |



*Note 3

Indoor unit		Outdoor unit		
Model name	① Gas pipe	② Liquid pipe	Model name	
PEFY-AF1200CFM	ø22.2 (7/8)	ø9.52 (3/8)	PUHY-P120TKMU/YKMU-A(-BS)	Gas pipe ø22.2 (7/8) Liquid pipe ø12.7 (1/2)

(2) Outdoor unit

PUHY-P120TKMU-A(-BS)

Unit : mm(in.)

Note1. Please refer to the next page for information regarding necessary spacing around the unit and foundation work.
2. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

Connecting pipe specifications

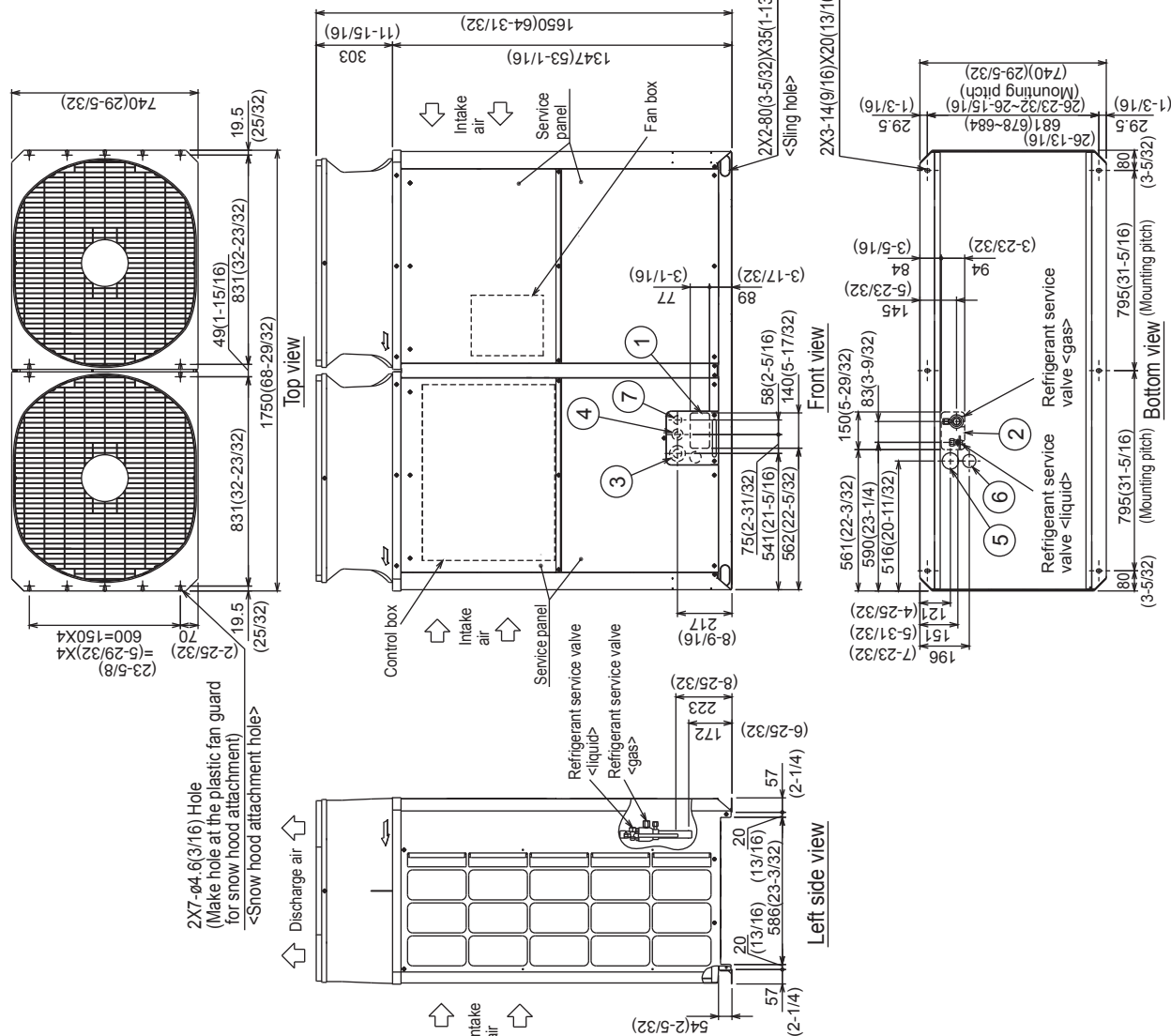
Model	Refrigerant pipe		Diameter	
	Liquid	Gas	Liquid	Gas
PUHY-P120TKMU	ø9.52 Brazed (3/8)"*2 (ø12.7 Brazed) (1/2)"*1*3*4	ø28.58 Brazed (1-1/8)"*2	ø12.7 (1/2)	ø28.58 (1-1/8)

*1 Expand the on-site piping and connect to the refrigerant service valve piping.

*2 Use the pipe joint(field supply) and connect to the refrigerant service valve piping.

*3 Indicates dimensions and connection specifications in the case the unit is used in combination with other outdoor units.

*4 Furthest piping length (OU from IU) ≧ 40m(131ft)

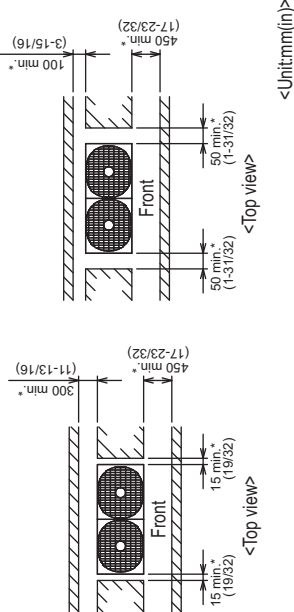


NO.	Usage	Specifications
①	Front through hole	140 x 77 Knockout hole (5-17/32)(3-1/16)
②	Bottom through hole	150 x 94 Knockout hole (5-29/32)(3-23/32)
③	Front through hole	ø62.7 or ø34.5 Knockout hole (2-15/32)(1-3/8)
④	Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	Bottom through hole	ø65 Knockout hole (2-9/16)
⑥	Bottom through hole	ø52 Knockout hole (2-1/16)
⑦	For transmission cables	ø34 Knockout hole (1-11/32)

1.Required space around the unit

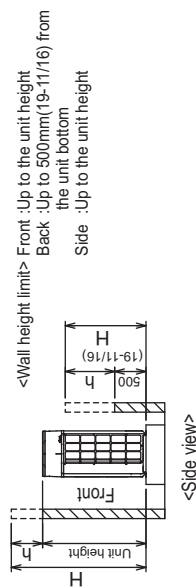
●In case of single installation

- ① Secure enough space around the unit as shown in the figure below.
- With a space of at least 300mm(11-13/16) to the wall on the back of the unit



<Unit:mm(in)>

- ② When the height of the walls on the front,back or on the sides<H> exceeds the wall height limit as defined below add the height that exceeds the height limit <h> to the figures that are marked with an asterisk.



2.Foundation work

- ① Take into consideration the surface strength,water drainage route, piping route,and wiring route when preparing the installation site.
- ② Build the foundation in such way that the corner of the installation leg is securely supported as shown in the right figure.(Fig.A)
When using a rubber isolating cushion, please ensure it is large enough to cover the entire width of each of the unit's legs.
- ③ The protrusion length of the anchor bolt must not exceed 30mm(1-3/16).(Fig.A)
- ④ Use four fixing plates as shown in the right figure <field supply required> when using post-installed anchor bolts.(Fig.B)
- ⑤ To prevent small animals and water and snow from entering the unit and damaging its parts, close the gap around the edges of through holes for pipes and wires with filler plates <field supply required>.
- ⑥ When the pipes or cables are routed at the bottom of the unit, make sure that the through hole at the base of the unit does not get blocked with the installation base.
- ⑦ Refer to the Installation Manual when installing units on an installation base.

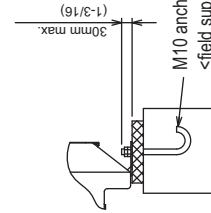


Fig.A

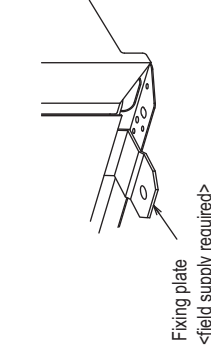
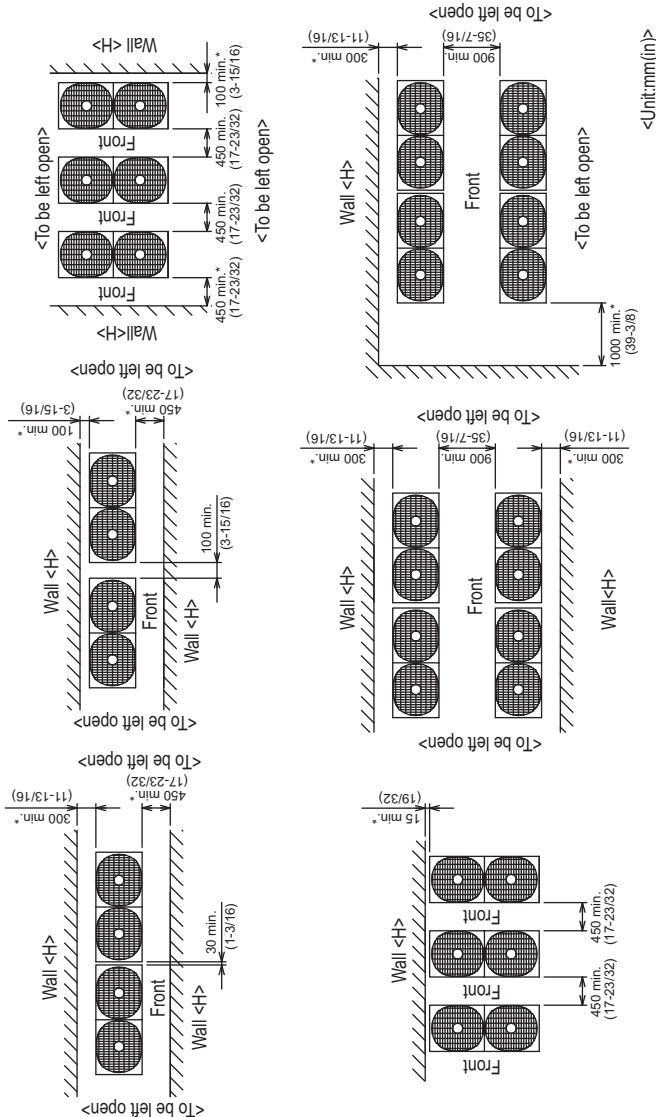


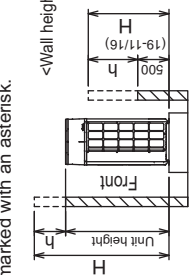
Fig.B

●In case of collective installation

- ① When multiple units are installed adjacent to each other, secure enough space to allow for air circulation and walkway between groups of units as shown in the figures below.
- ② At least two sides must be left open.
- ③ As with the single installation, add the height that exceeds the height limit<h> to the figures that are marked with an asterisk.
- ④ If there is a wall at both the front and the rear of the unit, install up to three units consecutively in the side direction and provide a space of 1000mm or more as inlet space/ passage space for each three units.



<Unit:mm(in)>



<Side view>

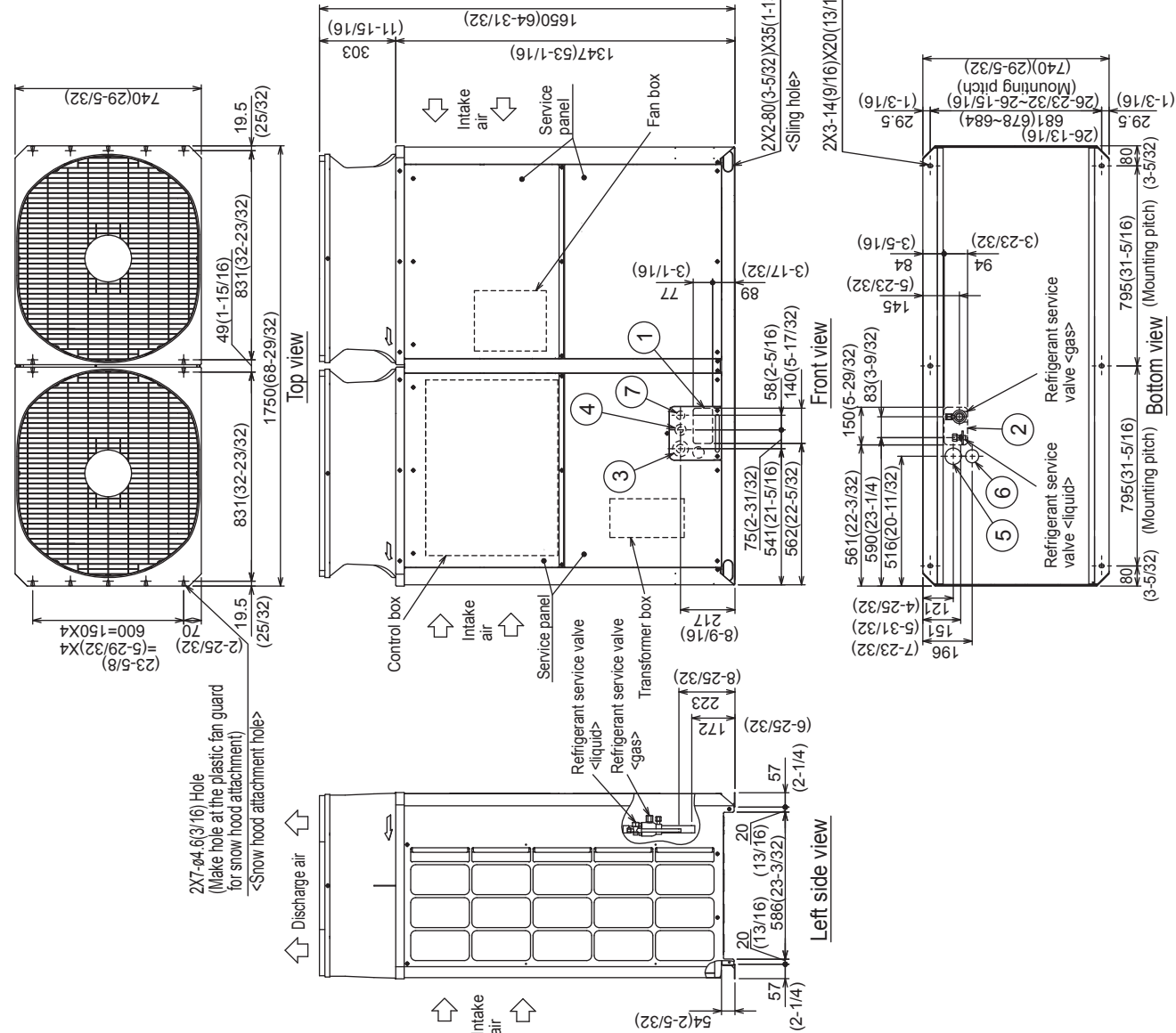
PUHY-P120YKMU-A(-BS)

Note 1. Please refer to the next page for information regarding necessary spacing around the unit and foundation work.
2. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe		Service valve	
	Liquid	Gas	Liquid	Gas
PUHY-P120YKMU	ø9.52 Braze (3/8) *2 (ø12.7 Braze) (1/2) *1 *3 *4	ø28.58 Braze (1-1/8) *2	ø12.7 (1/2)	ø28.58 (1-1/8)

*1 Expand the on-site piping and connect to the refrigerant service valve piping.
*2 Use the pipe joint (field supply) and connect to the refrigerant service valve piping.
*3 Indicates dimensions and connection specifications in the case the unit is used in combination with other outdoor units.
*4 Furthest piping length (OU from IU) ≥ 40m (131ft)



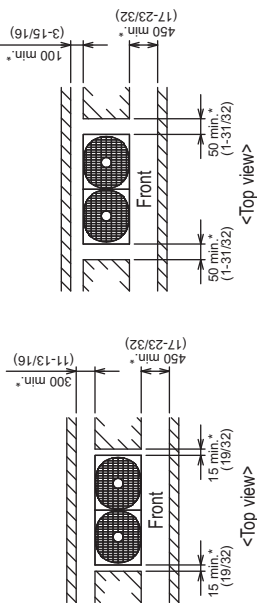
NO.	Usage	Specifications
①	Front through hole	140 x 77 Knockout hole (5-17/32) (3-1/16)
②	Bottom through hole	150 x 94 Knockout hole (5-29/32) (3-23/32)
③	Front through hole	ø2.7 or ø34.5 Knockout hole (2-15/32) (1-3/8)
④	Front through hole	ø43.7 or ø22.2 Knockout hole (1-3/4) (7/8)
⑤	Bottom through hole	ø65 Knockout hole (2-9/16)
⑥	Bottom through hole	ø52 Knockout hole (2-1/16)
⑦	For transmission cables	ø34 Knockout hole (1-11/32)

Unit : mm(in.)

1.Required space around the unit

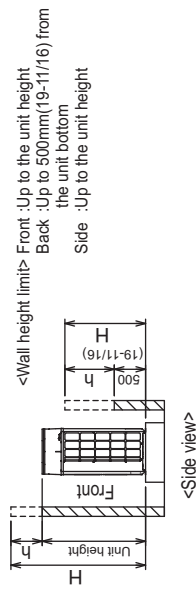
● In case of single installation

- ① Secure enough space around the unit as shown in the figure below.
 - With a space of at least 300mm(11-13/16) to the wall on the back of the unit



<Unit:mm(in)>

- ② When the height of the walls on the front,back or on the sides<H> exceeds the wall height limit as defined below add the height that exceeds the height limit <h> to the figures that are marked with an asterisk.



2.Foundation work

- ① Take into consideration the surface strength,water drainage route, piping route and wiring route when preparing the installation site.
 - <Note that the drain water comes out of the unit during operation.>
- ② Build the foundation in such way that the corner of the installation leg is securely supported as shown in the right figure.(Fig.A)
 - When using a rubber isolating cushion, please ensure it is large enough to cover the entire width of each of the unit's legs.
- ③ The protrusion length of the anchor bolt must not exceed 30mm(1-3/16).(Fig.A)
- ④ Use four fixing plates as shown in the right figure <field supply required> when using post-installed anchor bolts.(Fig.B)
- ⑤ To prevent small animals and water and snow from entering the unit and damaging its parts, close the gap around the edges of through holes for pipes and wires with filler plates <field supply required>
- ⑥ When the pipes or cables are routed at the bottom of the unit, make sure that the through hole at the base of the unit does not get blocked with the installation base.
- ⑦ Refer to the Installation Manual when installing units on an installation base.

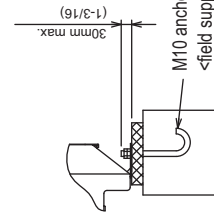


Fig.A

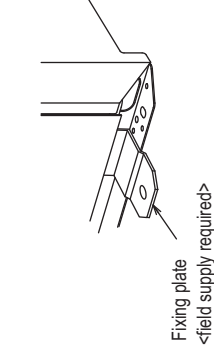
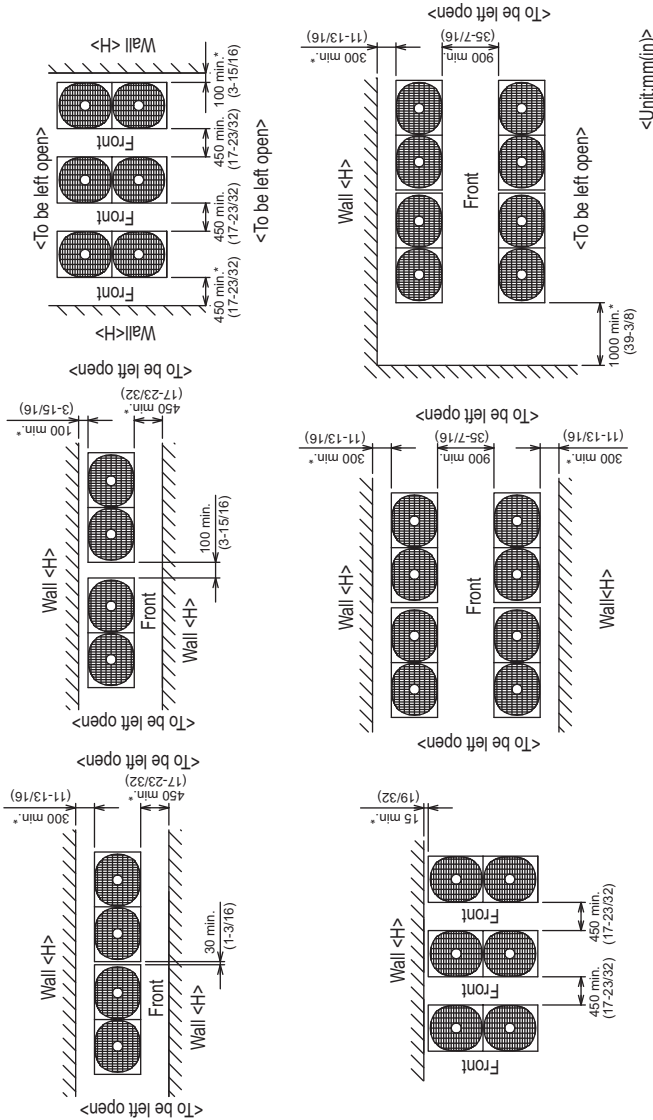


Fig.B

● In case of collective installation

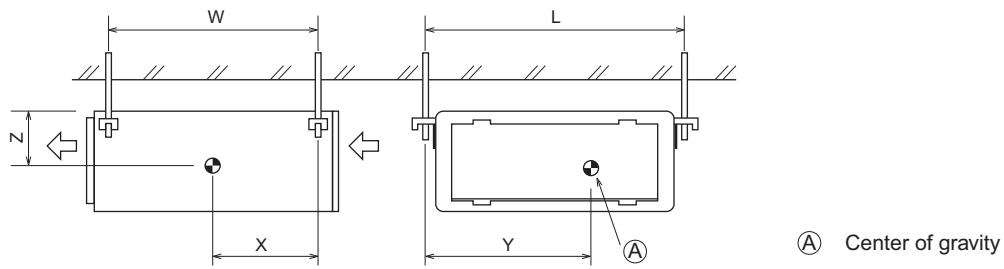
- ① When multiple units are installed adjacent to each other, secure enough space to allow for air circulation and walkway between groups of units as shown in the figures below.
- ② At least two sides must be left open.
- ③ As with the single installation, add the height that exceeds the height limit<h> to the figures that are marked with an asterisk.
- ④ If there is a wall at both the front and the rear of the unit, install up to three units consecutively in the side direction and provide a space of 1000mm or more as inlet space/ passage space for each three units.



