MITSUBISHI ELECTRIC
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AIR CONDITIONING SYSTEMS

HYBRID CITY MULTI

DATA BOOK

MODEL

CMB-WP-V-GA1
CMB-WP-V-GB1
PEFY-WP-VMS1-E
PEFY-WP-VMA-E
PLFY-WP-VBM-E
PFFY-WP-VLRMM-E

YLM 4th edition

HYBRID CITY MULTI
Databook

HYBRID CITY MULTI
1. INDOOR UNITS

PEFY-WP-VMS1-E

1. SPECIFICATIONS

Model			PEFY-WP10VMS1-E	PEFY-WP15VMS1-E	PEFY-WP20VMS1-E	PEFY-WP25VMS1-E
Power source			1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz
Cooling capacity	*1	kW	1.2	1.7	2.2	2.8
(Nominal)	*1	kcal/h	1,000	1,500	1,900	2,400
	*1	BTU/h	4,100	5,800	7,500	9,600
*2	Power input	kW	0.030	0.050	0.051	0.060
*2	Current input	A	0.21	0.44	0.49	0.51
Heating capacity	*3	kW	1.4	1.9	2.5	3.2
(Nominal)	*3	kcal/h	1,200	1,600	2,200	2,800
	*3	BTU/h	4,800	6,500	8,500	10,900
*2	Power input	kW	0.030	0.030	0.031	0.040
*2	Current input	A	0.21	0.33	0.38	0.40
External finish			Galvanized steel plate	Galvanized steel plate	Galvanized steel plate	Galvanized steel plate
External dimension H x W x D		mm	200 x 790 x 700	200 x 790 x 700	200 x 790 x 700	200 x 790 x 700
		in.	7-7/8 x 31-1/8 x 27-9/16	7-7/8 x 31-1/8 x 27-9/16	7-7/8 x 31-1/8 x 27-9/16	7-7/8 x 31-1/8 x 27-9/16
Net weight		kg (lbs)	19 (42)	19 (42)	20 (45)	20 (45)
Heat exchanger			Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)
	Water Volume	L	0.4	0.7	0.9	0.9
FAN	Type x Quantity		Sirocco fan x 2	Sirocco fan x 2	Sirocco fan x 2	Sirocco fan x 2
*4	External static press.	Pa	<5> - 15 - <35> - <50>	<5> - 15 - <35> - <50>	<5> - 15 - <35> - <50>	<5> - 15 - <35> - <50>
		mmH_2O	<0.5> - 1.5 - <3.6> - <5.1>	<0.5> - 1.5 - <3.6> - <5.1>	<0.5> - 1.5 - <3.6> - <5.1>	<0.5> - 1.5 - <3.6> - <5.1>
	Motor Type		DC motor	DC motor	DC motor	DC motor
	Motor output	kW	0.096	0.096	0.096	0.096
	Driving mechanism		Direct-driven by motor	Direct-driven by motor	Direct-driven by motor	Direct-driven by motor
	Air flow rate		(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)
		m^3/min	4.0 - 4.5 - 5.0	5.0 - 6.0 - 7.0	5.5 - 6.5 - 8.0	5.5 - 7.0 - 9.0
		L/s	67 - 75 - 83	83 - 100 - 117	92 - 108 - 133	92 - 117 - 150
		cfm	141 - 159 - 177	177 - 212 - 247	194 - 230 - 282	194 - 247 - 318
Sound pressure level (measured in anechoic room)			(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)
	*2	dB <A>	20-23-25	22-24-28	23-25-29	23-26-30
Insulation material			EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam
Air filter			PP honeycomb fabric.	PP honeycomb fabric.	PP honeycomb fabric.	PP honeycomb fabric.
Protection device			Fuse	Fuse	Fuse	Fuse
Refrigerant control device			-	-	-	-
Connectable outdoor unit/HBC controller			CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1
Water piping diameter	Inlet	in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw
*5 *6	Outlet	in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw
Field drain pipe size		mm (in.)	O.D.32 (1-1/4)	O.D.32 (1-1/4)	O.D.32 (1-1/4)	O.D.32 (1-1/4)
Drawing	External		KD94T794X01	KD94T794X01	KD94T794X01	KD94T794X01
	Wiring		KD94T793X01	KD94T793X01	KD94T793X01	KD94T793X01
	Refrigerant cycle		-	-	-	-
Standard attachment	Document		Installation Manual, Instruction Book	Installation Manual, Instruction Book	Installation Manual, Instruction Book	Installation Manual, Instruction Book
	Accessory		Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band
Optional parts	Control box replace kit		PAC-KE70HS-E	PAC-KE70HS-E	PAC-KE70HS-E	PAC-KE70HS-E
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.			

Notes:

1. Nominal cooling conditions
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. The values are measured at the factory setting of external static pressure.
3. Nominal heating conditions
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
4. The factory setting of external static pressure is shown without < >.
   Refer to "Fan characteristics curves", according to the external static pressure, in DATA BOOK for the usable range of air flow rate.
5. Be sure to install a valve on the water outlet.
6. Install a strainer (40 mesh or more) on the pipe next to the valve to remove the foreign matters.
7. Please group units that operate on 1 branch.

Unit converter

kcal/h	=kW x 860
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.

1. SPECIFICATIONS

Model				PEFY-WP32VMS1-E	PEFY-WP40VMS1-E	PEFY-WP50VMS1-E	
Power source				1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	
Cooling capacity (Nominal)		*1	kW	3.6	4.5	5.6	
		*1	kcal/h	3,100	3,900	4,800	
		*1	BTU/h	12,300	15,400	19,100	
	*2	Power input	kW	0.071	0.090	0.090	
	*2	Current input	A	0.61	0.73	0.77	
Heating capacity (Nominal)		*3	kW	4.0	5.0	6.3	
		*3	kcal/h	3,400	4,300	5,400	
		*3	BTU/h	13,600	17,100	21,500	
	*2	Power input	kW	0.051	0.070	0.070	
	*2	Current input	A	0.50	0.62	0.66	
External finish				Galvanized steel plate	Galvanized steel plate	Galvanized steel plate	
External dimension H x W x D			mm	200 x 990 x 700	200 x 990 x 700	200 x 1,190 x 700	
			in.	7-7/8 x 39 x 27-9/16	7-7/8 x 39 x 27-9/16	7-7/8 x 46-7/8 x 27-9/16	
Net weight			kg (lbs)	25 (56)	25 (56)	27 (60)	
Heat exchanger				Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	
	Water Volume		L	1.0	1.0	1.7	
FAN	Type x Quantity			Sirocco fan x 3	Sirocco fan x 3	Sirocco fan x 4	
*4	External static press.		Pa	<5> - 15 - <35> - <50>	<5> - 15 - <35> - <50>	<5> - 15 - <35> - <50>	
			mmH_2O	<0.5> - 1.5 - <3.6> - <5.1>	<0.5> - 1.5 - <3.6> - <5.1>	<0.5> - 1.5 - <3.6> - <5.1>	
	Motor Type			DC motor	DC motor	DC motor	
	Motor output		kW	0.096	0.096	0.096	
	Driving mechanism			Direct-driven by motor	Direct-driven by motor	Direct-driven by motor	
	Air flow rate			(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	
			m^3/min	8.0 - 9.0 - 11.0	9.5 - 11.0 - 13.0	12.0 - 14.0 - 16.5	
			L/s	133 - 150 - 183	158 - 183 - 217	200 - 233 - 275	
			cfm	282 - 318 - 388	335 - 388 - 459	424 - 494 - 583	
Sound pressure level (measured in anechoic room)				(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	
		*2	dB <A>	28-30-33	30-32-35	30-33-36	
Insulation material				EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam	
Air filter				PP honeycomb fabric.	PP honeycomb fabric.	PP honeycomb fabric.	
Protection device				Fuse	Fuse	Fuse	
Refrigerant control device				-	-	-	
Connectable outdoor unit/HBC controller				CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	
Water piping diameter	Inlet		in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	
*5 *6	Outlet		in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	
Field drain pipe size			mm (in.)	O.D.32 (1-1/4)	O.D.32 (1-1/4)	O.D.32 (1-1/4)	
Drawing	External			KD94T794X01	KD94T794X01	KD94T794X01	
	Wiring			KD94T793X01	KD94T793X01	KD94T793X01	
	Refrigerant cycle			-	-	-	
Standard attachment	Document			Installation Manual, Instruction Book	Installation Manual, Instruction Book	Installation Manual, Instruction Book	
	Accessory			Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band	
Optional parts	Control box replace kit			PAC-KE70HS-E	PAC-KE70HS-E	PAC-KE70HS-E	
Remarks	Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.						

Notes:

1.Nominal cooling conditions
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2.The values are measured at the factory setting of external static pressure.
3.Nominal heating conditions
Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
4.The factory setting of external static pressure is shown without < >.
Refer to "Fan characteristics curves", according to the external static pressure, in DATA BOOK for the usable range of air flow rate.
5.Be sure to install a valve on the water outlet.
6.Install a strainer (40 mesh or more) on the pipe next to the valve to remove the foreign matters.
7.Please group units that operate on 1 branch.

Unit converter

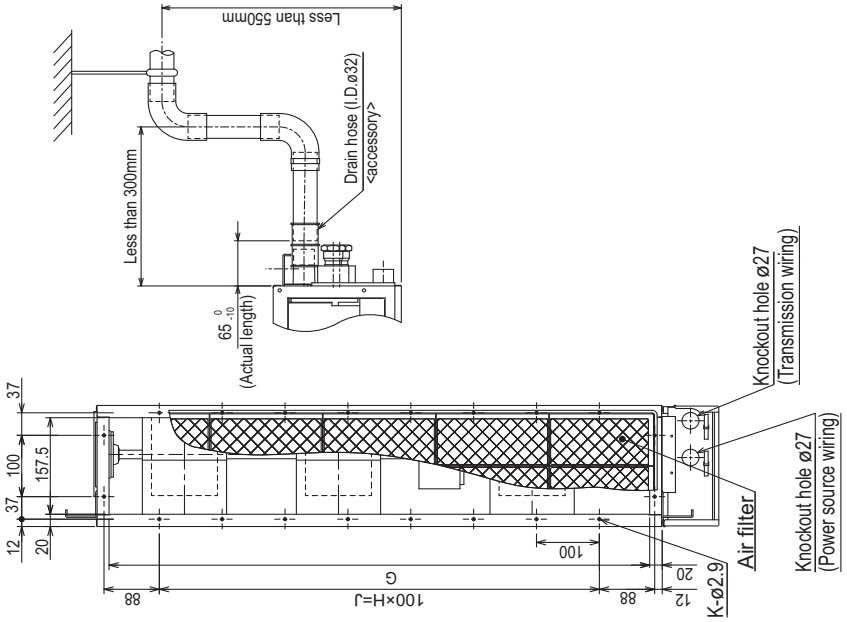
kcal/h	=kW x 860
BTU/h	=kW x 3,412
cfm	=m^3/min x 35.31
lbs	=kg/0.4536

*Above specification data is subject to rounding variation.

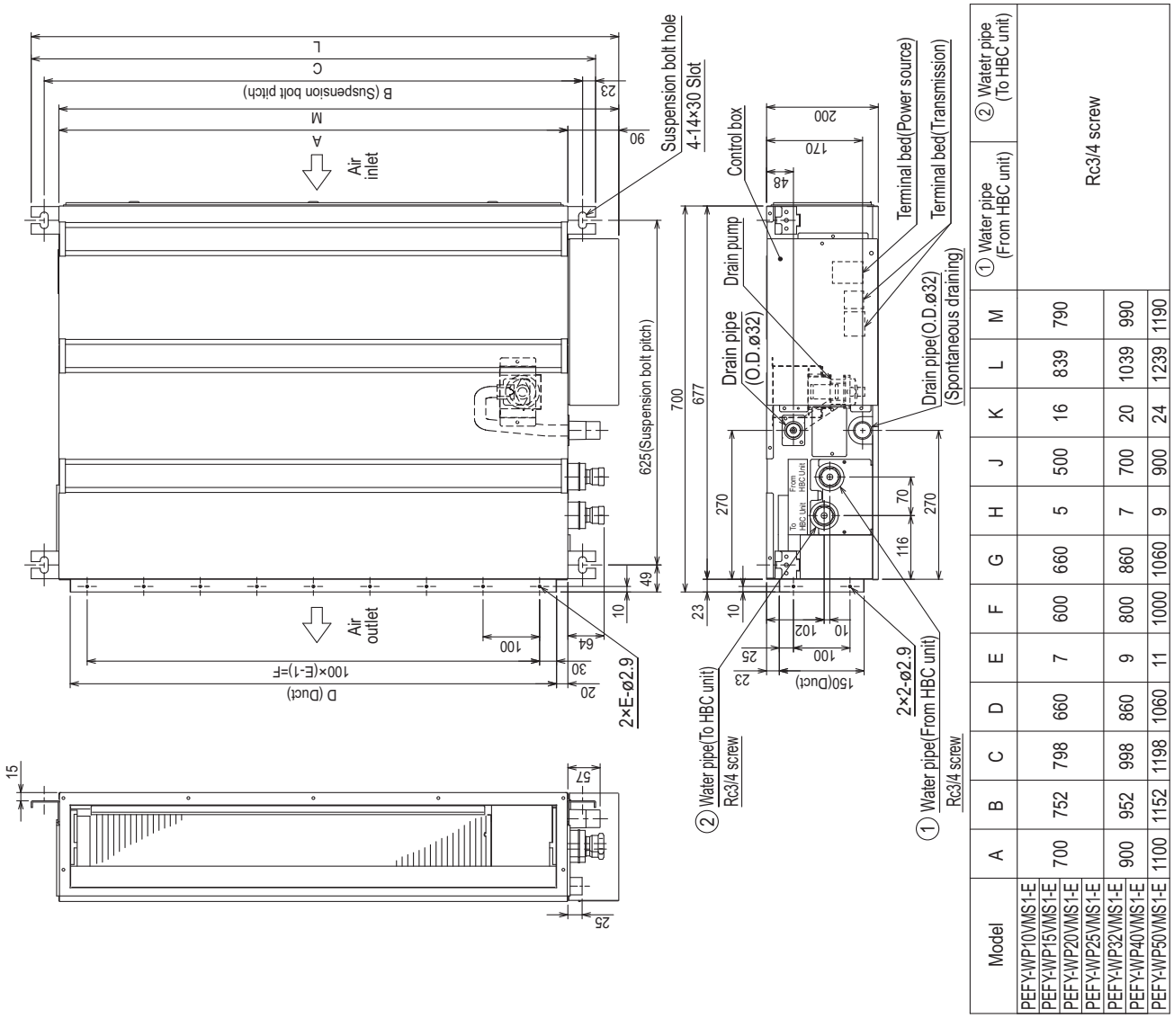
2. EXTERNAL DIMENSIONS

PEFY-WP10, 15, 20, 25, 32, 40, 50VMS1-E

Unit: mm



Note1. Use M10 screw for the suspension bolt (field supply).
2. Keep the service space for the maintenance at the bottom.
3. This chart indicates for PEFY-WP32, 40VMS1-E models, which has 3 fans.
PEFY-WP10, 15, 20, 25VMS1-E models have 2 fans.
PEFY-WP50VMS1-E models have 4 fans.
4. In case an inlet duct is used, remove the air filter (supply with the unit), then install the filter (field supply) at suction side.



Model	A	B	C	D	E	F	G	H	J	K	L	M	① Water pipe (From HBC unit)	② Watetr pipe (To HBC unit)
PEFY-WP10VMS1-E	700	752	798	660	7	600	660	5	500	16	839	790	Rc3/4 screw	
PEFY-WP15VMS1-E														
PEFY-WP20VMS1-E														
PEFY-WP25VMS1-E														
PEFY-WP32VMS1-E	900	952	998	860	9	800	860	7	700	20	1039	990		
PEFY-WP40VMS1-E														
PEFY-WP50VMS1-E	1100	1152	1198	1060	11	1000	1060	9	900	24	1239	1190		

[Maintenance access space]
Secure enough access space to allow for the maintenance, inspection, and replacement of the motor, fan, drain pump, heat exchanger, and electric box in one of the following ways.
Select an installation site for the indoor unit so that its maintenance access space will not be obstructed by beams or other objects.

(1) When a space of 300mm or more is available below the unit between the unit and the ceiling. (Fig.1)
·Create access door 1 and 2 (450x450mm each) as shown in Fig.2.
(Access door 2 is not required if enough space is available below the unit for a maintenance worker to work in.)

(2) When a space of less than 300mm is available below the unit between the unit and the ceiling.
(At least 20mm of space should be left below the unit as shown in Fig.3.)
·Create access door 1 diagonally below the electric box and access door 3 below the unit as shown in Fig.4.
or
·Create access door 4 below the electric box and the unit as shown in Fig.5.

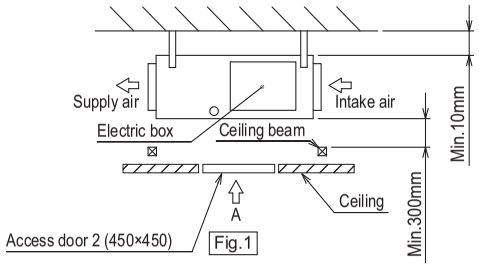


Fig.1

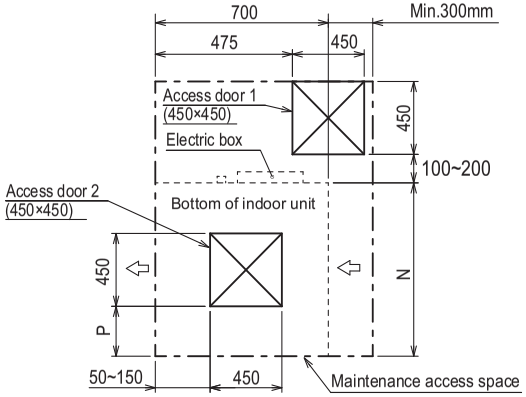


Fig.2 (Viewed from the direction of the arrow A)

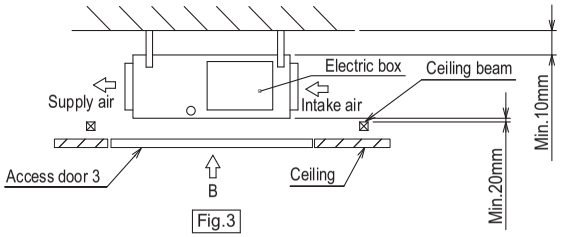


Fig.3

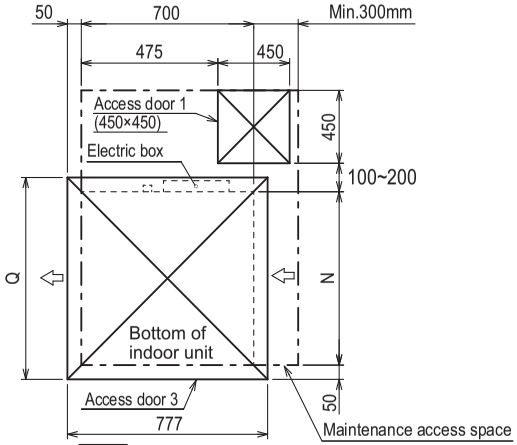


Fig.4 (Viewed from the direction of the arrow B)

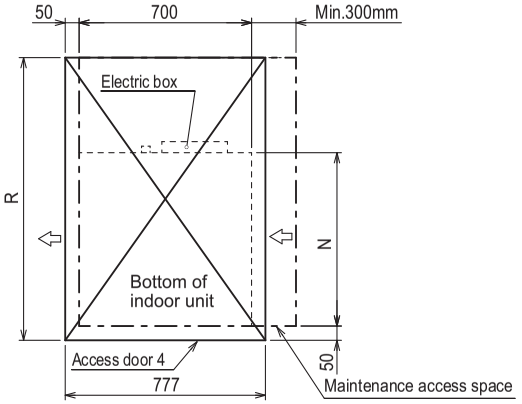


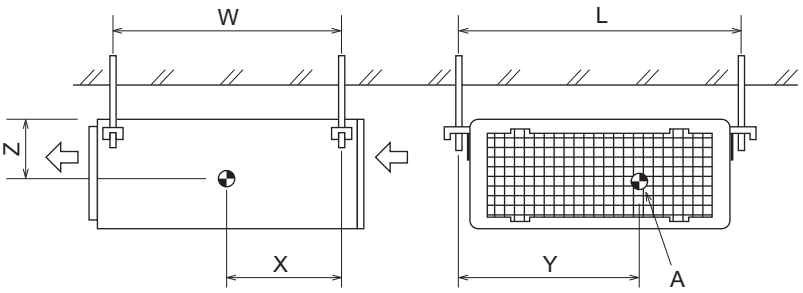
Fig.5 (Viewed from the direction of the arrow B)

Model	N	P	Q	R
PEFY-WP10VMS1-E	700	50~150	800	1300
PEFY-WP15VMS1-E				
PEFY-WP20VMS1-E				
PEFY-WP25VMS1-E				
PEFY-WP32VMS1-E	900	150~250	1000	1500
PEFY-WP40VMS1-E				
PEFY-WP50VMS1-E	1100	250~350	1200	1700

Unit: mm

3. CENTER OF GRAVITY

PEFY-WP10, 15, 20, 25, 32, 40, 50VMS1-E

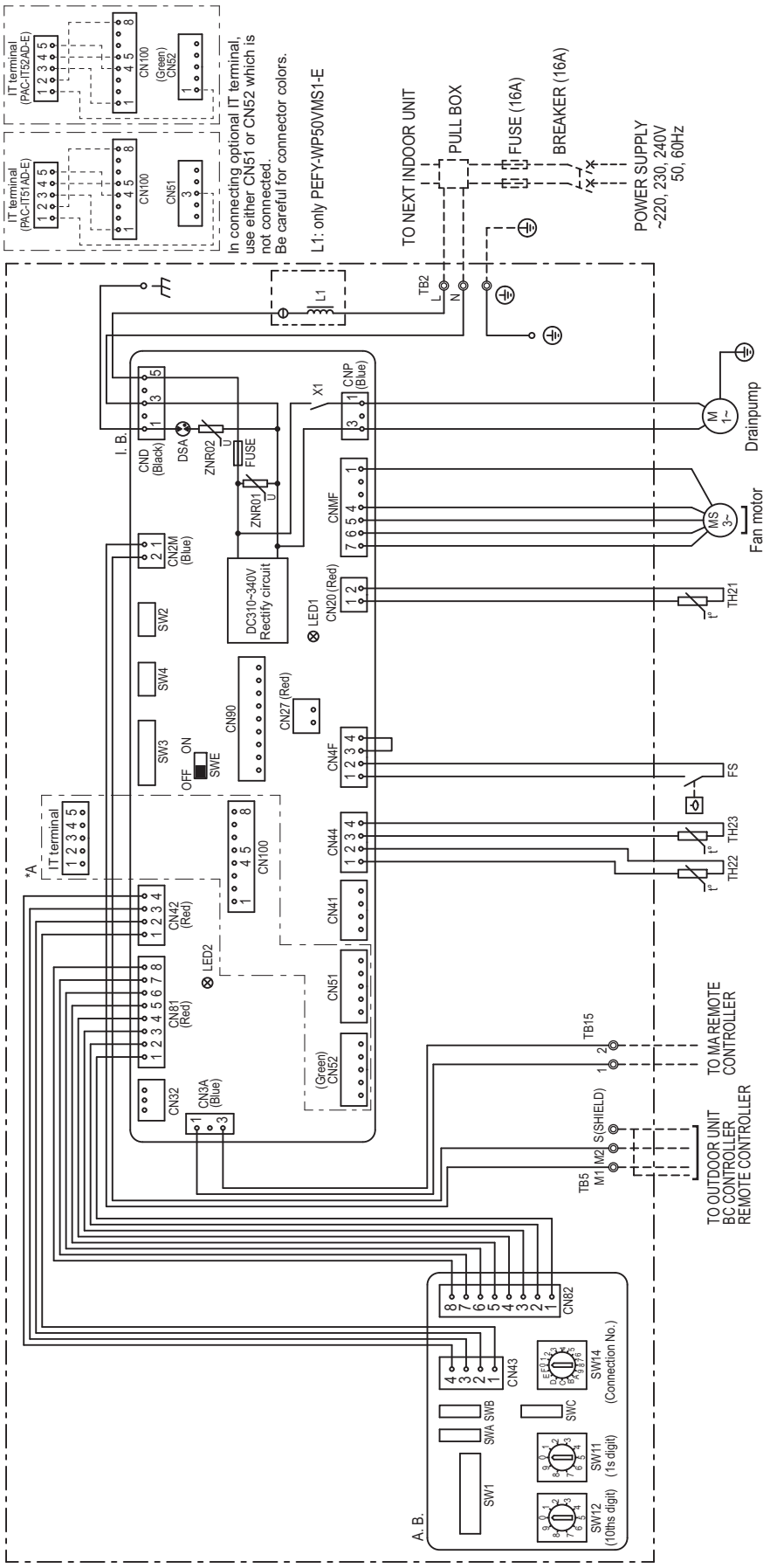


A: Center of gravity

(mm)[in]

Model name	W	L	X	Y	Z
PEFY-WP10VMS1-E	625 [24-5/8]	752 [29-5/8]	263 [10-3/8]	338 [13-5/16]	105 [4-5/32]
PEFY-WP15VMS1-E	625 [24-5/8]	752 [29-5/8]	263 [10-3/8]	338 [13-5/16]	105 [4-5/32]
PEFY-WP20VMS1-E	625 [24-5/8]	752 [29-5/8]	263 [10-3/8]	338 [13-5/16]	105 [4-5/32]
PEFY-WP25VMS1-E	625 [24-5/8]	752 [29-5/8]	263 [10-3/8]	338 [13-5/16]	105 [4-5/32]
PEFY-WP32VMS1-E	625 [24-5/8]	952 [37-1/2]	280 [11-1/32]	422 [16-5/8]	104 [4-1/8]
PEFY-WP40VMS1-E	625 [24-5/8]	952 [37-1/2]	280 [11-1/32]	422 [16-5/8]	104 [4-1/8]
PEFY-WP50VMS1-E	625 [24-5/8]	1152 [45-3/8]	285 [11-1/4]	511 [20-1/8]	104 [4-1/8]

PEFY-WP10, 15, 20, 25, 32, 40, 50VMS1-E



NOTE: Symbols used in wiring diagram above are,
------ (HEAVY DOTTED LINE):FIELD WIRING
----- (THIN DOTTED LINE) :OPTIONAL PARTS
⊖ : CONNECTOR
◎ : TERMINAL

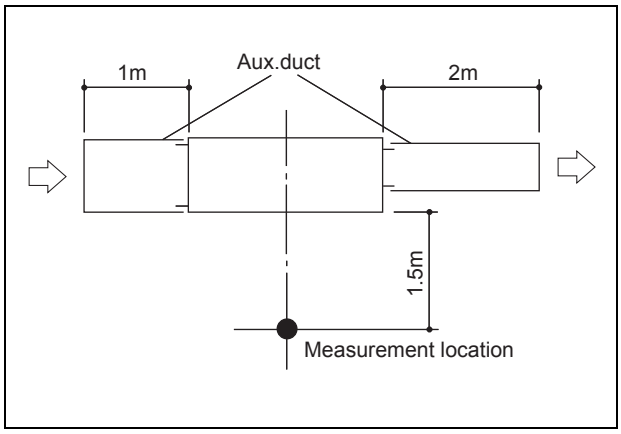
SYMBOL EXPLANATION

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
I.B.	Indoor controller board	CN32	Connector (Remote switch)	SW3(I.B.)	Switch (for mode selection)
A.B.	Address board	CN41	Connector (HA terminal-A)	SW4(I.B.)	Switch (for model selection)
TB2	Power source terminal block	CN51	Connector (Centrally control)	SWE(I.B.)	Connector (emergency operation)
TB5	Transmission terminal block	CN52	Connector (Remote indication)	SW1(A.B.)	Switch (for mode selection)
TB15	Transmission terminal block	CN90	Connector (Wireless)	SW11(A.B.)	Switch (1s digit address set)
FUSE	Fuse AC250V 6.3A	CN100	Connector (IT terminal)	SW12(A.B.)	Switch (10ths digit address set)
ZNR01, 02	Varistor	FS	Float switch	SW14(A.B.)	Switch (connection No.set)
DSA	Arrester	TH21	Thermistor (inlet air temp.detection)	SWA(A.B.)	Switch (for static pressure selection)
X1	Aux. relay	TH22	Thermistor (piping temp.detection/water in)	SWB(A.B.)	Switch (for model selection)
L1	AC reactor (Power factor improvement)	TH23	Thermistor (piping temp.detection/water out)	SWC(A.B.)	Switch (for static pressure selection)
CN27	Connector (Damper)	SW2(I.B.)	Switch (for capacity code)		

5. SOUND LEVELS

5-1. Sound levels

PEFY-WP-VMS1-E



* Measured in anechoic room.