<Unit:mm(in)>

3. Center of Gravity

(1) Indoor unit

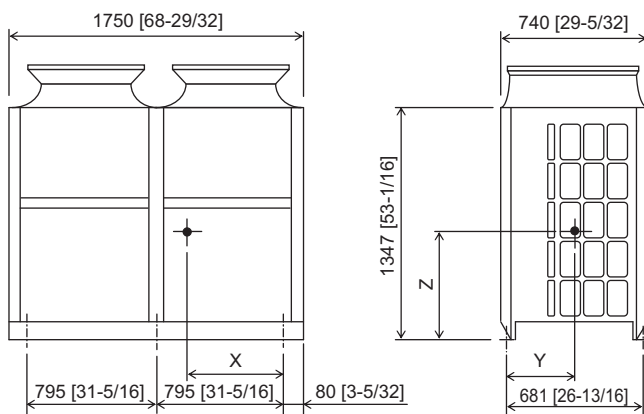


Ⓐ Center of gravity

Unit: mm[in.]

Model name	W	L	X	Y	Z	Product Weight (kg [lbs])
PEFY-AF1200CFM	1338 [52-11/16]	1325 [52-3/16]	700 [27-9/16]	675 [26-5/8]	240 [9-1/2]	130 [287]

(2) Outdoor unit

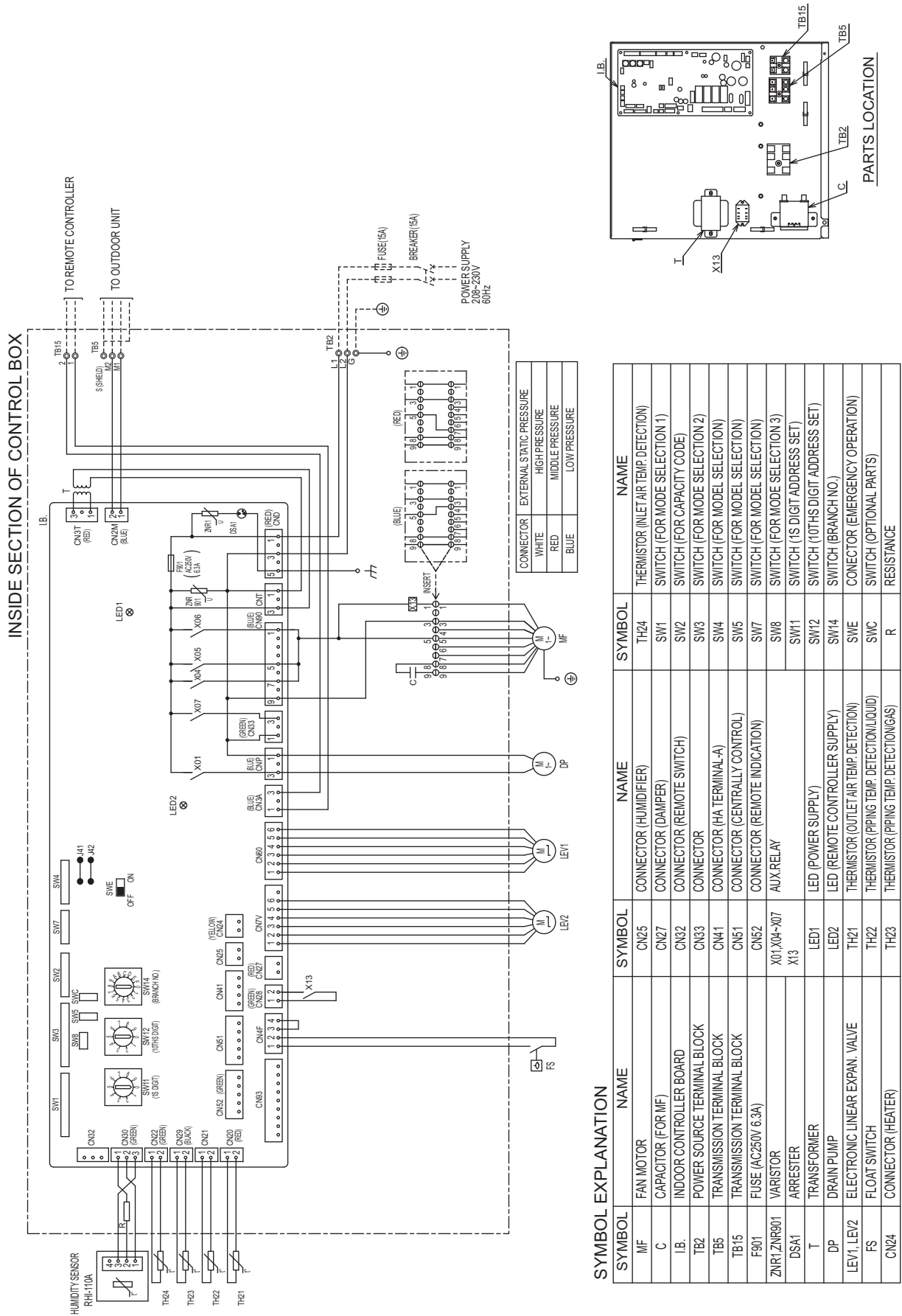


Unit: mm[in.]

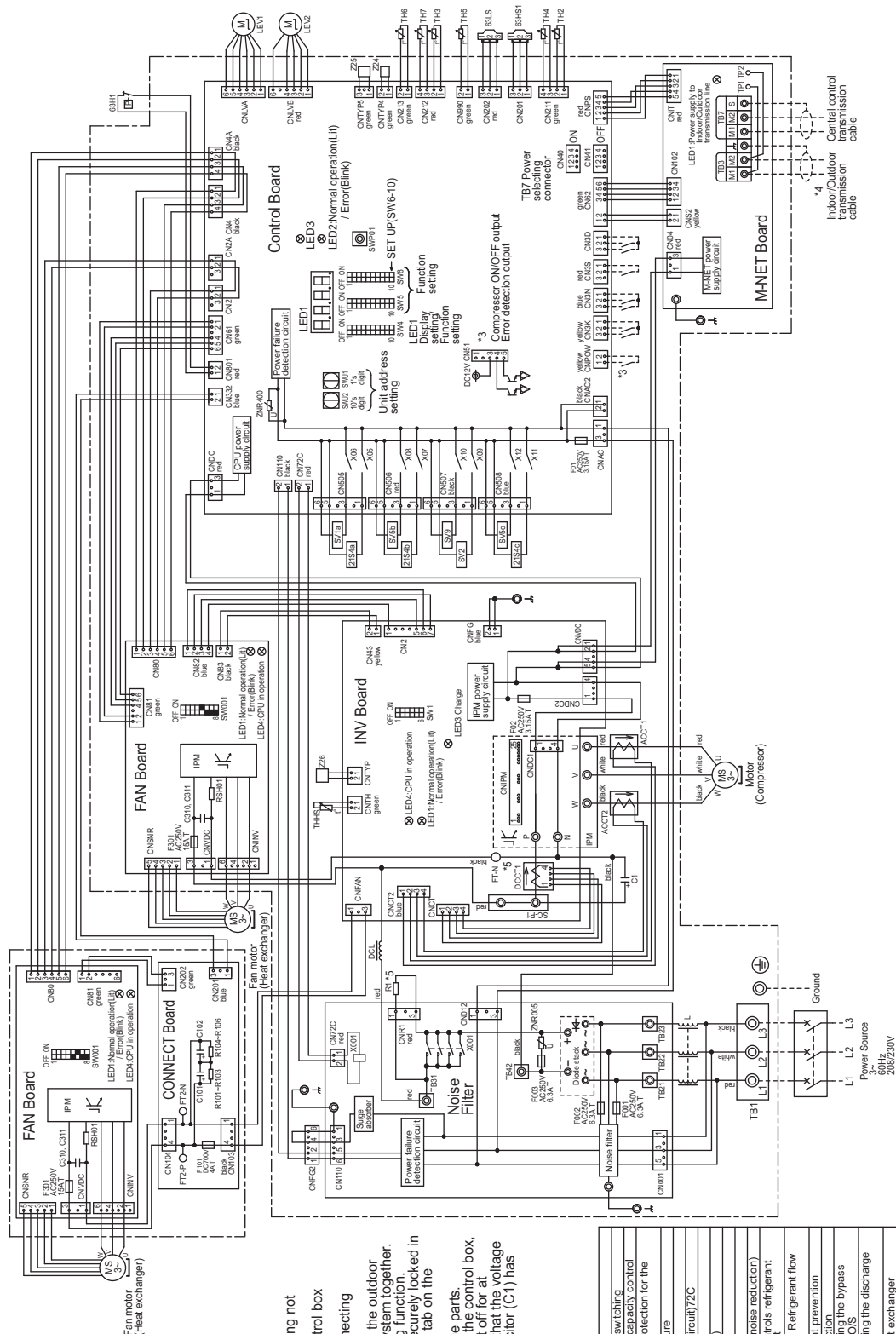
Model name	X	Y	Z
PUHY-P120TKMU-A(-BS)	688[27-3/32]	326 [12-27/32]	652[25-11/16]
PUHY-P120YKMU-A(-BS)	722[28-7/16]	316 [12-15/32]	638[25-1/8]

4. Electrical Wiring Diagrams

(1) Indoor unit
PEFY-AF1200CFM

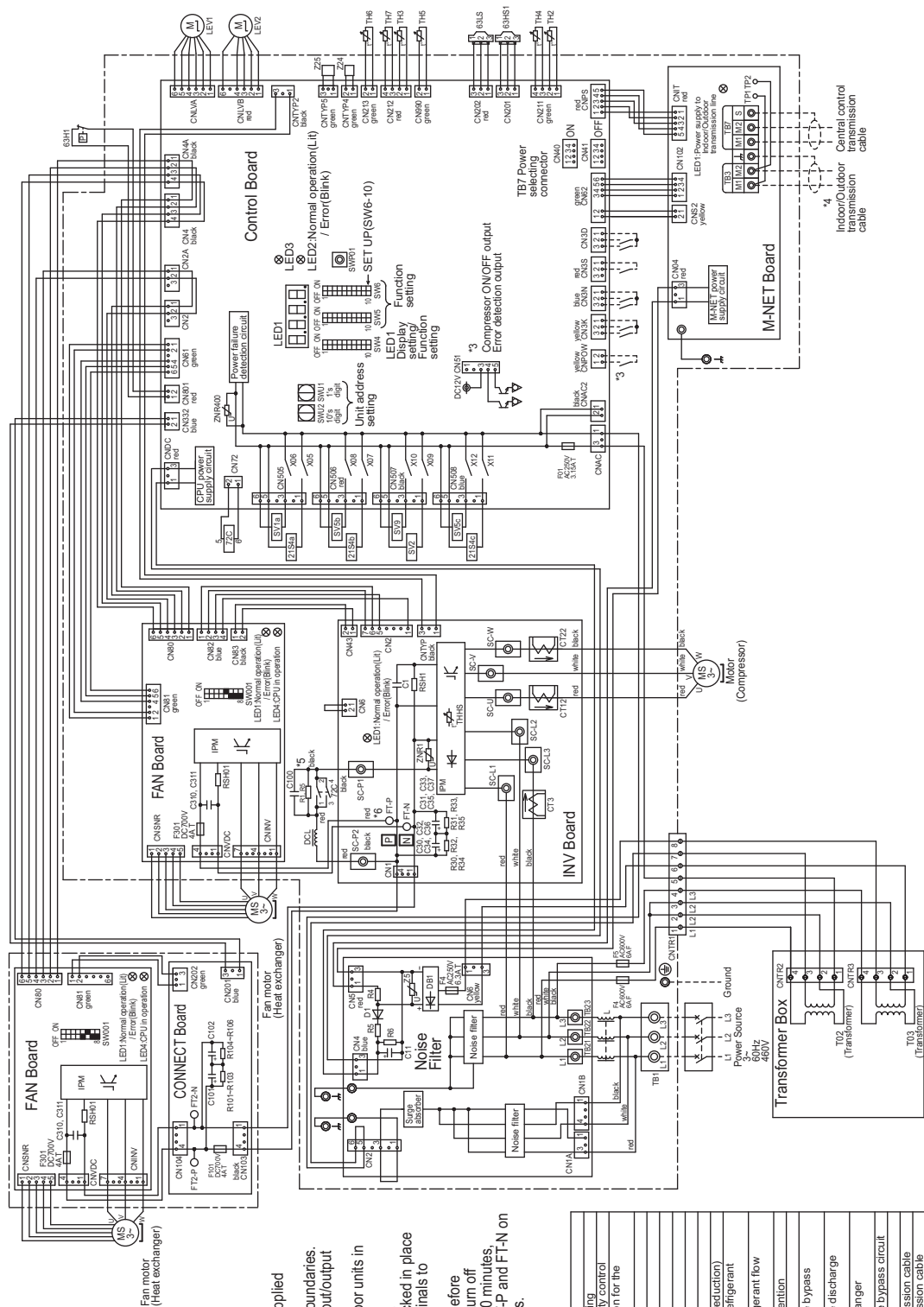


(2) Outdoor unit
PUHY-P120TKMU-A(-BS)



<Symbol explanation>

Symbol	Explanation
4-way valve	4-way valve
215A/b, c	Compressor capacity control
63H1	High pressure protection for the outdoor unit
63HS1	Discharge pressure
63LS	Pressure
X001	Low pressure
ACCT1, 2	Magnetic relay (inverter main circuit) 2C
CT	Capacitor (inverter main circuit)
DCCT1	Current sensor(DC)
DCL	DC reactor
LEV1	Choke coil (for high frequency noise reduction)
LEV2	Pressure control, Refrigerant flow in H/C circuit
R1	Pressure control, Refrigerant flow rate control
RSH01	For inrush current prevention
SV1a	For current detection
SV2	For opening/closing the bypass circuit under the O/S
SV5b, c	For opening/closing the discharge suction bypass
SV9	For opening/closing the bypass circuit
TB1	Terminal block
TB3	Indoor/Outdoor transmission cable
TB7	Central control transmission cable
TH2	Subcool bypass outlet temperature
TH3	Pipe temperature
TH4	Discharge pipe temperature
TH5	ACC inlet pipe temperature
TH6	Subcooled liquid refrigerant temperature
TH7	Oil temperature
TH8	OPM temperature
Z24, 25, 26	Function setting connector



- *1. Single-dotted lines indicate wiring not supplied with the unit.
- *2. Dot-dash lines indicate the control box boundaries.
- *3. Refer to the Data book for connecting input/output signal connectors.
- *4. Daisy-chain terminals (TB3) on the outdoor units in the same refrigerant system together.
- *5. Faston terminals have a locking function. Make sure the terminals are securely locked in place after insertion. Press the tab on the terminals to removed them.
- *6. Control box houses high-voltage parts. Before inspecting the inside of the control box, turn off the power, keep the off for at least 10 minutes, and confirm that the voltage between FT-P and FT-N on INV Board has dropped to DC20V or less.

<Symbol explanation>

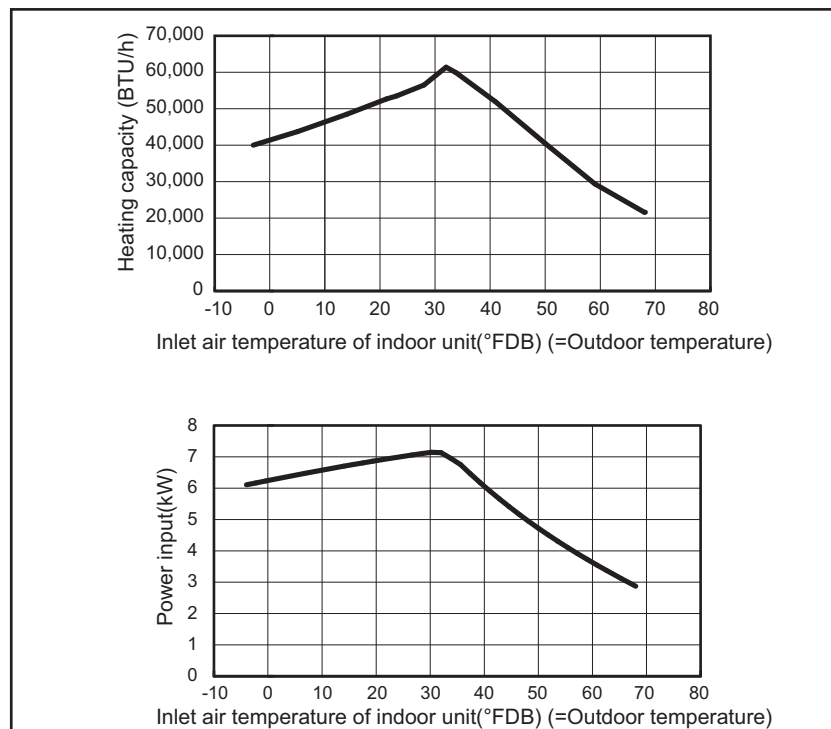
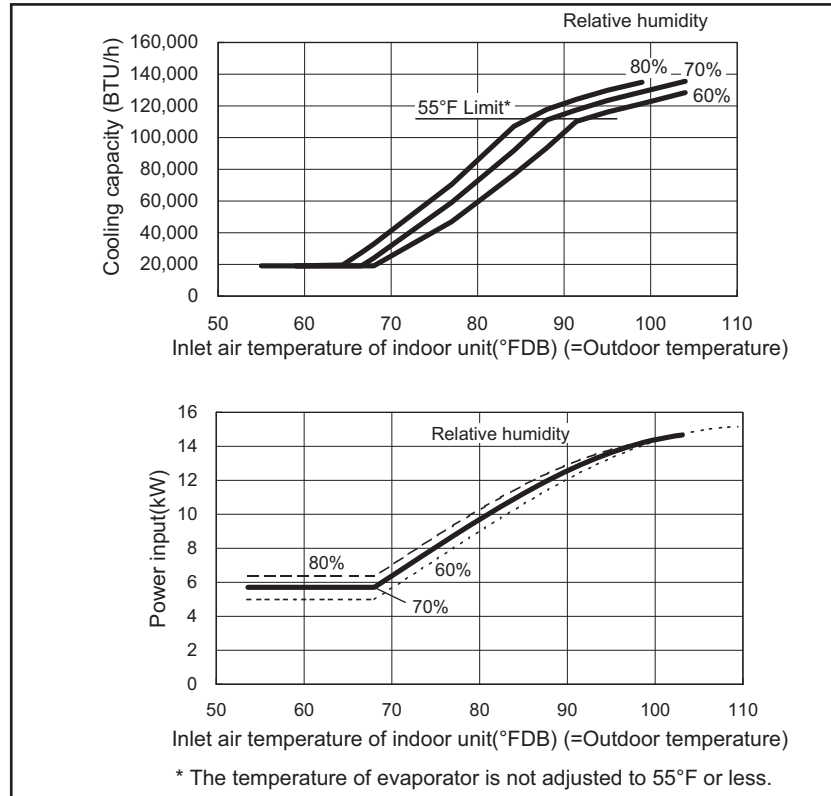
Symbol	Explanation
21S4a	4-way valve
21S4b, c	Cooling/Heating switching
69H1	Heat exchanger capacity control
72C	Pressure switch
63HS1	High pressure protection for the outdoor unit
63LS	Pressure sensor
C30-C37	Discharge pressure
CT12, 22, 3	Low pressure
DCL	Magnetic relay (inverter main circuit)
LEV1	Capacitor (inverter main circuit)
LEV2	Current sensor(AC)
RI, 5	DC reactor
RS401, RS11	Unit case fan for high frequency noise reduction
SV1a	Unit case fan Controls refrigerant flow in HIC circuit
SV2	Pressure control, Refrigerant flow rate control
SV5b, c	For inrush current prevention
TB1	Resistor
TB3	Solenoid valve
TH2	For opening/closing the bypass circuit under the O/S
TH3	For opening/closing the discharge suction bypass
TH4	Outdoor unit heat exchanger
TH5	For opening/closing the bypass circuit
TH6	Power supply
TH7	Indoor/Outdoor transmission cable
TH8	Indoor/Outdoor transmission cable
TH9	Central control transmission cable
TH10	Terminal block
TH11	Thermistor
TH12	Pipe temperature
TH13	Subcool bypass outlet temperature
TH14	Discharge pipe temperature
TH15	ACC inlet pipe temperature
TH16	Subcooled liquid refrigerant temperature
TH17	OK temperature
TH18	IPW temperature
Z24, 25	Function setting connector

VIII | Product Data (PEFY-AF1200CFM)

1. Capacity tables

(1) Correction by temperature

CITY MULTI could have varied capacity at different designing temperature. Using the nominal cooling/heating capacity value and the ratio below, the capacity can be observed at various temperature.