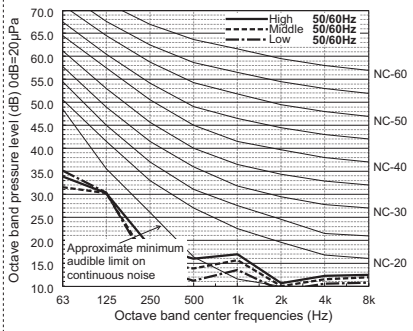
Sound level at anechoic room: Low-Mid-High

		Sound level dB (A)			
		5Pa	15Pa	35Pa	50Pa
PEFY-WP10VMS1-E	220-240V	20 - 21 - 22	20 - 23 - 25	23 - 24 - 25	23 - 25 - 27
PEFY-WP15VMS1-E	220-240V	22 - 24 - 26	22 - 24 - 28	23 - 26 - 29	23 - 27 - 30
PEFY-WP20VMS1-E	220-240V	22 - 25 - 28	23 - 25 - 29	24 - 27 - 30	25 - 28 - 32
PEFY-WP25VMS1-E	220-240V	22 - 25 - 29	23 - 26 - 30	24 - 28 - 31	25 - 29 - 33
PEFY-WP32VMS1-E	220-240V	26 - 28 - 30	28 - 30 - 33	30 - 32- 35	31 - 33 - 36
PEFY-WP40VMS1-E	220-240V	29 - 31 - 34	30 - 32 - 35	31 - 34 - 37	32 - 34 - 38
PEFY-WP50VMS1-E	220-240V	29 - 32 - 35	30 - 33 - 36	31 - 35 - 39	32 - 36 - 40

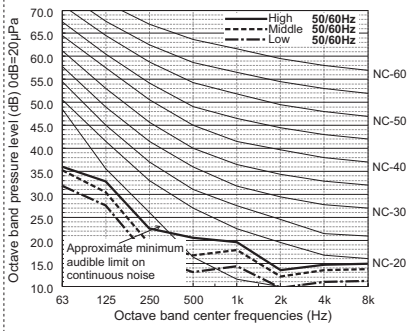
5. SOUND LEVELS

5-2. NC curves

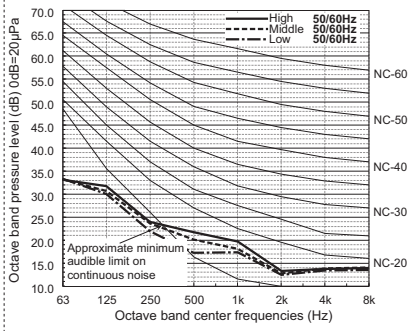
PEFY-WP10VMS1-E
External Static Pressure: 5Pa [0.02in.WG]
Power Source: 220,230,240V, 50/60Hz



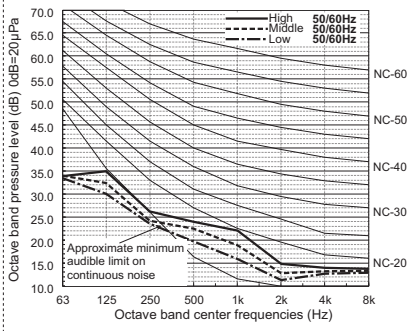
PEFY-WP10VMS1-E
External Static Pressure: 15Pa [0.06in.WG]
Power Source: 220,230,240V, 50/60Hz



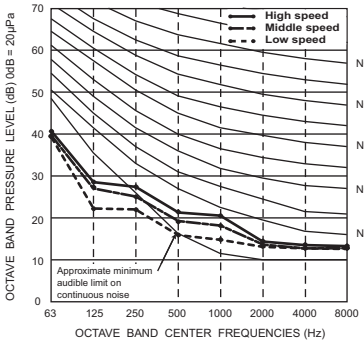
PEFY-WP10VMS1-E
External Static Pressure: 35Pa [0.14in.WG]
Power Source: 220,230,240V, 50/60Hz



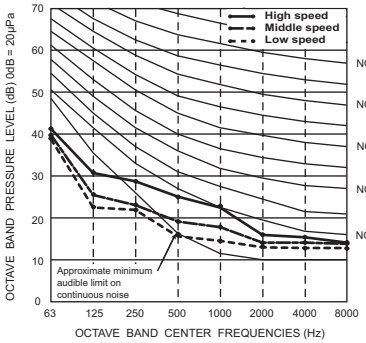
PEFY-WP10VMS1-E
External Static Pressure: 50Pa [0.20in.WG]
Power Source: 220,230,240V, 50/60Hz



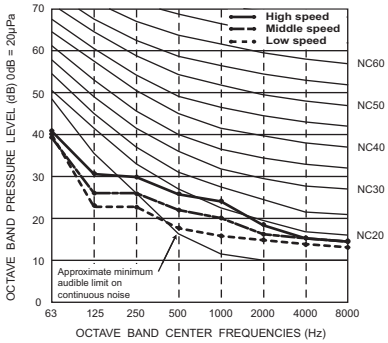
PEFY-WP15VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz



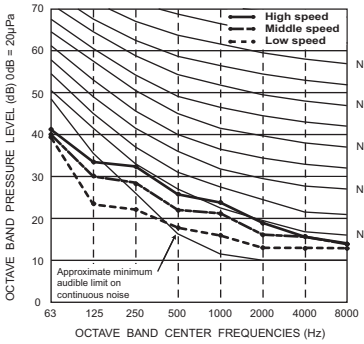
PEFY-WP15VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz



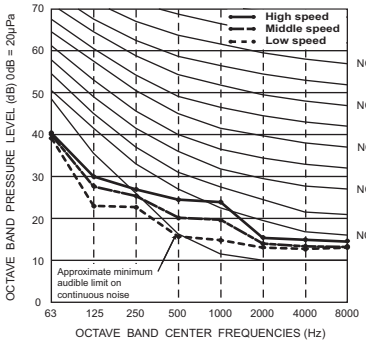
PEFY-WP15VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz



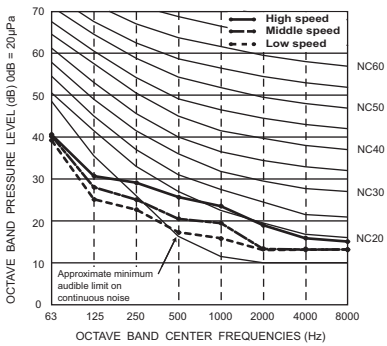
PEFY-WP15VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz



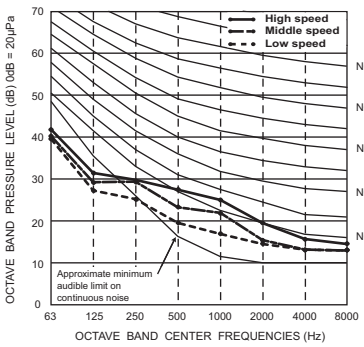
PEFY-WP20VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz



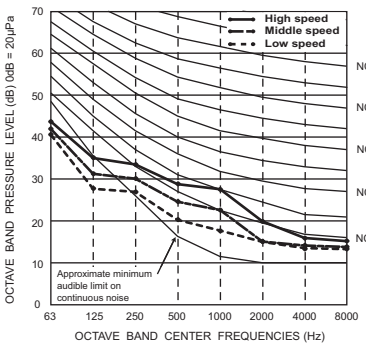
PEFY-WP20VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz



PEFY-WP20VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz

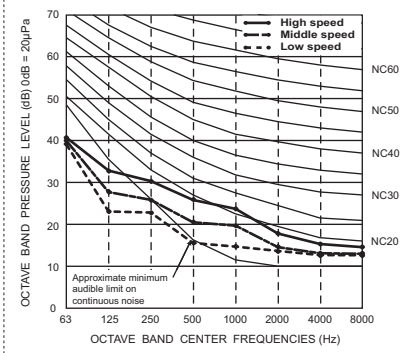


PEFY-WP20VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz

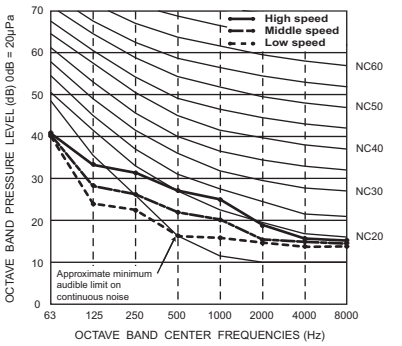


5. SOUND LEVELS

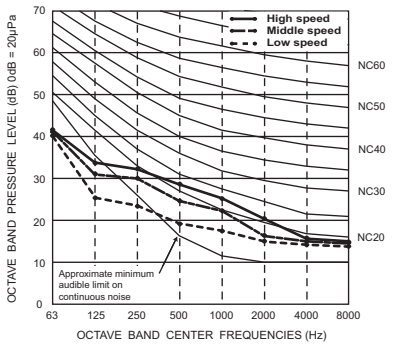
PEFY-WP25VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz



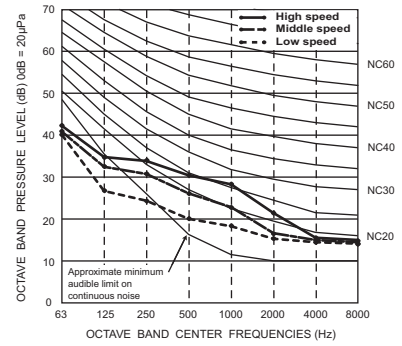
PEFY-WP25VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz



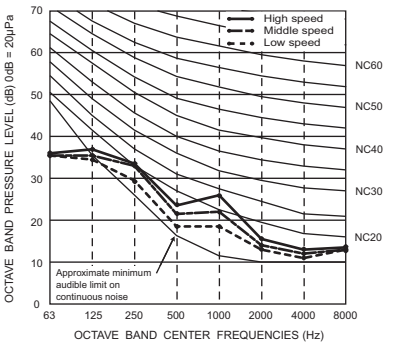
PEFY-WP25VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz



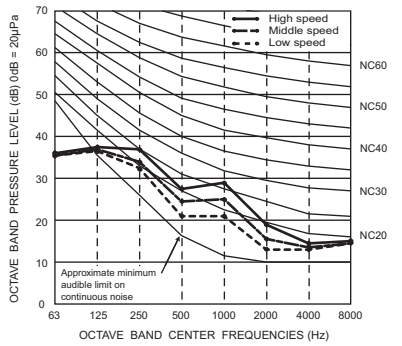
PEFY-WP25VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz



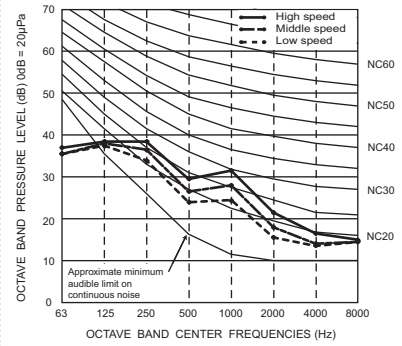
PEFY-WP32VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz



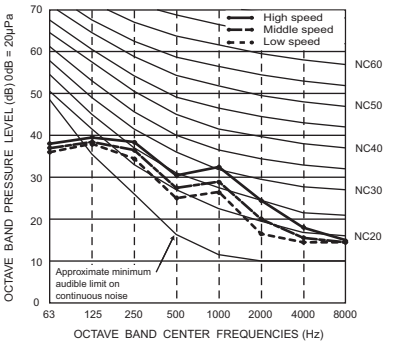
PEFY-WP32VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz



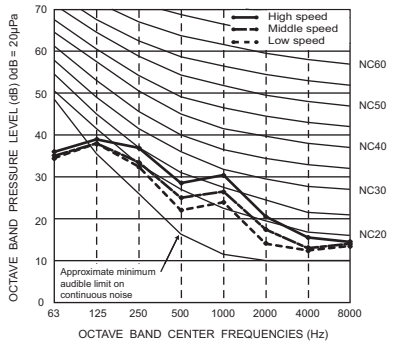
PEFY-WP32VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz



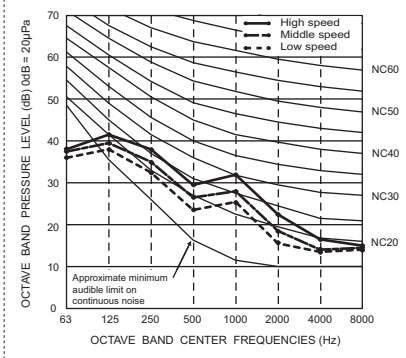
PEFY-WP32VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz



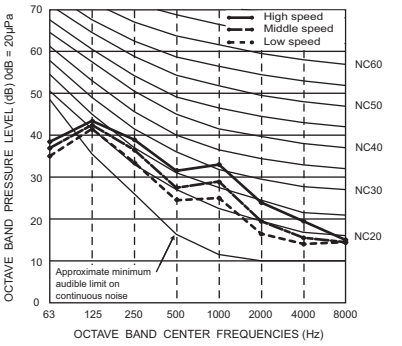
PEFY-WP40VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz



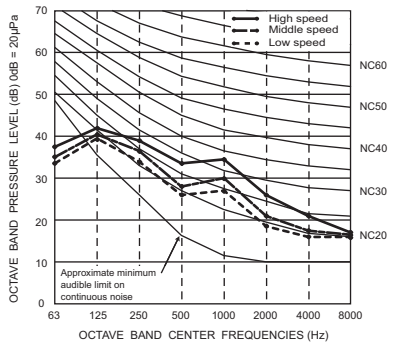
PEFY-WP40VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz



PEFY-WP40VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz

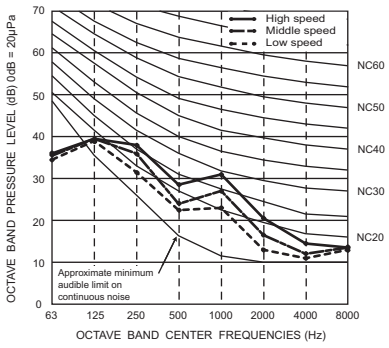


PEFY-WP40VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz

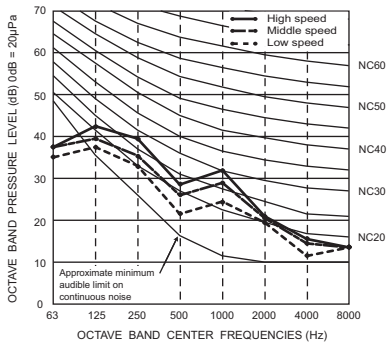


5. SOUND LEVELS

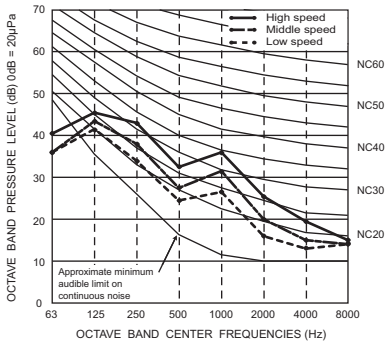
PEFY-WP50VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz



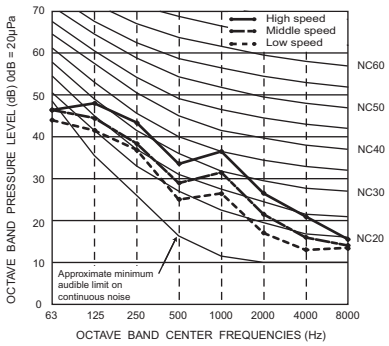
PEFY-WP50VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz



PEFY-WP50VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz

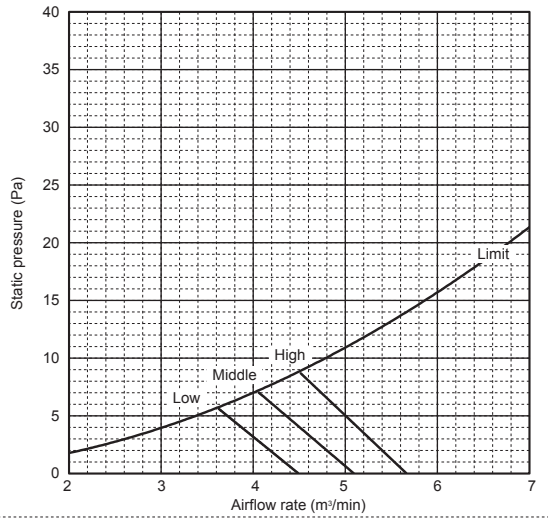


PEFY-WP50VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz

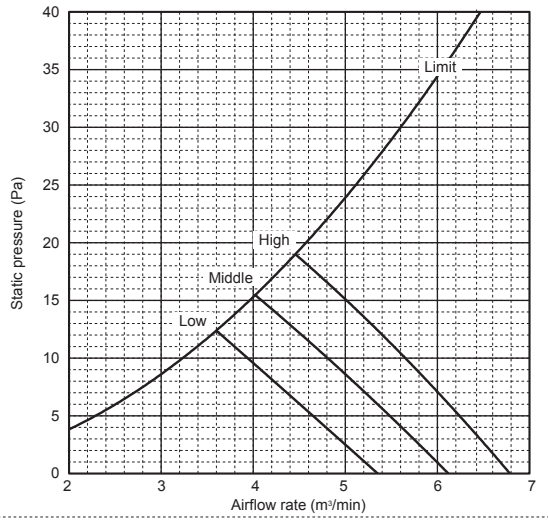


6. FAN CHARACTERISTICS CURVES

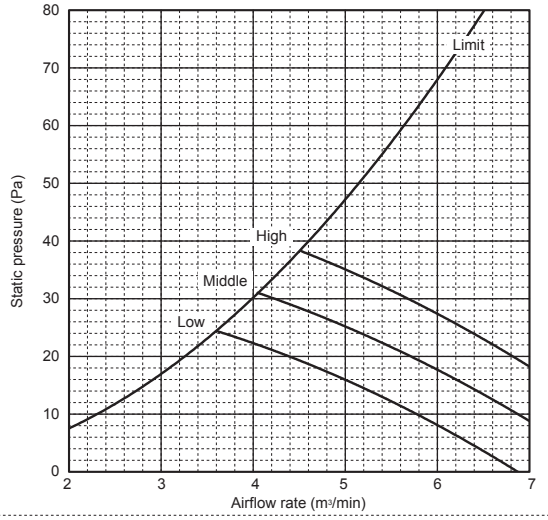
PEFY-WP10VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



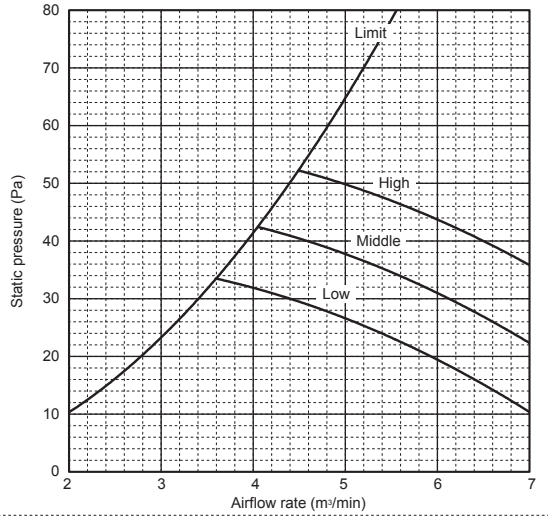
PEFY-WP10VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



PEFY-WP10VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

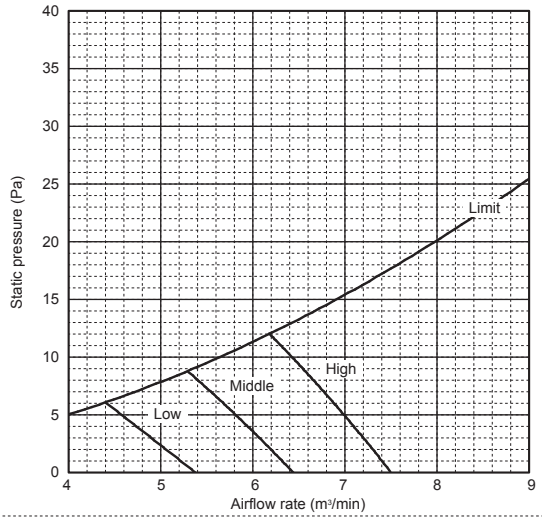


PEFY-WP10VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

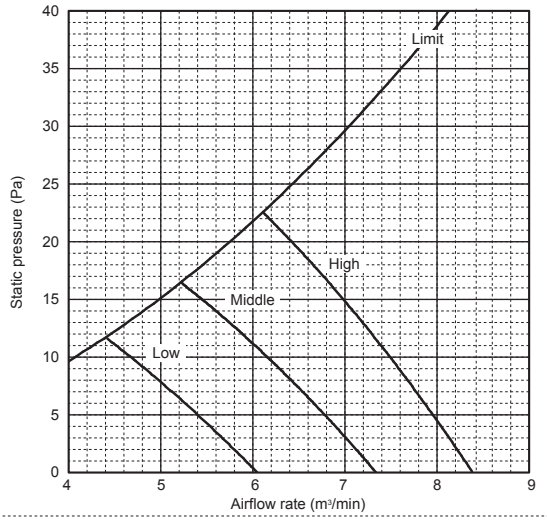


6. FAN CHARACTERISTICS CURVES

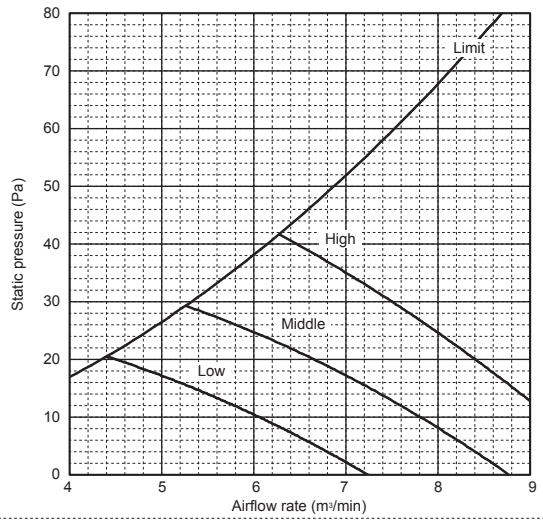
PEFY-WP15VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



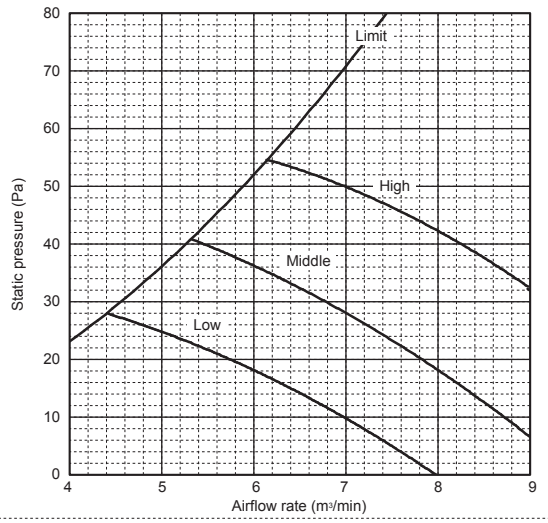
PEFY-WP15VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



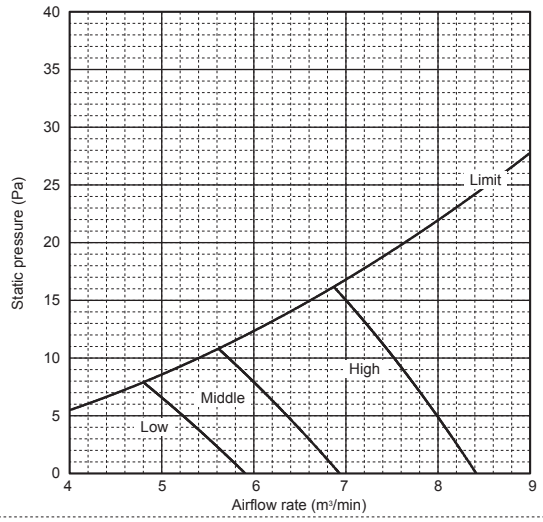
PEFY-WP15VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



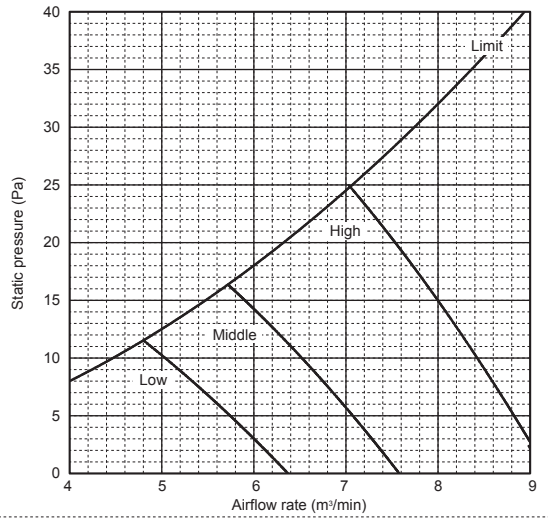
PEFY-WP15VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



PEFY-WP20VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

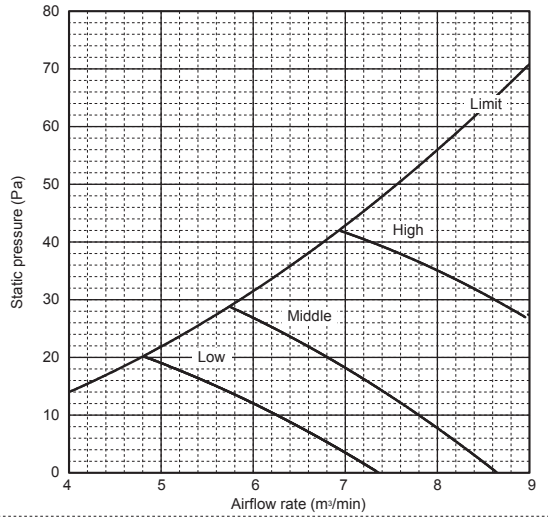


PEFY-WP20VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

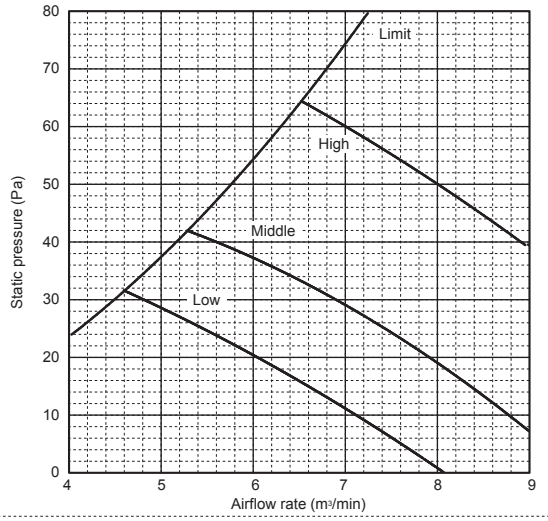


6. FAN CHARACTERISTICS CURVES

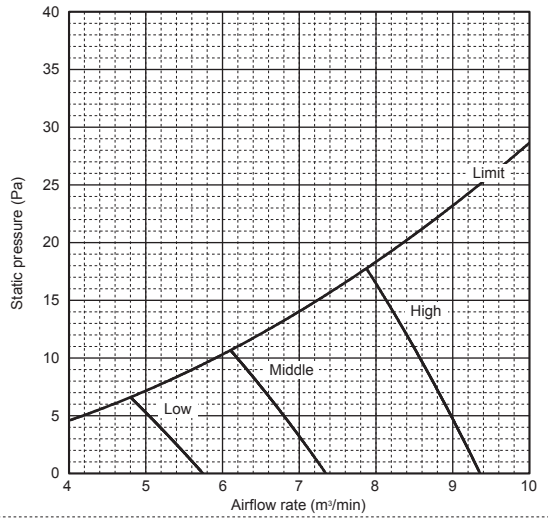
PEFY-WP20VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



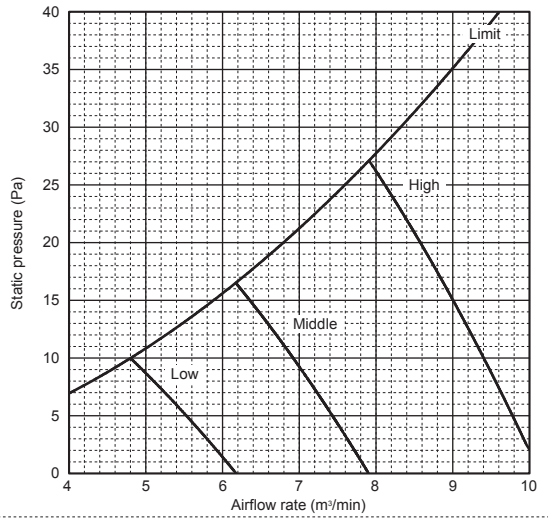
PEFY-WP20VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



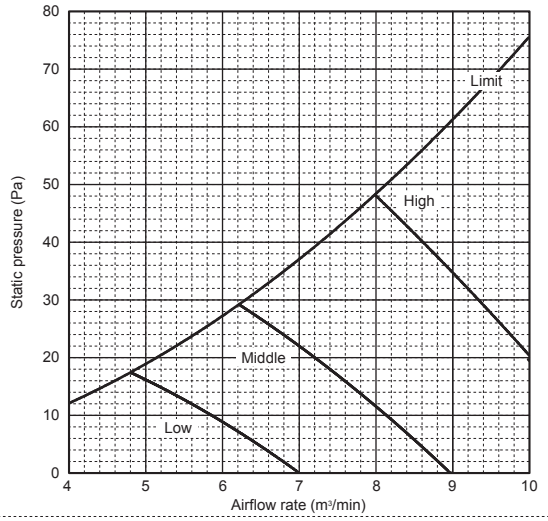
PEFY-WP25VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



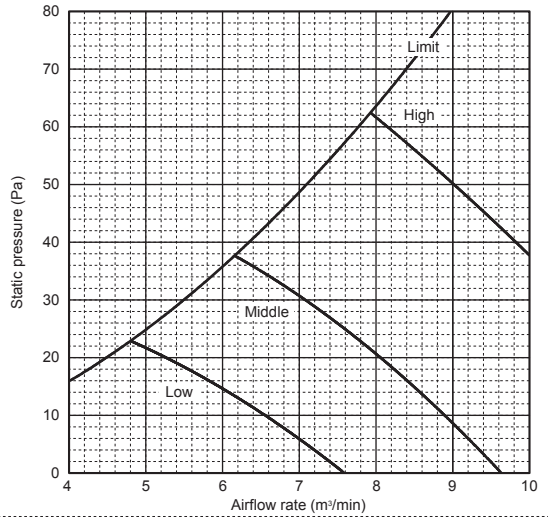
PEFY-WP25VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



PEFY-WP25VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

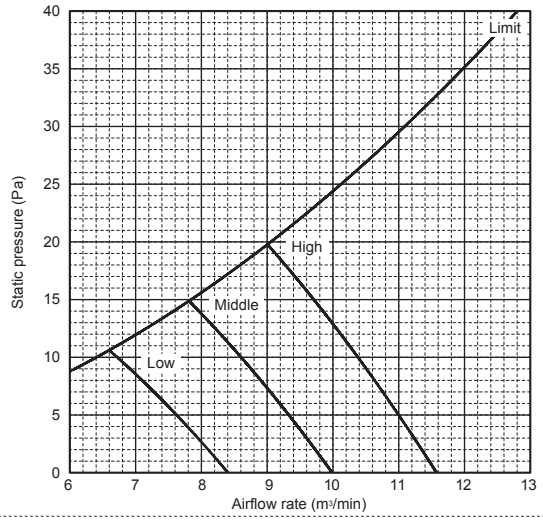


PEFY-WP25VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

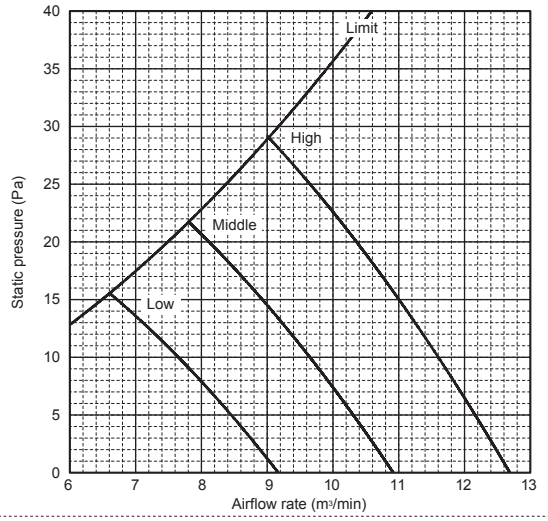


6. FAN CHARACTERISTICS CURVES

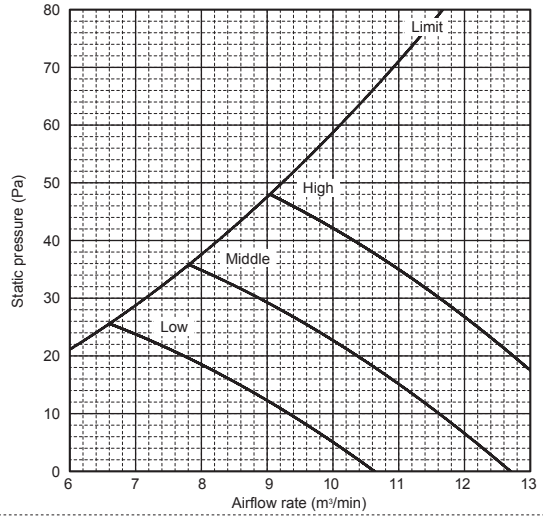
PEFY-WP32VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



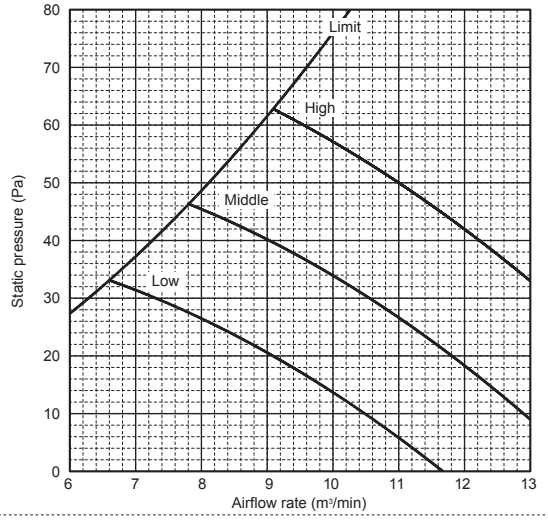
PEFY-WP32VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



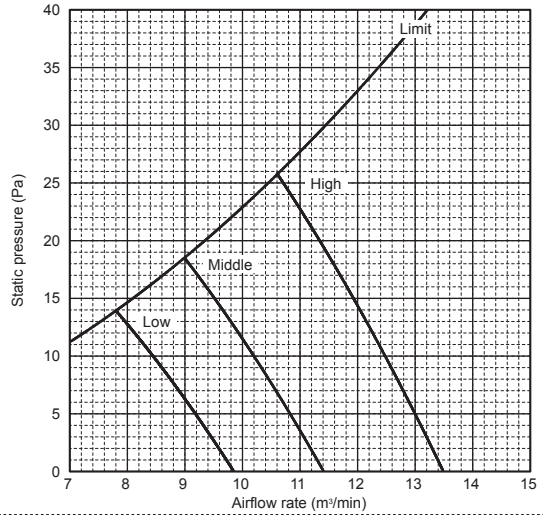
PEFY-WP32VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



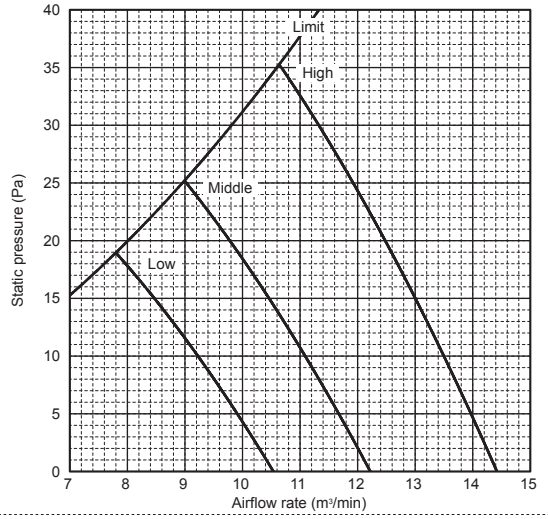
PEFY-WP32VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



PEFY-WP40VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

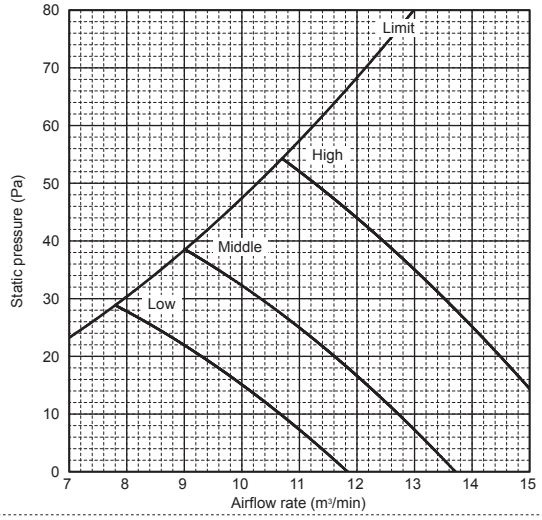


PEFY-WP40VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

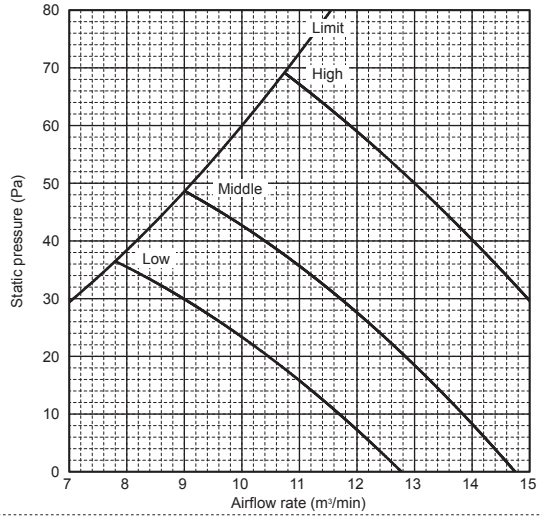


6. FAN CHARACTERISTICS CURVES

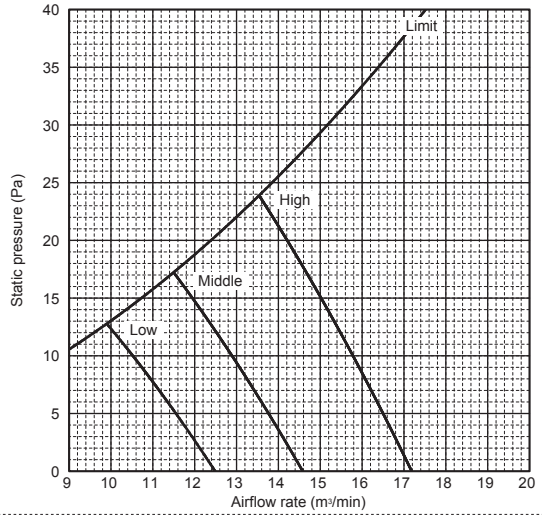
PEFY-WP40VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



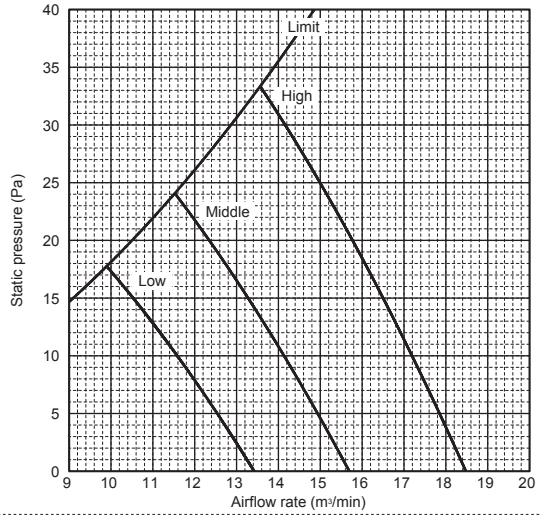
PEFY-WP40VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



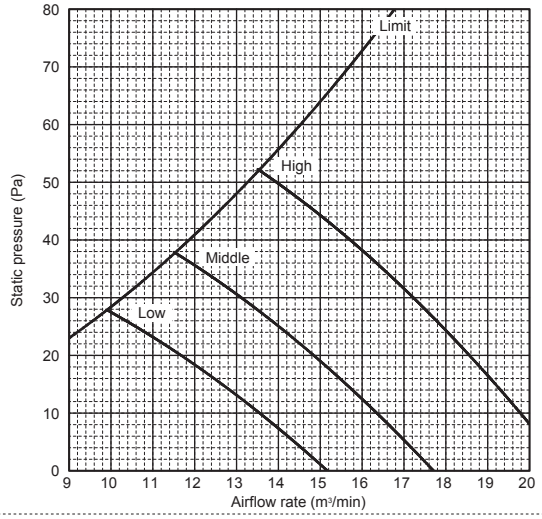
PEFY-WP50VMS1-E
External static pressure : 5Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



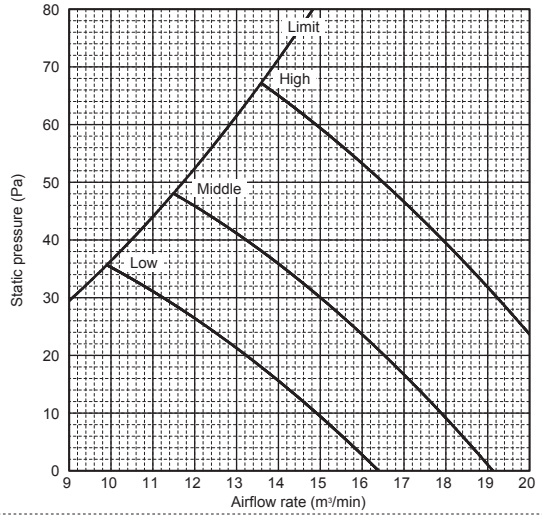
PEFY-WP50VMS1-E
External static pressure : 15Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



PEFY-WP50VMS1-E
External static pressure : 35Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet



PEFY-WP50VMS1-E
External static pressure : 50Pa
Power source : 220,230,240V, 50/60Hz
Suction : Back inlet

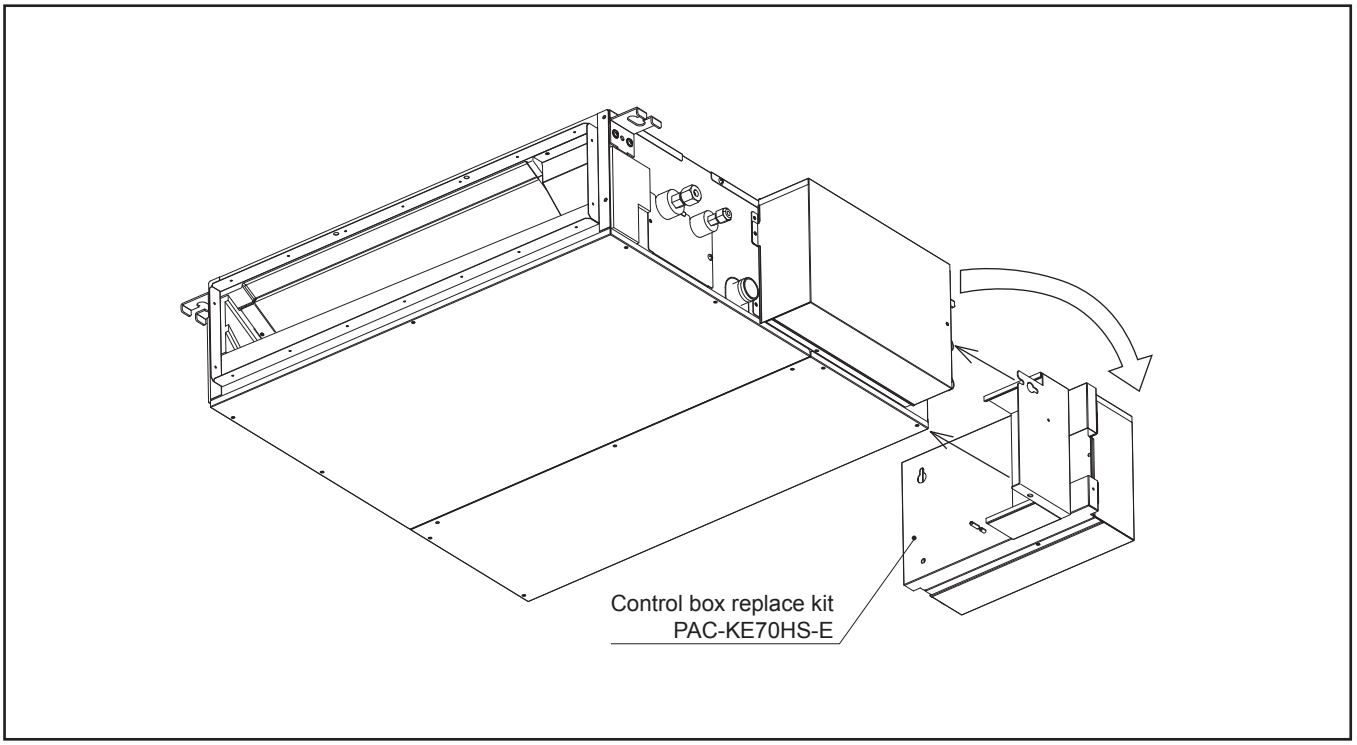


7. OPTIONAL PARTS

7-1. Optional parts line up for the Indoor unit

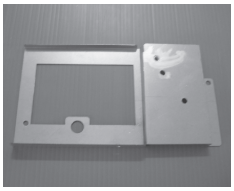
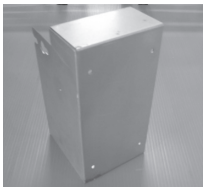
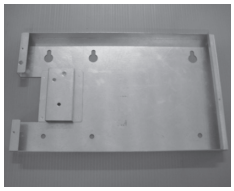
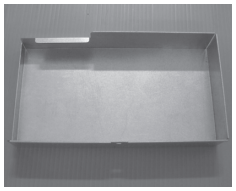
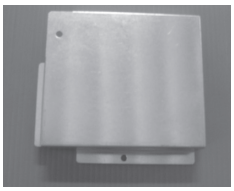
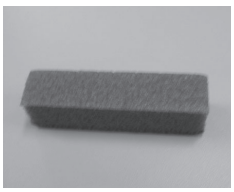
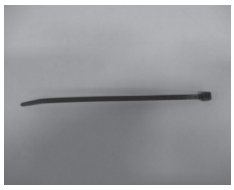
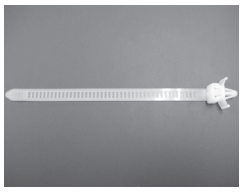
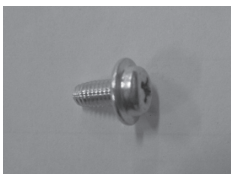
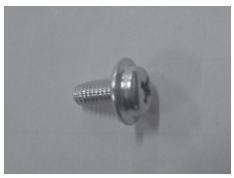
	Control box replace kit
PEFY-WP10, 15, 20, 25, 32, 40, 50VMS1-E	PAC-KE70HS-E

PEFY-WP-VMS1-E



7-2. Control box replace kit

PAC-KE70HS-E

Parts	①PLATE A	② PLATE B	③ PLATE C	④ COVER A
Q'ty	1	1	1	1
Shape				
Parts	⑤ COVER B	⑥ LEAD WIRE MOTOR	⑦ LEAD WIRE LEV	⑧ LEAD WIRE THM A
Q'ty	1	1	1	1
Shape		 White 7-pin connector	 White 6-pin connector	 White 4-pin connector
Parts	⑨ LEAD WIRE THM B	⑩ LEAD WIRE EARTH	⑪ LEAD WIRE PUMP	⑫ LEAD WIRE FS
Q'ty	1	1	1	1
Shape	 Red 2-pin connector	 Ring terminal on both ends	 Blue 3-pin connector	 White 4-pin connector
Parts	⑬ INSULATOR	⑭ Connecting terminals	⑮ BAND	⑯ CLAMP
Q'ty	3	4	6	4
Shape				
Parts	⑰ SCREW 1	⑱ SCREW 2	⑲ SCREW 3	⑳ FERRITE CORE
Q'ty	2	4	5	1
Shape	 4X10	 4X10 with a washer	 5X10 with a washer	

When installing the control box replace kit on the air inlet on the unit, ⑫LEAD WIRE FS is not used.

PEFY-WP-VMA-E

1. SPECIFICATIONS

Model			PEFY-WP20VMA-E	PEFY-WP25VMA-E	PEFY-WP32VMA-E	PEFY-WP40VMA-E
Power source			1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz
Cooling capacity	*1	kW	2.2	2.8	3.6	4.5
(Nominal)	*1	kcal/h	1,900	2,400	3,100	3,900
	*1	BTU/h	7,500	9,600	12,300	15,400
*2	Power input	kW	0.07	0.09	0.11	0.14
*2	Current input	A	0.55	0.64	0.74	1.15
Heating capacity	*3	kW	2.5	3.2	4.0	5.0
(Nominal)	*3	kcal/h	2,200	2,800	3,400	4,300
	*3	BTU/h	8,500	10,900	13,600	17,100
*2	Power input	kW	0.05	0.07	0.09	0.12
*2	Current input	A	0.44	0.53	0.63	1.04
External finish			Galvanized steel plate	Galvanized steel plate	Galvanized steel plate	Galvanized steel plate
External dimension HxWxD		mm	250 x 700 x 732	250 x 900 x 732	250 x 900 x 732	250 x 1,100 x 732
		in.	9-7/8 x 27-9/16 x 28-7/8	9-7/8 x 35-7/16 x 28-7/8	9-7/8 x 35-7/16 x 28-7/8	9-7/8 x 43-5/16 x 28-7/8
Net weight		kg (lbs)	21 (47)	26 (58)	26 (58)	31 (69)
Heat exchanger			Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)
	Water Volume	L	0.7	1.0	1.0	1.8
FAN	Type x Quantity		Sirocco fan x 1	Sirocco fan x 1	Sirocco fan x 1	Sirocco fan x 2
*4	External static press.	Pa	<35> - 50 - <70> - <100> - <150>	<35> - 50 - <70> - <100> - <150>	<35> - 50 - <70> - <100> - <150>	<35> - 50 - <70> - <100> - <150>
		mmH_2O	<3.6> - 5.1 - <7.1> - <10.2> - <15.3>	<3.6> - 5.1 - <7.1> - <10.2> - <15.3>	<3.6> - 5.1 - <7.1> - <10.2> - <15.3>	<3.6> - 5.1 - <7.1> - <10.2> - <15.3>
	Motor Type		DC motor	DC motor	DC motor	DC motor
	Motor output	kW	0.085	0.085	0.085	0.121
	Driving mechanism		Direct-driven by motor	Direct-driven by motor	Direct-driven by motor	Direct-driven by motor
	Air flow rate		(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)
		m^3/min	7.5 - 9.0 - 10.5	10.0 - 12.0 - 14.0	12.0 - 14.5 - 17.0	14.5 - 18.0 - 21.0
		L/s	125 - 150 - 175	167 - 200 - 233	200 - 242 - 283	242 - 300 - 350
		cfm	265 - 318 - 371	353 - 424 - 494	424 - 512 - 600	512 - 636 - 742
Sound pressure level (measured in anechoic room)			(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)
	*2	dB <A>	23-26-29	23-27-30	25-29-32	26-29-34
Insulation material			EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam	EPS, Polyethylene foam, Urethane foam
Air filter			PP honeycomb fabric.	PP honeycomb fabric.	PP honeycomb fabric.	PP honeycomb fabric.
Protection device			Fuse	Fuse	Fuse	Fuse
Refrigerant control device			-	-	-	-
Connectable outdoor unit/HBC controller			CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1
Diameter of water pipe	Inlet	in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw
*5 *6	Outlet	in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw
Field drain pipe size		mm (in.)	O.D.32 (1-1/4)	O.D.32 (1-1/4)	O.D.32 (1-1/4)	O.D.32 (1-1/4)
Drawing	External		KD94L918X01	KD94L918X01	KD94L918X01	KD94L918X01
	Wiring		KD94L919X01	KD94L919X01	KD94L919X01	KD94L919X01
	Refrigerant cycle		-	-	-	-
Standard attachment	Document		Installation Manual, Instruction Book	Installation Manual, Instruction Book	Installation Manual, Instruction Book	Installation Manual, Instruction Book
	Accessory		Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band	Insulation pipe for water pipe, Washer, Drain hose, Tie band
Optional parts	Filter box		PAC-KE91TB-E	PAC-KE92TB-E	PAC-KE92TB-E	PAC-KE93TB-E
Remarks			* Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. * Due to continuing improvement, above specifications may be subject to change without notice.			

Notes:

1. Nominal cooling conditions
   Indoor: 27°CD.B./19°CW.B. (81°CD.B./66°CW.B.), Outdoor: 35°CD.B. (95°CD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. The values are measured at the factory setting of external static pressure.
3. Nominal heating conditions
   Indoor: 20°CD.B. (68°CD.B.), Outdoor: 7°CD.B./6°CW.B. (45°CD.B./43°CW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
4. The factory setting of external static pressure is shown without < >.
   Refer to "Fan characteristics curves", according to the external static pressure, in DATA BOOK for the usable range of air flow rate.
5. Be sure to install a valve on the water outlet.
6. Install a strainer (40 mesh or more) on the pipe next to the valve to remove the foreign matters.
7. Group units that operate on 1 branch.

Unit converter

kcal/h	=kW x 860
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.

1. SPECIFICATIONS

Model			PEFY-WP50VMA-E			
Power source			1-phase 220-230-240 V 50/ 60 Hz			
Cooling capacity	*1	kW	5.6			
(Nominal)	*1	kcal/h	4,800			
	*1	BTU/h	19,100			
*2	Power input	kW	0.14			
*2	Current input	A	1.15			
Heating capacity	*3	kW	6.3			
(Nominal)	*3	kcal/h	5,400			
	*3	BTU/h	21,500			
*2	Power input	kW	0.12			
*2	Current input	A	1.04			
External finish			Galvanized steel plate			
External dimension HxWxD		mm	250 x 1,100 x 732			
		in.	9-7/8 x 43-5/16 x 28-7/8			
Net weight		kg (lbs)	31 (69)			
Heat exchanger			Cross fin (Aluminum fin and copper tube)			
	Water Volume	L	1.8			
FAN	Type x Quantity		Sirocco fan x 2			
*4	External static press.	Pa	<35> - 50 - <70> - <100> - <150>			
		mmH_2O	<3.6> - 5.1 - <7.1> - <10.2> - <15.3>			
	Motor Type		DC motor			
	Motor output	kW	0.121			
	Driving mechanism		Direct-driven by motor			
	Air flow rate		(Low-Mid-High)			
		m^3/min	14.5 - 18.0 - 21.0			
		L/s	242 - 300 - 350			
		cfm	512 - 636 - 742			
Sound pressure level (measured in anechoic room)			(Low-Mid-High)			
*2		dB <A>	26-29-34			
Insulation material			EPS, Polyethylene foam, Urethane foam			
Air filter			PP honeycomb fabric.			
Protection device			Fuse			
Refrigerant control device			-			
Connectable outdoor unit/HBC controller			CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1			
Diameter of water pipe	Inlet	in.	Rc 3/4 screw			
*5 *6	Outlet	in.	Rc 3/4 screw			
Field drain pipe size		mm (in.)	O.D.32 (1-1/4)			
Drawing	External		KD94L918X01			
	Wiring		KD94L919X01			
	Refrigerant cycle		-			
Standard attachment	Document		Installation Manual, Instruction Book			
	Accessory		Insulation pipe for water pipe, Washer, Drain hose, Tie band			
Optional parts	Filter box		PAC-KE93TB-E			
Remarks			* Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. * Due to continuing improvement, above specifications may be subject to change without notice.			