(2) Cooling capacity with PUHY-P120TKMU/YKMU-A(-BS)

PEFY-AF1200CFM

CA : Capacity SHC : Sensible Heat Capacity

Outdoor air temperature		Humidity											
°FDB	°CDB	60%				70%				80%			
		CA(kW)	SHC(kW)	CA(BTU/h)	SHC(BTU/h)	CA(kW)	SHC(kW)	CA(BTU/h)	SHC(BTU/h)	CA(kW)	SHC(kW)	CA(BTU/h)	SHC(BTU/h)
104	40	37.6	13.0	128,400	44,300	39.7	11.1	135,500	37,800	-	-	-	-
99	37	35.6	13.6	121,400	46,400	37.8	11.9	128,800	40,500	39.5	10.4	134,900	35,300
95	35	34.0	13.9	116,100	47,300	36.2	12.4	123,400	42,100	38.1	10.9	129,800	37,200
88	31	27.4	12.8	93,500	43,700	32.6	12.8	111,100	43,700	34.5	11.7	117,800	39,800
77	25	13.8	8.6	47,000	29,300	17.3	8.6	59,100	29,300	20.7	8.6	70,500	29,200
68	20	5.6	5.5	19,100	18,700	7.1	5.1	24,000	17,200	9.7	5.1	32,900	17,300
59	15	5.6	5.5	19,100	18,600	5.6	4.5	19,100	15,500	5.6	3.7	19,100	12,700
55	13	5.6	5.5	19,100	18,600	5.6	4.6	19,100	15,600	5.6	3.8	19,100	13,100

This table shows the capacity in case that the target outlet air temperature of the evaporator is 55°F.
Outdoor air temperature means Inlet air temperature of indoor unit in the table above.

Thermo regulating function

Mode	Condition	State
Cooling	Tin < 70°F and TDin < 55°F	Thermo OFF
	Tin ≥ 72°F and TDin ≥ 57°F	Thermo ON

Tin : Outdoor air temperature

TDin : Dew point temperature of inlet air

(3) Heating capacity with PUHY-P120TKMU/YKMU-A(-BS)

PEFY-AF1200CFM

SHC : Sensible Heat Capacity

Outdoor air temperature				SHC (Set=63°F*)		SHC (Set=73°F*)		SHC (Set=83°F*)	
°FDB	°CDB	°FWB	°CWB	BTU/h	kW	BTU/h	kW	BTU/h	kW
-3	-19.5	-4	-20	40,000	11.7	40,000	11.7	40,000	11.7
5	-15	4	-16	43,700	12.8	43,700	12.8	43,700	12.8
14	-10	12	-11	48,500	14.2	48,500	14.2	48,500	14.2
23	-5	21	-6	50,200	14.7	53,500	15.7	53,500	15.7
32	0	29	-2	38,800	11.4	51,400	15.1	61,400	18.0
41	5	37	3	27,600	8.1	40,100	11.8	51,900	15.2
50	10	45	7	21,600	6.3	28,800	8.5	40,500	11.9
59	15	54	12	21,600	6.3	21,600	6.3	29,400	8.6
68	20	62	17	0	0.0	21,600	6.3	21,600	6.3

*There are times when the temperature of supply air does not reach the setting temperature in the low outdoor air temperature.
Outdoor air temperature means Inlet air temperature of indoor unit in the table above.

Thermo regulating function

Mode	Condition	State
Heating	Tin ≥ 57°F	Thermo OFF
	Tin < 55°F	Thermo ON

Tin : Outdoor air temperature

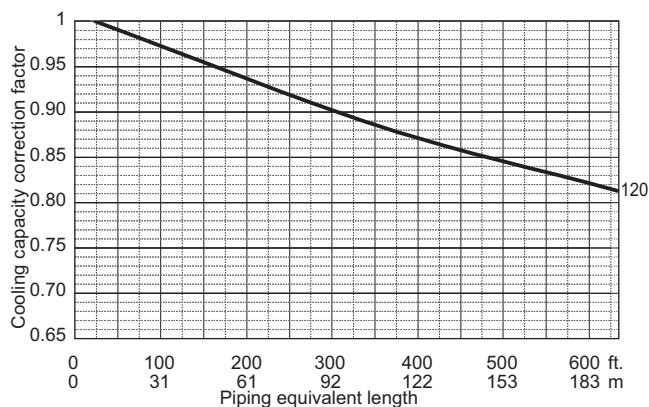
TDin : Dew point temperature of inlet air

(4) Correction by refrigerant piping length

CITY MULTI system can extend the piping flexibly within its limitation for the actual situation. Yet, a decrease of cooling/heating capacity could happen correspondently. Using following correction factor according to the equivalent length of the piping shown at (4)-1 and (4)-2, the capacity can be observed. (4)-3 shows how to obtain the equivalent length of piping.

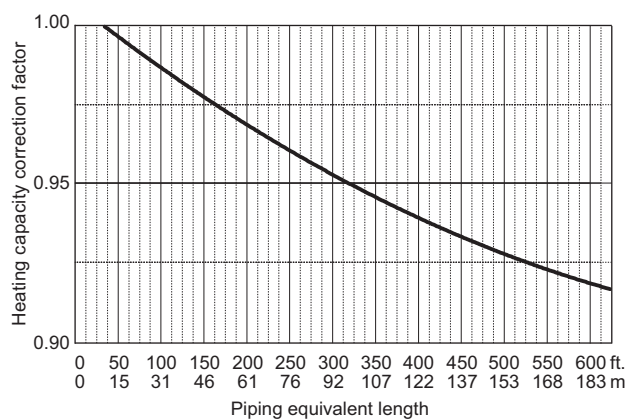
(4)-1. Cooling capacity correction

PUHY-P120TKMU/YKMU-A(-BS)



(4)-2. Heating capacity correction

PUHY-P120TKMU/YKMU-A(-BS)



(4)-3. How to obtain the equivalent length of piping

PUHY-P120TKMU/YKMU-A(-BS)

Equivalent length = (Actual piping length to the farthest indoor unit) + (1.64 x number of bent on the piping) ft.

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.50 x number of bent on the piping) m

(5) Correction at frosting and defrosting

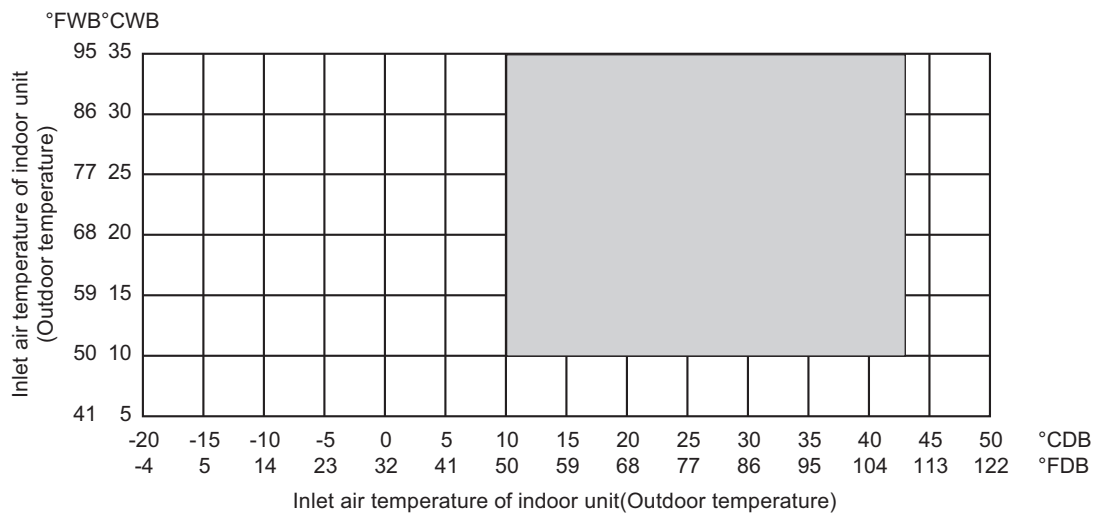
Due to frosting at the outdoor heat exchanger and the automatic defrosting operation, the heating capacity of the outdoor unit should be considered by multiplying the correction factor shown in the table below.

Table of correction factor at frosting and defrosting

Outdoor inlet air temp. °C	6	4	2	1	0	-2	-4	-6	-8	-10	-20
Outdoor inlet air temp. °F	43	39	36	34	32	28	25	21	18	14	-4
PUHY-P120TKMU/YKMU-A(-BS)	1.00	0.93	0.82	0.80	0.82	0.86	0.90	0.90	0.95	0.95	0.95

(6) Temp. range of running

Cooling

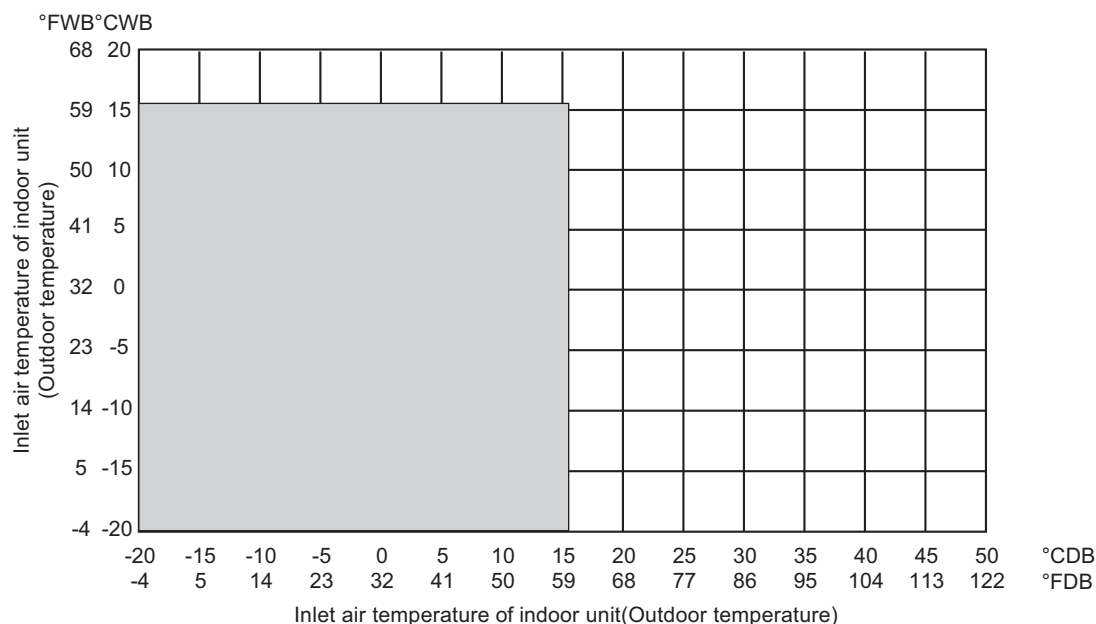


Thermo regulating function

Mode	Condition	State
Cooling	Tin < 70°F and TDin < 55°F	Thermo OFF
	Tin ≥ 72°F and TDin ≥ 57°F	Thermo ON

Tin : Outdoor air temperature
TDin : Dew point temperature of inlet air

Heating



Thermo regulating function

Mode	Condition	State
Heating	Tin ≥ 57°F	Thermo OFF
	Tin < 55°F	Thermo ON

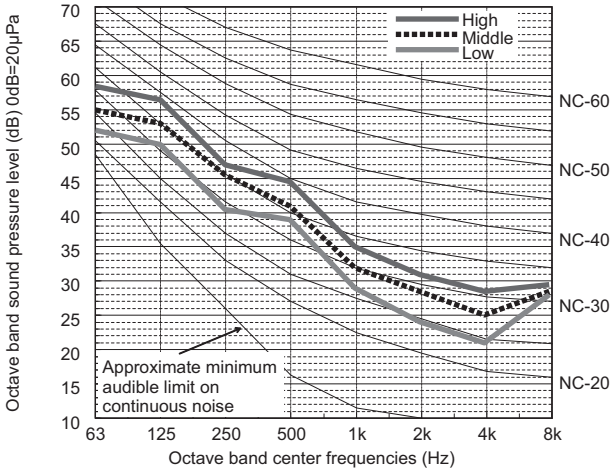
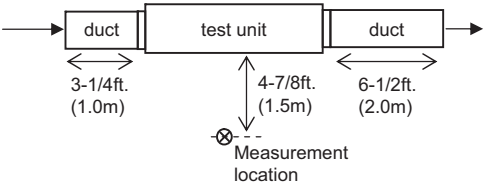
Tin : Outdoor air temperature

2. Sound levels

(1) Indoor unit

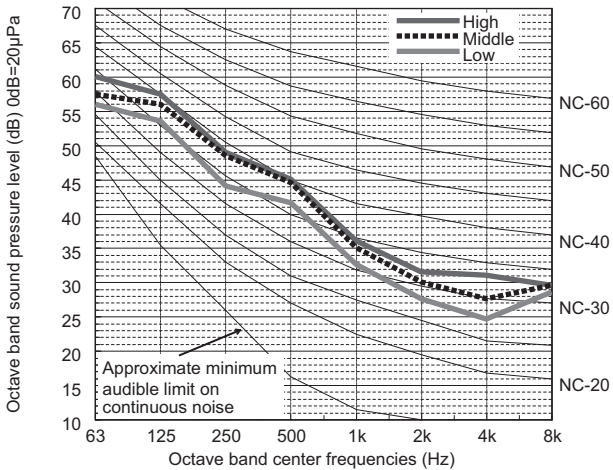
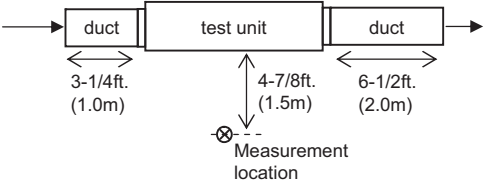
PEFY-AF1200CFM

Power source : Single phase 208V 60Hz
External static pressure[in.WG]([Pa])
High : 0.88(219)
Middle : 0.60(149)
Low : 0.40(99.6)



Condition (External static pressure)	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
High	58.5	56.5	47.0	44.5	35.0	31.0	28.5	29.5	46.0
Middle	55.0	53.0	45.5	41.0	32.0	28.5	25.0	28.5	43.0
Low	52.0	50.0	40.5	39.0	29.0	24.0	21.0	28.0	40.0

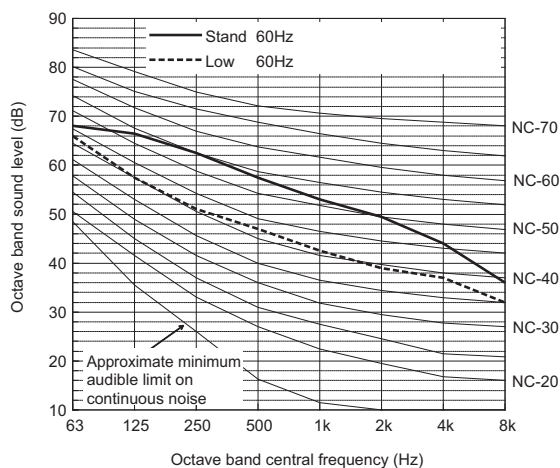
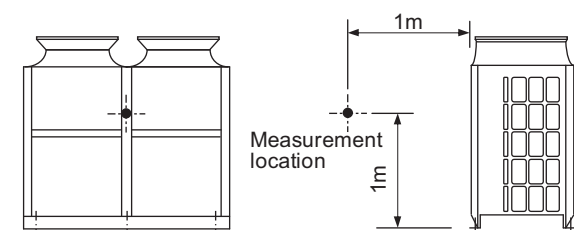
Power source : Single phase 230V 60Hz
External static pressure[in.WG]([Pa])
High : 1.04(259)
Middle : 0.80(199)
Low : 0.64(159)



Condition (External static pressure)	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
High	60.0	57.5	49.0	45.0	36.0	31.5	31.0	29.5	47.0
Middle	57.5	56.0	48.5	44.5	35.0	30.0	27.5	29.5	46.0
Low	56.0	53.5	44.0	41.5	32.5	27.5	24.5	28.5	43.0

(2) Outdoor unit

PUHY-P120TKMU/YKMU-A(-BS)



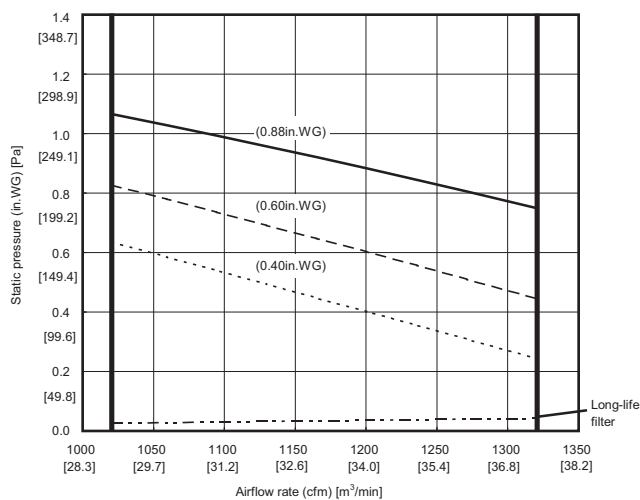
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
Standard	60Hz	68.0	66.5	62.5	57.5	53.0	49.5	44.0	36.0	60.0
Low noise mode	60Hz	66.0	57.5	51.0	47.0	42.5	39.0	37.0	32.0	50.0

When Low noise mode is set, the A/C system's capacity is limited. The system could return to normal operation from Low noise mode automatically in the case that the operation condition is severe.

3. Fan characteristics curves

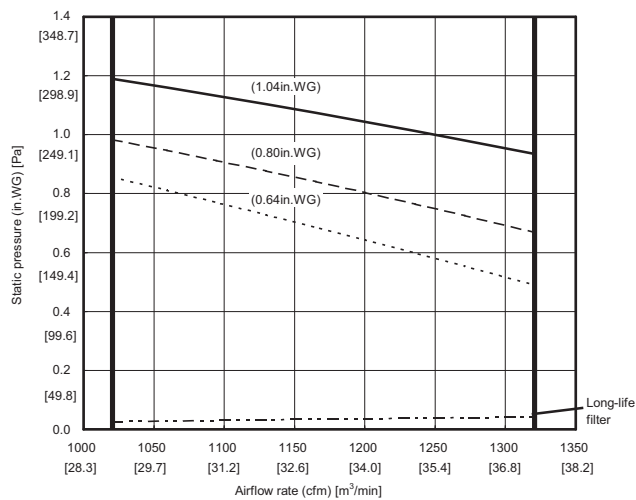
PEFY-AF1200CFM

External static pressure : 0.88, 0.60, 0.40 (in.WG), 220, 150, 100 [Pa]
Power source : 208V / 60Hz



PEFY-AF1200CFM

External static pressure : 1.04, 0.80, 0.64 (in.WG), 260, 200, 160 [Pa]
Power source : 230V / 60Hz



IX Piping Design (PEFY-AF1200CFM)

1. R410A piping material

Refrigerant pipe for CITY MULTI shall be made of phosphorus deoxidized copper, and has two types.

A. Type-O : Soft copper pipe (annealed copper pipe), can be easily bent with human's hand.

B. Type-1/2H pipe : Hard copper pipe (Straight pipe), being stronger than Type-O pipe of the same radial thickness.

The maximum operation pressure of R410A air conditioner is 4.30 MPa . The refrigerant piping should ensure the safety under the maximum operation pressure. MITSUBISHI ELECTRIC recommends pipe size as [Table 1-1], or You shall follow the local industrial standard. Pipes of radial thickness 0.7mm or less shall not be used.

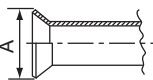
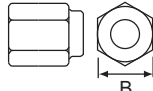
[Table 1-1] Copper pipe size and radial thickness for R410A CITY MULTI.

Size (mm)	Size (inch)	Radial thickness (mm)	Pipe type
ø6.35	ø1/4"	0.8	Type-O
ø9.52	ø3/8"	0.8	Type-O
ø12.7	ø1/2"	0.8	Type-O
ø15.88	ø5/8"	1.0	Type-O
ø19.05	ø3/4"	1.2	Type-O
ø19.05	ø3/4"	1.0	Type-1/2H or H
ø22.2	ø7/8"	1.0	Type-1/2H or H
ø25.4	ø1"	1.0	Type-1/2H or H
ø28.58	ø1-1/8"	1.0	Type-1/2H or H
ø31.75	ø1-1/4"	1.1	Type-1/2H or H
ø34.93	ø1-3/8"	1.2	Type-1/2H or H
ø41.28	ø1-5/8"	1.4	Type-1/2H or H

* For pipe sized ø19.05 (3/4") for R410A air conditioner, choice of pipe type is up to you.

Flare

Due to the relative higher operation pressure of R410A compared to R22, the flare connection should follow dimensions mentioned below so as to achieve enough the air-tightness.

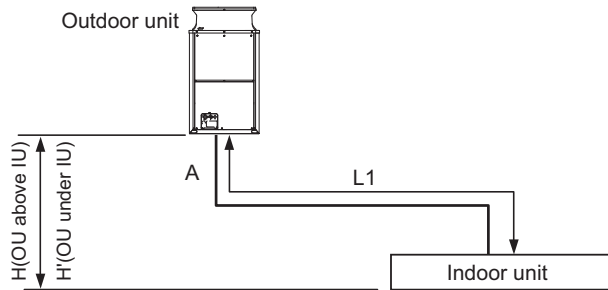
Flare pipe	Pipe size	A (For R410A) (mm[in.])	Flare nut	Pipe size	B (For R410A) (mm[in.])
	ø6.35 [1/4"]	9.1		ø6.35 [1/4"]	17.0
	ø9.52 [3/8"]	13.2		ø9.52 [3/8"]	22.0
	ø12.70 [1/2"]	16.6		ø12.70 [1/2"]	26.0
	ø15.88 [5/8"]	19.7		ø15.88 [5/8"]	29.0
	ø19.05 [3/4"]	24.0		ø19.05 [3/4"]	36.0

2. Piping design

(1) PUHY-P120TKMU/YKMU-A(-BS) + PEFY-AF1200CFM

Note

- As bents cause pressure loss on transportation of refrigerant, fewer bents design is better;
Piping length needs to consider the actual length and equivalent length which bents are counted.
Equivalent piping length (m)
=Actual piping length+"M" x Quantity of bent.



[Table (1)-1] Piping length (m [ft.])