Notes :

1.Nominal cooling conditions
Indoor: 27°CD.B./19°CW.B. (81°CD.B./66°CW.B.), Outdoor: 35°CD.B. (95°CD.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2.The values are measured at the factory setting of external static pressure.
3.Nominal heating conditions
Indoor: 20°CD.B. (68°CD.B.), Outdoor: 7°CD.B./6°CW.B. (45°CD.B./43°CW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
4.The factory setting of external static pressure is shown without < >.
Refer to "Fan characteristics curves", according to the external static pressure, in DATA BOOK for the usable range of air flow rate.
5.Be sure to install a valve on the water outlet.
6.Install a strainer (40 mesh or more) on the pipe next to the valve to remove the foreign matters.
7.Group units that operate on 1 branch.

Unit converter

kcal/h	=kW x 860
BTU/h	=kW x 3,412
cfm	=m^3/min x 35.31
lbs	=kg / 0.4536

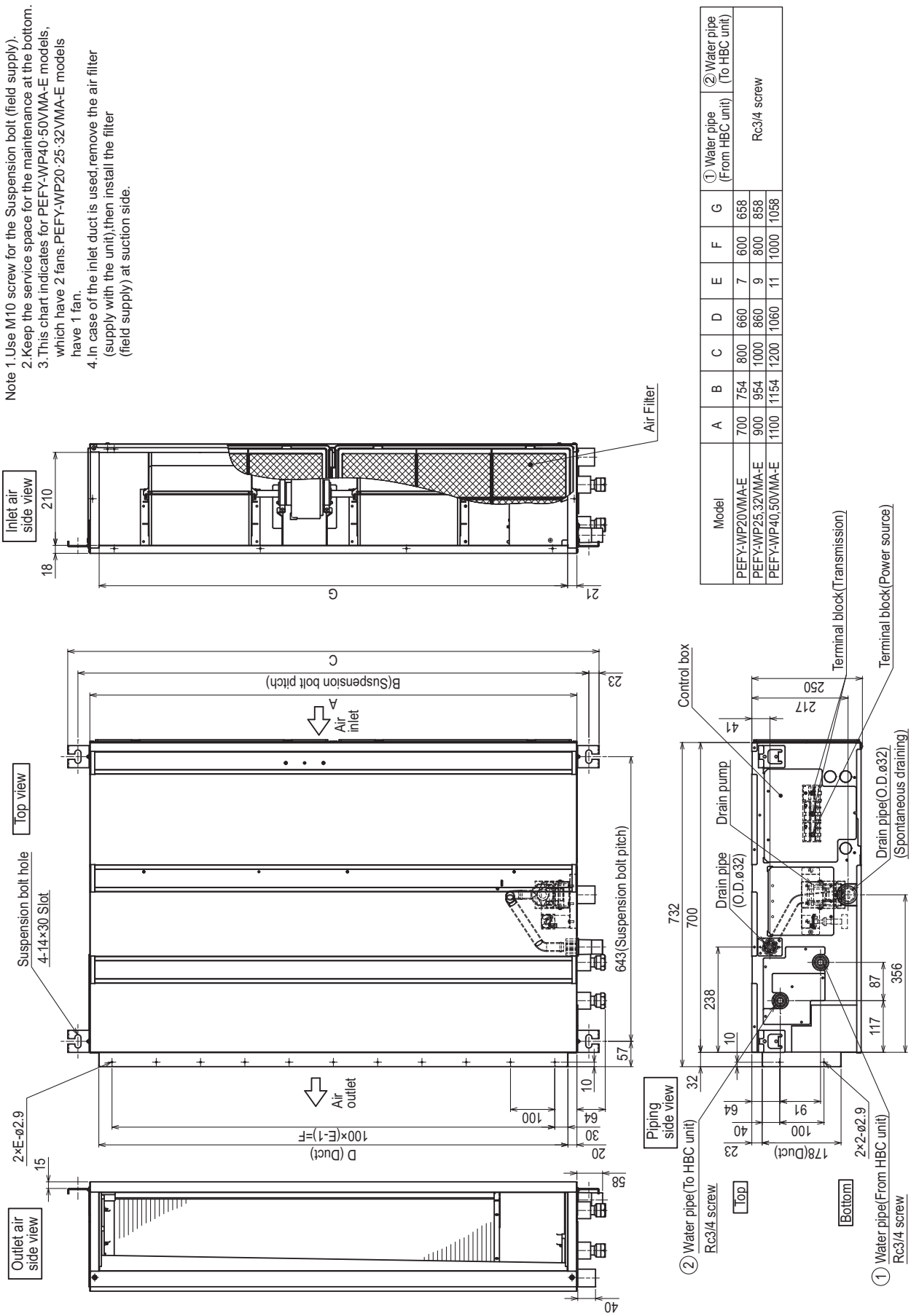
*Above specification data is subject to rounding variation.

PEFY-WP20, 25, 32, 40, 50VMA-E

Unit: mm

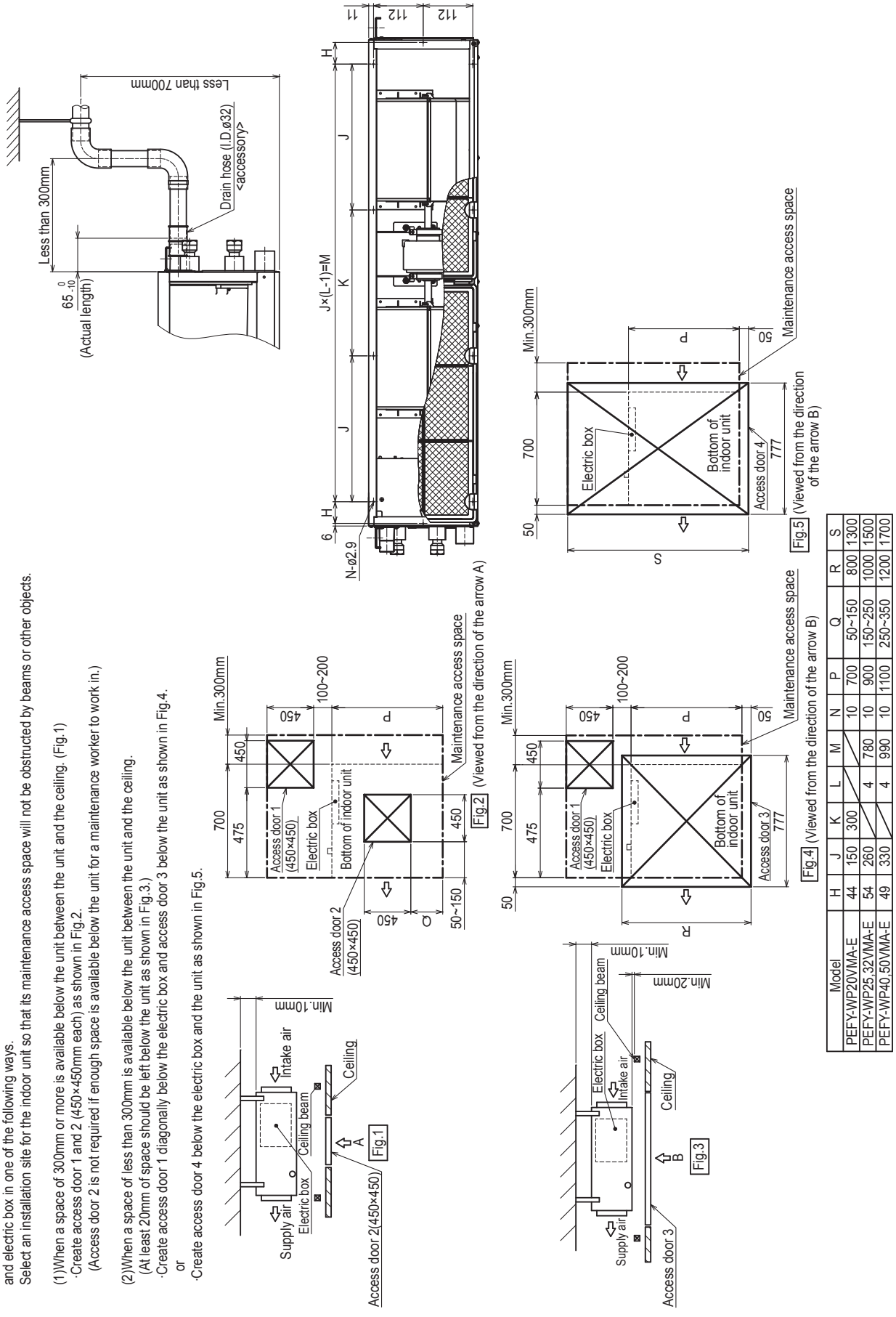
Note 1.Use M10 screw for the Suspension bolt (field supply).
2.Keep the service space for the maintenance at the bottom.
3.This chart indicates for PEFY-WP40·50VMA-E models, which have 2 fans.PEFY-WP20·25·32VMA-E models have 1 fan.
4.In case of the inlet duct is used,remove the air filter (supply with the unit),then install the filter (field supply) at suction side.

Model	A	B	C	D	E	F	G	① Water pipe (From HBC unit)	② Water pipe (To HBC unit)
PEFY-WP20VMA-E	700	754	800	660	7	600	658	Rc3/4 screw	
PEFY-WP25,32VMA-E	900	954	1000	860	9	800	858		
PEFY-WP40,50VMA-E	1100	1154	1200	1060	11	1000	1058		



PEFY-WP20, 25, 32, 40, 50VMA-E

Unit: mm



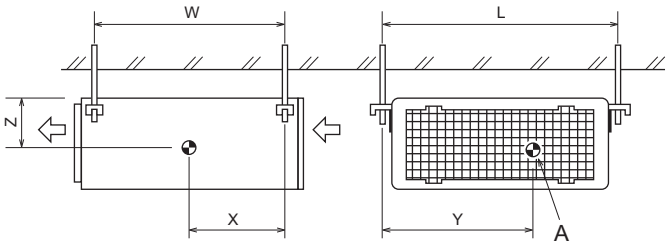
[Maintenance access space]
Secure enough access space to allow for the maintenance, inspection, and replacement of the motor, fan, drain pump, heat exchanger, and electric box in one of the following ways.
Select an installation site for the indoor unit so that its maintenance access space will not be obstructed by beams or other objects.

(1)When a space of 300mm or more is available below the unit between the unit and the ceiling. (Fig.1)
·Create access door 1 and 2 (450×450mm each) as shown in Fig.2.
(Access door 2 is not required if enough space is available below the unit for a maintenance worker to work in.)

(2)When a space of less than 300mm is available below the unit between the unit and the ceiling.
(At least 20mm of space should be left below the unit as shown in Fig.3.)
·Create access door 1 diagonally below the electric box and access door 3 below the unit as shown in Fig.4.
or
·Create access door 4 below the electric box and the unit as shown in Fig.5.

Model	H	J	K	L	M	N	P	Q	R	S
PEFY-WP20VMA-E	44	150	300			10	700	50~150	800	1300
PEFY-WP25,32VMA-E	54	260		4	780	10	900	150~250	1000	1500
PEFY-WP40,50VMA-E	49	330		4	990	10	1100	250~350	1200	1700

PEFY-WP20, 25, 32, 40, 50VMA-E

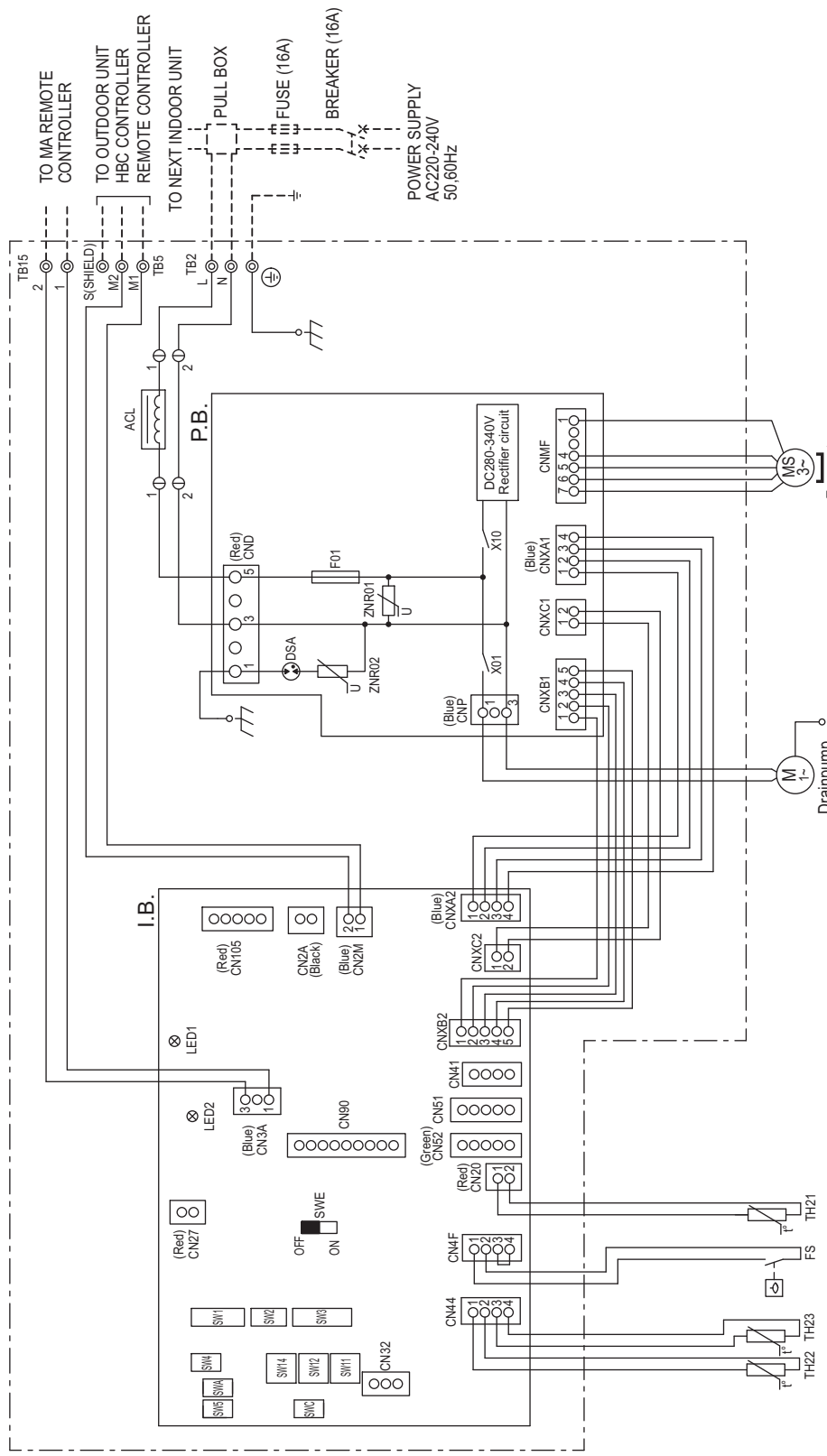


A : Center of gravity

(mm)[in]

Model name	W	L	X	Y	Z
PEFY-WP20VMA-E	643 [25 - 6/16]	754 [29 - 11/16]	330 [13]	300 [11 -13/16]	130 [5 -2/16]
PEFY-WP25VMA-E	643 [25 - 6/16]	954 [37 - 9/16]	340 [13 - 7/16]	375 [14 -13/16]	130 [5 -2/16]
PEFY-WP32VMA-E	643 [25 - 6/16]	954 [37 - 9/16]	340 [13 - 7/16]	375 [14 -13/16]	130 [5 -2/16]
PEFY-WP40VMA-E	643 [25 - 6/16]	1154 [45 - 7/16]	325 [12 - 13/16]	525 [20 -11/16]	130 [5 -2/16]
PEFY-WP50VMA-E	643 [25 - 6/16]	1154 [45 - 7/16]	325 [12 - 13/16]	525 [20 -11/16]	130 [5 -2/16]

PEFY-WP20, 25, 32, 40, 50VMA-E



SYMBOL EXPLANATION

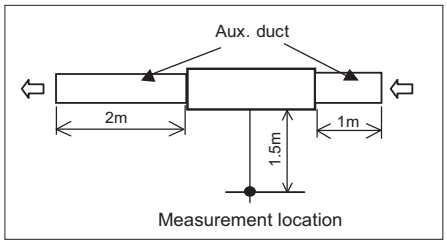
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
I.B.	Indoor controller board	CN41	Connector (HA terminal-A)	SW4(I.B.)	Switch (for model selection)
P.B.	Power supply board	CN51	Connector (Centrally control)	SW5(I.B.)	Switch (for mode selection)
TB2	Power source terminal block	CN52	Connector (Remote indication)	SW11(I.B.)	Switch (1s digit address set)
TB5	Transmission terminal block	CN90	Connector (Wireless)	SW12(I.B.)	Switch (10ths digit address set)
TB15	Transmission terminal block	CN105	Connector (IT terminal)	SW14(I.B.)	Switch (BRANCH No.)
F01	Fuse AC250V 6.3A	CN2A	Connector (0-10V Analog input)	SWA(I.B.)	Switch (for static pressure selection)
ZNR01,02	Varistor	FS	Float switch	SWC(I.B.)	Switch (for static pressure selection)
DSA	Arrester	TH21	Thermistor (inlet air temp.detection)	SWE(I.B.)	Connector (emergency operation)
X01	Aux. relay	TH22	Thermistor (piping temp.detection/water in)	LED1	LED(Power supply)
X10	Aux. relay	TH23	Thermistor (piping temp.detection/water out)	LED2	LED(Remote controller supply)
ACL	AC reactor(Power factor improvement)	SW1(I.B.)	Switch (for mode selection)		
CN27	Connector (Damper)	SW2(I.B.)	Switch (for capacity code)		
CN32	Connector (Remote switch)	SW3(I.B.)	Switch (for mode selection)		

5. SOUND LEVELS

5-1. Sound levels

5-1-1. Sound levels (Measured condition : With 1m air inlet duct and 2m air outlet duct)

PEFY-WP-VMA-E



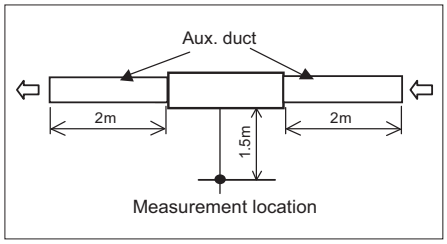
* Measured in anechoic room.

Sound level at anechoic room : Low-Mid-High

Model	Sound level dB(A)				
	35Pa	50Pa	70Pa	100Pa	150Pa
PEFY-WP20VMA-E	28-30-34	28-30-34	29-32-36	29-33-37	31-35-40
PEFY-WP25VMA-E	28-30-34	28-30-34	29-32-36	29-33-37	32-36-40
PEFY-WP32VMA-E	28-31-35	28-32-35	29-33-37	30-34-38	32-37-41
PEFY-WP40VMA-E	30-33-37	30-34-38	31-36-39	33-37-41	36-41-44
PEFY-WP50VMA-E	30-33-37	30-34-38	31-36-39	33-37-41	36-41-44

5-1-2. Sound levels (Measured condition : With 2m air inlet duct and 2m air outlet duct)

PEFY-WP-VMA-E



* Measured in anechoic room.

Sound level at anechoic room : Low-Mid-High

Model	Sound level dB(A)				
	35Pa	50Pa	70Pa	100Pa	150Pa
PEFY-WP20VMA-E	23-25-28	23-26-29	24-27-30	25-28-32	28-32-36
PEFY-WP25VMA-E	23-26-29	23-27-30	24-28-31	26-29-33	29-33-37
PEFY-WP32VMA-E	24-28-31	25-29-32	26-30-33	27-31-34	29-34-38
PEFY-WP40VMA-E	26-29-33	26-29-34	26-30-35	29-33-37	32-37-41
PEFY-WP50VMA-E	26-29-33	26-29-34	26-30-35	29-33-37	32-37-41

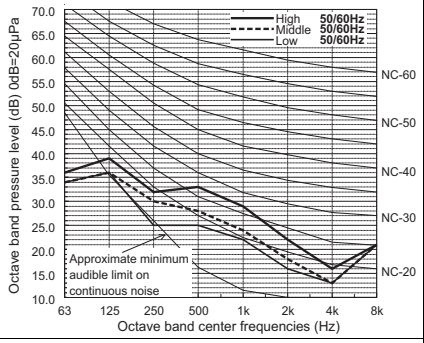
5. SOUND LEVELS

5-2. NC curves

5-2-1. NC curves (Sound level measured condition : With 1m air inlet duct and 2m air outlet duct)

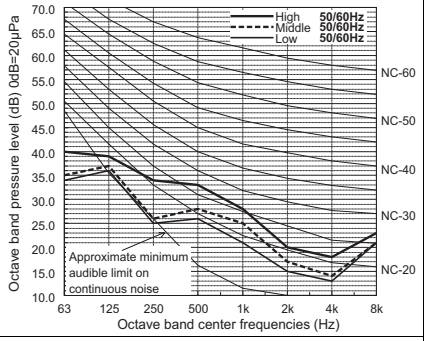
PEFY-WP20VMA-E

External Static Pressure: 35Pa
Power Source: 220-240V(50/60Hz)



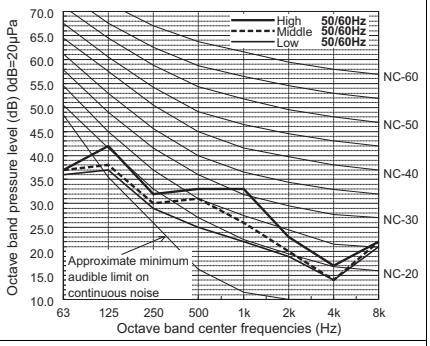
PEFY-WP20VMA-E

External Static Pressure: 50Pa
Power Source: 220-240V(50/60Hz)



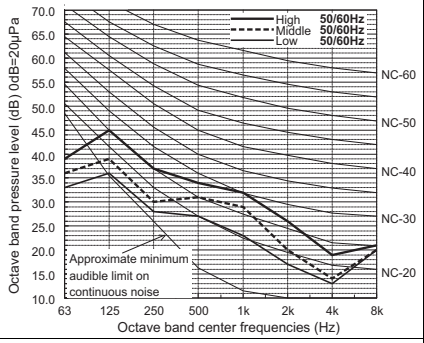
PEFY-WP20VMA-E

External Static Pressure: 70Pa
Power Source: 220-240V(50/60Hz)



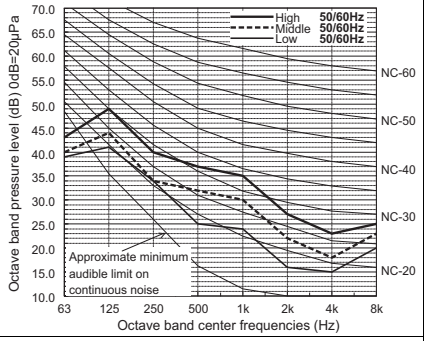
PEFY-WP20VMA-E

External Static Pressure: 100Pa
Power Source: 220-240V(50/60Hz)



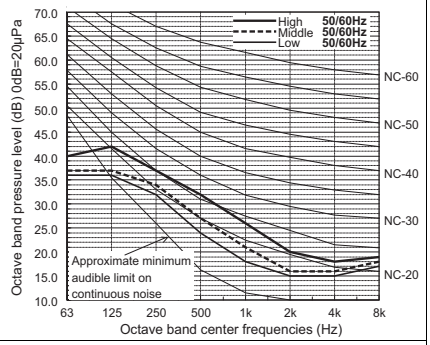
PEFY-WP20VMA-E

External Static Pressure: 150Pa
Power Source: 220-240V(50/60Hz)



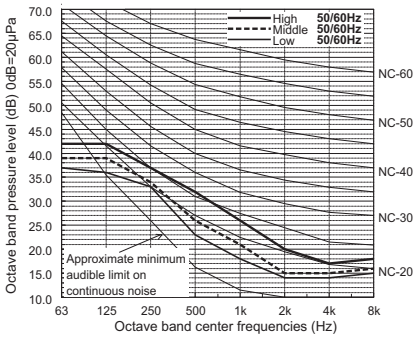
PEFY-WP25VMA-E

External Static Pressure: 35Pa
Power Source: 220-240V(50/60Hz)



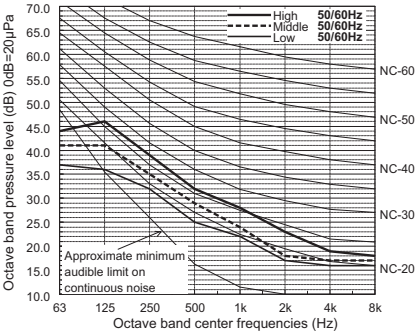
PEFY-WP25VMA-E

External Static Pressure: 50Pa
Power Source: 220-240V(50/60Hz)



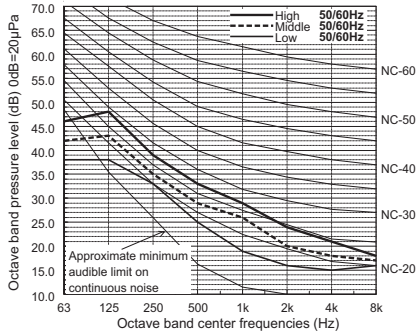
PEFY-WP25VMA-E

External Static Pressure: 70Pa
Power Source: 220-240V(50/60Hz)



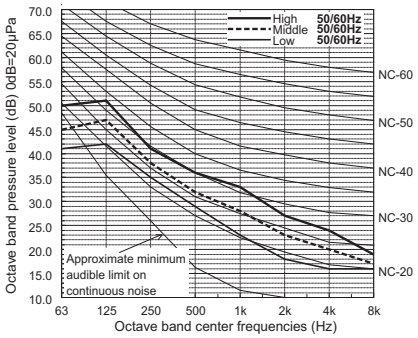
PEFY-WP25VMA-E

External Static Pressure: 100Pa
Power Source: 220-240V(50/60Hz)



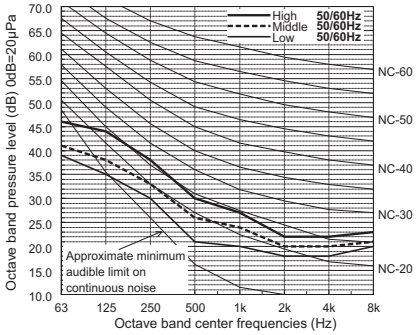
PEFY-WP25VMA-E

External Static Pressure: 150Pa
Power Source: 220-240V(50/60Hz)



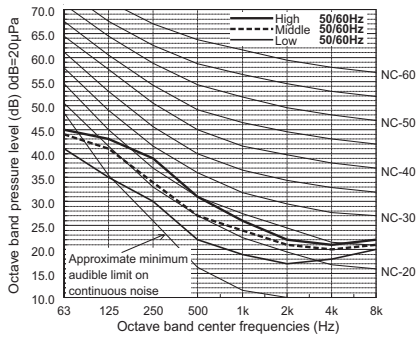
PEFY-WP32VMA-E

External Static Pressure: 35Pa
Power Source: 220-240V(50/60Hz)



PEFY-WP32VMA-E

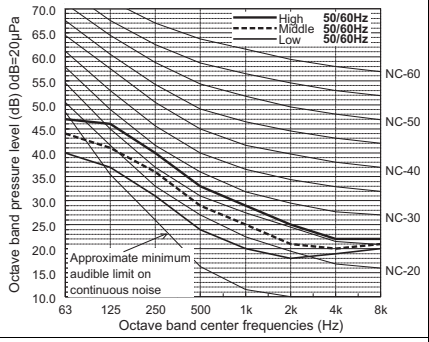
External Static Pressure: 50Pa
Power Source: 220-240V(50/60Hz)