Item	Piping in the figure	Max. length	Max. equivalent length
Farthest IU from OU (L1)	A	165 [541']	190 [623']
Height between OU and IU (OU above IU)	H	50 [164']	-
Height between OU and IU (OU under IU)	H'	40 [131']	-

OU : Outdoor Unit ; IU : Indoor Unit

[Table (1)-2] Bent equivalent length "M"

Outdoor Model	M (m/bent [ft./bent])
PUHY-P120TKMU/YKMU-A(-BS)	0.42 [1.38']

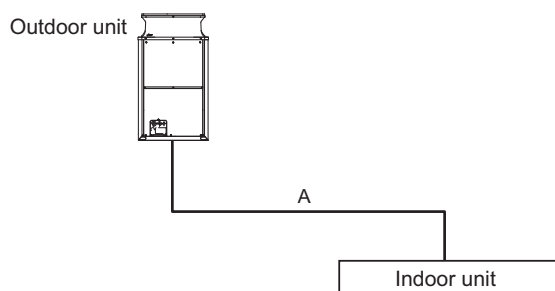
[Table (1)-3] Piping "A" size selection rule (mm [in.])

Outdoor	Pipe(Liquid)	Pipe(Gas)
PUHY-P120TKMU/YKMU-A(-BS)	ø9.52 [3/8"]	ø28.58 [1-1/8"]

[Table (1)-4] Indoor unit piping size selection rule (mm [in.])

Indoor Unit size	Pipe(Liquid)	Pipe(Gas)
PEFY-AF1200CFM	ø12.7 [1/2"]	ø22.20 [7/8"]

(2) Calculation of additional refrigerant to be charged



•Amount of additional refrigerant to be charged

- Refrigerant for extended pipes (field piping) is not factory-charged to the outdoor unit. Add an appropriate amount of refrigerant for each pipes on site.
- Record the size of each high pressure pipe and liquid pipe, and the amount of refrigerant that was charged on the outdoor unit for future reference.

•Calculating the amount of additional refrigerant to be charged

- The amount of refrigerant to be charged is calculated with the size of the on-site-installed high pressure pipes and liquid pipes, and their length.
- Calculate the amount of refrigerant to be charged according to the formula below.
- Round up the calculation result to the nearest 0.1kg. (i.e., 12.38kg[435.1oz] = 12.4 kg[436oz])

<Amount of additional refrigerant to be charged>

•Calculating the amount of additional refrigerant to be charged

Additional refrigerant charge	=	Total length of liquid pipe sized ø12.7 [1/2"]	+	Connected Indoor Units	Charged amount
(kg)		(m) x 0.12 (kg/m)		PEFY-AF1200CFM	3.0 kg [106 oz]
(oz)		(ft.) x 1.29 [oz/ft.]			

•Amount of factory charged refrigerant

Outdoor unit Model	Charged amount
PUHY-P120TKMU/YKMU-A(-BS)	11.8 kg[417oz]

•Sample calculation

A : ø12.7 [1/2"] 40m [131ft.]

Therefore, additional refrigerant charge (kg) = $40 \times 0.12 + 3$
 $= 7.8\text{kg}$
 $\approx 7.8\text{kg}$

or

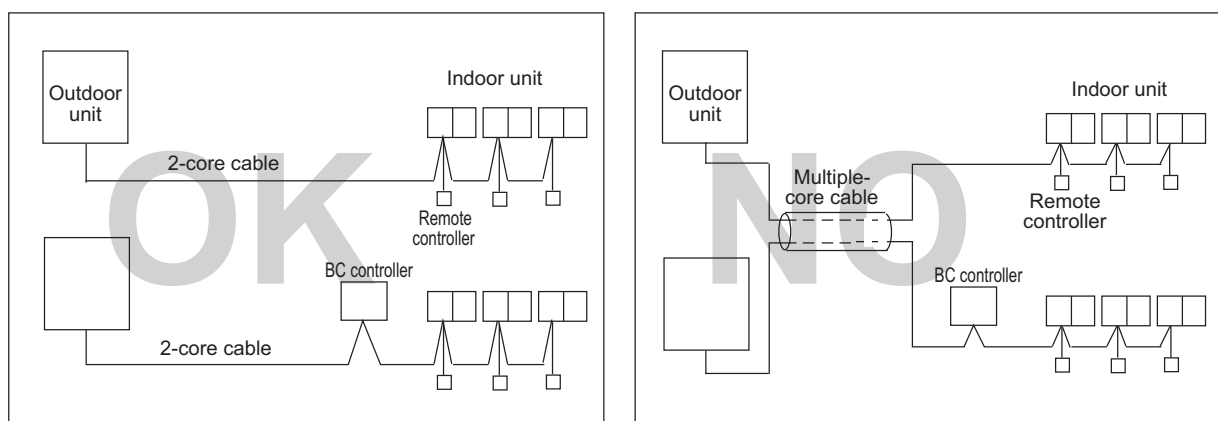
Therefore, additional refrigerant charge (oz) = $131 \times 1.29 + 106$
 $= 274.99\text{oz}$
 $\approx 275\text{oz}$

X Wiring Design (PEFY-AF1200CFM)

1. Electrical work

(1) General cautions

- 1) Follow ordinance of your governmental organization for technical standard related to electrical equipment, wiring regulations, and guidance of each electric power company.
- 2) Wiring for control (hereinafter referred to as transmission cable) shall be (50mm or more) apart from power source wiring so that it is not influenced by electric noise from power source wiring. (Do not insert transmission cable and power source wire in the same conduit.)
- 3) Be sure to provide designated grounding work to outdoor unit.
- 4) Give some allowance to wiring for electrical part box of indoor and outdoor units, because the box is sometimes removed at the time of service work.
- 5) Never connect 380~415V(220~240V) power source to terminal block of transmission cable. If connected, electrical parts will be burnt out.
- 6) Use 2-core shield cable for transmission cable. If transmission cables of different systems are wired with the same multiple-core cable, the resultant poor transmitting and receiving will cause erroneous operations.



(2) Power supply for Indoor unit and Outdoor unit

(2)-1. Electrical characteristics of Indoor unit

•Symbols: MCA:Min.Circuit Amps (=1.25 x FLA) FLA:Full Load Amps IFM:Indoor Fan Motor Output:Fan motor rated output

Model	Indoor Unit				IFM	
	Hz	Volts	Voltage range	MCA(A)	Output(kW)	FLA(A)
PEFY-AF1200CFM	60Hz	208 / 230V	188 to 253V	3.99 / 4.31	0.62 / 0.74	3.19 / 3.45

(2)-2. Electrical characteristics of Outdoor unit at cooling mode

•Symbols:MCA:Min.Circuit Amps SC:Starting Current

Model	Outdoor Units						Compressor		FAN
	Hz	Volts	Voltage range	MCA (A)	Max.Fuse (A)	MCOP (A)	Output (kW)	SC(A)	Output (kW)
PUHY-P120TKMU-A(-BS)	60Hz	208 / 230V	188 to 253V	45 / 42	50	73 / 67	8.1	15	0.92+0.92
PUHY-P120YKMU-A(-BS)		460V	414 to 506V	20	25	33	8.1	7	0.92+0.92

(2)-3. Power cable specifications

Thickness of wire for main power supply, capacities of the switch and system impedance

3-phase 3-wire , 208/230V , 60Hz	Minimum wire thickness (mm ² /AWG)			Switch(A)		Breaker for wiring (NFB)	Breaker for current leakage
	Main cable	Branch	Ground	Capacity	Fuse		
PUHY-P120TKMU-A(-BS)	13.3/6	-	13.3/6	50	50	50	50A 100mA 0.1sec. or less
PEFY-AF1200CFM	2.1/14	2.1/14	2.1/14	15	15	15	20A 30mA or 100mA 0.1sec. or less

3-phase 3-wire , 460V , 60Hz	Minimum wire thickness (mm ² /AWG)			Switch(A)		Breaker for wiring (NFB)	Breaker for current leakage
	Main cable	Branch	Ground	Capacity	Fuse		
PUHY-P120YKMU-A(-BS)	5.3/10	-	5.3/10	25	25	25	25A 30mA or 100mA 0.1sec. or less
PEFY-AF1200CFM	2.1/14	2.1/14	2.1/14	15	15	15	20A 30mA or 100mA 0.1sec. or less

- 1) Use dedicated power supplies for the outdoor unit and indoor unit. Ensure OC is wired individually.
- 2) Bear in mind ambient conditions (ambient temperature, direct sunlight, rain water, etc.) when proceeding with the wiring and connections.
- 3) The wire size is the minimum value for metal conduit wiring. If the voltage drops, use a wire that is one rank thicker in diameter. Make sure the power-supply voltage does not drop more than 10%.
- 4) Specific wiring requirements should adhere to the wiring regulations of the region.
- 5) Power supply cords of parts of appliances for outdoor use shall not be lighter than polychloroprene sheathed flexible cord (design 245 IEC57). For example, use wiring such as YZW.
- 6) A switch with at least 3 mm [1/8 in.] contact separation in each pole shall be provided by the Air Conditioner installer.

 WARNING

- Be sure to use specified wires for connections and ensure no external force is imparted to terminal connections. If connections are not fixed firmly, heating or fire may result.
- Be sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.

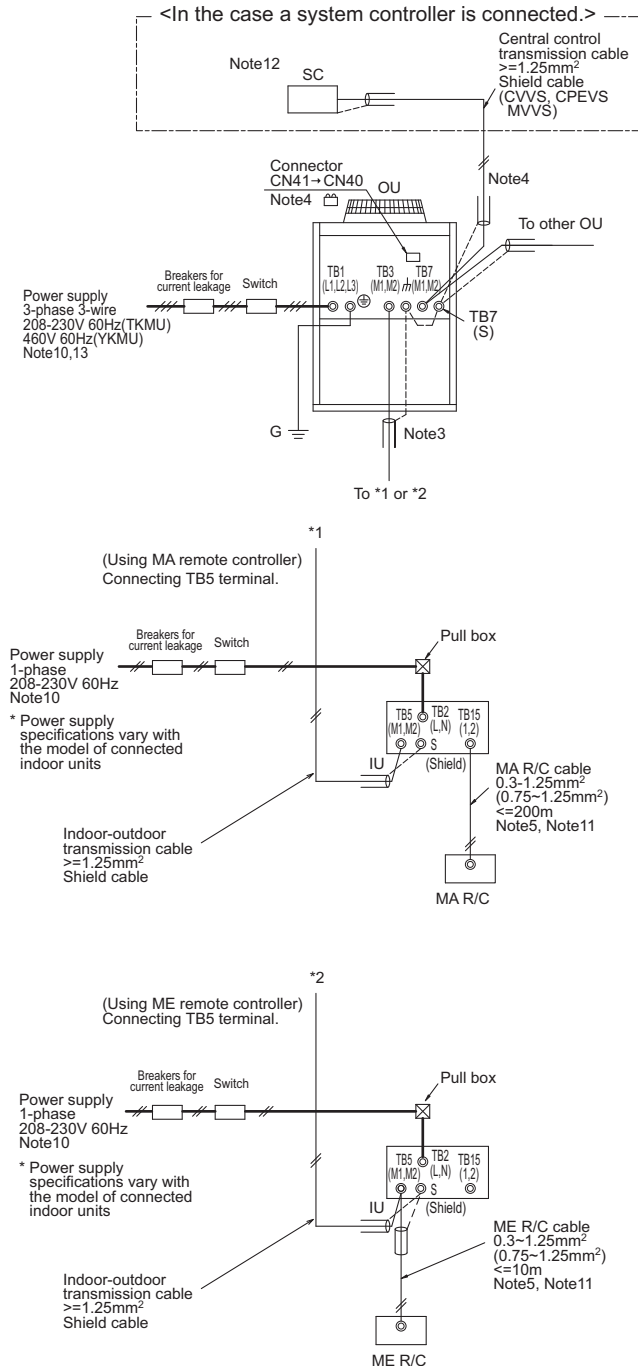
 CAUTION

- A breaker for current leakage must be attached to the power supply. If no earth leakage breaker is installed, it may cause an electric shock.
- Do not use anything other than a breaker and fuse with the correct capacity. Using a fuse or wire of too large capacity may cause malfunction or fire.

(2)-4. Power supply examples

The local standards and/or regulations is applicable at a higher priority.

(2)-4-1 PUHY-P120TKMU/YKMU-A(-BS)



Note:

- 1 The transmission cable is not-polarity double-wire.
- 2 Symbol © means a screw terminal for wiring.
- 3 The shield wire of transmission cable should be connected to the grounding terminal at Outdoor unit. All shield wire of M-Net transmission cable among Indoor units should be connected to the S terminal at Indoor unit or all shield wire should be connected together. The broken line at the scheme means shield wire.
- 4 When the Outdoor unit connected with system controller, power-supply to TB7 of the outdoor unit(s) is needed. The connector change from CN41 to CN40 at one of the outdoor units will enable the outdoor unit to supply power to TB7, or an extra power supplying unit PAC-SC51KUA should be used. The transmission cable (above 1.25mm², shielded, CVVS/CPEVS/MVVS) among Outdoor units and system controllers is called central control transmission cable. The shield wire of the central control transmission cable must be grounded at the Outdoor unit whose CN41 is changed to CN40.
- 5 MA R/C transmission cable (0.3-1.25mm²) must be less than 200m in length, while ME R/C transmission cable (0.3-1.25mm²) must be less than 10m in length. But transmission cable to the ME R/C can be extend using a M-NET cable (>=1.25mm²) when the length is counted in the M-Net length. Both Compact MA and ME R/C transmission cables size 0.75~1.25mm² in thickness.
- 6 MA remote controller and ME remote controller should not be grouped together. When a PAR-30MAA is connected to a group, no other MA remote controllers can be connected to the same group.
- 7 If using 1 or 2 (main/sub) MA remote controller to control more than 1 Indoor unit, use MA transmission cable to connect all the TB15 terminals of the Indoor units. It is called "Grouping". If using 1 or 2 (main/sub) ME remote controller control more than 1 indoor unit, set address to Indoor unit and ME remote controller. For the method, refer to X 2. (3) "Address setting".
- 8 Indoor board consumes power from TB3. The power balance should be considered according to System Design 2-3 "System configuration restrictions".
- 9 If Transmission booster is needed, be sure to connect the shield wires to the both sides to the booster.
- 10 The critical current for choosing power source equipment is approximate 1.4 times of total rated current of the Outdoor unit(s) or Indoor unit(s).
- 11 Numbers shown with () indicates a diameter of the compact remote controller.
- 12 When System controller (SC) is connected to the system, turn the SW2-1 on.
- 13 The phases of electricity power must be confirmed to be right used. Phase-reverse, or phase-missing could break the controllers.

Symbol		Model	Breakers for current leakage *1, *2, *4	Switch		Switch*4 (NFB) <A>	Minimum Wire thickness	
				BKC <A>	OCP*3, *4 <A>		Power wire <mm²/AWG>	G wire <mm²/AWG>
BKC	Breaker capacity	PUHY-P120TKMU	50A 100mA 0.1sec. or less	50	50	50	13.3/6	13.3/6
OCP	Over-current protector	PUHY-P120YKMU	25A 30mA or 100mA 0.1sec. or less	25	25	25	5.3/10	5.3/10
NFB	Non-fuse breaker	*1 The breakers for current leakage should support Inverter circuit. (e.g. Mitsubishi Electric's NV-C series or equivalent).						
OU	Outdoor unit	*2 Breakers for current leakage should combine using of switch.						
IU	Indoor unit	*3 It shows data for B-type fuse of the breaker for current leakage.						
SC	System controller	*4 If a large electric current flows due to malfunction or faulty wiring, earth-leakage breakers on the unit side and on the centralized controller side may both operate.						
MA R/C	MA remote controller	Depending on the importance of the system, separate the power supply system or take protective coordination of breakers.						
ME R/C	ME remote controller							

*1 The breakers for current leakage should support Inverter circuit. (e.g. Mitsubishi Electric's NV-C series or equivalent).

*2 Breakers for current leakage should combine using of switch.

*3 It shows data for B-type fuse of the breaker for current leakage.

*4 If a large electric current flows due to malfunction or faulty wiring, earth-leakage breakers on the unit side and on the centralized controller side may both operate.

Depending on the importance of the system, separate the power supply system or take protective coordination of breakers.

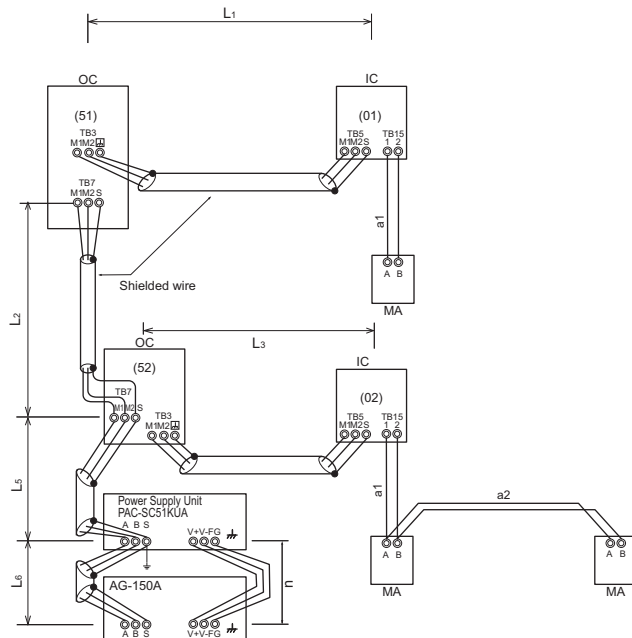
2. M-NET control

(1) Transmission cable length limitation

(1)-1. Using MA Remote controller

Long transmission cable causes voltage down, therefore, the length limitation should be obeyed to secure proper transmission.

Max. length via Outdoor (M-NET cable)	$L1+L2+L3, L1+L2+L5+L6, L3+L5+L6$	$\leq 500\text{m}[1640\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length to Outdoor (M-NET cable)	$L1, L3, L5, L2+L5, L6$	$\leq 200\text{m}[656\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length from MA to Indoor	$a1+a2$	$\leq 200\text{m}[656\text{ft.}]$	$0.3-1.25\text{mm}^2$ [AWG22-16]
24VDC to AG-150A	n	$\leq 50\text{m}[164\text{ft.}]$	$0.75-2.0\text{mm}^2$ [AWG18-14]



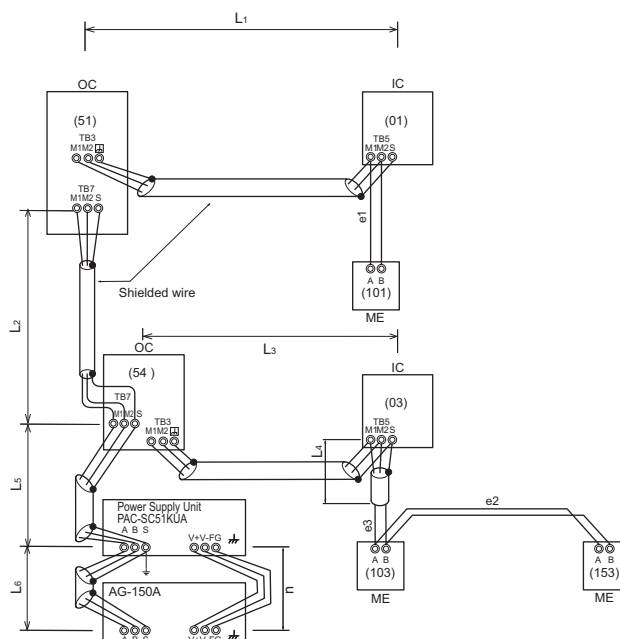
OC : Outdoor unit controller; IC: Indoor unit controller; MA: MA remote controller

(1)-2. Using ME Remote controller

Long transmission cable causes voltage down, therefore, the length limitation should be obeyed to secure proper transmission.

Max. length via Outdoor (M-NET cable)	$L1+L2+L3, L1+L2+L5+L6, L1+L2+L3+L4, L3+L5+L6$	$\leq 500\text{m}[1640\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length to Outdoor (M-NET cable)	$L1, L3, L5, L2+L5, L6, L3+L4$	$\leq 200\text{m}[656\text{ft.}]$	1.25mm^2 [AWG16] or thicker
Max. length from ME to Indoor	$e1, e2, e3$	$\leq 10\text{m}[32\text{ft.}]^*1$	$0.3-1.25\text{mm}^2$ [AWG22-16] *1
24VDC to AG-150A	n	$\leq 50\text{m}[164\text{ft.}]$	$0.75-2.0\text{mm}^2$ [AWG18-14]

*1. If the length from ME to Indoor exceed 10m, use 1.25mm^2 [AWG16] shielded cable, but the total length should be counted into Max. length via Outdoor.



OC : Outdoor unit controller; IC: Indoor unit controller; ME: ME remote controller

(2) Transmission cable specifications

System configuration	For a single-refrigerant system		
Transmission cable length	Less than 120 m [394 ft]		More than 120 m [394 ft]
Facility example (for electrical noise judgment)	Residence or independent store without electrical noise	Building, clinic, hospital or communications station without electrical noise supposedly generated from inverter equipment, private power generator, high-frequency medical equipment, radio-used communications equipment and so on	All facilities
Types of transmission cables	VCTF, VCTFK, CVV, CVS, VVR, VVF, VCT or shielding wire CVVS or CPEVS	Shielding wire CVVS or CPEVS	
Length	Less than 120 m [394 ft]		Less than 200 m [656 ft]

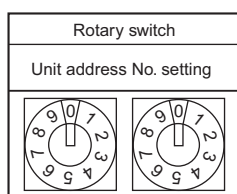
	MA remote controller	M-NET remote controller
Types of cables	Sheathed 2-core cable (unshielded) CVV	Sheathed 2-core cable (unshielded) CVV
Cable diameter	0.3 to 1.25 mm ² [AWG22 to 16]	0.3 to 1.25 mm ² [AWG22 to 16]
Length	Less than 200 m [656 ft]	Add any portion in excess of 10 m [32 ft] to within the longest allowable transmission cable length 200 m [656 ft] (Shielding portion is more than 1.25 mm ² [AWG16])

CVVS,MVVS : PVC insulated PVC jacketed shielded control cable
CPEVS : PE insulated PVC jacketed shielded communication cable
CVV : PVC insulated PVC sheathed control cable

(3) Address setting

(3)-1. Switch operation

In order to constitute CITY MULTI in a complete system, switch operation for setting the unit address No. and connection No. is required.



1) Address No. of outdoor unit, indoor unit and remote controller.

The address No. is set at the address setting board.

2) Caution for switch operations

- Be sure to shut off power source before switch setting. If operated with power source on, switch can not operate properly.
- No units with identical unit address shall exist in one whole air conditioner system. If set erroneously, the system can not operate.

3) MA remote controller

- When connecting only one remote controller to one group, it is always the main remote controller.
When connecting two remote controllers to one group, set one remote controller as the main remote controller and the other as the sub remote controller.
- The factory setting is "Main".
- Refer to the "Instruction Book" that came with the MA remote controller for how to set the switches.

(3)-2. Rule of setting address

Unit		Address setting	Example		Note
Indoor unit		01 ~ 50	 		Use the most recent address within the same group of indoor units.
Outdoor unit		51 ~ 99, 100 (Note1)	 		The smallest address of indoor unit in same refrigerant system + 50 Assign sequential address numbers to the outdoor units in one refrigerant circuit system. OC and OS are automatically detected. (Note 2) * Please reset one of them to an address between 51 and 99 when two addresses overlap. * The address automatically becomes "100" if it is set as "01~ 50"
Local remote controller	ME, LOSSNAY Remote controller (Main)	101 ~ 150	1 Fixed	 	The smallest address of indoor unit in the group + 100 * The place of "100" is fixed to "1"
	ME, LOSSNAY Remote controller (Sub)	151 ~ 199, 200	1 Fixed	 	The address of main remote controller + 50 * The address automatically becomes "200" if it is set as "00"
System controller	Group remote controller	201 ~ 250	2 Fixed	 	The smallest group No. to be managed + 200
	System remote controller	000, 201 ~ 250		  	
	ON/OFF remote controller	000, 201 ~ 250		  	The smallest group No. to be managed + 200 * The smallest group No. to be managed is changeable.
	AG-150A G-50A GB-50A	000, 201 ~ 250		  	
	LMAP03U	201 ~ 250	2 Fixed	 	

Note1: To set the address to "100", set it to "50"

Note2: Outdoor units OC and OS in one refrigerant circuit system are automatically detected.

OC and OS are ranked in descending order of capacity. If units are the same capacity, they are ranked in ascending order of their address.

(3)-3. System examples

Factory setting

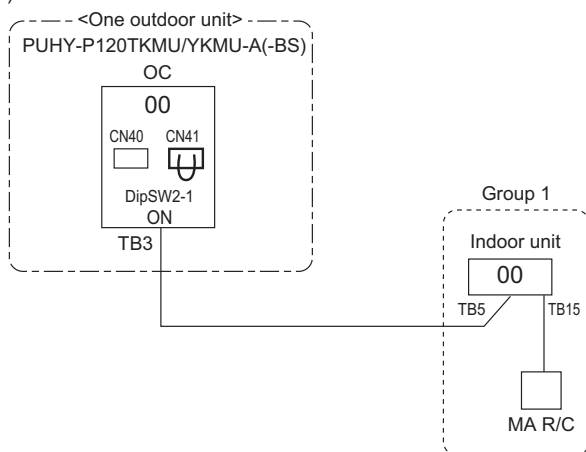
Original switch setting of the outdoors, indoors, controllers and LMAP at shipment is as follows.

- Outdoor unit : Address: 00, CN41: U (Jumper), DipSW2-1: OFF
- Indoor unit : Address: 00
- Remote controller : Address: 100

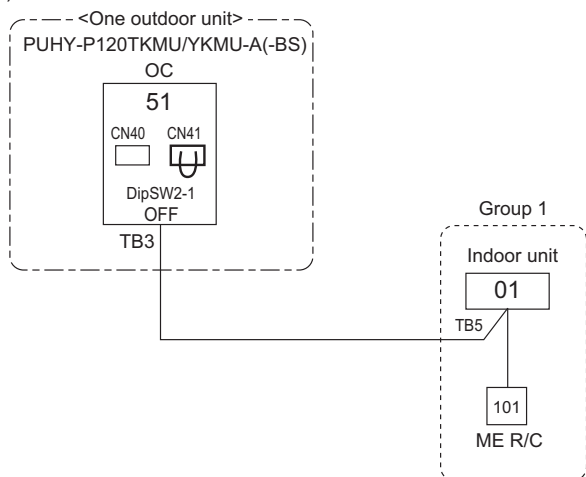
Setting at the site

- DipSW2-1(Outdoor) : When the System Remote Controller is used, all the Dip SW2-1 at the outdoor units should be set to "ON".
- CN40/CN41 : Change jumper from CN41 to CN 40 at outdoor control board will activate central transmission power supply to TB7;
Power supply unit is recommended to use for a system having more than 1 outdoor unit, because the central transmission power supply from TB7 of one of outdoor units is risking that the outdoor unit failure may let down the whole central control system.

(3)-3-1 MA remote controller

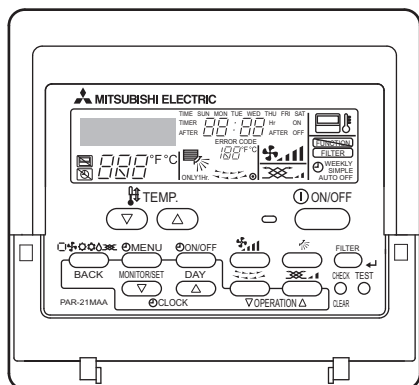


(3)-3-2 ME remote controller



XI Remote Controller (PEFY-AF1200CFMR & PEFY-AF1200CFM)

1. MA remote controller [PAR- 21MAA]



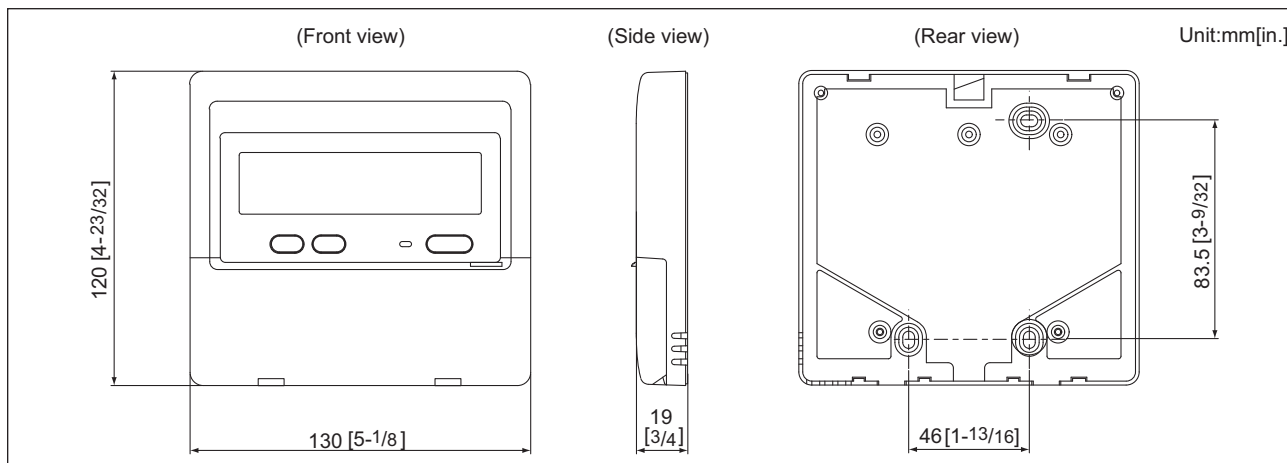
- High-quality white color body and light-green display.
- Dot LCD is applied.
Choose from Japanese, Chinese, English, German, Spanish, Russian, Italian, French displays.
- Connectable to all CITY MULTI indoor units, and automatically adjust its function with the connected indoor unit.
- Limiting the temperature setting range is possible.
Helps to avoid over-cooling or over-heating. Saves energy.
- Auto-stop timer is available.
Helps to avoid forgetting to turn off the air conditioner.
- Weekly scheduler is available.
ON/OFF/Temperature setting 8 times per day, 1 week scheduling.
- Grouping via cross-over wire directly.
- Usable as the local remote controller for system controller (MELANS)
* Combining ME remote controller and/or LOSSNAY remote controller in a group is not possible.

■ Functions

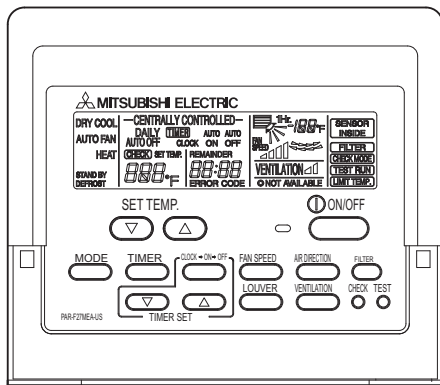
□:Each unit ○:Each group ●:Each block
△:Each floor ◎:Collective ×:Not available

Item	Description	Operations	Display
ON/OFF	ON and OFF operation for a single group	○	○
Operation mode switching	Switches between Cool / Dry / Auto* / Fan / Heat. Operation modes vary depending on the air conditioner unit. *Auto only supported for the City Multi R2 series.	○	○
Temperature setting	Sets the temperature for a single group Range of temperature setting Cool/Dry : 19°C - 30°C (14°C - 30°C)/67°F - 87°F (57°F - 87°F) Heat : 17°C - 28°C (17°C - 28°C)/63°F - 83°F (63°F - 83°F) Auto : 19°C - 28°C (17°C - 28°C)/67°F - 83°F (63°F - 83°F) () For PEFY/PEFY by setting DipSW 7-1 to ON and limits to N16H fan speed only.	○	○
Fan speed setting	Models with 4 air flow speed settings: Hi/Mid-2/Mid-1/Low Models with 3 air flow speed settings: Hi/Mid/Low Models with 2 air flow speed settings: Hi/Low Fan speed setting (including Auto) varies depending on the model.	○	○
Air flow direction setting	Air flow direction angles (4-angle, or 5-angle Swing) Auto Louver ON/OFF Air flow direction settings vary depending on the model.	○	○
Weekly scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the minute.	○	○
Permit / Prohibit local operation	Individually prohibit operation of each local remote control function (ON/OFF, Change operation mode, Set temperature, Reset filter). *1: When the local remote controller inactivation command is received from the main system controller, " " is displayed.	×	*1 ○
Prohibition/permission of specified mode (Cooling prohibited /heating prohibited /cooling-heating prohibited)	By the setting from System Controller, the operation for the following modes is prohibited. At cooling prohibited : Cool, Dry, Auto, At heating prohibited : Heat, Auto, At cooling-heating prohibited : Cool, Heat, Dry, Auto	×	○
Indoor unit intake temperature	Measures the intake temperature of the indoor unit when the indoor unit is operating.	×	○
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed.	×	□
Test run	This operates air conditioner units in test run mode.	○	○
Ventilation equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY. LOSSNAY items that can be set are "Hi" "Low" "Stop". Ventilation mode switching is not available.	○	○
Function to limit the setting range of room temperature (Set temperature range limit)	Set temperature range limit to cooling, heating, or auto mode.	○	○
Easy-to-operate simplified locking function (Auto lock function)	Setting/releasing of simplified locking for remote control switch can be performed. · Locking of all switches · Locking of all switches except ON/OFF switch	○	○

■ External dimension



2. ME remote controller [PAR- F27MEA-US]



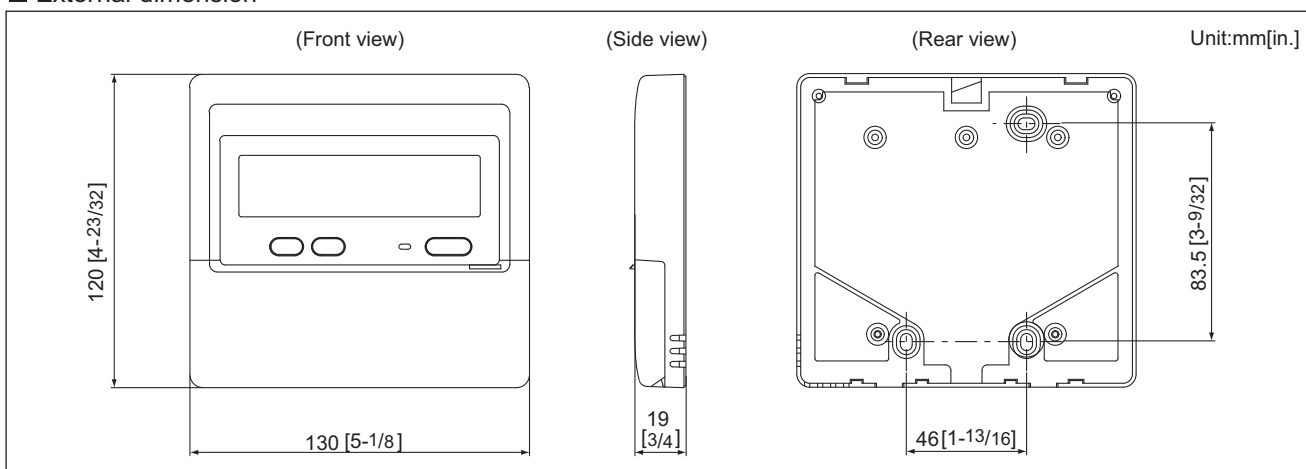
- Three timer modes are available with enhanced function.
- The room temperature can be limited by the initial setting. By setting the room temperature range narrower than usual setting, cooling/heating operation with excessive temperature can be prevented and thus save energy.
- Allows for simple “button locking” function.
- LCD temperature can be set and displayed in increments of 2°F.

■ Functions

□: Each unit ○: Each group ●: Each block
△: Each floor ◎: Collective ×: Not available

Item	Description	Operations	Display
ON/OFF	Run and stop operation for a single group	○	○
DRY COOL AUTO FAN HEAT Operation mode switching	Switches between Cool / Dry / Auto* / Fan / Heat. Operation modes vary depending on the air conditioner unit. *Auto only supported for the City Multi R2 series.	○	○
SET TEMP. Temperature setting	Sets the temperature for a single group Temperature can be set within the ranges below. (In increments of 2°F)(Temperature display is not available in [°C], but only in [°F].) Cool/Dry : 67°F - 87°F (57°F - 87°F) / 19°C - 30°C (14°C - 30°C) Heat : 63°F - 83°F (63°F - 83°F) / 17°C - 28°C (17°C - 28°C) Auto : 67°F - 83°F (63°F - 83°F) / 19°C - 28°C (17°C - 28°C) () For PDPY/PEFY/PFFY by setting DipSW 7-1 to ON and limits to NIGH fan speed only.	○	○
Fan speed setting	Models with 4 air flow speed settings: Hi/Mid-2/Mid-1/Low Models with 3 air flow speed settings: Hi/Mid/Low Models with 2 air flow speed settings: Hi/Low Fan speed setting varies depending on the model.	○	○
Air flow direction setting	Air flow direction angles (4-angle, Swing) Louver ON/OFF Air flow direction settings vary depending on the model.	○	○
Permit / Prohibit local operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Reset filter). *1: When the local remote controller inactivation command is received from the main system controller, "- CENTRALLY CONTROLLED -" is displayed.	×	※1 ○
Indoor unit intake temperature	Measures the intake temperature of the indoor unit when it is operating.	×	○
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed.	×	□
Timer operation	The three timer modes allows, a proper mode to be selected to meet the usage. One day timer : ON/OFF setting of one time on one day can be applied. Daily timer : ON/OFF setting by the One day timer can be repeated for everyday. Auto OFF timer : OFF timer can be set in a range from 30 minutes to 4 hours. *Setting of Auto OFF timer automatically activates OFF timer at the next operation. This function can be utilized to prevent the negligence of OFF setting.	○	○
Test run	This operates air conditioner units in test run mode.	○	○
Function to limit the setting range of room temperature (Set temperature range limit)	The range of room temperature setting can be limited by the initial setting. The lowest limit temperature can be made higher than the usual (67°F/19°C) at cooling/drying, while the upper limit temperature lower than the usual (83°F/28°C) at heating. *When making the function to limit room temperature setting range effective, the operation mode cannot be set to the auto mode.	○	○
Easy-to-operate simplified locking function (Auto lock function)	Setting/releasing of simplified locking for remote control switch can be performed. · Locking of all switches · Locking of all switches except Start/Stop switch	○	○

■ External dimension

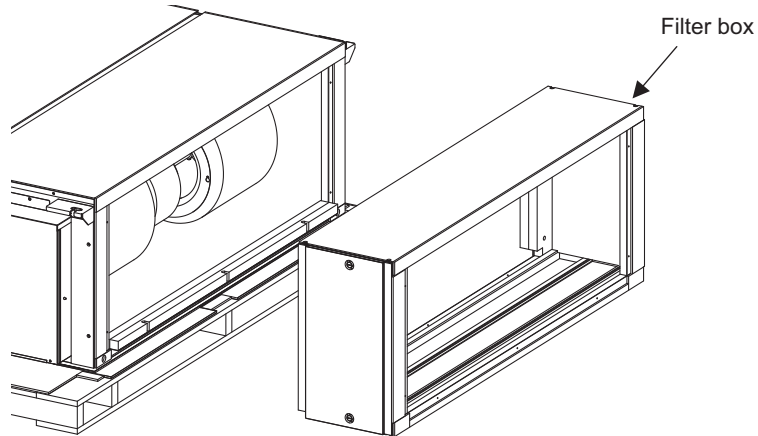


XII Optional Parts (PEFY-AF1200CFMR & PEFY-AF1200CFM)

1. Filter box

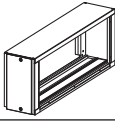
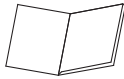
(1) Model names and applicable models

Model name	Applicable types	Applicable filter			
		Filter	Model name	Size	Q'ty
PAC-KE97TB-E	PEFY-AF1200CFM(R)	Long life filter	PAC-KE85LAF	411 x 600	2



(2) Provided parts

PAC-KE-TB-E

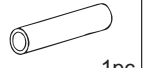
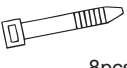
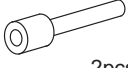
Item	1 Screw	2 Filter box	3 Installation manual
Quantity	10	1	1
Shape			

Detailed installation information should be referred to its Installation Manual (WT05693X01)

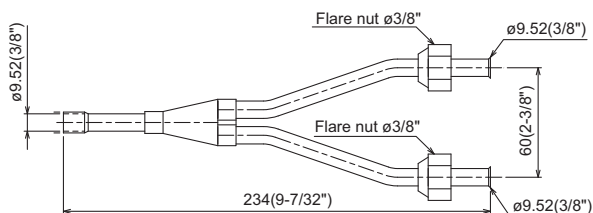
2. Twinning pipe - PEFY-AF1200CFMR only

Twinning pipe - PEFY-AF1200CFMR only "CMY-R160C-J" for BC controller is used to combine 2 ports of the BC controller to indoor unit as shown in [Fig.(1)-1].

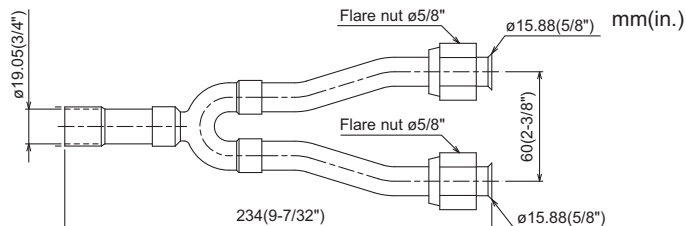
The Joint kit include following items:

① Instruction	② Joint pipe (for liquid side)	③ Joint pipe (for gas side)	④ Cover 1	⑤ Cover 2 (for gas side)	⑥ Cover 3 (for liquid side)	⑦ Band	⑧ Reducer
 This sheet 1pc	 1pc	 1pc	 2pcs	 1pc	 1pc	 8pcs	 2pcs

③ Joint pipe(for liquid side)

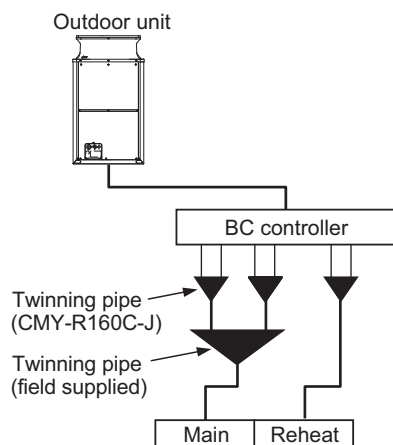


③ Joint pipe(for gas side)



(1) Designing CMY-R160C-J to a PURY-P120TKMU/YKMU-A(-BS) system

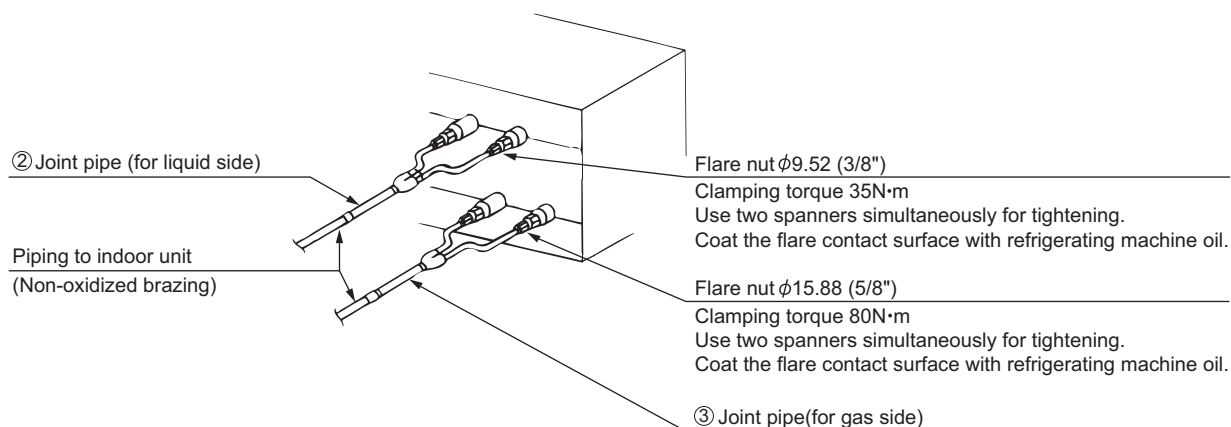
[Fig.(1)-1]



(2) Piping at the installation site

The connection of CMY-R160C-J to BC controller and pipe leading to Indoor units is referable to [Fig.(2)-1] Non-oxidized brazing is necessary. All piping must be careful to avoid foreign material getting inside. After piping and air-tight testing, insulation work to the Joint and pipe should be done. Details is available at the Installation Manual.