5. SOUND LEVELS

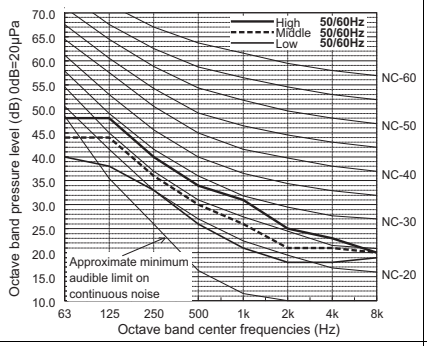
PEFY-WP32VMA-E

External Static Pressure: 70Pa
Power Source: 220-240V(50/60Hz)



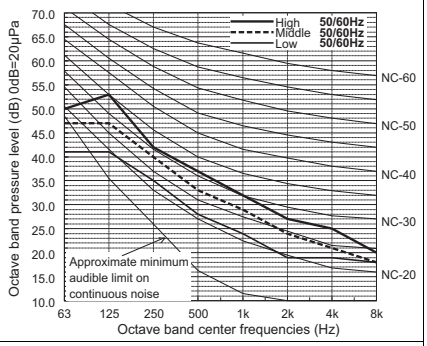
PEFY-WP32VMA-E

External Static Pressure: 100Pa
Power Source: 220-240V(50/60Hz)



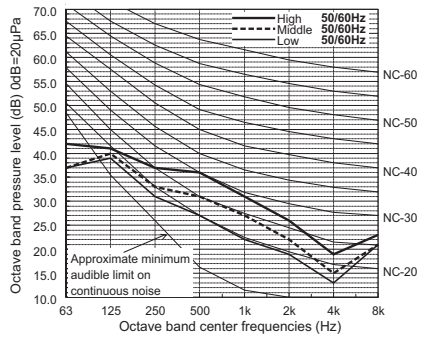
PEFY-WP32VMA-E

External Static Pressure: 150Pa
Power Source: 220-240V(50/60Hz)



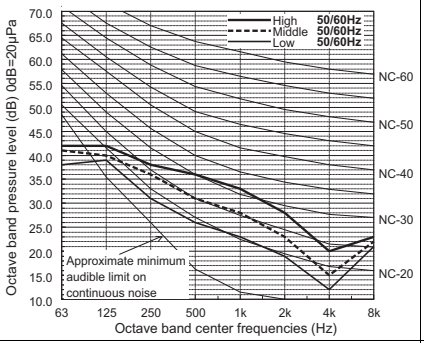
PEFY-WP40,50VMA-E

External Static Pressure: 35Pa
Power Source: 220-240V(50/60Hz)



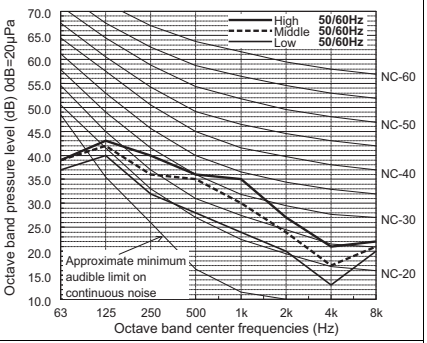
PEFY-WP40,50VMA-E

External Static Pressure: 50Pa
Power Source: 220-240V(50/60Hz)



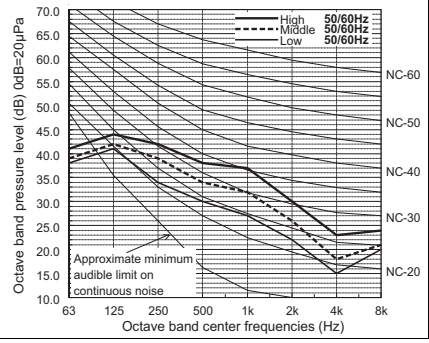
PEFY-WP40,50VMA-E

External Static Pressure: 70Pa
Power Source: 220-240V(50/60Hz)



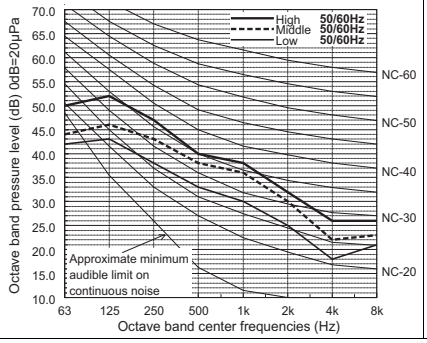
PEFY-WP40,50VMA-E

External Static Pressure: 100Pa
Power Source: 220-240V(50/60Hz)



PEFY-WP40,50VMA-E

External Static Pressure: 150Pa
Power Source: 220-240V(50/60Hz)

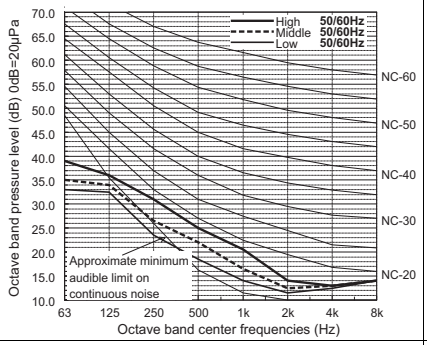


5. SOUND LEVELS

5-2-2. NC curves (Sound level measured condition : With 2m air inlet duct and 2m air outlet duct)

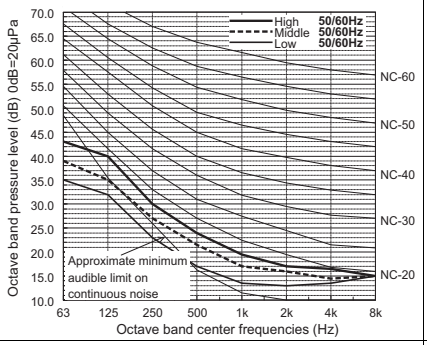
PEFY-WP20VMA-E

External Static Pressure: 35Pa
Power Source: 220-230-240V(50/60Hz)



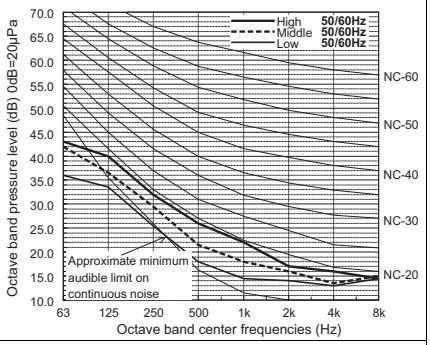
PEFY-WP20VMA-E

External Static Pressure: 50Pa
Power Source: 220-230-240V(50/60Hz)



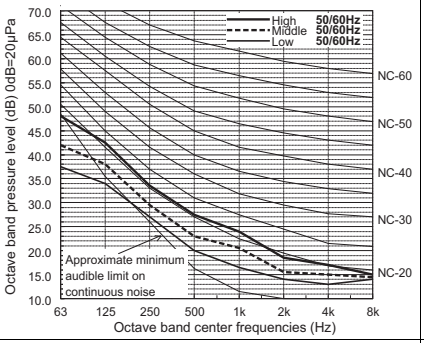
PEFY-WP20VMA-E

External Static Pressure: 70Pa
Power Source: 220-230-240V(50/60Hz)



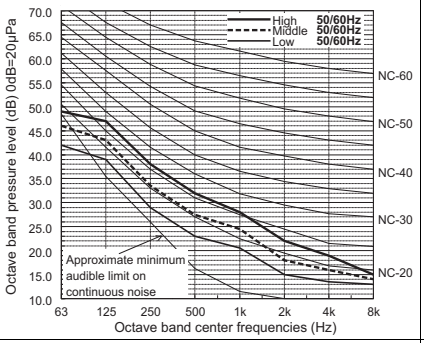
PEFY-WP20VMA-E

External Static Pressure: 100Pa
Power Source: 220-230-240V(50/60Hz)



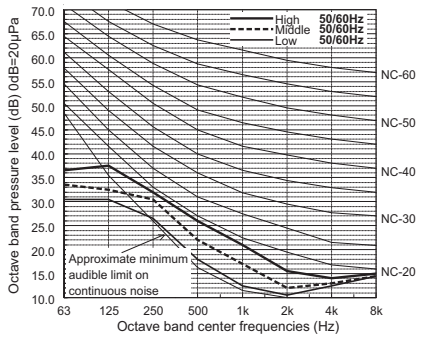
PEFY-WP20VMA-E

External Static Pressure: 150Pa
Power Source: 220-230-240V(50/60Hz)



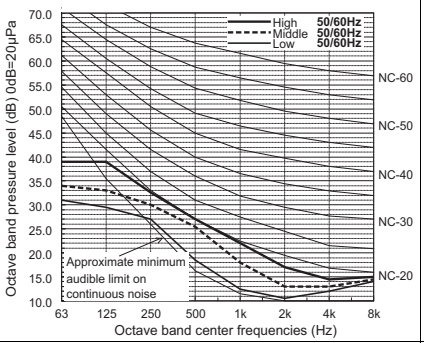
PEFY-WP25VMA-E

External Static Pressure: 35Pa
Power Source: 220-230-240V(50/60Hz)



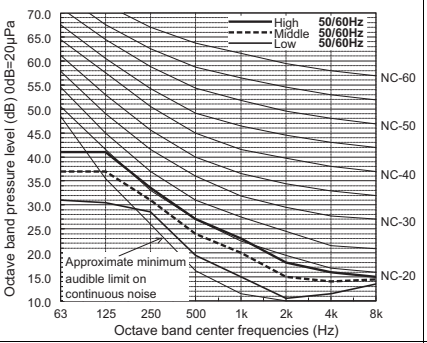
PEFY-WP25VMA-E

External Static Pressure: 50Pa
Power Source: 220-230-240V(50/60Hz)



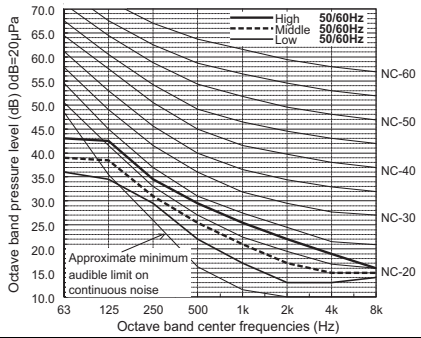
PEFY-WP25VMA-E

External Static Pressure: 70Pa
Power Source: 220-230-240V(50/60Hz)



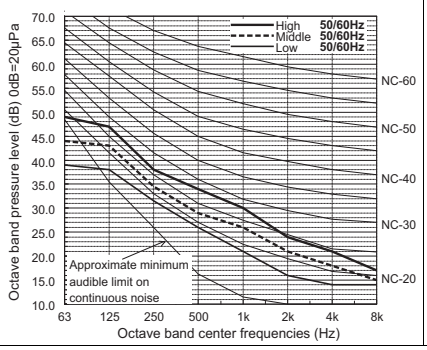
PEFY-WP25VMA-E

External Static Pressure: 100Pa
Power Source: 220-230-240V(50/60Hz)



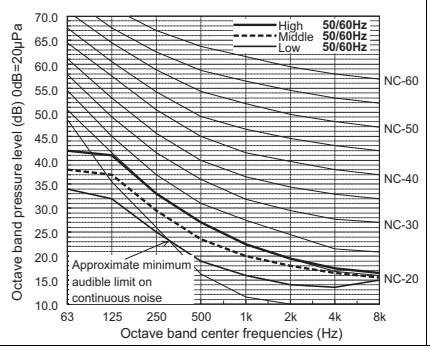
PEFY-WP25VMA-E

External Static Pressure: 150Pa
Power Source: 220-230-240V(50/60Hz)



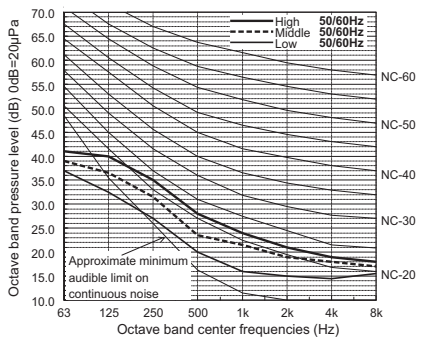
PEFY-WP32VMA-E

External Static Pressure: 35Pa
Power Source: 220-230-240V(50/60Hz)



PEFY-WP32VMA-E

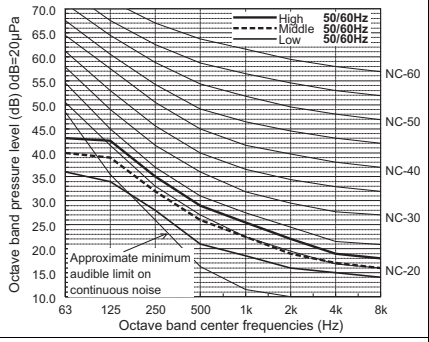
External Static Pressure: 50Pa
Power Source: 220-230-240V(50/60Hz)



5. SOUND LEVELS

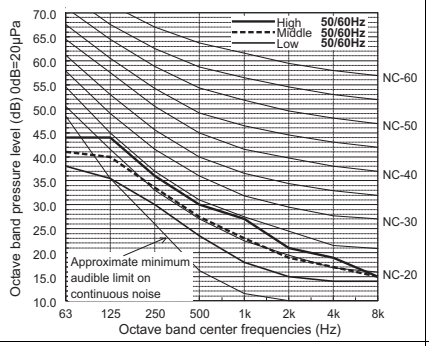
PEFY-WP32VMA-E

External Static Pressure: 70Pa
Power Source: 220-230-240V(50/60Hz)



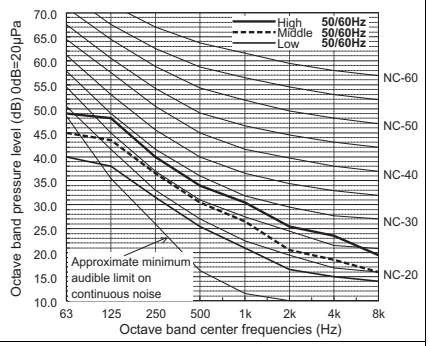
PEFY-WP32VMA-E

External Static Pressure: 100Pa
Power Source: 220-230-240V(50/60Hz)



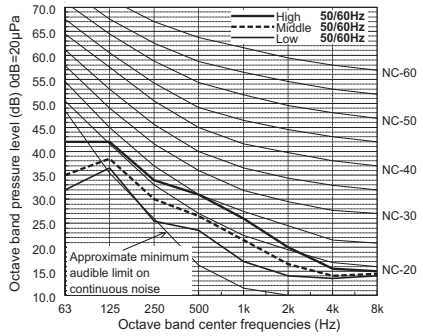
PEFY-WP32VMA-E

External Static Pressure: 150Pa
Power Source: 220-230-240V(50/60Hz)



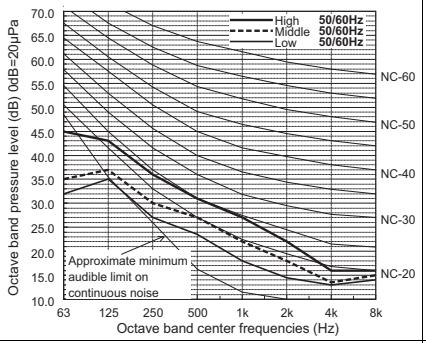
PEFY-WP40, 50VMA-E

External Static Pressure: 35Pa
Power Source: 220-230-240V(50/60Hz)



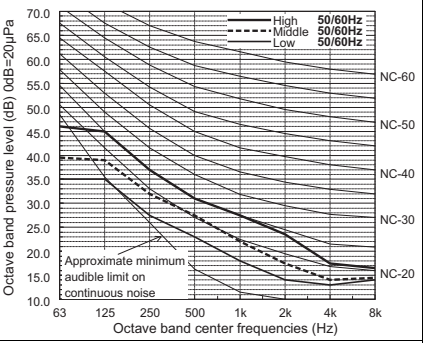
PEFY-WP40, 50VMA-E

External Static Pressure: 50Pa
Power Source: 220-230-240V(50/60Hz)



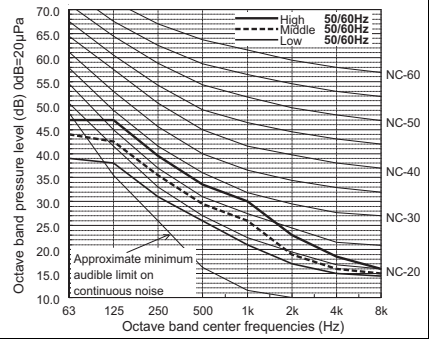
PEFY-WP40, 50VMA-E

External Static Pressure: 70Pa
Power Source: 220-230-240V(50/60Hz)



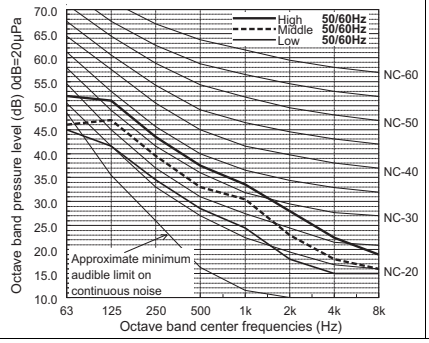
PEFY-WP40, 50VMA-E

External Static Pressure: 100Pa
Power Source: 220-230-240V(50/60Hz)



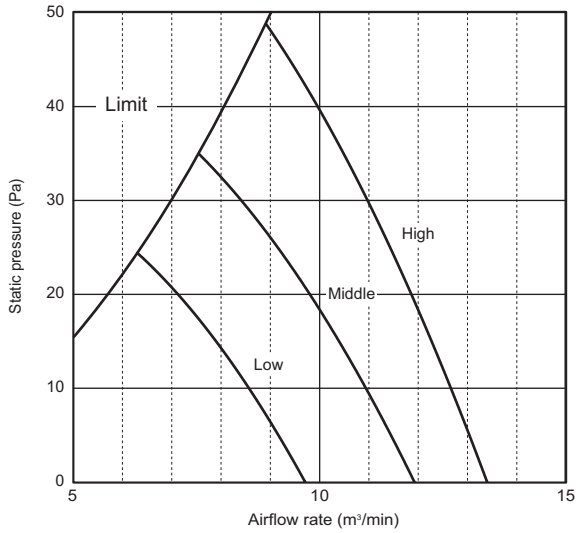
PEFY-WP40, 50VMA-E

External Static Pressure: 150Pa
Power Source: 220-230-240V(50/60Hz)

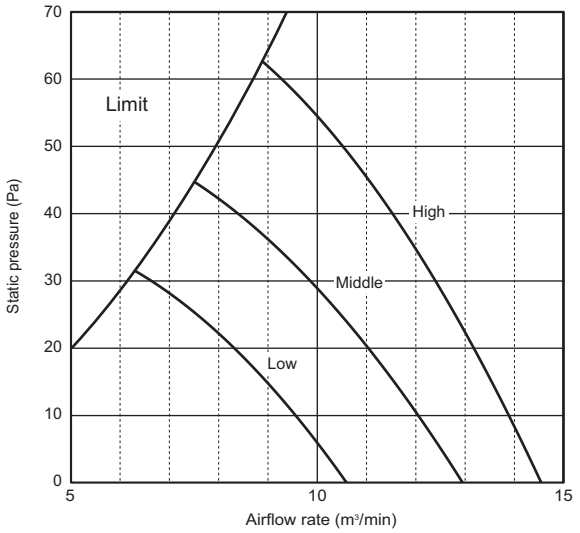


6. FAN CHARACTERISTICS CURVES

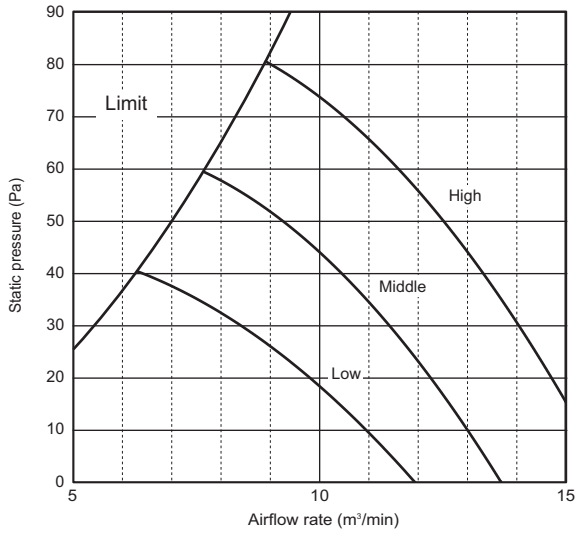
PEFY-WP20VMA-E
External static pressure : 35Pa
Power source : 220-240V



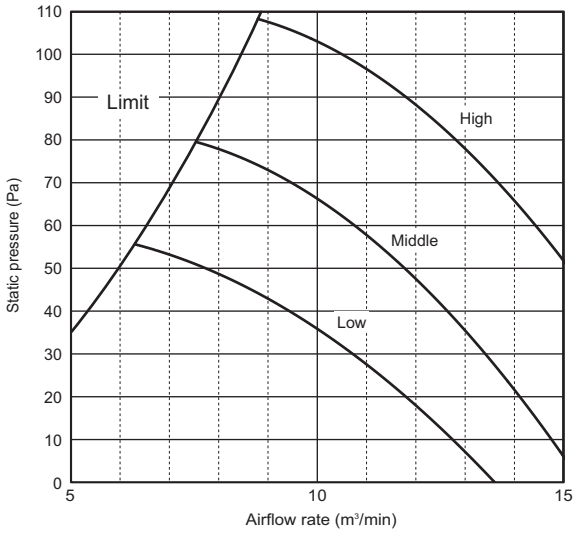
PEFY-WP20VMA-E
External static pressure : 50Pa
Power source : 220-240V



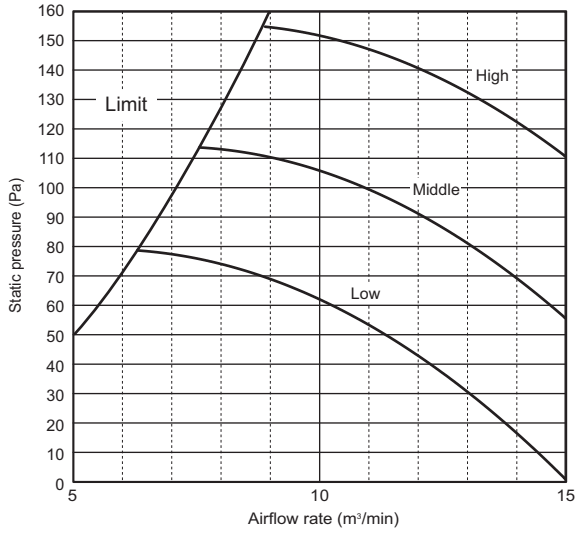
PEFY-WP20VMA-E
External static pressure : 70Pa
Power source : 220-240V



PEFY-WP20VMA-E
External static pressure : 100Pa
Power source : 220-240V

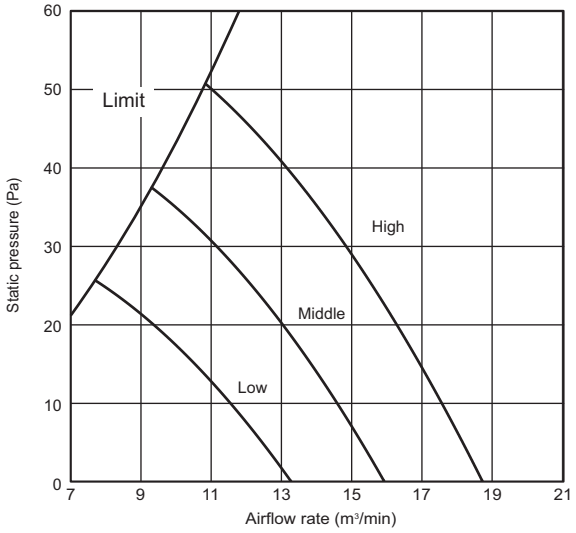


PEFY-WP20VMA-E
External static pressure : 150Pa
Power source : 220-240V

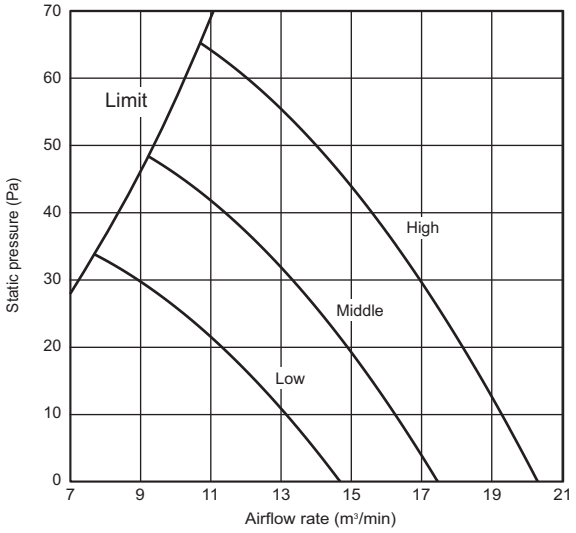


6. FAN CHARACTERISTICS CURVES

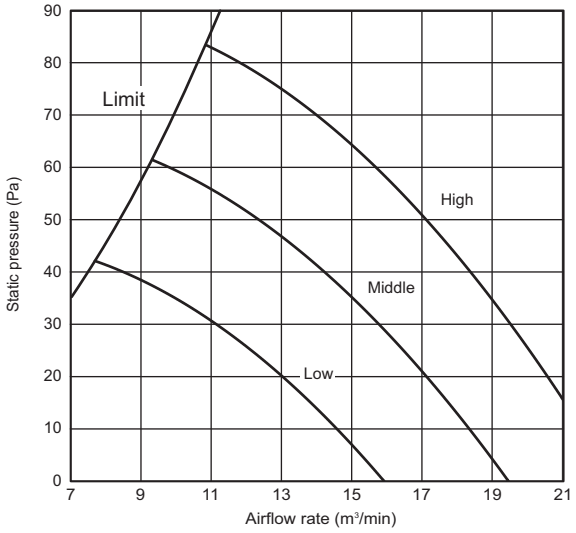
PEFY-WP25VMA-E
External static pressure : 35Pa
Power source : 220-240V



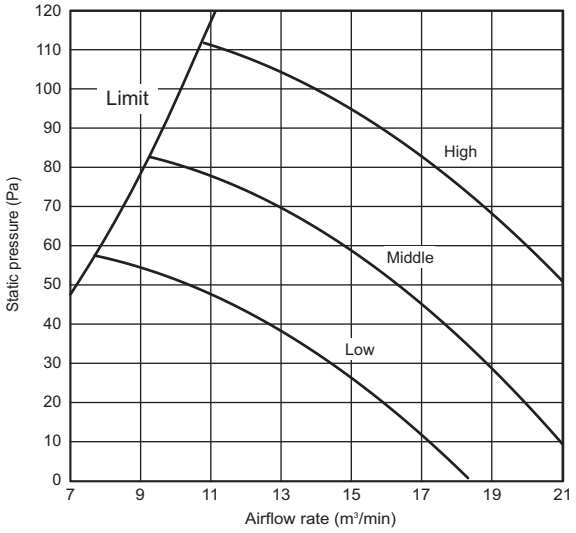
PEFY-WP25VMA-E
External static pressure : 50Pa
Power source : 220-240V



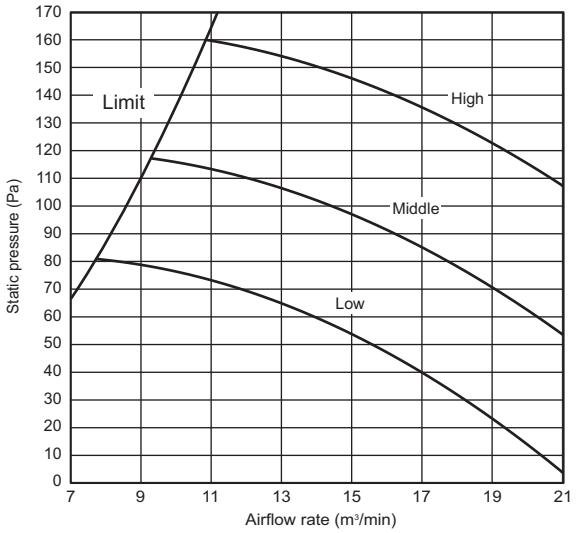
PEFY-WP25VMA-E
External static pressure : 70Pa
Power source : 220-240V



PEFY-WP25VMA-E
External static pressure : 100Pa
Power source : 220-240V

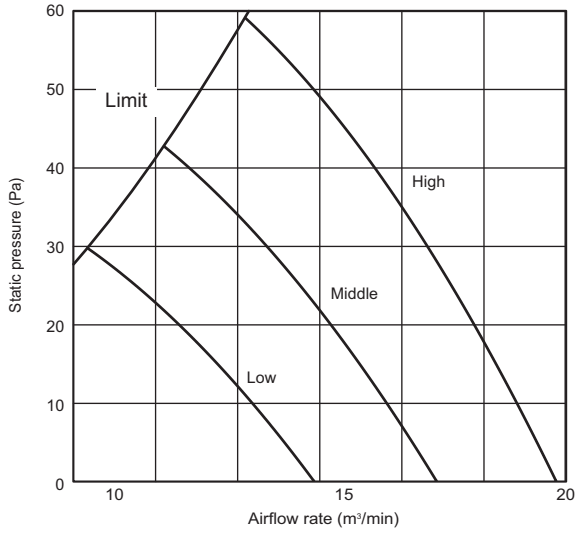


PEFY-WP25VMA-E
External static pressure : 150Pa
Power source : 220-240V

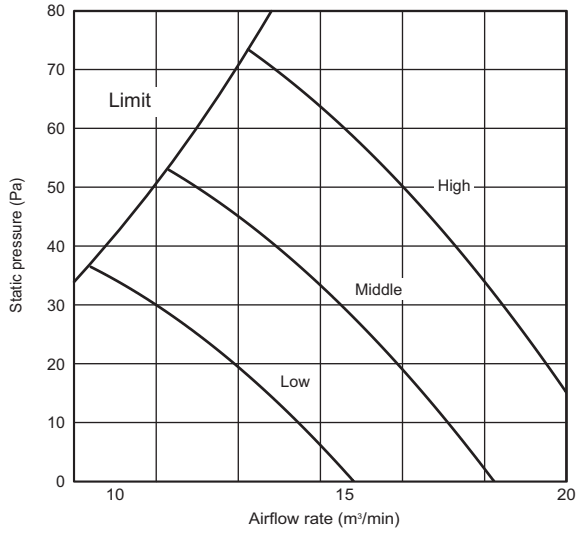


6. FAN CHARACTERISTICS CURVES

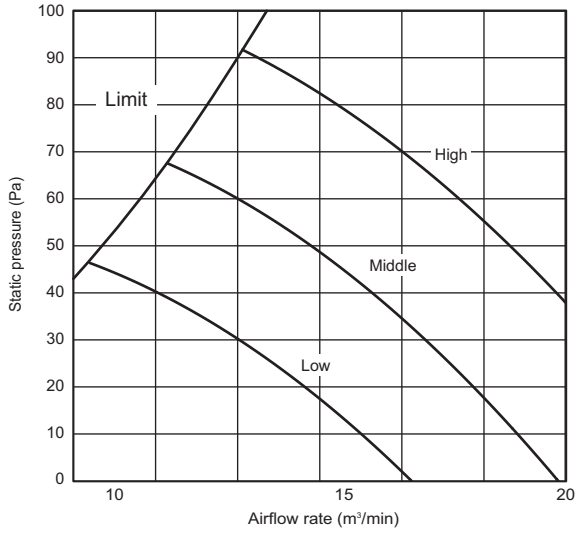
PEFY-WP32VMA-E
External static pressure : 35Pa
Power source : 220-240V



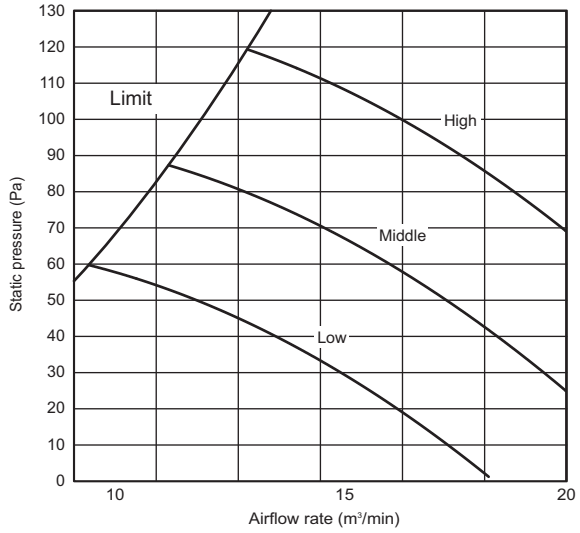
PEFY-WP32VMA-E
External static pressure : 50Pa
Power source : 220-240V



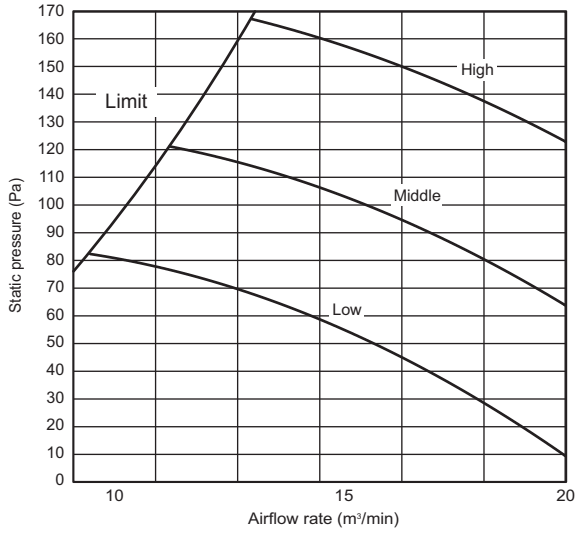
PEFY-WP32VMA-E
External static pressure : 70Pa
Power source : 220-240V



PEFY-WP32VMA-E
External static pressure : 100Pa
Power source : 220-240V

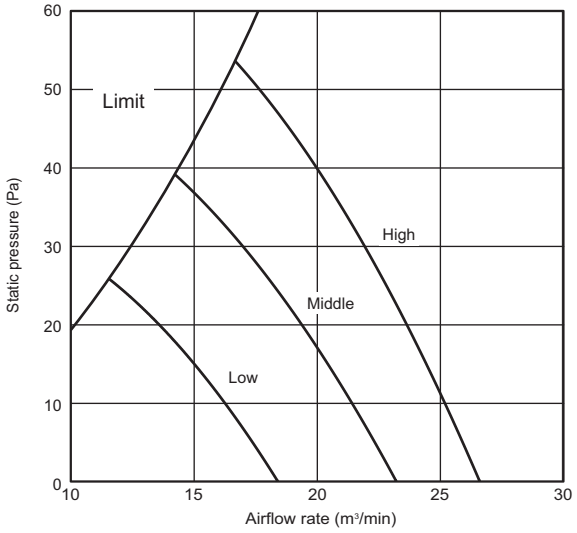


PEFY-WP32VMA-E
External static pressure : 150Pa
Power source : 220-240V

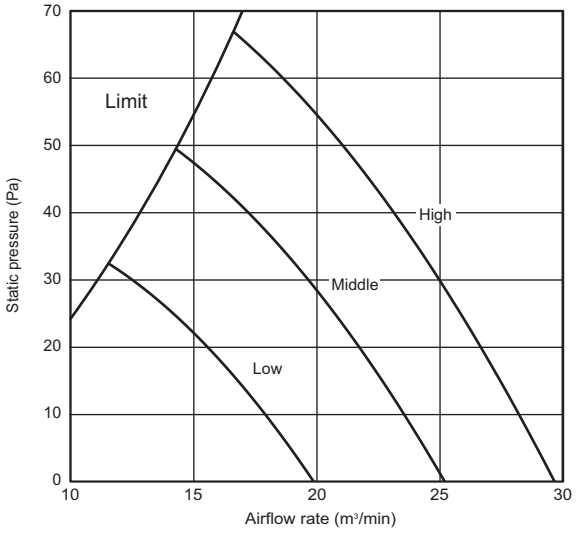


6. FAN CHARACTERISTICS CURVES

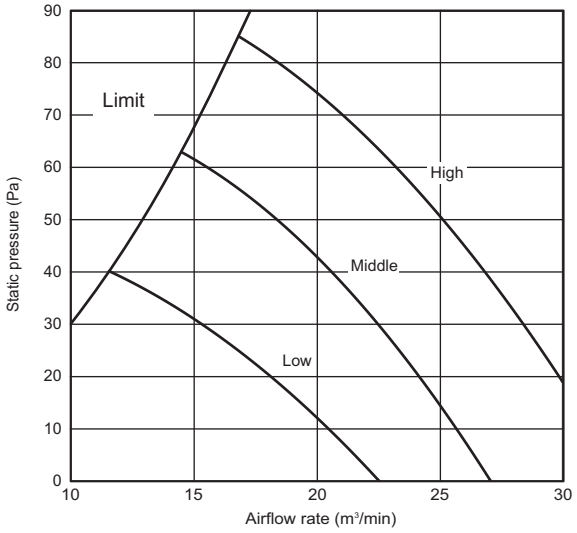
PEFY-WP40,50VMA-E
External static pressure : 35Pa
Power source : 220-240V



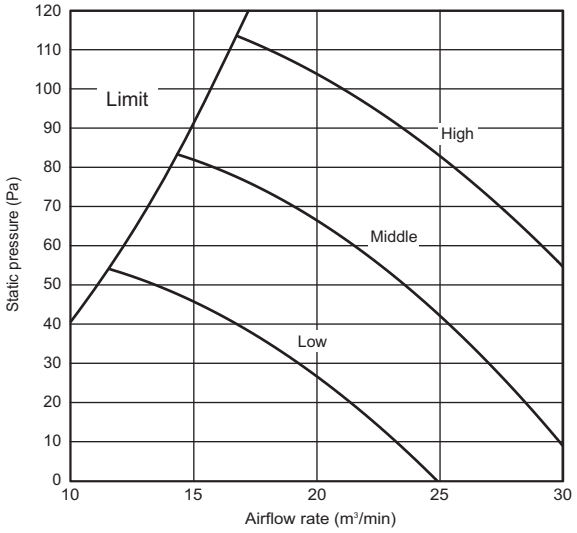
PEFY-WP40,50VMA-E
External static pressure : 50Pa
Power source : 220-240V



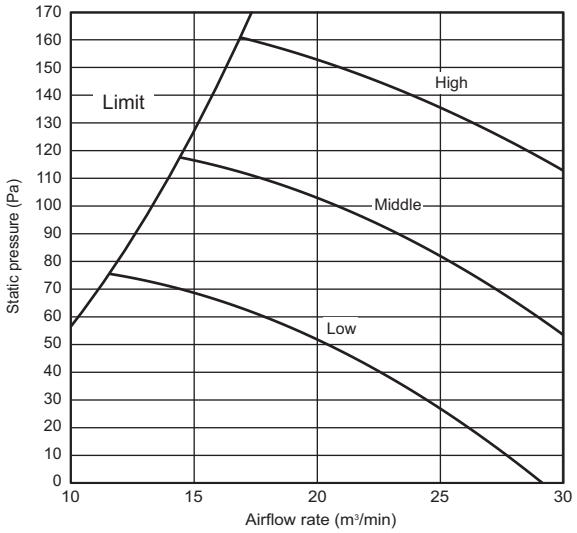
PEFY-WP40,50VMA-E
External static pressure : 70Pa
Power source : 220-240V



PEFY-WP40,50VMA-E
External static pressure : 100Pa
Power source : 220-240V



PEFY-WP40,50VMA-E
External static pressure : 150Pa
Power source : 220-240V

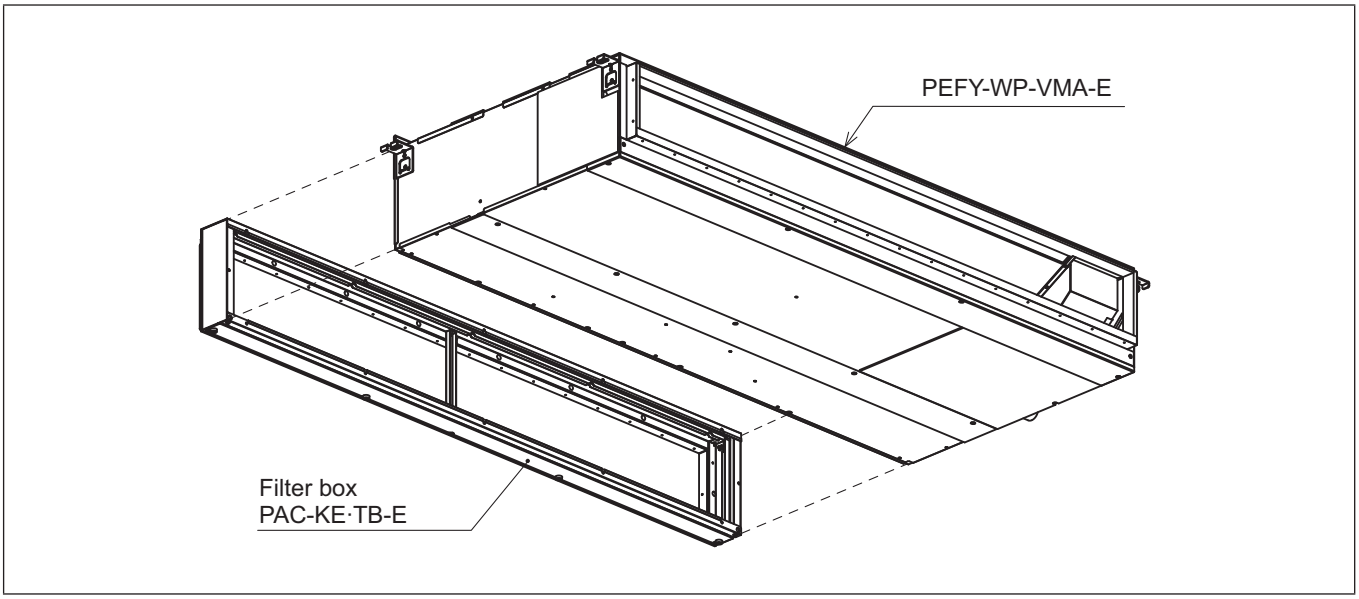


7. OPTIONAL PARTS

7-1. Optional parts line up for the Indoor unit

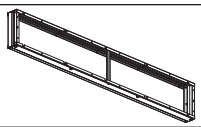
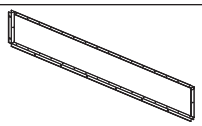
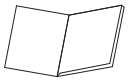
	Filter box
PEFY-WP20VMA-E	PAC-KE91TB-E
PEFY-WP25, 32VMA-E	PAC-KE92TB-E
PEFY-WP40, 50VMA-E	PAC-KE93TB-E

● PEFY-WP-VMA-E



7-2. Filter box

PAC-KE-TB-E

Item	1 Screw	2 Filter box	3 FLANGE	4 Installation manual	
Quantity	30	1	1	1	
Shape					

Detailed installation information should be referred to its Installation Manual.

PLFY-WP-VBM-E

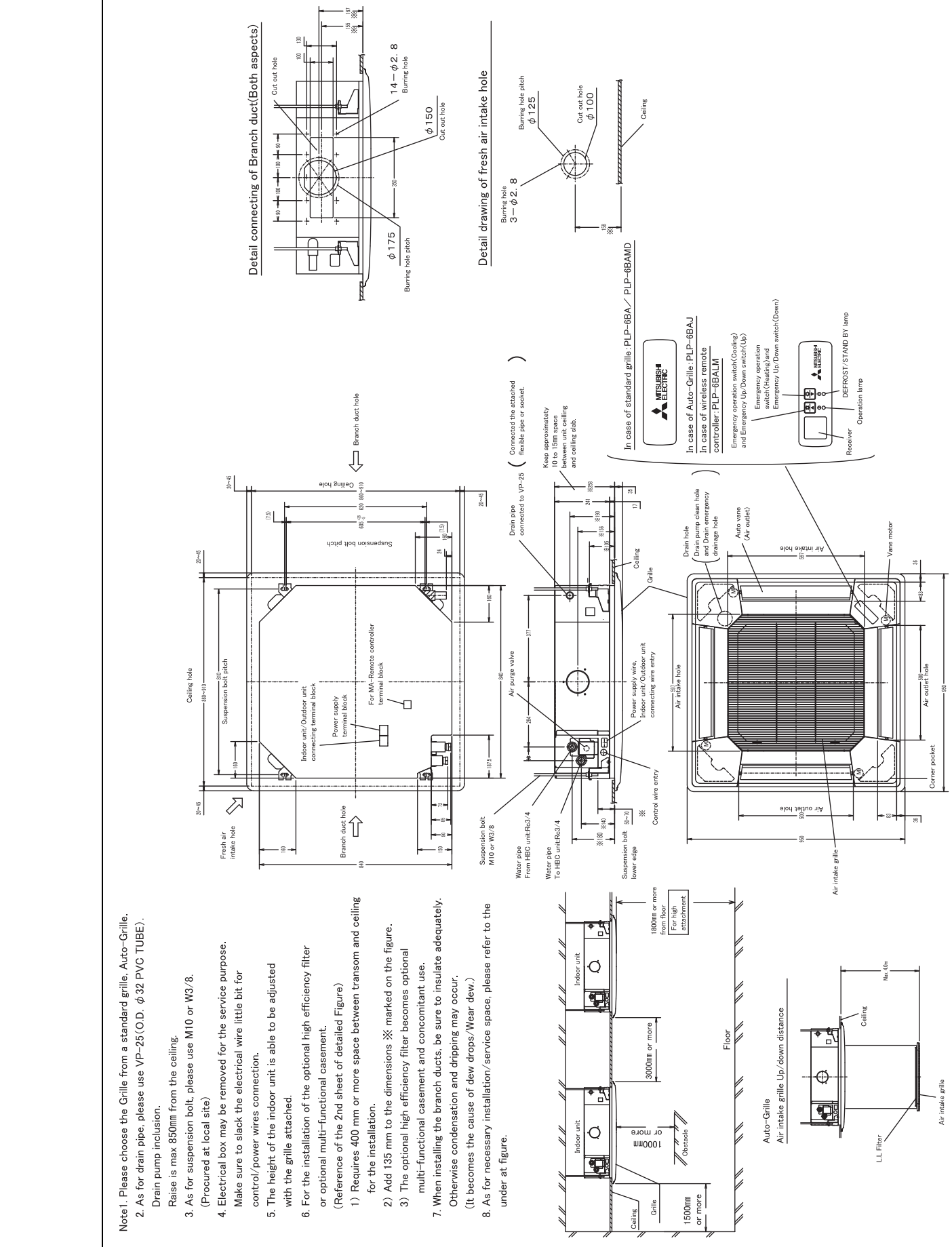
1. SPECIFICATIONS

Model			PLFY-WP32VBM-E	PLFY-WP40VBM-E	PLFY-WP50VBM-E
Power source			1-phase 220-230-240 V 50/60Hz		
Cooling capacity	*1	kW	3.6	4.5	5.6
	*1	kcal/h	3,100	3,900	4,800
	*1	BTU/h	12,300	15,400	19,100
	Power input	kW	0.04	0.04	0.05
	Current input	A	0.35	0.35	0.45
Heating capacity	*2	kW	4.0	5.0	6.3
	*2	kcal/h	3,400	4,300	5,400
	*2	BTU/h	13,600	17,100	21,500
	Power input	kW	0.03	0.03	0.04
	Current input	A	0.28	0.28	0.38
External finish			Galvanized steel sheet		
External dimension	H x W x D	mm	258 x 840 x 840		
		in.	10-3/16 x 33-3/32 x 33-3/32		
Net weight		kg(lbs)	22(49)		
Heat exchanger			Cross fin (Aluminum fin and copper tube)		
Water Volume		L	1.5		
FAN Type x Quantity			Turbo Fan × 1		
External static press		Pa	0		
Motor Type			DC motor		
Motor output		kW	0.05		
Driving mechanism			Direct-driven by motor		
Air flow rate (Low-Mid1-Mid2-High)		m^3 / min	13-14-15-16	13-14-15-16	13-15-17-19
		L/ s	217-233-250-267	217-233-250-267	217-250-283-317
		cfm	459-494-530-565	459-494-530-565	459-530-601-671
Sound pressure level (Low-Mid1-Mid2-High)		dB<A>	27-29-30-31	27-29-30-31	27-30-32-34
Insulation material			PS		
Air filter			PP honeycomb		
Protection device			Fuse		
Refrigerant control device			-		
Connectable outdoor unit/HBC controller			CITY MULTI YLM series/CMB-WP-V-GA1, CMB-WP-V-GB1		
Water piping diameter	Inlet	in.	Rc 3/4 screw		
*3*4	Outlet	in.	Rc 3/4 screw		
Field drain pipe size		mm (in.)	O.D.32 (1-1/4)		
Standard attachment	Document accessory		Installation Manual, Instruction Book		
Optional parts	Decoration panel **1		PLP-6BA		
	Automatic filter elevation panel **1		PLP-6BAJ		
	Space panel		PAC-SH48AS-E		
	Air outlet shutter plate		PAC-SH51SP-E		
	High efficiency filter element **2		PAC-SH59KF-E		
	Multi-function casement		PAC-SH53TM-E		
	i-see sensor corner panel		PAC-SA1ME-E		
	Flange for fresh air intake		PAC-SH65OF-E		
	Wireless signal receiver		PAR-SF9FA-E		
	**1.PLFY-P-VBM-E should use together with PLP-6BA(J). **2.PAC-SH53TM-E is necessary to use with filter PAC-SH59KF-E.				
Remarks			*Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. *Due to continuing improvement, above specifications may be subject to change without notice.		

Notes:	Unit converter
1.Nominal cooling conditions Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.) Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.) 2.Nominal heating conditions Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.) Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.) 3.Be sure to install a valve on the water outlet. 4.Install a strainer (40 mesh or more) on the pipe next to the valve to remove the foreign matters. 5.Please group units that operate on 1 branch.	kcal/h =kW x 860 BTU/h =kW x 3,412 cfm =m^3/min x 35.31 lbs =kg/0.4536

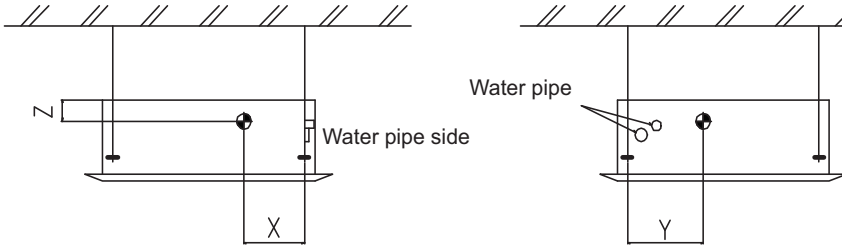
PLFY-WP32, 40, 50VBM-E

Unit : mm



Note1. Please choose the Grille from a standard grille, Auto-Grille.
2. As for drain pipe, please use VP-25(O.D. φ32 PVC TUBE).
Drain pump inclusion.
Raise is max 850mm from the ceiling.
3. As for suspension bolt, please use M10 or W3/8.
(Procured at local site)
4. Electrical box may be removed for the service purpose.
Make sure to slack the electrical wire little bit for control/power wires connection.
5. The height of the indoor unit is able to be adjusted with the grille attached.
6. For the installation of the optional high efficiency filter or optional multi-functional casement.
(Reference of the 2nd sheet of detailed Figure)
1) Requires 400 mm or more space between transom and ceiling for the installation.
2) Add 135 mm to the dimensions ※ marked on the figure.
3) The optional high efficiency filter becomes optional multi-functional casement and concomitant use.
7. When installing the branch ducts, be sure to insulate adequately.
Otherwise condensation and dripping may occur.
(It becomes the cause of dew drops/Wear dew.)
8. As for necessary installation/service space, please refer to the under at figure.

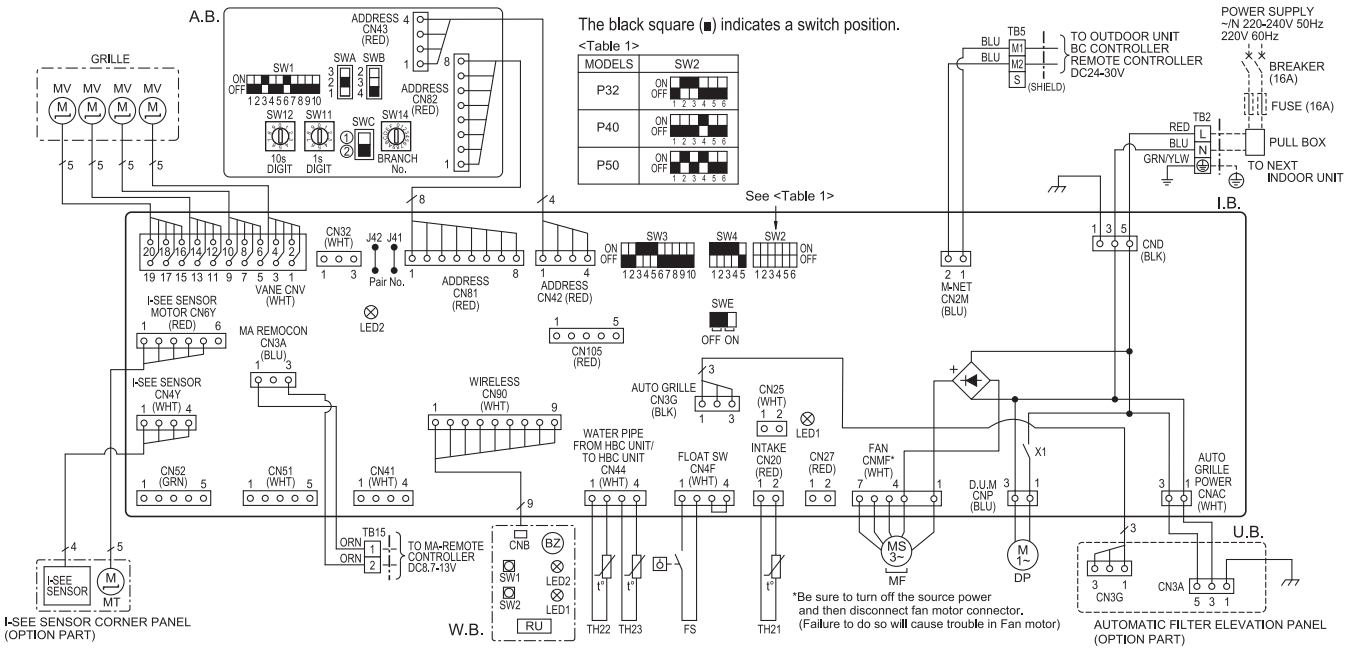
PLFY-WP32, 40, 50VBM-E



(mm) [in]

Model name	X	Y	Z
PLFY-WP32VBM-E	280 [11-1/32]	400 [15-3/4]	105 [4-5/32]
PLFY-WP40VBM-E	280 [11-1/32]	400 [15-3/4]	105 [4-5/32]
PLFY-WP50VBM-E	280 [11-1/32]	400 [15-3/4]	105 [4-5/32]

PLFY-WP32, 40, 50VBM-E



NOTES:
1. At servicing for outdoor unit, always follow the wiring diagram of outdoor unit.
2. In case of using MA-Remote controller, please connect to TB15. (Remote controller wire is non-polar.)
3. In case of using M-NET, please connect to TB5. (Transmission line is non-polar.)
4. Symbol [S] of TB5 is the shield wire connection.
5. Symbols used in wiring diagram above are, □□□ : terminal block, ○○○ : connecter.
6. The setting of the SW2 dip switches differs in the capacity. For the detail, refer to <Table 1>.