[Fig.(2)-1] Connecting CMY-R160C-J



XIII Installation (PEFY-AF1200CFMR & PEFY-AF1200CFM)

1. Indoor installation

(1) Selecting an installation site

- Select a site with sturdy fixed surface sufficiently durable against the weight of unit.
- Before installing unit, the route of which to carry in unit to the installation site should be determined.
- Select a site where the unit is not affected by entering air.
- Select a site where the flow of supply and return air is not blocked.
- Select a site where refrigerant piping can easily be routed to the outside.
- Select a site that allows the supply air to be fully distributed in room.
- Do not install unit at a site with oil splashing or steam in much quantity.
- Do not install unit at a site where combustible gas may generate, flow in, stagnate or leak.
- Do not install unit at a site where equipment generating high frequency waves (a high frequency wave welder for example) is provided.
- Do not install unit at a site where fire detector is located at the supply air side. (Fire detector may operate erroneously due to the heated air supplied during heating operation.)
- When special chemical product may scatter around such as site chemical plants and hospitals, full investigation is required before installing unit. (The plastic components may be damaged depending on the chemical product applied.)
- If the unit is run for long hours when the air above the ceiling is at high temperature/high humidity (due point above 26 °C [79 °F]), condensation may be produced in the indoor unit. When operating the units in this condition, add insulation material (10 - 20 mm [13/32 to 13/16 in.]) to the entire surface of the indoor unit to avoid condensation.

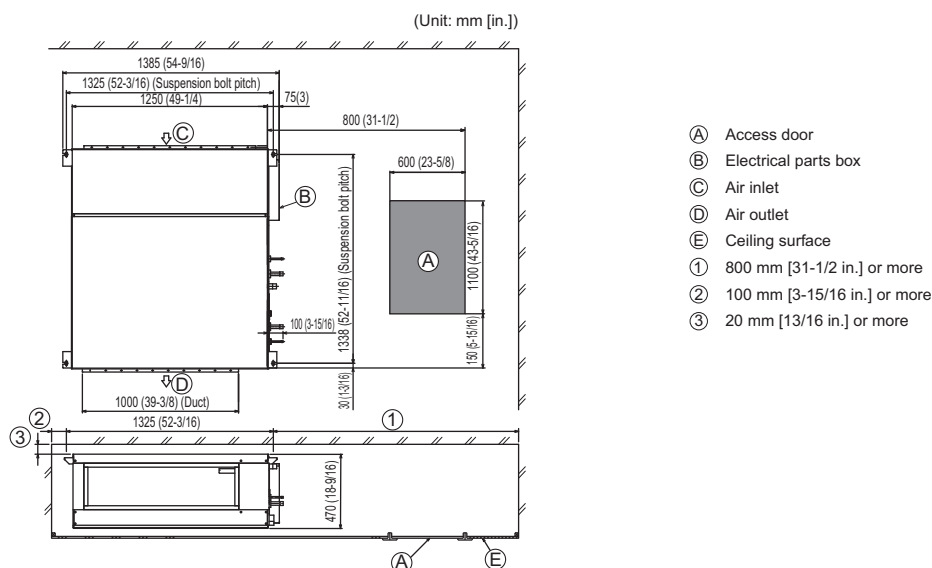
WARNING

The unit must be securely installed on a structure that can sustain its weight. If the unit is mounted on an unstable structure, it may fall down causing injuries.

(1)-1. Securing installation and service space

- Select the optimum direction of supply airflow according to the configuration of the room and the installation position.
- As the piping and wiring are connected at the bottom and side surfaces, and the maintenance is made at the same surfaces, allow sufficient space. For the efficient suspension work and safety, provide as much space as possible.

[Fig.(1)-1.1]



(1)-2. Connecting indoor units with BC controllers and outdoor units

For connecting indoor units with BC controllers and outdoor units, refer to section (5)-1 (page 69) and, BC controllers and outdoor units installation manual.

(2) Fixing hanging bolts

(2)-1. Fixing hanging bolts

Hanging structure

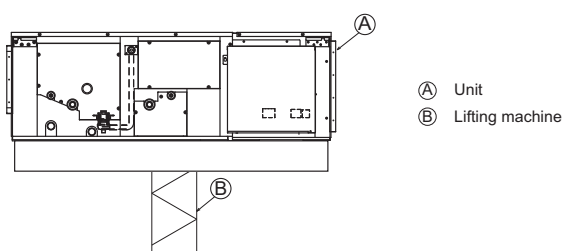
- Ceiling: The ceiling structure varies from building to building. For detailed information, consult your construction company.
- If necessary, reinforce the hanging bolts with anti-quake supporting members as countermeasures against earthquakes.
 - * Use M10 for hanging bolts and anti-quake supporting members (field supplied).

(3) Installing the unit

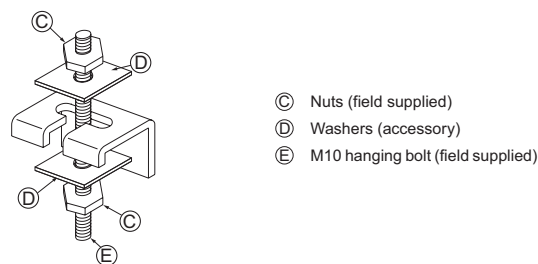
(3)-1. Hanging the unit body

- Bring the indoor unit to an installation site as it is packed.**
- To hang the indoor unit, use a lifting machine to lift and pass through the hanging bolts.**

[Fig.(3)-1.1]



[Fig.(3)-1.2]



(3)-2. Confirming the unit's position and fixing hanging bolts

- Use the gauge supplied with the panel to confirm that the unit and hanging bolts are positioned properly. If they are not positioned properly condensate may form due to air leaks. Be sure to check the position.**
- Use a level to check that the surface indicated by (A) is at level. Ensure that the hanging bolt nuts are tightened to fix the hanging bolts.**
- To ensure that drain is discharged, be sure to hang the unit at level using a level.**



CAUTION

Install the unit in horizontal position. If the side with the drain port is installed higher, it may cause water leakage.

(4) Refrigerant pipe and drain pipe specifications

To avoid condensation, provide sufficient antisweating and insulation to the refrigerant and drain pipes. When using commercially available refrigerant pipes, be sure to wrap commercially available insulation (with a heat-resisting temperature of more than 100 °C [212 °F] and thickness given below) onto both liquid and gas pipes. Insulate all indoor pipes with form polyethylene insulation with a minimum density of 0.03 and a thickness as specified in the table below.

- 1) Select the thickness of insulation by pipe size.

Pipe size	Insulating material's thickness
6.4 to 25.4 mm [1/4 to 1 in.]	More than 10 mm [13/32 in.]
28.6 to 38.1 mm [1-1/8 to 1-1/2 in.]	More than 15 mm [19/32 in.]

- 2) If the unit is to be used on the top story of a building and under conditions of high temperature and humidity, it is necessary to use pipe size and insulation thicker than those given in the table above.
- 3) If there are customer's specifications, follow them.

(4)-1. Refrigerant pipe and drain pipe specifications

PEFY-AF1200CFMR

(Unit: mm [in.])

Outdoor Unit Model		PURY-P120TKMU/YKMU-A(-BS)
Refrigerant pipe*1 (Braze connection)	Liquid pipe	ø 19.05 [3/4]
	Gas pipe	ø 28.58 [1-1/8]
Drain pipe		O.D. ø 32 [1-1/4]

- *1. The pipe sizes in the above table show those used to connect outdoor units to BC controllers. Use liquid pipe of ø 9.52 [3/8] and gas pipe of ø 22.2 [7/8] to connect indoor units to BC controllers. Separately sold twinning pipe is required for the connection.

PEFY-AF1200CFM

(Unit: mm [in.])

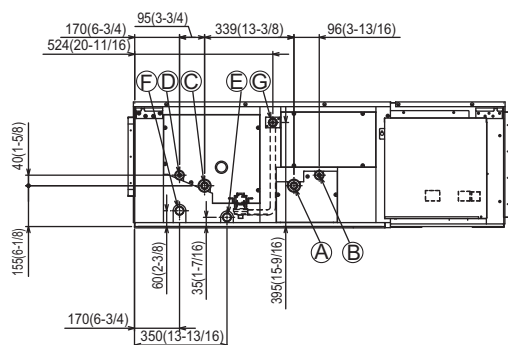
Outdoor Unit Model		PUHY-P120TKMU/YKMU-A(-BS)
Refrigerant pipe (Braze connection)	Liquid pipe	ø 12.7 [1/2]*1
	Gas pipe	ø 22.2 [7/8]
Drain pipe		O.D. ø 32 [1-1/4]

- *1. The supplied reducer is required.

(4)-2. Refrigerant pipe, drain pipe

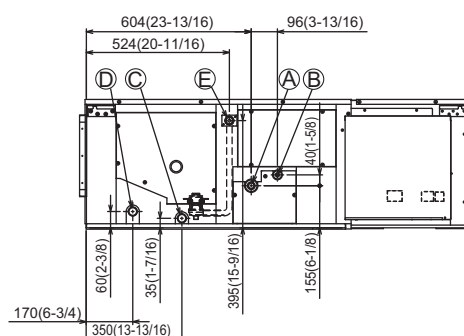
[Fig.(4)-2.1]

PEFY-AF1200CFMR



- (A) Gas refrigerant piping brazing connection of main coil: ø22.2 (7/8)
- (B) Liquid refrigerant piping brazing connection of main coil: ø9.52 (3/8)
- (C) Gas refrigerant piping brazing connection of reheat coil: ø22.2 (7/8)
- (D) Liquid refrigerant piping brazing connection of reheat coil: ø9.52 (3/8)
- (E) Drain pipe (O.D. ø32 [1-1/4], primary draining)
- (F) Drain pipe (O.D. ø32 [1-1/4], secondary draining)
- (G) Drain pipe (O.D. ø32 [1-1/4])

PEFY-AF1200CFM



(Unit: mm [in.])

- (A) Gas refrigerant piping brazing connection: ø22.2 (7/8)
- (B) Liquid refrigerant piping brazing connection: ø9.52 (3/8)
- (C) Drain pipe (O.D. ø32 [1-1/4], primary draining)
- (D) Drain pipe (O.D. ø32 [1-1/4], secondary draining)
- (E) Drain pipe (O.D. ø32 [1-1/4])

(5) Connecting refrigerant pipes and drain pipes

(5)-1. Refrigerant piping work

This piping work must be done in accordance with the installation manuals for both outdoor unit and BC controller (simultaneous cooling and heating R2 series).

- R2-series is designed to so that the refrigerant pipe from an outdoor unit is received by BC controller and branches at the BC controller to connect between indoor units.
- For constraints on pipe length and allowable elevation differences, refer to the outdoor unit manual.
- Braze the pipe connections.

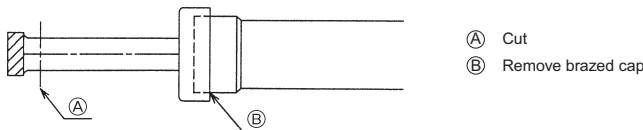


CAUTION

Install the refrigerant piping for the indoor unit in accordance with the following.

- 1) Cut the tip of the indoor unit piping, remove the gas, and then remove the brazed cap.

[Fig.(5)-1.1]

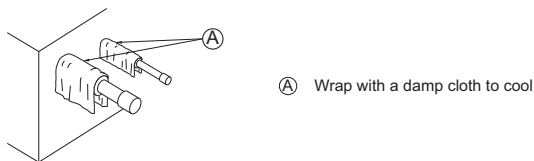


- 2) Pull out the insulation on the site refrigerant piping, braze the unit piping, and replace the insulation in its original position. Wrap the piping with insulating tape.

Note

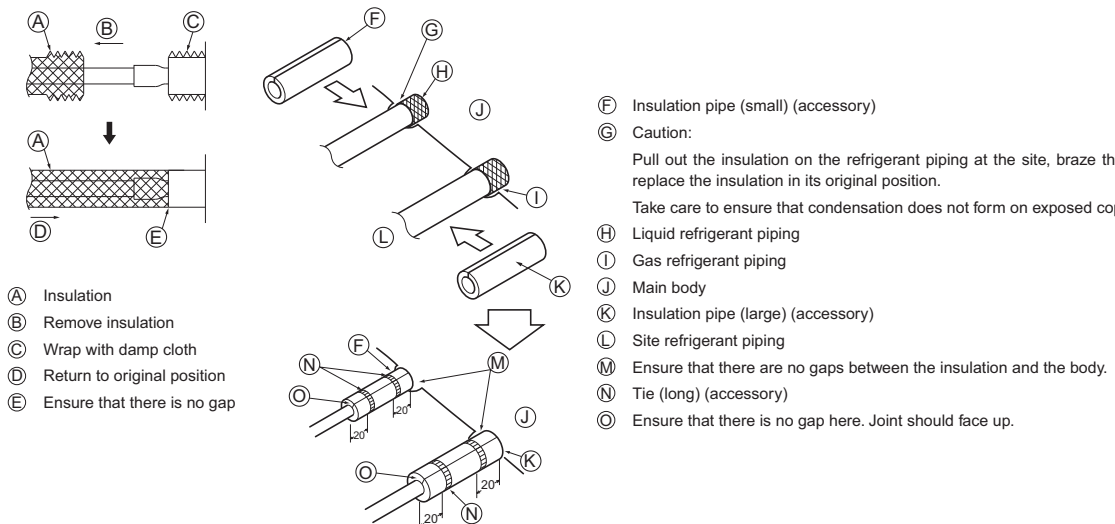
- When brazing the refrigerant pipes, be sure to braze, after covering a wet cloth to the pipes of the units in order to prevent it from burning and shrinking by heat.

[Fig.(5)-1.2]



- Pay strict attention when wrapping the copper piping since wrapping the piping may cause condensation instead of preventing it.

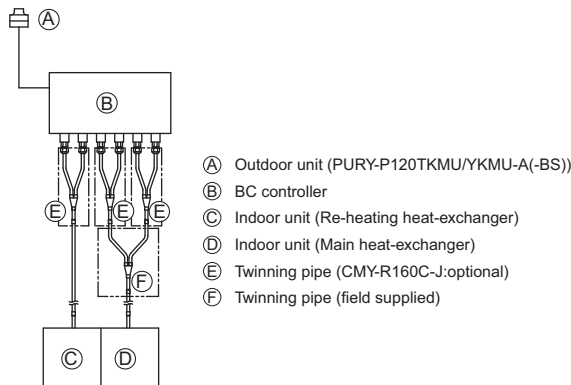
[Fig.(5)-1.3]



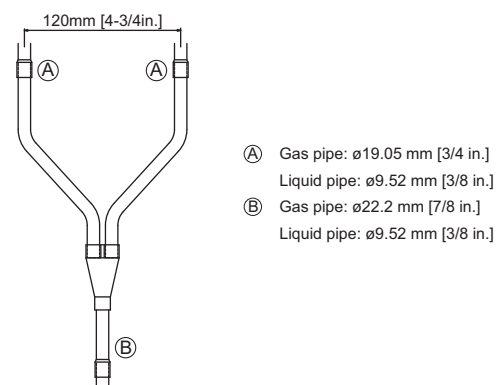
For PEFY-AF1200CFMR

- Use the optional twinning pipe (CMY-R160C-J) and field supplied twinning pipe to connect between the BC controller and indoor units.
- Refer to [Fig.(5)-1.5] for the detail of the field supplied twinning pipe.

[Fig.(5)-1.4]



[Fig.(5)-1.5]



Cautions on refrigerant piping

- Be sure to use non-oxidative brazing for brazing to ensure that no foreign matter or moisture enter into the pipe.
- Be sure to apply refrigerating machine oil over the flare connection surface and tighten the connection using a double spanner.
- Provide a metal brace to support the refrigerant pipe so that no load is imparted to the indoor unit pipe. This metal brace should be 50 cm [19-11/16 in.] away from the indoor unit's flare connection.

WARNING

When installing and moving the unit, do not charge it with refrigerant other than the refrigerant specified on the unit.

- Mixing of a different refrigerant, air, etc. may cause the refrigerant cycle to malfunction and result in severe damage.

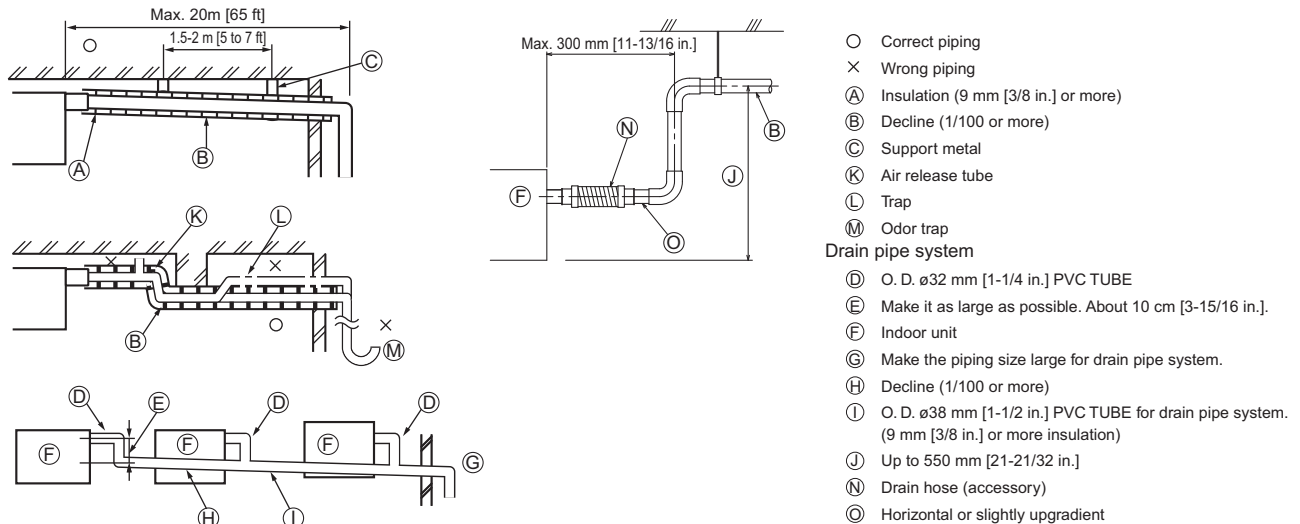
CAUTION

- Use refrigerant piping made of C1220 (Cu-DHP) phosphorus deoxidized copper as specified in the JIS H3300 "Copper and copper alloy seamless pipes and tubes." In addition, be sure that the inside and outside surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.
- Never use existing refrigerant piping.
 - The large amount of chlorine in conventional refrigerant and refrigerator oil in the existing piping will cause the new refrigerant to deteriorate.
- Store the piping to be used indoors and keep both ends of the piping sealed until just before brazing.
 - If dust, dirt, or water get into the refrigerant cycle, the oil will deteriorate and the compressor may fail.
- Use ester oil, ether oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections. (For models using R410A)
 - The refrigerant used in the unit is highly hygroscopic and mixes with water and will degrade the refrigerator oil.

(5)-2. Drain piping work

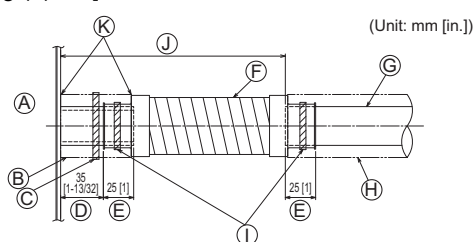
- Ensure that the drain piping is sloping downward (pitch of more than 1/100) to the outdoor (discharge) side. Do not install a trap.
- Ensure that any drain pipe length is less than 20 m [65 ft] (excluding the difference). If the drain piping is long, provide metal braces to prevent it from waving. Never provide any air vent pipe. Otherwise drain may be ejected.
- Use a hard vinyl chloride pipe O.D. $\phi 32$ mm [1-1/4 in.] for drain piping.
- Ensure that collected pipes are 10 cm [3-15/16 in.] lower than the unit body's drain port.
- Do not provide any odor trap at the drain discharge port.
- Put the end of the drain piping at a location where no odor is generated.
- Do not put the end of the drain piping in any drain where ionic gases are generated.

[Fig.(5)-2.1]



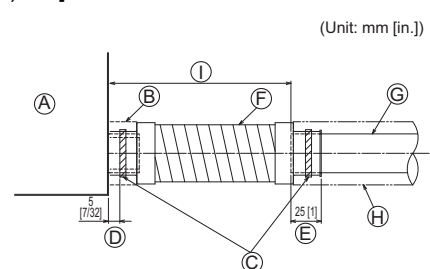
- 1) Insert the drain hose (accessory) into the drain port (insertion margin: 25 mm [1 in.]).
 (The drain hose must not be bent more than 45° to prevent the hose from breaking or clogging.)
 (Attach the hose with glue for the hard vinyl chloride pipe, and fix it with the band (small, accessory).)
- 2) Attach the drain pipe (O.D. $\phi 32$ mm [1-1/4 in.] PVC TUBE, field supplied).
 (Attach the pipe with glue for the hard vinyl chloride pipe, and attach it with the band (small, accessory).)
- 3) Perform insulation work on the drain pipe (O.D. $\phi 32$ mm [1-1/4 in.] PVC TUBE) and on the socket (including elbow).
- 4) Check the drainage. (Refer to [Fig.(5)-3.1])
- 5) Attach the insulation (accessory), and attach it with the band (large, accessory) to insulate the drain port.