[LEGEND]

SYMBOL	NAME		SYMBOL	NAME		SYMBOL	NAME	
I.B.	INDOOR CONTROLLER BOARD		DP	DRAIN PUMP		A.B.	ADDRESS BOARD	
CN27	CONNECTOR	DAMPER	FS	DRAIN FLOAT SWITCH		SWA	SWITCH	CEILING HEIGHT SELECTOR
CN32		REMOTE SWITCH	MF	FAN MOTOR		SWB		DISCHARGE OUTLET NUMBER SELECTOR
CN51		CENTRALLY CONTROL	MV	VANE MOTOR		SWC		OPTION SELECTOR
CN52		REMOTE INDICATION	TB2	TERMINAL BLOCK	POWER SUPPLY	SW1		MODE SELECTION
CN105	IT TERMINAL		TB5		TRANSMISSION	SW11		ADDRESS SETTING ONES DIGIT
FUSE	FUSE (T6.3AL250V)		TB15		MA-REMOTE CONTROLLER	SW12		ADDRESS SETTING TENS DIGIT
LED1	POWER SUPPLY (I.B.)		TH21	THERMISTOR	ROOM TEMP. DETECTION (0°C/15kΩ, 25°C/5.4kΩ)	SW14		CONNECTION NO.
LED2	POWER SUPPLY (I.B.)					OPTION PART		
SW2	SWITCH	CAPACITY CODE	TH22		PIPE TEMP. DETECTION/FROM HBC UNIT (0°C/15kΩ, 25°C/5.4kΩ)	W.B.	PCB FOR WIRELESS REMOTE CONTROLLER	
SW3		MODE SELECTION				BZ	BUZZER	
SW4		MODEL SELECTION	TH23		PIPE TEMP. DETECTION/TO HBC UNIT (0°C/15kΩ, 25°C/5.4kΩ)	LED1	LED (OPERATION INDICATION : GREEN)	
SWE		DRAIN PUMP (TEST MODE)				LED2	LED (PREPARATION FOR HEATING : ORANGE)	
X1	AUX. RELAY	DRAIN PUMP				RU	RECEIVING UNIT	
						SW1	EMERGENCY OPERATION (HEAT/DOWN)	
						SW2	EMERGENCY OPERATION (COOL/UP)	

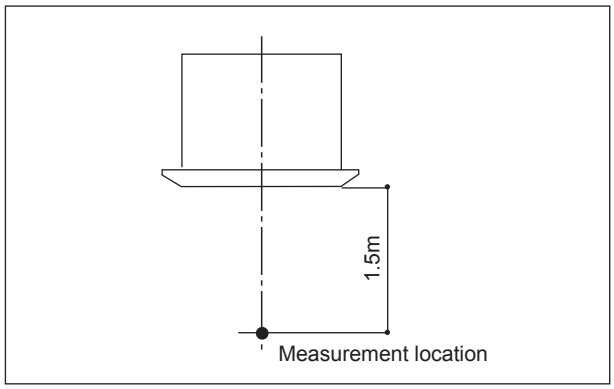
LED on indoor board for service

Mark	Meaning	Function
LED1	Main power supply	Main Power supply (Indoor unit:220-240V) power on → lamp is lit
LED2	Power supply for MA-Remote controller	Power supply for MA-Remote controller on → lamp is lit

5. SOUND LEVELS

5-1. Sound levels

PLFY-WP-VBM-E



* Measured in anechoic room.

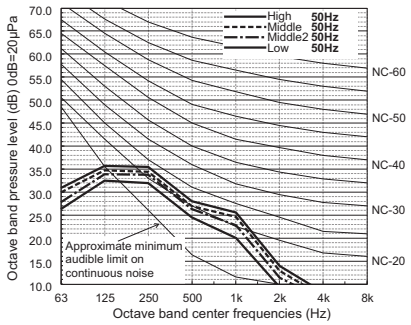
Sound level at anechoic room: Low-Mid2-Mid1-High

	Sound level dB (A)
PLFY-WP32VBM-E	27-29-30-31
PLFY-WP40VBM-E	27-29-30-31
PLFY-WP50VBM-E	27-30-32-34

5-2. NC curves

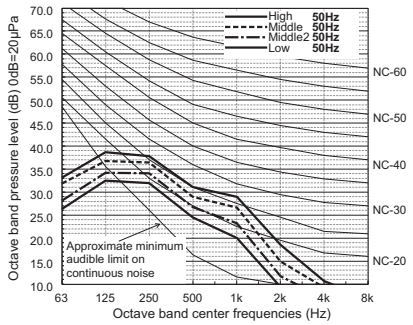
PLFY-WP32, 40VBM-E

External Static Pressure: 0Pa
Power Source: 220, 230, 240V, 50/60Hz



PLFY-WP50VBM-E

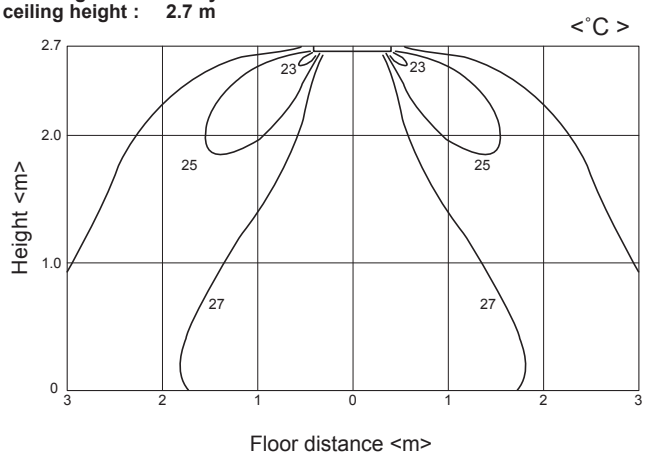
External Static Pressure: 0Pa
Power Source: 220, 230, 240V, 50/60Hz



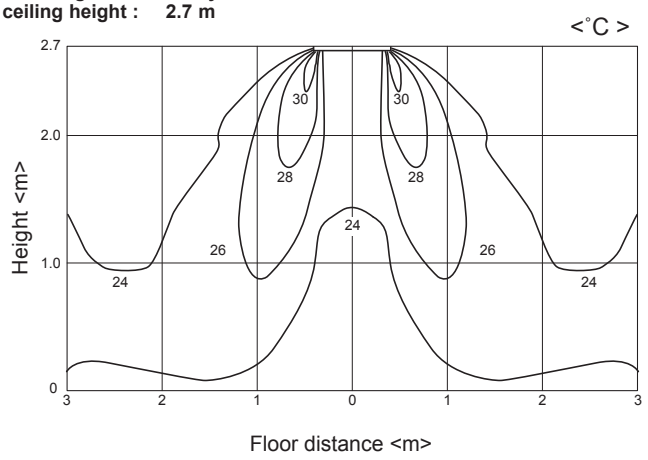
6. TEMPERATURE/AIRFLOW DISTRIBUTIONS

6-1. Temperature distributions

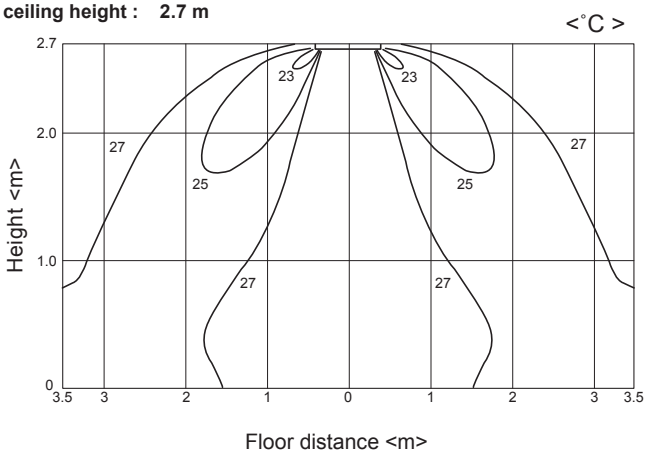
• PLFY-WP32, 40VBM-E
<Cooling mode> Standard
Flow angle : 30° 4-way flow
ceiling height : 2.7 m



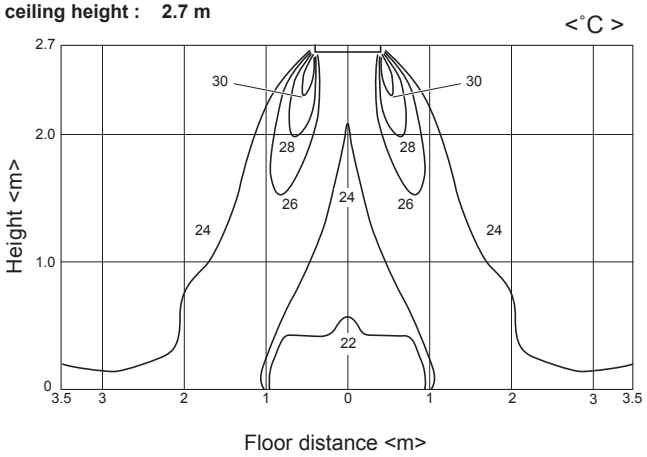
<Heating mode> Standard
Flow angle : 60° 4-way flow
ceiling height : 2.7 m



• PLFY-WP50VBM-E
<Cooling mode> Standard
Flow angle : 30° 4-way flow
ceiling height : 2.7 m



<Heating mode> Standard
Flow angle : 60° 4-way flow
ceiling height : 2.7 m

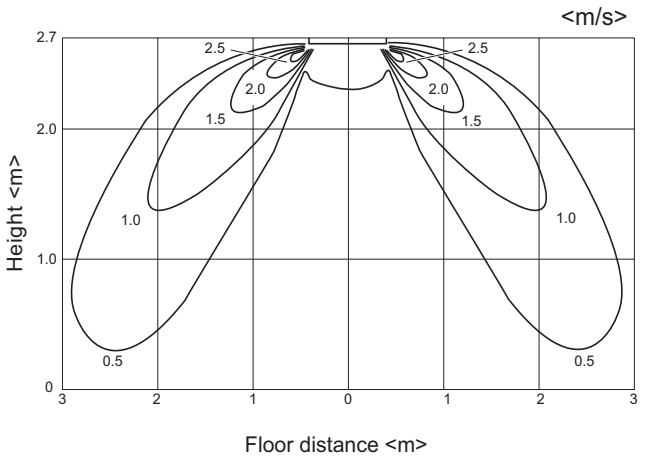


Note : These figures show typical temperature distributions in the conditions above. In the actual installation, they may differ from these figures under the influence of air temperature conditions, ceiling height, cooling/heating load,obstacles,etc.

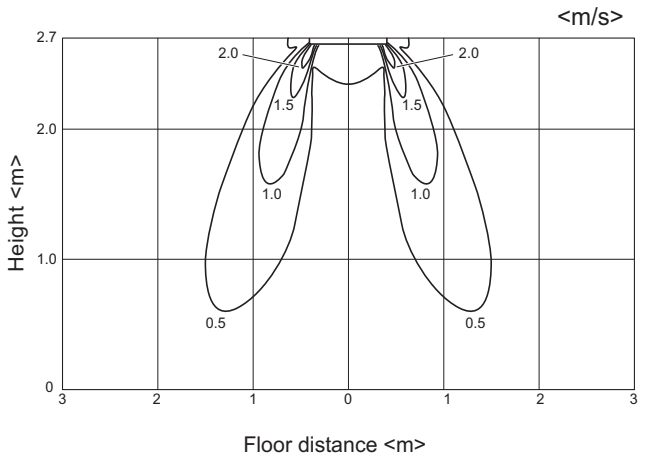
6-2. Airflow distributions

PLFY-WP32, 40VBM-E

<Cooling mode>
Flow angle 30°

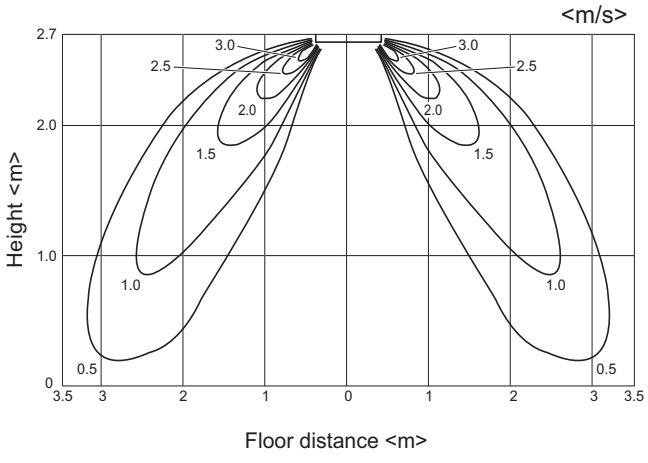


<Heating mode>
Flow angle 60°

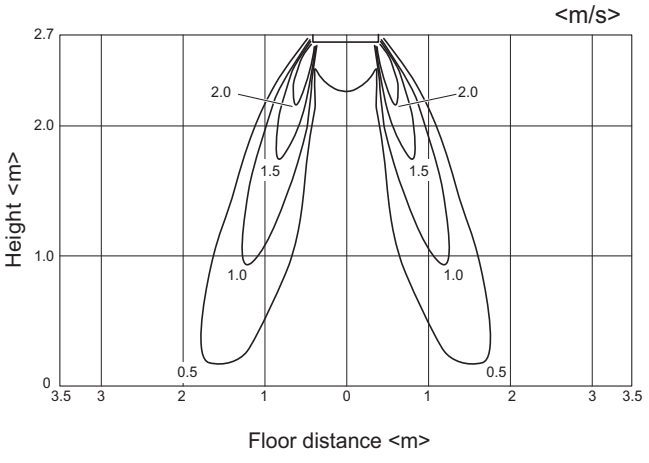


PLFY-WP50VBM-E

<Cooling mode>
Flow angle 30°



<Heating mode>
Flow angle 60°



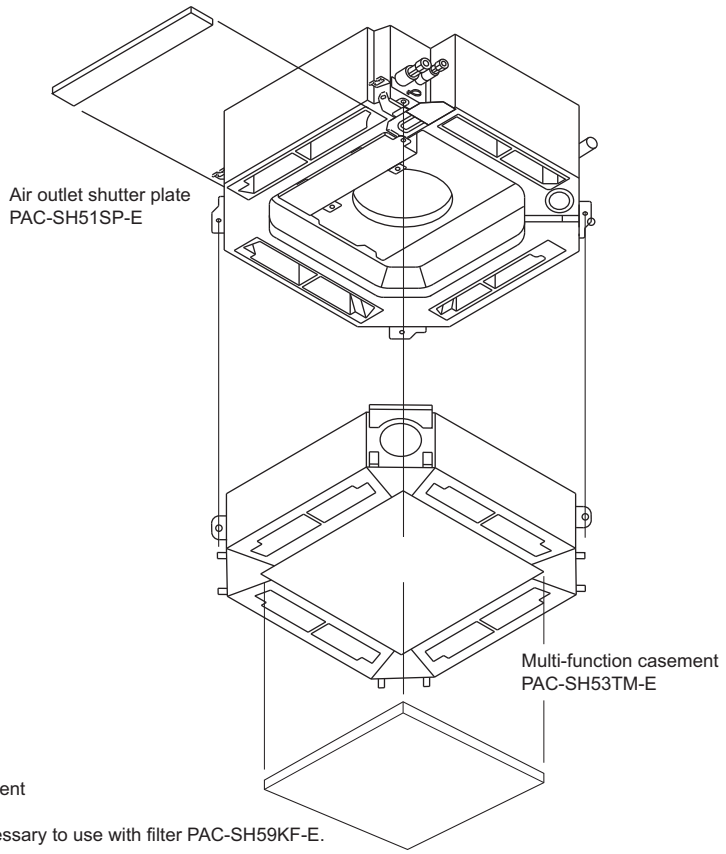
Note : These figures show typical airflow distributions in the conditions above. In the actual installation, they may differ from these figures under the influence of air temperature conditions, ceiling height, cooling/heating load,obstacles,etc.

7. OPTIONAL PARTS

7-1. Optional parts line up for the Indoor unit

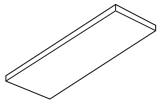
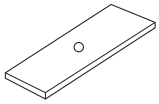
	Description	Model
PLFY-WP-VBM-E	Air outlet shutter plate	PAC-SH51SP-E
	Multi-function casement	PAC-SH53TM-E
	High efficiency filter element	PAC-SH59KF-E
	i-see Sensor corner panel	PAC-SA1ME-E
	Automatic filter elevation panel	PLP-6BAJ
	Wireless signal receiver	PAR-SA9FA-E
	Space panel	PAC-SH48AS-E
	Duct flange for fresh air intake	PAC-SH65OF-E

PLFY-WP-VBM-E



7-2. Air outlet shutter plate

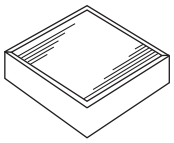
Using the air outlet shutter plate to block the air outlet to modify the air-way from 4 to 3 or 2.
With 1 PAC-SH51SP-E, 4 air-ways can be changed to 3;
With 2 PAC-SH51SP-E, 4 air-ways can be changed to 2;
Changing to 1 way is not allowed.
Material: Foamed polyethylene + foamed urethane, color: Black

Item	① Shutter plate	② Insulator	
Quantity	2	1	
Shape			

Detailed installation information should be referred to its Installation Manual.

7-3. High efficiency filter element

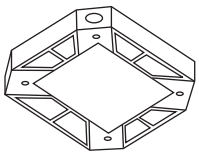
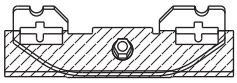
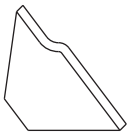
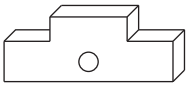
Life span: 2,500 hr (Dust concentration 0.15mg/m³); Colorimetric method 65% (JIS 11 class); No re-production.
* The actual dust situation affects the filter life span, which should be considered at the applying site.
Material: Electrostatic polyolefin fiber
High efficiency filter element PAC-SH59KF-E should be used together with the Multi-function casement PAC-SH53TM-E. When using PAC-SH59KF-E, switching on SWC of the Indoor unit address board is needed. Details should be referred to its Installation Manual.

Quantity	1	
Shape		

Detailed installation information is referred in its Installation Manual.

7-4. Multi-function casement

Multi-function casement is used for High efficiency filter element and/or fresh air intake from outdoor.
It should be used with High efficiency filter element PAC-SH59KF-E (Colorimetric method 65%).
Fresh air intake on the Multi-function casement is possible from any 2 or less corners among the 4 ones.
But duct and flange on the casement should be prepare locally.

Item	① Multi-functional casement	② Screw with washer (black)	③ Screw
Quantity	1	4	8
Shape		M5X0.8X25 	M5X0.8X12 
Item	④ Decoretive panel securing bracket	⑤ Insulator A for Decorative panel	⑥ Insulator B for Decorative panel
Quantity	4	1	1
Shape	With insulator 		

Detailed installation information should be referred to its Installation Manual.

7-5. i-see Sensor corner panel

i-see Sensor provides comfortable space as it detects the floor temperature to prevent spotty temperature.
And that enables the unit to save energy.
Attention
Make sure that there are no gaps between the unit and the grille, and the grille and ceiling.
※ It may cause dew dripping.

Item	i-see sensor corner panel	Plastic fastener	
Quantity	1	2	
Shape			

Detailed installation information should be referred to its Installation Manual.

7-6. Automatic filter elevation panel

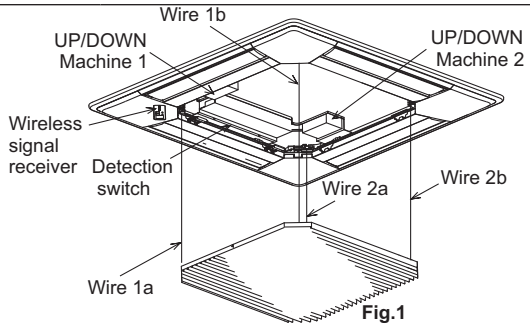
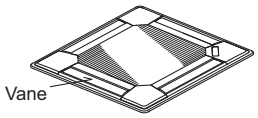
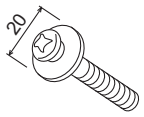
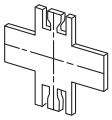
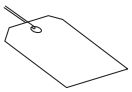


Fig.1

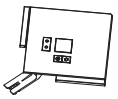
· Air intake grille can be lifted and lowered automatically by wired remote controller (MA type) or wireless remote controller (Item 9).
· Lowering the air intake grille allows you to clean the filter easily.
· You can set up eight different stages of lowering distance for the air intake grille according to the set up location if desired. (Maximum : 4m)

Item	Decorative panel	Screw with washer	Installation gauge	Plastic fastener
Quantity	1	4	1	3
Shape	 Vane	M5X0.8X25  20	 (Used split into four pieces)	
Item	Tag	Screw	Screw	Screw
Quantity	1	4	1	3
Shape		4X8  Only three are used	4X12 	M5X10 
Item	Wireless remote controller			
Quantity	1			
Shape				

Detailed installation information should be referred to its Installation Manual.

7. OPTIONAL PARTS

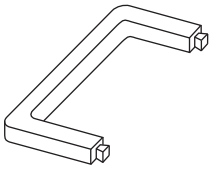
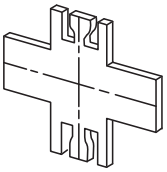
7-7. Wireless signal receiver

Wireless signal receiver PAR-SF9FA-E/PAR-SA9FA-E is necessary for using wireless remote controller PAR-SF9FA-E/PAR-SA9FA-E is a corner panel with the signal receiver for wireless remote controller.		
Item	Wireless signal receiver for VFM	Wireless signal receiver for VBM
Quantity	1	1
Shape		

Detailed installation information should be referred to its Installation Manual.

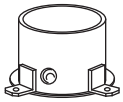
7-8. Space panel

*only for VBM

Decorative cover for the installation when the ceiling height is low.		
Item	Space panel	Gauge for installation
Quantity	2	1
Shape		

7-9. Duct flange for fresh air intake

*only for VBM

Part to attach a duct to take in fresh air from outdoors.			
Item	Duct flange	Insulator	Screws (M4 x 10)
Quantity	1	1	3
Shape			

PFFY-WP-VLRMM-E

1. SPECIFICATIONS

Model				PFFY-WP20VLRMM-E	PFFY-WP25VLRMM-E	PFFY-WP32VLRMM-E	PFFY-WP40VLRMM-E
Power source				1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz	1-phase 220-230-240 V 50/60 Hz
Cooling capacity		*1	kW	2.2	2.8	3.6	4.5
(Nominal)		*1	kcal/h	1,900	2,400	3,100	3,900
		*1	BTU/h	7,500	9,600	12,300	15,400
	*2	Power input	kW	0.040	0.040	0.050	0.050
	*2	Current input	A	0.35	0.35	0.47	0.47
Heating capacity		*3	kW	2.5	3.2	4.0	5.0
(Nominal)		*3	kcal/h	2,200	2,800	3,400	4,300
		*3	BTU/h	8,500	10,900	13,600	17,100
	*2	Power input	kW	0.040	0.040	0.050	0.050
	*2	Current input	A	0.35	0.35	0.47	0.47
External finish				Galvanized steel plate	Galvanized steel plate	Galvanized steel plate	Galvanized steel plate
External dimension H x W x D			mm	639 x 886 x 220	639 x 1,006 x 220	639 x 1,006 x 220	639 x 1,246 x 220
			in.	25-3/16 x 34-15/16 x 8-11/16	25-3/16 x 39-5/8 x 8-11/16	25-3/16 x 39-5/8 x 8-11/16	25-3/16 x 49-1/16 x 8-11/16
Net weight			kg (lbs)	22 (49)	25 (56)	25 (56)	29 (64)
Heat exchanger				Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)	Cross fin (Aluminum fin and copper tube)
	Water Volume		L	0.9	1.3	1.3	1.5
FAN	Type x Quantity			Sirocco fan x 1	Sirocco fan x 2	Sirocco fan x 2	Sirocco fan x 2
*4	External static press.		Pa	20 - <40> - <60>	20 - <40> - <60>	20 - <40> - <60>	20 - <40> - <60>
			mmH_2O	2.0 - <4.1> - <6.1>	2.0 - <4.1> - <6.1>	2.0 - <4.1> - <6.1>	2.0 - <4.1> - <6.1>
	Motor Type			DC motor	DC motor	DC motor	DC motor
	Motor output		kW	0.096	0.096	0.096	0.096
	Driving mechanism			Direct-driven by motor	Direct-driven by motor	Direct-driven by motor	Direct-driven by motor
	Air flow rate			(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)
			m^3/min	4.5 - 5.0 - 6.0	6.0 - 7.0 - 8.0	7.5 - 9.0 - 10.5	8.0 - 10.0 - 11.5
			L/s	75 - 83 - 100	100 - 117 - 133	125 - 150 - 175	133 - 167 - 192
			cfm	159 - 177 - 212	212 - 247 - 282	265 - 318 - 371	282 - 353 - 406
Sound pressure level (measured in anechoic room)				(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)	(Low-Mid-High)
		*2	dB <A>	31-33-38	31-33-38	31-35-38	34-37-40
Insulation material				Polyethylene foam, Urethane foam	Polyethylene foam, Urethane foam	Polyethylene foam, Urethane foam	Polyethylene foam, Urethane foam
Air filter				PP honeycomb fabric.	PP honeycomb fabric.	PP honeycomb fabric.	PP honeycomb fabric.
Protection device				Fuse	Fuse	Fuse	Fuse
Refrigerant control device				-	-	-	-
Connectable outdoor unit				CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1	CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1
Water piping diameter	Inlet		in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw
*5 *6	Outlet		in.	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw	Rc 3/4 screw
Field drain pipe size			mm (in.)	I.D.26 (1) <Accessory hose O.D.27 (1-3/32) (top end: O.D.20 (13/16))>	I.D.26 (1) <Accessory hose O.D.27 (1-3/32) (top end: O.D.20 (13/16))>	I.D.26 (1) <Accessory hose O.D.27 (1-3/32) (top end: O.D.20 (13/16))>	I.D.26 (1) <Accessory hose O.D.27 (1-3/32) (top end: O.D.20 (13/16))>
Drawing	External			KD94T792X01	KD94T792X01	KD94T792X01	KD94T792X01
	Wiring			KD94T791X01	KD94T791X01	KD94T791X01	KD94T791X01
	Refrigerant cycle			-	-	-	-
Standard attachment	Document			Installation Manual, Instruction Book	Installation Manual, Instruction Book	Installation Manual, Instruction Book	Installation Manual, Instruction Book
	Accessory			Insulation pipe for water pipe, Drain hose (flexible joint), Screw plate, Level adjusting screw, Hose band	Insulation pipe for water pipe, Drain hose (flexible joint), Screw plate, Level adjusting screw, Hose band	Insulation pipe for water pipe, Drain hose (flexible joint), Screw plate, Level adjusting screw, Hose band	Insulation pipe for water pipe, Drain hose (flexible joint), Screw plate, Level adjusting screw, Hose band
Optional parts							
Remarks				Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.			

Notes:

1. Nominal cooling conditions
   Indoor: 27 °CD.B./19 °CW.B. (81 °FD.B./66 °FW.B.), Outdoor: 35 °CD.B. (95 °FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. The values are measured at the factory setting of external static pressure.
3. Nominal heating conditions
   Indoor: 20 °CD.B. (68 °FD.B.), Outdoor: 7 °CD.B./6 °CW.B. (45 °FD.B./43 °FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
4. The factory setting of external static pressure is shown without < >.
   Refer to "Fan characteristics curves", according to the external static pressure, in DATA BOOK for the usable range of air flow rate.
5. Be sure to install a valve on the water outlet.
6. Install a strainer (40 mesh or more) on the pipe next to the valve to remove the foreign matters.
7. Please group units that operate on 1 branch.

Unit converter

kcal/h	=kW x 860
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.