[Fig.(5)-2.2]



- (A) Indoor unit
 (B) Insulation (long) (accessory)
 (C) Tie (long) (accessory)
 (D) Visible part
 (E) Insertion margin
 (F) Drain hose (accessory)
 (G) Drain pipe (O.D. $\phi 32$ mm [1-1/4 in.] PVC, field supplied)
 (H) Insulation (field supplied)
 (I) Tie (short) (accessory)
 (J) Max. 180 ± 5 mm [7-3/32 $\pm$ 7/32 in.]
 (K) The joint of the insulation must be positioned up.

[Fig.(5)-2.3]

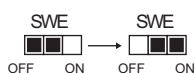


- (A) Indoor unit
 (B) Insulation (short) (accessory)
 (C) Tie (short) (accessory)
 (D) Attaching the band
 (E) Insertion margin
 (F) Drain hose (accessory)
 (G) Drain pipe (O.D. $\phi 32$ mm [1-1/4 in.] PVC, field supplied)
 (H) Insulation (field supplied)
 (I) Max. 145 ± 5 mm [5-23/32 $\pm$ 7/32 in.]

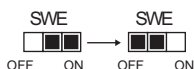
(5)-3.Confirming drain discharge

- Make sure that the drain-lift mechanism operates normally for discharge and that there is no water leaking from the connections.**
- Be sure to confirm the above when the system is operating in heating mode.
- Be sure to confirm the above before ceiling work is done in the case of a new construction.

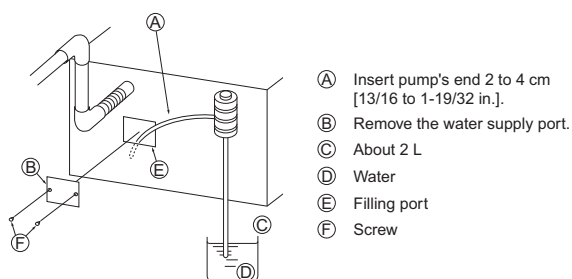
- 1) Remove the water supply port cover on the same side as the indoor unit piping.
- 2) Fill water into the feed water pump using a feed water tank. In filling, be sure to put the end of the pump or tank in a drain pan. (If the insertion is incomplete, water may flow over the machine.)
- 3) Perform the test run in cooling mode, or turn on the switch SWE on the controller circuit board. (The drain pump and the fan are forced to operate without remote controller operation.) Make sure using a transparent hose that drain is discharged.



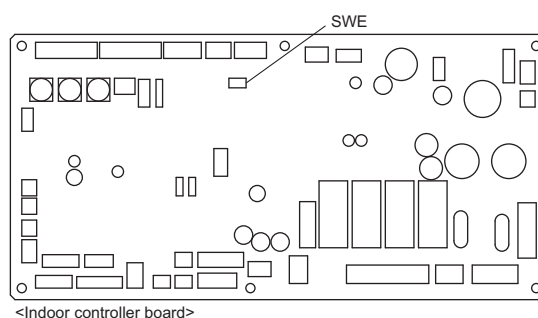
- 4) After confirmation, cancel the test run mode, and turn off the main power. When the switch SWE has been turned on, turn it off, and attach the water supply port cover into its original position.



[Fig.(5)-3.1]



[Fig.(5)-3.2]



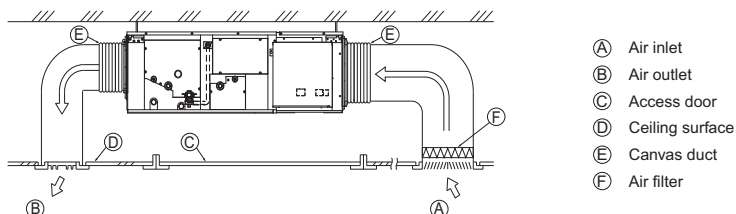
(6) Duct work

- When connecting ducts, insert a canvas duct between the main body and the duct.
- Use non-combustible duct components.
- Install sufficient insulation to prevent condensation forming on outlet duct flanges and outlet ducts.

CAUTION

**Keep the distance between the inlet grille and the fan over 850 mm [33-15/32 in.].
If it is less than 850 mm [33-15/32 in.], install a safety guard on the fan.**

[Fig.(6)-0.1]



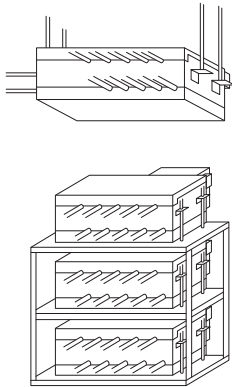
2. BC controller installation - PEFY-AF1200CFMR only

(1) Selecting an installation site

- Place not exposed to rain (BC controller is a special machine for indoor use.)
- Place with large enough service space
- Place in which refrigerant pipes can be provided within the limitations
- Place not exposed to direct radiant heat from other heat sources
- Do not install the unit in any oily steamy place or near any machine that generates high frequencies. Doing so may cause a risk of fire, erroneous operation or dew drop
- Place with less noise effect generated from other units
- Place in which water piping, refrigerant piping and electrical wiring can be done easily
- Avoid places exposed to the generation, inflow, accumulation or leakage of flammable and sulfuric gases
- Place in which a downward pitch of more than 1/100 can be taken for drain piping

1) For hanging from the ceiling [Fig.(1)-0.1]

[Fig.(1)-0.1]



- Provide a inspection hole 450 mm [17-23/32 in] square to the ceiling surface as shown in [Fig.(1)-1.1] (page 74).
- Above the ceiling of corridor, bath room, etc., where persons are not regularly there (Avoid installing at around center of the room).
- Place with strength to the degree that hanging bolts can be mounted (that sustains a pull-out load of 60 kg [133 LBS] per bolt)
- Be sure to install BC controllers level.

2) For stacking on a rack [Fig.(1)-0.1]

- Place in which sufficient space can be obtained around a rack
- Place with floor strength that sustains the entire weight



WARNING

Be sure to install the unit in a place that well sustains the entire weight.
If there is a lack of strength, it may cause the unit to fall down, resulting in an injury.



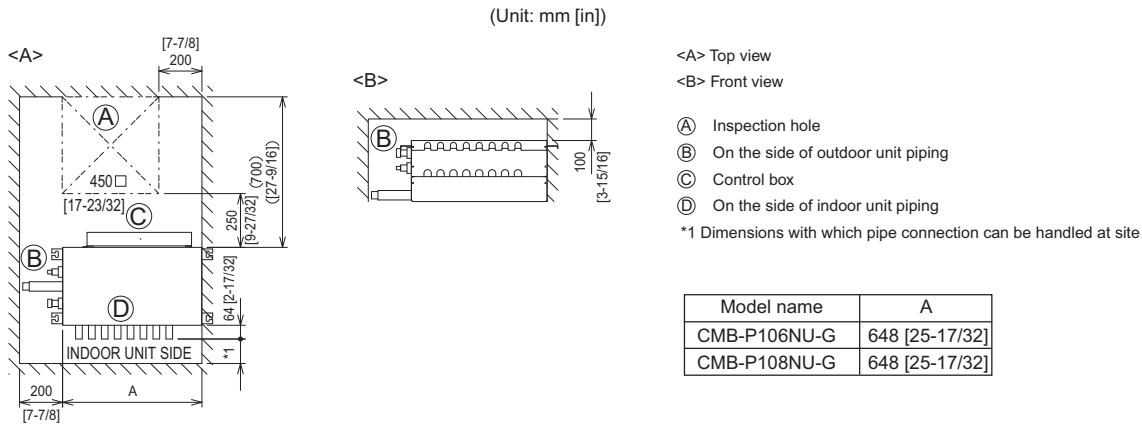
CAUTION

Be sure to install the unit level.

(1)-1. Securing installation and service space

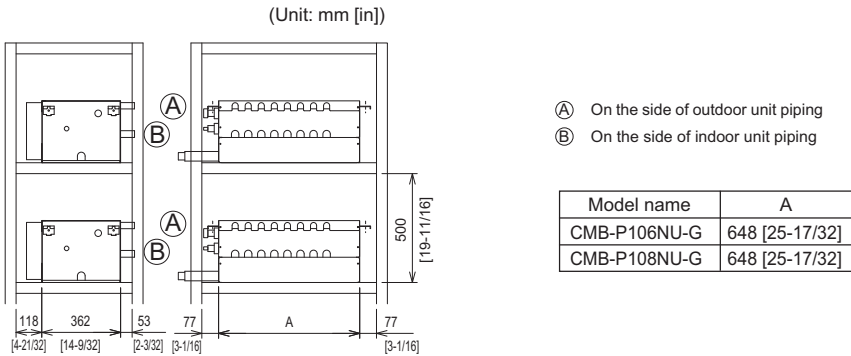
1) For hanging from the ceiling
(This is a reference view showing the least installation space.)

[Fig.(1)-1.1]



2) When stacking on a rack
(This is a reference view showing the least installation space.)

[Fig.(1)-1.2]



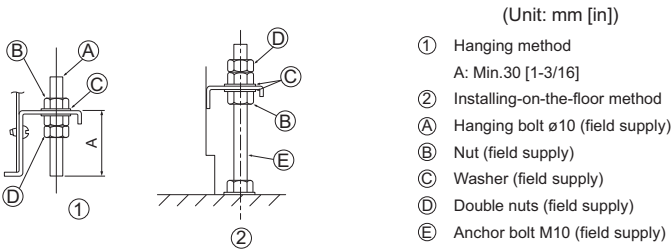
(2) Installing BC controller

(2)-1. Installing BC controllers

Installing hanging bolts

Install locally procured hanging bolts (all screws) following the procedure given in the figure. The hanging bolt size is ø10 (M10 screw).
To hang the unit, use a lifting machine to lift and pass it through the hanging bolts.

[Fig.(2)-1.1]



◆Be sure to install the BC controllers level. Installing obliquely may cause a risk of drain leakage. Use a level to check the unit’s level. If it is oblique, loosen the fixing nut and make an adjustment.

CAUTION
Be sure to install the unit body level.

(3) Connecting refrigerant pipes and drain pipes

(3)-1. Connecting refrigerant pipes

- 1) Connect the liquid and gas pipes of each indoor unit to the same (correct) end connection numbers as indicated on the indoor unit flare connection section of each BC controller. If connected to wrong end connection numbers, there will be no normal operation.
- 2) List indoor unit model names in the name plate on the BC controller control box (for identification purposes), and BC controller end connection numbers and address numbers in the name plate on the indoor unit side.
- 3) If the number of connected indoor units is less than the number of branch holes, it does not matter which end connections you leave.
Seal unused end connections using flare nuts with end caps just as they were capped when shipped from the factory. No end cap will lead to refrigerant leakage.
- 4) When using branch pipes (CMY-Y102S-G), be sure to connect them level.
- 5) Be sure to tighten the flare nuts using a double spanner. Otherwise the refrigerant may leak.
- 6) Be sure to use non-oxidative brazing where necessary. If you do not use nonoxidative brazing, it may clog the pipes.
- 7) After completing pipe connection, support the pipes to ensure that load is not imparted to the BC controller's end connections (particularly to the gas pipes of indoor units).

WARNING

When installing and moving the unit, do not charge it with refrigerant other than the refrigerant (R410A) specified on the unit.

- Mixing of a different refrigerant, air, etc. may cause the refrigerant cycle to malfunction and result in severe damage.

CAUTION

- Use refrigerant piping made of C1220 (Cu-DHP) phosphorus deoxidized copper as specified in the JIS H3300 "Copper and copper alloy seamless pipes and tubes". In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.**
- Never use existing refrigerant piping.**
 - The large amount of chlorine in conventional refrigerant and refrigerator oil in the existing piping will cause the new refrigerant to deteriorate.
- Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing.**
 - If dust, dirt, or water gets into the refrigerant cycle, the oil will deteriorate and the compressor may fail.
- Use ester oil, ether oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections.**
 - The refrigerant used in the unit is highly hygroscopic and if it mixes with water it will degrade the refrigerator oil.

(3)-2. Refrigerant piping work

After connecting the refrigerant pipes of all indoor and outdoor units with the outdoor units' stop valves remained fully closed, evacuate vacuum from the outdoor units' stop valve service ports.

After completing the above, open the outdoor units' stop valves. This connects the refrigerant circuit (between outdoor and BC controller) completely.

How to handle stop valves is described on each outdoor unit.

Note

- Before tightening the flare nut, apply refrigerating machine oil lightly over the valve flare surface and its seating surface.**
- Use a double spanner for pipe connection.**
- After pipe connection, be sure to check that there is no gas leakage, using a leak detector or soap-and-water solution.**
- Before brazing the refrigerant piping, always wrap the piping on the main body, and the thermal insulation piping, with damp cloths to prevent heat shrinkage and burning the thermal insulation tubing.** Take care to ensure that the flame does not come into contact with the main body itself.
- Do not use leak-detection additive.**

WARNING

Do not mix anything other than the specified refrigerant (R410A) into the refrigerating cycle when installing or moving. Mixing air may cause the refrigerating cycle to get abnormally high temperature, resulting in a burst.

CAUTION

Cut the tip of the indoor unit piping, remove the gas, and then remove the brazed cap.

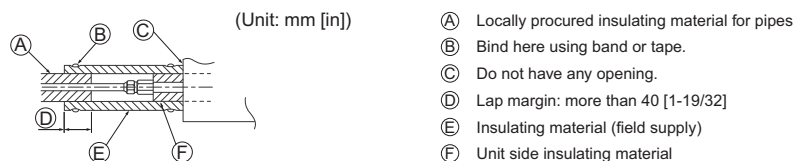
[Fig.(3)-2.1]



(3)-3. Insulating refrigerant pipes

Be sure to wind heat-resisting polyethylene form of more than 20 mm [13/16 in] in thickness onto both liquid and gas pipes and also put it into the joints between indoor unit and insulating material so that there will be no gap. Incomplete insulation may cause a risk of dew drop. Pay careful attention, particularly when insulating above the ceiling.

[Fig.(3)-3.1]

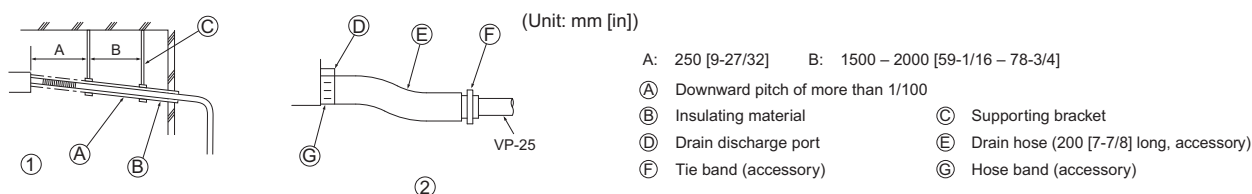


(3)-4. Drain piping work

1) Drain piping work

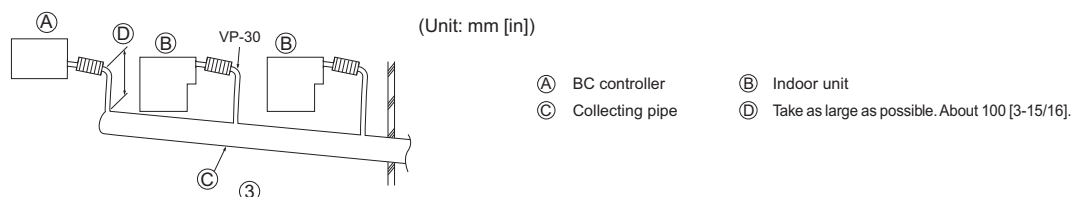
- ♦Ensure that the drain piping is downward (pitch of more than 1/100) to the outdoor (discharge) side. If it is impossible to take any downward pitch, use an optionally available drain-up mechanism to obtain a downward pitch of more than 1/100.
- ♦Ensure that any cross-wise drain piping is less than 20 m [65 ft]. If the drain piping is long, provide metal braces to prevent it from waving. Never provide any air vent pipe. Otherwise drain may be ejected.
- ♦Connect the supplied drain hose to the discharge port on the unit body. Use hard vinyl chloride pipes VP-25 (ø32) for drain piping (②). Tighten the supplied drain hose onto the discharge port using the supplied hose band. (For this, do not use any adhesive because the drain hose will be removed for service later.)
- ♦Do not have any odor trap around the discharge port.

[Fig.(3)-4.1]



- ♦As shown in ③, install a collecting pipe about 100 mm [3-15/16 in] below the drain ports and give it a downward pitch of more than 1/100. This collecting pipe should be of VP-30.
- ♦Set the end of drain piping in a place without any risk of odor generation.
- ♦Do not put the end of drain piping into any drain where ionic gases are generated.
- ♦Although it is free to choose to take out piping in any direction, be sure to observe the instructions above.
- ♦When using an optionally available drain-up mechanism, follow its instruction manual for drain piping.

[Fig.(3)-4.2]



2) Discharge test

After completing drain piping work, open the BC controller panel, fill water, and test drain discharge. At this moment, check to see that there is no water leakage from the connections.

3) Insulating drain pipes

Provide sufficient insulation onto the drain pipes just as for refrigerant pipes.



CAUTION

Be sure to provide drain piping and heat-insulate it in order to prevent dew condensation. If there is a deficiency in piping work, it may cause a risk of water leakage and so wet your property.

3. Outdoor installation

(1) Requirement on installation site

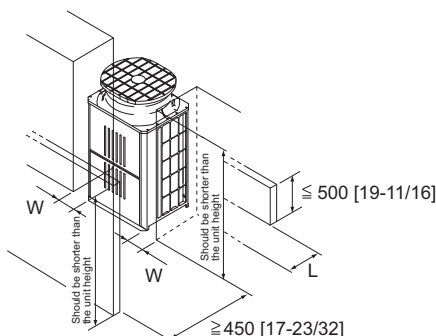
- 1) No direct thermal radiation to the unit.
- 2) No possibility of annoying the neighbors by the sound of the unit.
Valves and refrigerant flow on the outdoor unit may generate noise.
- 3) Avoid the sites where strong winds blow.
- 4) With strength to bear the weight of the unit.
- 5) Drain flow from the unit is cared at heating mode.
- 6) Enough space for installation and service as shown at 3.(2).
- 7) Avoid the sites where acidic solutions or chemical sprays (sulfur series) are used frequently.
- 8) The unit should be secure from combustible gas, oil, steam, chemical gas like acidic solution, sulfur gas and so on.

(2) Spacing

In case of single installation

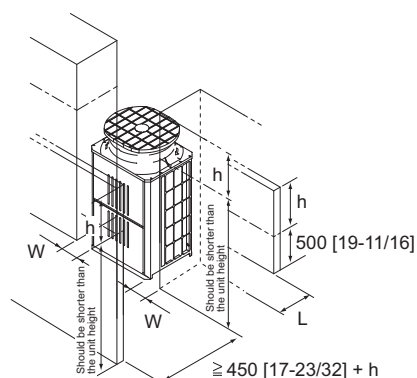
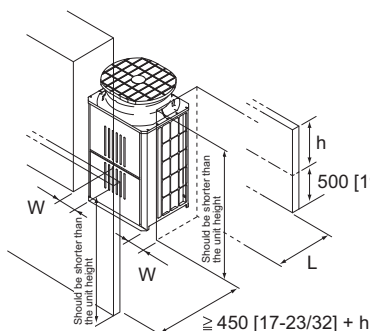
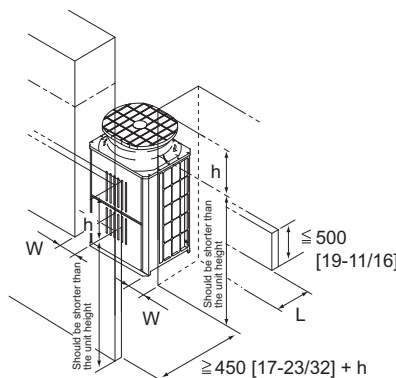
- ♦Secure enough space around the unit as shown in the figure.
- ♦If the wall height exceeds the height limit, widen the space labeled "L" and "W" by the amount that exceeds the limit (labeled <h> in the figure).

1) Walls are lower than the height limit.



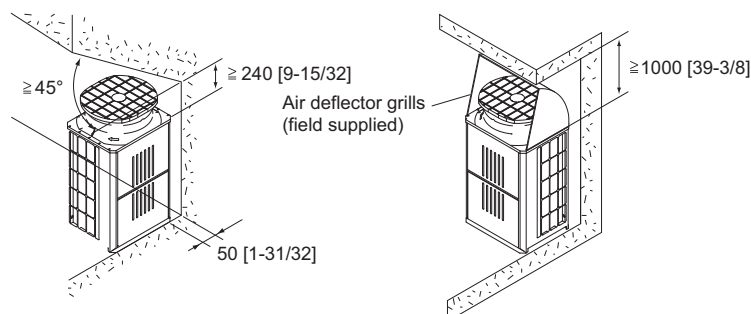
Condition	L	W
Minimum space behind the unit	≥ 100 [3-15/16]	≥ 50 [1-31/32]
Minimum space on both sides of the unit	≥ 300 [11-13/16]	≥ 15 [19/32]

2) If the wall height (H) of the front, rear or side exceeds the wall height restriction



Condition	L	W
Minimum space behind the unit	≥ 100 [3-15/16] + h	≥ 50 [1-31/32] + h
Minimum space on both sides of the unit	≥ 300 [11-13/16] + h	≥ 15 [19/32] + h

3) If there are obstacles at the upper part of the unit



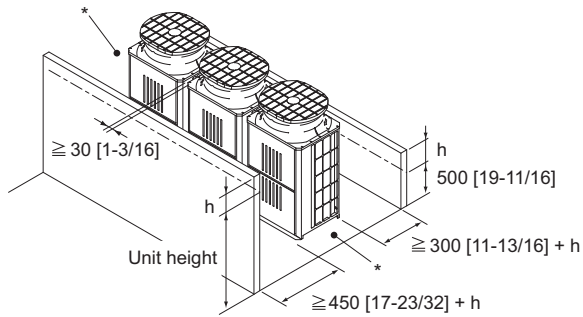
(Unit : mm [in.])

In case of collective installation and continuous installation

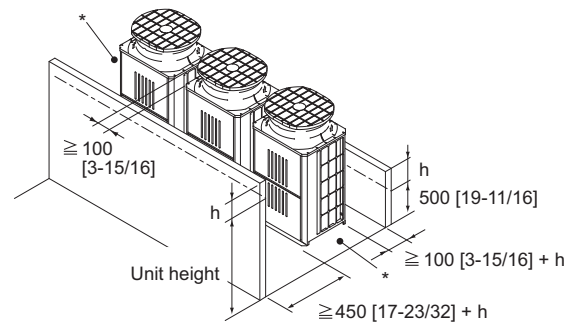
- When multiple units are installed adjacent to each other, secure enough space to allow for air circulation and passageways between groups of units as shown in the figures.
* Leave both sides of each group of units open.
- As with single installation, if the wall height exceeds the height limit, widen the space in the front and the back of a given group of units by the amount that exceeds the limit (labeled <h> in the figure).
- If there is a wall at both the front and the rear of the unit, install up to six units (three units : P120, 144) consecutively in the side direction and provide a space of 1000mm or more as inlet space/passage space for each six units (three units : P120, 144).

1) Side-by-side installation

<The space on both sides of a given group of units is minimum.>

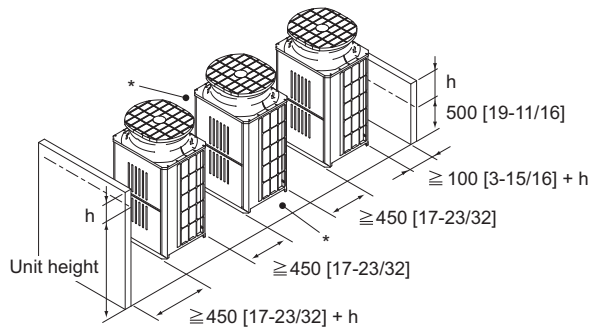


<The space on both sides of a given group of units is minimum.>

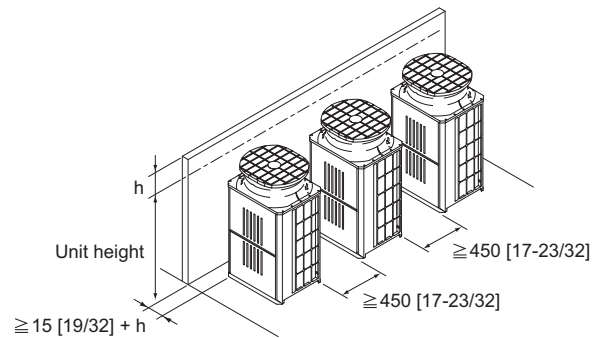


2) Face-to-face installation

<There are walls in the front and the back of a given group of units.>

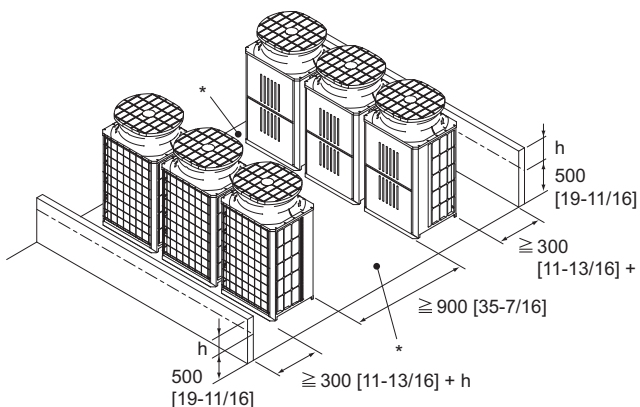


<There is a wall on one side.>

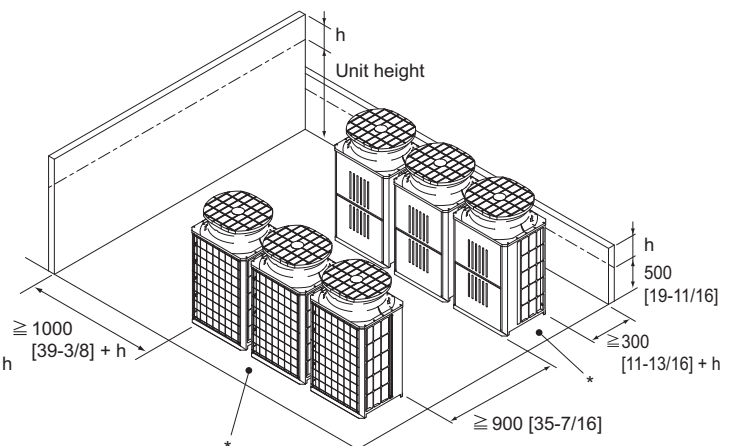


3) Combination of face-to-face and side-by-side installations

<There are walls in the front and the back of a given group of units.>



<There is a wall on one side and either the front or the back of a given group of unit.>



(Unit : mm [in.])

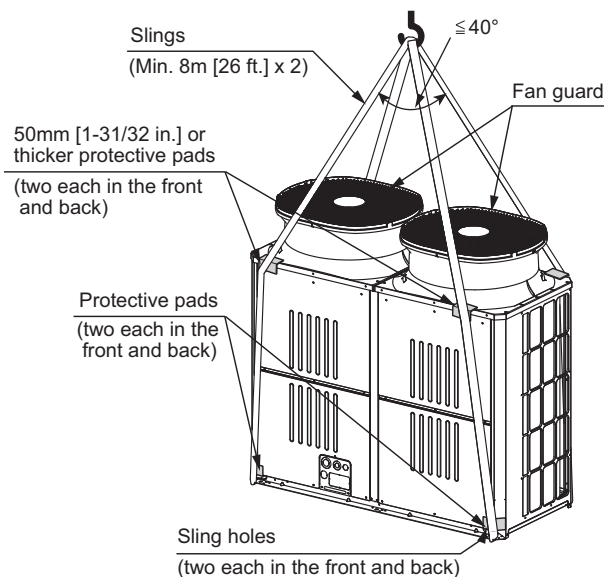
(3) Piping direction

(3)-1. Lifting method

- When lifting the unit with ropes, run the ropes under the unit and use the lifting hole.
- Support the unit at four points with two ropes, and avoid giving mechanical shock.
- Suspension rope angle must be 40° or less, so as to avoid compressing fan guard.
- Use two ropes, each at least 8m [26 ft.] in length
- Use ropes strong enough to support the weight of the unit.
- Always suspend the unit from four corners. (It is dangerous to suspend a unit from two corners and must not be attempted.)
- Use protective pads to keep the ropes from scratching the panels on the unit.
- Use a 50mm [1-31/32 in.] or thicker cardboard or cloth as a protective pad on the top of the unit to prevent contact between the fan guard and slings.

PURY-P120TKMU/YKMU-A(-BS)

PUHY-P120TKMU/YKMU-A(-BS)



CAUTION

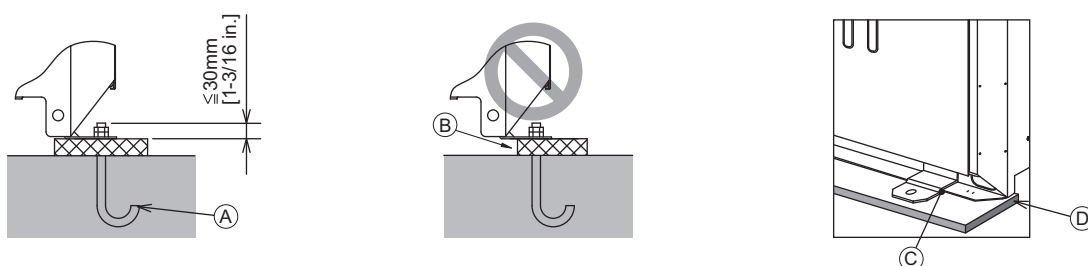
Exercise caution when transporting products.

- Products weighing more than 20 kg [45 LBS] should not be carried alone.
- Do not carry the product by the PP bands.
- To avoid the risk of injury, do not touch the heat exchanger fins.
- Plastic bags may pose a risk of choking hazard to children. Tear plastic bags into pieces before disposing of them.
- When lifting and transporting outdoor units with ropes, run the ropes through lifting hole at the unit base. Securely fix the unit so that the ropes will not slide off, and always lift the unit at four points to prevent the unit from falling.

(3)-2. Installation

- Secure the unit with anchor bolts as shown in the figure below so that the unit will not topple over with strong wind or during an earthquake.
- Install the unit on a durable base made of such materials as concrete or angle steel.
- Take appropriate anti-vibration measures (e.g., vibration damper pad, vibration isolation base) to keep vibrations and noise from being transmitted from the unit through walls and floors.
- When using a rubber cushion, install it so that the cushion covers the entire width of the unit leg.
- Install the unit in such a way that the corner of the angle bracket at the base of the unit shown in the figure below is securely supported.
- Install the anchor bolt in such a way that the top end of the anchor bolt do not stick out more than 30 mm [1-3/16 in.].
- This unit is not designed to be anchored with post-installation-type anchor bolts, although by adding fixing brackets anchoring with such type of anchor bolts becomes possible.

- (A) : M10 anchor bolt procured at the site.
 (B) : Corner is not seated.
 (C) : Fixing bracket for hole-in anchor bolt
 (3 locations to fix with screws).
 (D) : Anti-vibration rubber
 Install it so that the rubber covers the entire width of the unit leg.



Take into consideration the durability of the base, water drainage route (Drain water is discharged from outdoor units during operation.), piping route, and wiring route when performing foundation work.



WARNING

Properly install the unit on a surface that can withstand the weight of the unit. Unit installed on an unstable surface may fall and cause injury.



WARNING

Take appropriate safety measures against strong winds and earthquakes to prevent the unit from falling.

(3)-3. Anchor bolt positions

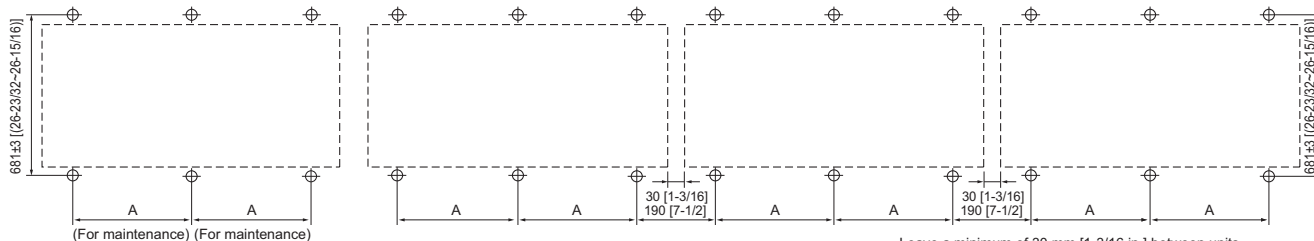
PURY-P120TKMU/YKMU-A(-BS)

PUHY-P120TKMU/YKMU-A(-BS)

• Individual installation

• Collective installation

(Unit : mm [in.])



Leave a minimum of 30 mm [1-3/16 in.] between units.

PUHY	P120
A	795±2 [31-5/16(31-1/4~31-13/32)]

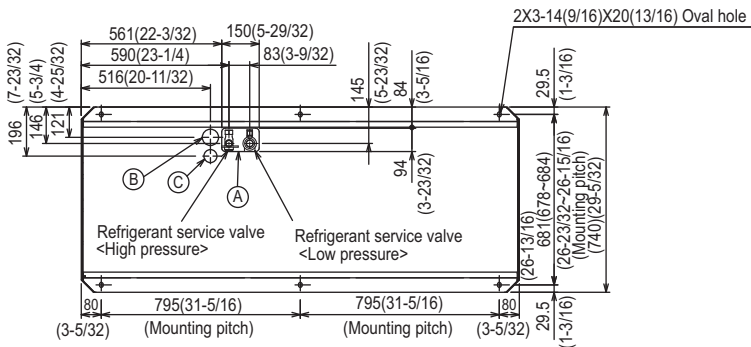
(3)-4. Installation

When the pipes and/or cables are routed at the bottom of the unit, make sure that the through hole at the base of the unit does not get blocked with the installation base.

When the pipes are routed at the bottom of the unit, the base should be at least 100 mm [3-15/16 in.] in height.

PURY-P120TKMU/YKMU-A(-BS)

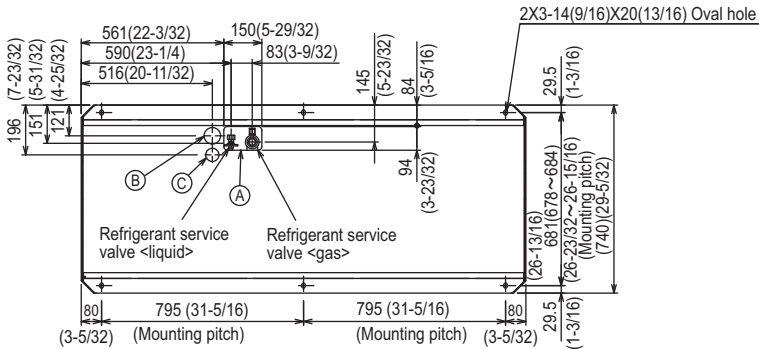
(Unit : mm [in.])



Bottom view

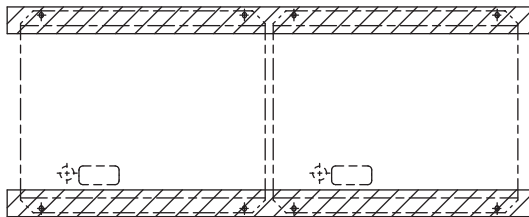
NO.	Usage	Specifications
(A)	For pipes	Bottom through hole 150 × 94 Knockout hole (5-29/32) (3-23/32)
(B)	For wires	Bottom through hole Ø65 Knockout hole (2-9/16)
(C)	For wires	Bottom through hole Ø52 Knockout hole (2-1/16)

PUHY-P120TKMU/YKMU-A(-BS)

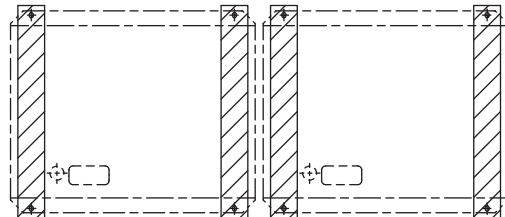


Bottom view

Installation base parallel to the unit's front panel



Installation base perpendicular to the unit's front panel



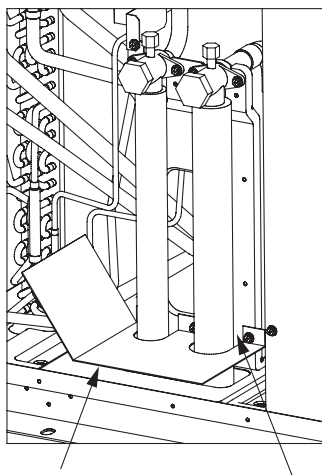
(3)-5. Refrigerant pipe routing

The gaps around the edges of through holes for pipes and wires on the unit allow water or mice to enter the unit and damage its parts. Close these gaps with filler plates.

This unit allows two types of pipe routing:

- ♦Bottom piping
- ♦Front piping

PURY-P120TKMU/YKMU-A(-BS)

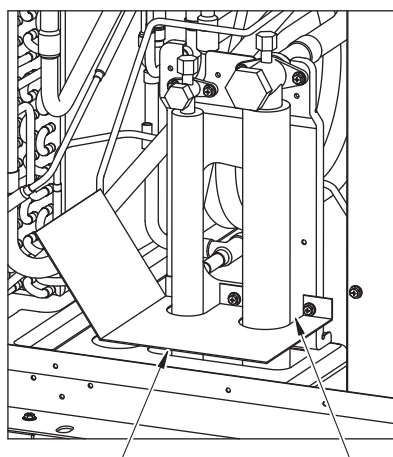


Example of closure materials
(field supply)

Fill the gap at the site

※ The figure above shows a unit on which a low-pressure twinning pipe kit is not installed.

PUHY-P120TKMU/YKMU-A(-BS)



Example of closure materials
(field supply)

Fill the gap at the site

⚠ CAUTION

To prevent small animals, water and snow from entering the unit and damage its parts, close the gap around the edges of through holes for pipes and wires with filler plates.

4. Caution for refrigerant leakage

The installer and/or air conditioning system specialist shall secure safety against refrigerant leakage according to local regulations or standards.

The following standard may be applicable if no local regulation or standard is available.

(1) Refrigerant property

R410A refrigerant is harmless and incombustible. The R410A is heavier than the indoor air in density. Leakage of the refrigerant in a room has possibility to lead to a hypoxia situation. Therefore, the Critical concentration specified below shall not be exceeded even if the leakage happens.

• Critical concentration

Critical concentration hereby is the refrigerant concentration in which no human body would be hurt if immediate measures can be taken when refrigerant leakage happens.

Critical concentration of R410A: 0.44kg/m³

(The weight of refrigeration gas per 1 m³ air conditioning space.);

* The Critical concentration is subject to ISO5149, EN378-1.

For the CITY MULTI system, the concentration of refrigerant leaked should not have a chance to exceed the Critical concentration in any situation.

(2) Confirm the Critical concentration and take countermeasure

The maximum refrigerant leakage concentration (Rmax) is defined as the result of the possible maximum refrigerant weight (Wmax) leaked into a room divided by its room capacity (V). It is referable to Fig.4-1. The refrigerant of Outdoor unit here includes its original charge and additional charge at the site.

The additional charge is calculated according to refrigerant charging calculation of each kind of Outdoor unit, and shall not be over charged at the site.

Procedure (2)-1~3 tells how to confirm maximum refrigerant leakage concentration (Rmax) and how to take countermeasures against a possible leakage.

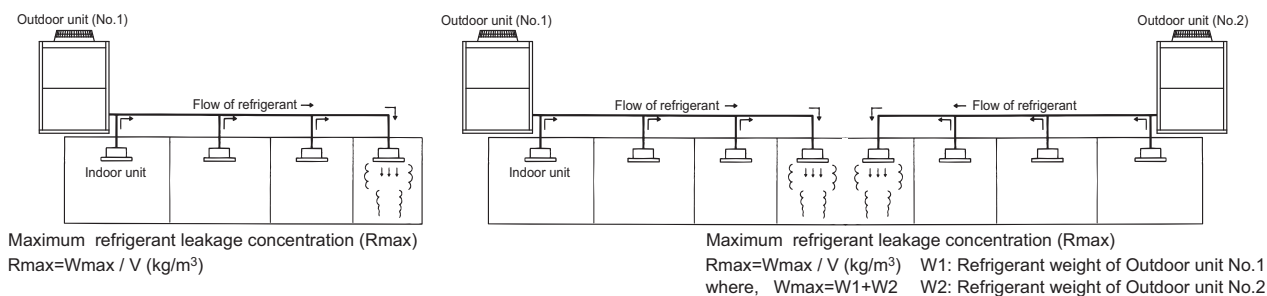


Fig. 4-1 The maximum refrigerant leakage concentration

(2)-1. Find the room capacity (V),

If a room having total opening area more than 0.15% of the floor area at a low position with another room/space, the two rooms/space are considered as one. The total space shall be added up.

(2)-2. Find the possible maximum leakage (Wmax) in the room. If a room has Indoor unit(s) from more than 1 Outdoor unit, add up the refrigerant of the Outdoor units.

(2)-3. Divide (Wmax) by (V) to get the maximum refrigerant leakage concentration (Rmax).

(2)-4. Find if there is any room in which the maximum refrigerant leakage concentration (Rmax) is over 0.44kg/m³.

If no, then the CITY MULTI is safe against refrigerant leakage.

If yes, following countermeasure is recommended to do at site.

Countermeasure 1: Let-out (making V bigger)

Design an opening of more than 0.15% of the floor area at a low position of the wall to let out the refrigerant whenever leaked.

e.g. make the upper and lower seams of door big enough.

Countermeasure 2: Smaller total charge (making Wmax smaller)

e.g. Avoid connecting more than 1 Outdoor unit to one room.

e.g. Using smaller model size but more Outdoor units.

e.g. Shorten the refrigerant piping as much as possible.

Countermeasure 3: Fresh air in from the ceiling (Ventilation)

As the density of the refrigerant is bigger than that of the air. Fresh air supply from the ceiling is better than air exhausting from the ceiling.

Fresh air supply solution refers to Fig.4-2~4.

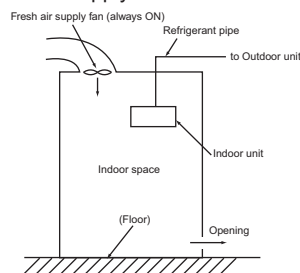


Fig.4-2. Fresh air supply always ON

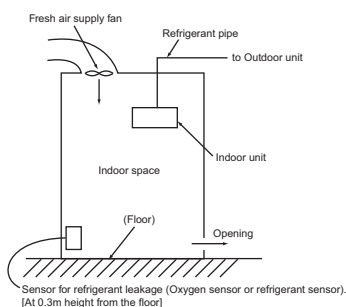


Fig.4-3. Fresh air supply upon sensor action

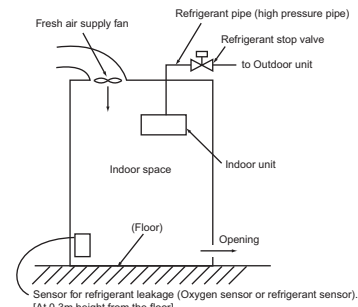


Fig.4-4. Fresh air supply and refrigerant shut-off upon sensor action

Note 1. Countermeasure 3 should be done in a proper way in which the fresh air supply shall be on whenever the leakage happens.

Note 2. In principle, MITSUBISHI ELECTRIC requires proper piping design, installation and air-tight testing after installation to avoid leakage happening.

In the area should earthquake happen, anti-vibration measures should be fully considered.

The piping should consider the extension due to the temperature variation.

**DATA BOOK PEFY-AF1200CFMR
PEFY-AF1200CFM
CMB-P106NU-G
CMB-P108NU-G
PURY-P120TKMU / YKMU-A (-BS)
PUHY-P120TKMU / YKMU-A (-BS)**



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

⚠ Warning

- Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.
 - Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, during repair, or at the time of disposal of the unit.
 - It may also be in violation of applicable laws.
 - MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
<http://Global.MitsubishiElectric.com>