1. SPECIFICATIONS

Model			PFFY-WP50VLRMM-E			
Power source			1-phase 220-230-240 V 50/60 Hz			
Cooling capacity (Nominal)	*1	kW	5.6			
	*1	kcal/h	4,800			
	*1	BTU/h	19,100			
*2	Power input	kW	0.070			
*2	Current input	A	0.65			
Heating capacity (Nominal)	*3	kW	6.3			
	*3	kcal/h	5,400			
	*3	BTU/h	21,500			
*2	Power input	kW	0.070			
*2	Current input	A	0.65			
External finish			Galvanized steel plate			
External dimension H x W x D		mm	639 x 1,246 x 220			
		in.	25-3/16 x 49-1/16 x 8-11/16			
Net weight		kg (lbs)	29 (64)			
Heat exchanger			Cross fin (Aluminum fin and copper tube)			
	Water Volume	L	1.5			
FAN	Type x Quantity		Sirocco fan x 2			
*4	External static press.	Pa	20 - <40> - <60>			
		mmH_2O	2.0 - <4.1> - <6.1>			
	Motor Type		DC motor			
	Motor output	kW	0.096			
	Driving mechanism		Direct-driven by motor			
	Air flow rate		(Low-Mid-High)			
		m^3/min	10.5 - 13.0 - 15.0			
		L/s	175 - 217 - 250			
		cfm	371 - 459 - 530			
Sound pressure level (measured in anechoic room)			(Low-Mid-High)			
	*2	dB <A>	37-42-45			
Insulation material			Polyethylene foam, Urethane foam			
Air filter			PP honeycomb fabric.			
Protection device			Fuse			
Refrigerant control device			-			
Connectable outdoor unit			CITY MULTI YLM series/ CMB-WP-V-GA1, CMB-WP-V-GB1			
Water piping diameter	Inlet	in.	Rc 3/4 screw			
*5 *6	Outlet	in.	Rc 3/4 screw			
Field drain pipe size		mm (in.)	I.D.26 (1) <Accessory hose O.D.27 (1-3/32) (top end: O.D.20 (13/16))>			
Drawing	External		KD94T792X01			
	Wiring		KD94T791X01			
	Refrigerant cycle		-			
Standard attachment	Document		Installation Manual, Instruction Book			
	Accessory		Insulation pipe for water pipe, Drain hose (flexible joint), Screw plate, Level adjusting screw, Hose band			
Optional parts						
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.			

Notes:

1.Nominal cooling conditions
Indoor: 27 °CD.B./19 °CW.B. (81 °FD.B./66 °FW.B.), Outdoor: 35 °CD.B. (95 °FD.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2.The values are measured at the factory setting of external static pressure.
3.Nominal heating conditions
Indoor: 20 °CD.B. (68 °FD.B.), Outdoor: 7 °CD.B./6 °CW.B. (45 °FD.B./43 °FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
4.The factory setting of external static pressure is shown without < >.
Refer to "Fan characteristics curves", according to the external static pressure, in DATA BOOK for the usable range of air flow rate.
5.Be sure to install a valve on the water outlet.
6.Install a strainer (40 mesh or more) on the pipe next to the valve to remove the foreign matters.
7.Please group units that operate on 1 branch.

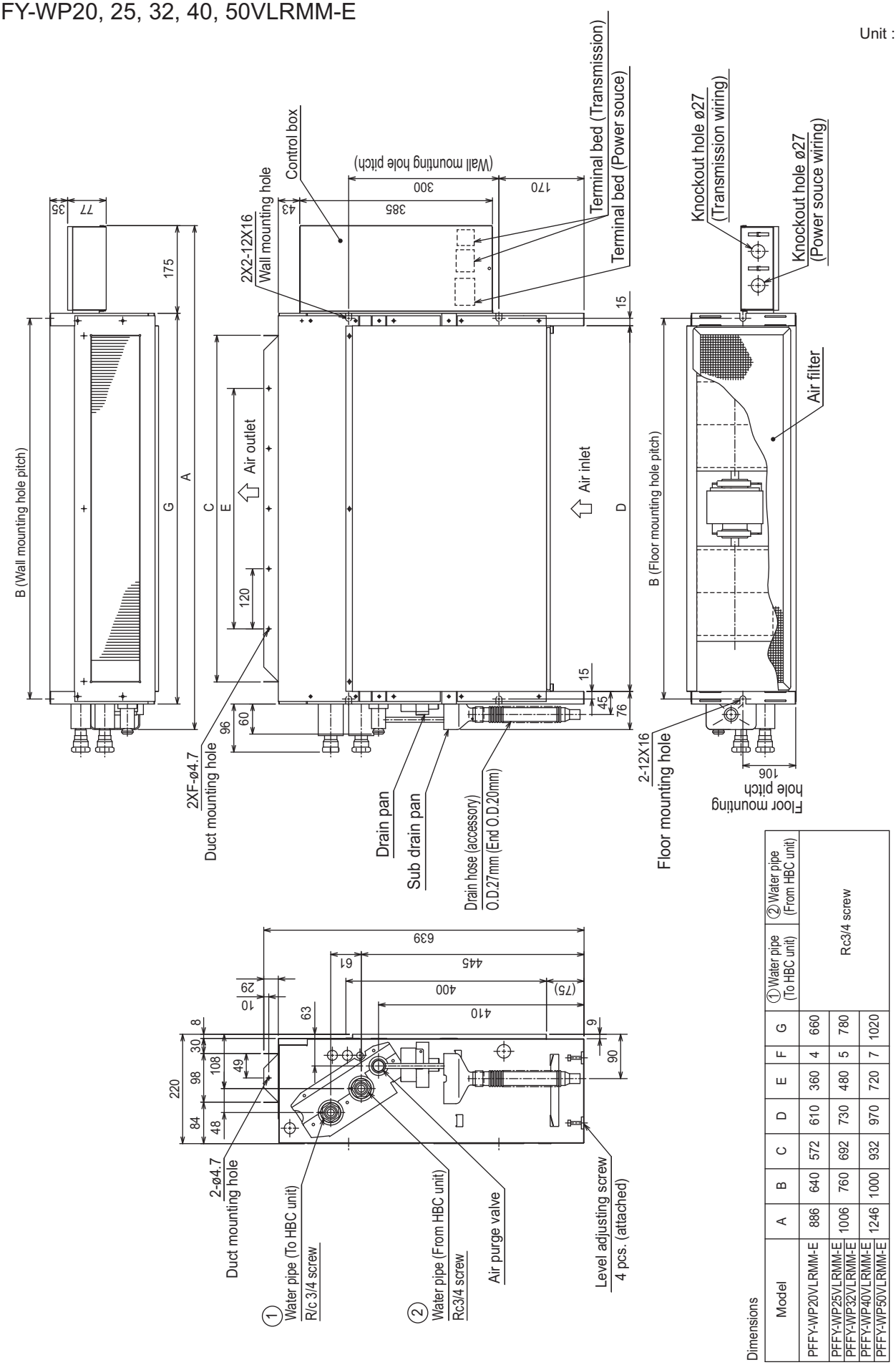
Unit converter

kcal/h	=kW x 860
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.

PFFY-WP20, 25, 32, 40, 50VLRMM-E

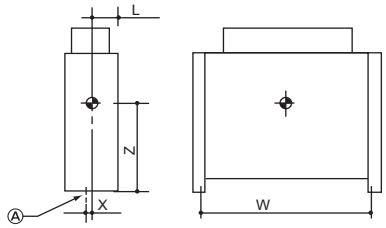
Unit : mm



Dimensions

Model	A	B	C	D	E	F	G	① Water pipe (To HBC unit)	② Water pipe (From HBC unit)
PFFY-WP20VLRMM-E	886	640	572	610	360	4	660	Rc3/4 screw	
PFFY-WP25VLRMM-E	1006	760	692	730	480	5	780		
PFFY-WP32VLRMM-E									
PFFY-WP40VLRMM-E	1246	1000	932	970	720	7	1020		
PFFY-WP50VLRMM-E									

PFFY-WP20, 25, 32, 40, 50VLRMM-E

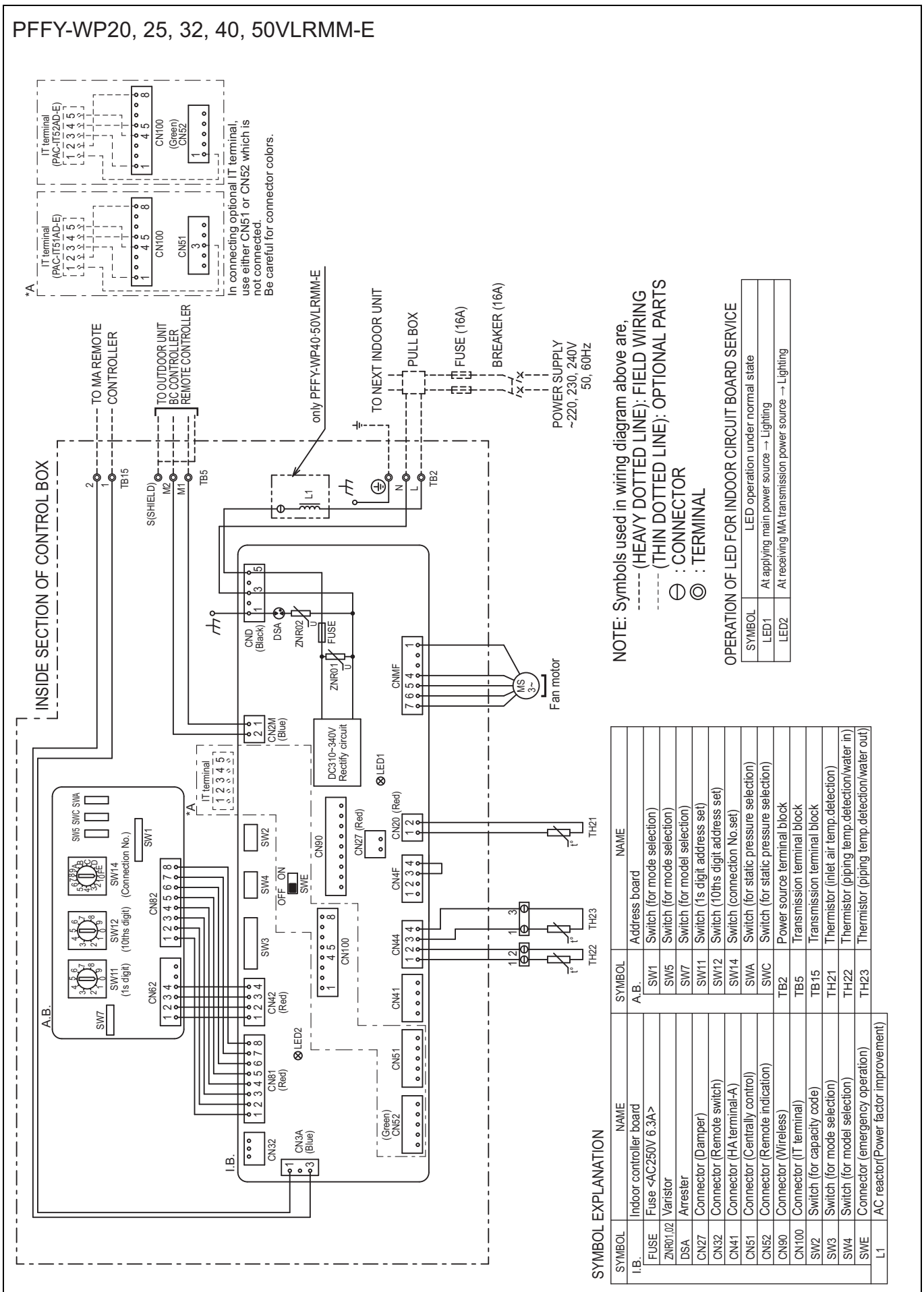


Ⓐ Floor hole for fixing

(mm)[in]

Model name	W	L	X	Z
PFFY-WP20VLRMM-E	640 [25-1/4]	100 [3-15/16]	17 [11/16]	335 [13-1/4]
PFFY-WP25VLRMM-E	760 [29-15/16]	100 [3-15/16]	17 [11/16]	335 [13-1/4]
PFFY-WP32VLRMM-E	760 [29-15/16]	100 [3-15/16]	17 [11/16]	335 [13-1/4]
PFFY-WP40VLRMM-E	1000 [39-3/8]	100 [3-15/16]	17 [11/16]	335 [13-1/4]
PFFY-WP50VLRMM-E	1000 [39-3/8]	100 [3-15/16]	17 [11/16]	335 [13-1/4]

PFFY-WP20, 25, 32, 40, 50VLRMM-E



NOTE: Symbols used in wiring diagram above are,
----- (HEAVY DOTTED LINE): FIELD WIRING
----- (THIN DOTTED LINE): OPTIONAL PARTS
⊖ : CONNECTOR
◎ : TERMINAL

OPERATION OF LED FOR INDOOR CIRCUIT BOARD SERVICE

SYMBOL	LED operation under normal state
LED1	At applying main power source → Lighting
LED2	At receiving MA transmission power source → Lighting

SYMBOL EXPLANATION

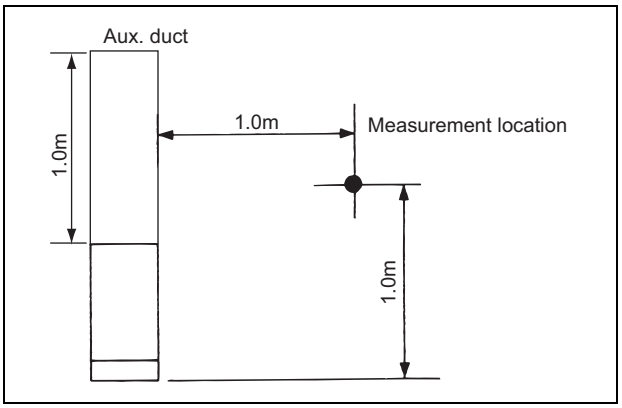
SYMBOL	NAME
I.B.	Indoor controller board
FUSE	Fuse <AC250V 6.3A>
ZNR01,02	Varistor
DSA	Arrester
CN27	Connector (Damper)
CN32	Connector (Remote switch)
CN41	Connector (HA terminal-A)
CN51	Connector (Centrally control)
CN52	Connector (Remote indication)
CN90	Connector (Wireless)
CN100	Connector (IT terminal)
SW2	Switch (for capacity code)
SW3	Switch (for mode selection)
SW4	Switch (for model selection)
SWE	Connector (emergency operation)
L1	AC reactor(Power factor improvement)

SYMBOL	NAME
A.B.	Address board
SW1	Switch (for mode selection)
SW5	Switch (for mode selection)
SW7	Switch (for model selection)
SW11	Switch (1s digit address set)
SW12	Switch (10ths digit address set)
SW14	Switch (connection No.set)
SWA	Switch (for static pressure selection)
SWC	Switch (for static pressure selection)
TB2	Power source terminal block
TB5	Transmission terminal block
TB15	Transmission terminal block
TH21	Thermistor (inlet air temp.detection)
TH22	Thermistor (piping temp.detection/water in)
TH23	Thermistor (piping temp.detection/water out)

5. SOUND LEVELS

5-1. Sound levels

PFFY-WP-VLRMM-E



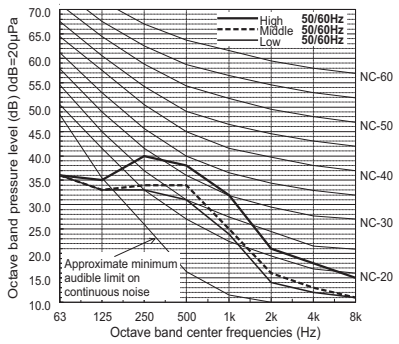
* Measured in anechoic room

Sound level at anechoic room : Low-Middle-High

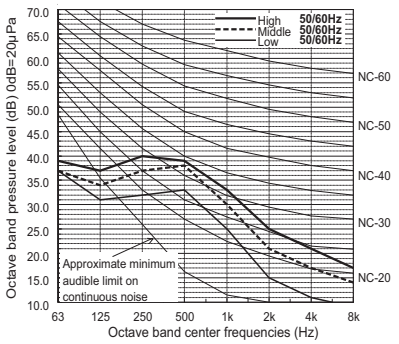
	Sound level dB (A)		
	20Pa	40Pa	60Pa
PFFY-WP20VLRMM-E	31-33-38	32-37-39	36-38-42
PFFY-WP25VLRMM-E	31-33-38	32-37-39	36-38-42
PFFY-WP32VLRMM-E	31-35-38	34-37-40	36-40-42
PFFY-WP40VLRMM-E	34-37-40	37-39-43	37-41-44
PFFY-WP50VLRMM-E	37-42-45	38-44-47	39-45-48

5-2. NC curves

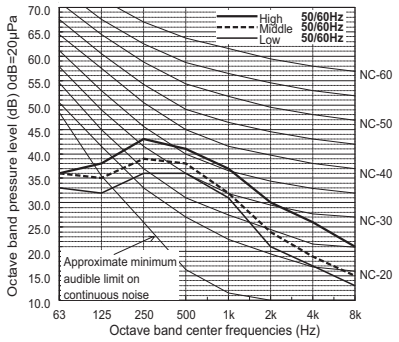
PFFY-WP20VLRMM-E
External Static Pressure: 20Pa
Power Source: 220-230-240V, 50/60Hz



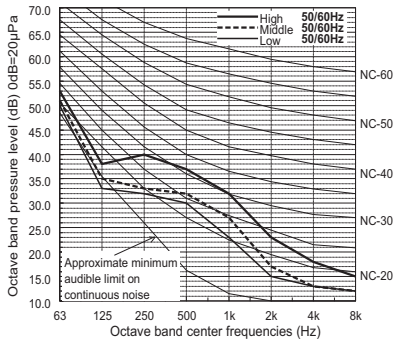
PFFY-WP20VLRMM-E
External Static Pressure: 40Pa
Power Source: 220-230-240V, 50/60Hz



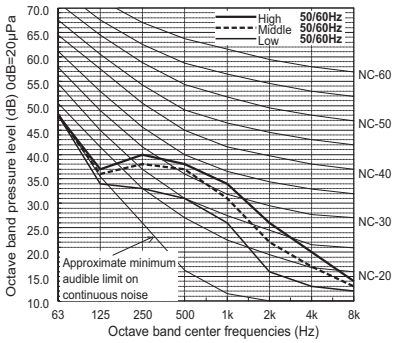
PFFY-WP20VLRMM-E
External Static Pressure: 60Pa
Power Source: 220-230-240V, 50/60Hz



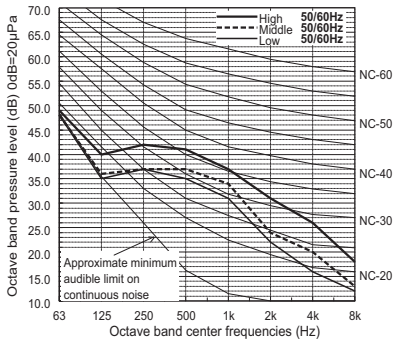
PFFY-WP25VLRMM-E
External Static Pressure: 20Pa
Power Source: 220-230-240V, 50/60Hz



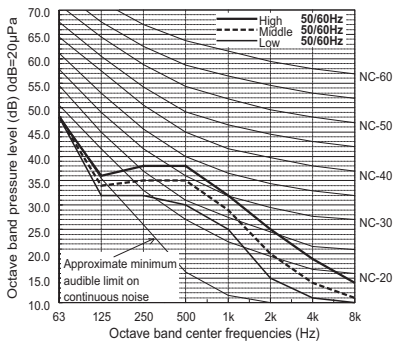
PFFY-WP25VLRMM-E
External Static Pressure: 40Pa
Power Source: 220-230-240V, 50/60Hz



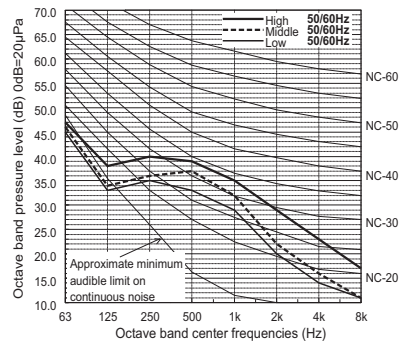
PFFY-WP25VLRMM-E
External Static Pressure: 60Pa
Power Source: 220-230-240V, 50/60Hz



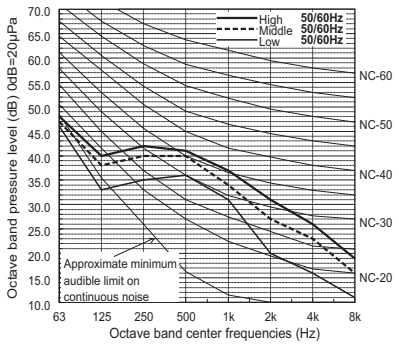
PFFY-WP32VLRMM-E
External Static Pressure: 20Pa
Power Source: 220-230-240V, 50/60Hz



PFFY-WP32VLRMM-E
External Static Pressure: 40Pa
Power Source: 220-230-240V, 50/60Hz

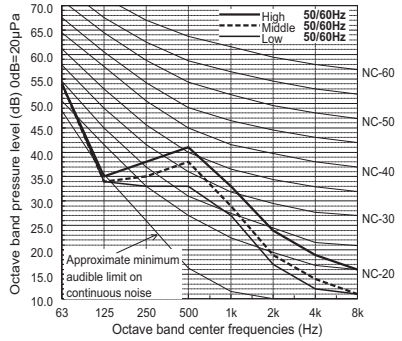


PFFY-WP32VLRMM-E
External Static Pressure: 60Pa
Power Source: 220-230-240V, 50/60Hz

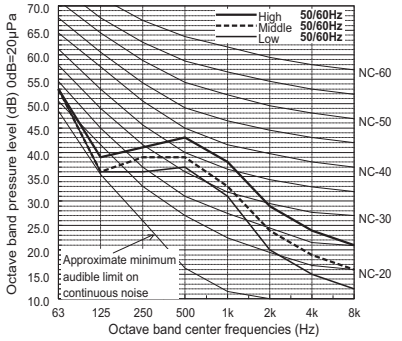


5. SOUND LEVELS

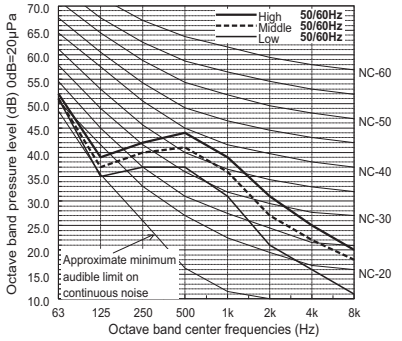
PFFY-WP40VLRMM-E
External Static Pressure: 20Pa
Power Source: 220-230-240V, 50/60Hz



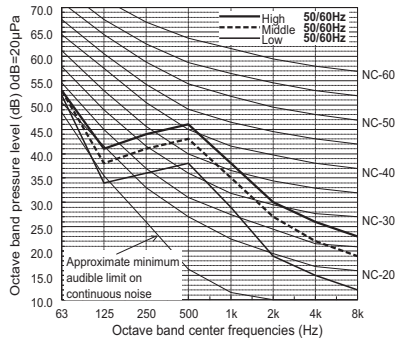
PFFY-WP40VLRMM-E
External Static Pressure: 40Pa
Power Source: 220-230-240V, 50/60Hz



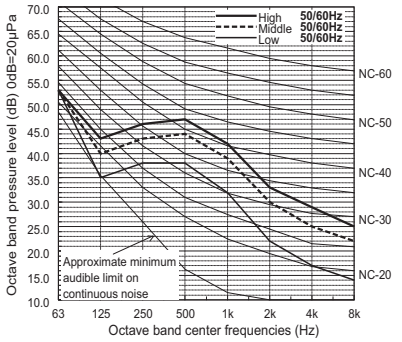
PFFY-WP40VLRMM-E
External Static Pressure: 60Pa
Power Source: 220-230-240V, 50/60Hz



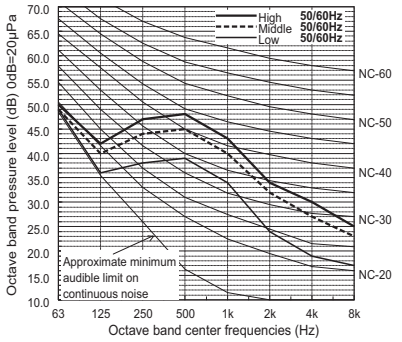
PFFY-WP50VLRMM-E
External Static Pressure: 20Pa
Power Source: 220-230-240V, 50/60Hz



PFFY-WP50VLRMM-E
External Static Pressure: 40Pa
Power Source: 220-230-240V, 50/60Hz

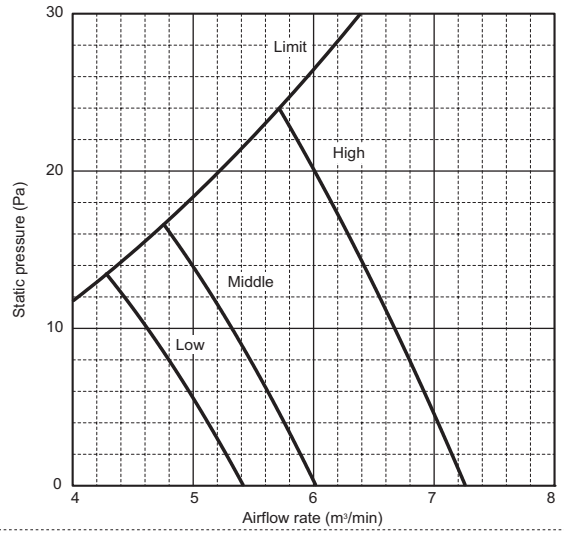


PFFY-WP50VLRMM-E
External Static Pressure: 60Pa
Power Source: 220-230-240V, 50/60Hz

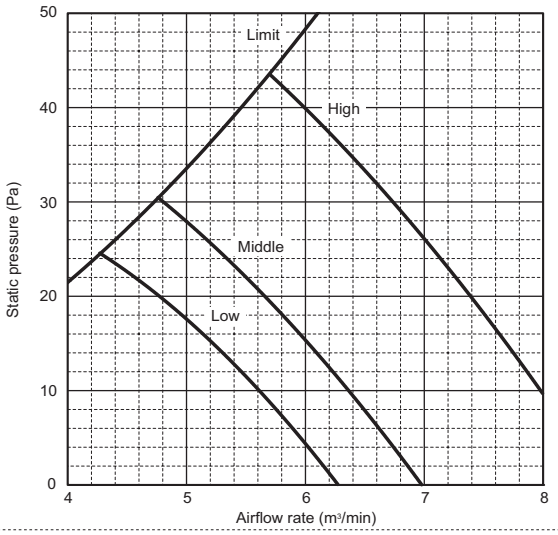


6. FAN CHARACTERISTICS CURVES

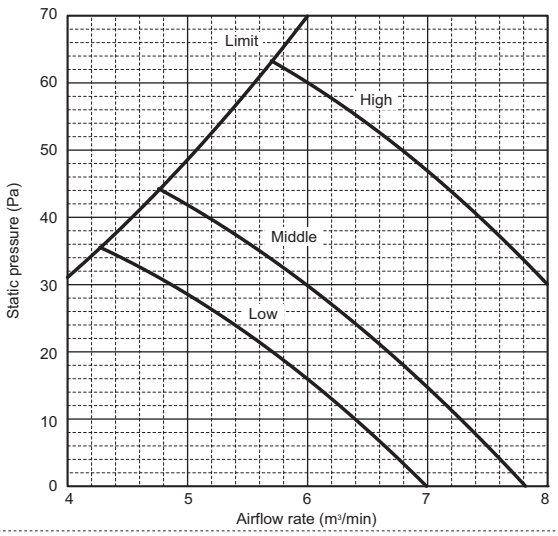
PFFY-WP20VLRMM-E
External static pressure : 20Pa
Power source : 220-230-240V, 50/60Hz



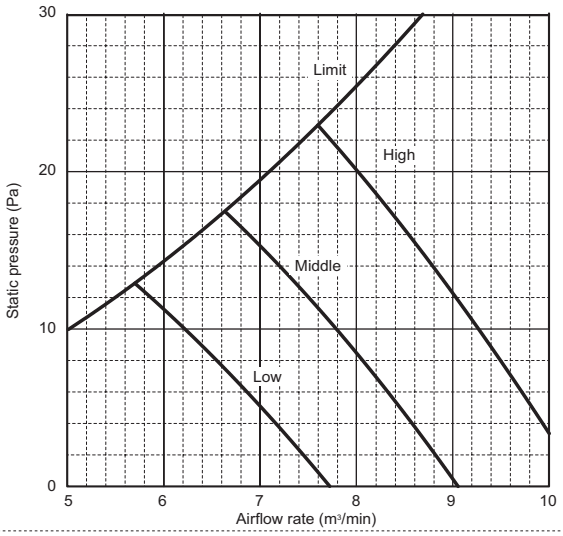
PFFY-WP20VLRMM-E
External static pressure : 40Pa
Power source : 220-230-240V, 50/60Hz



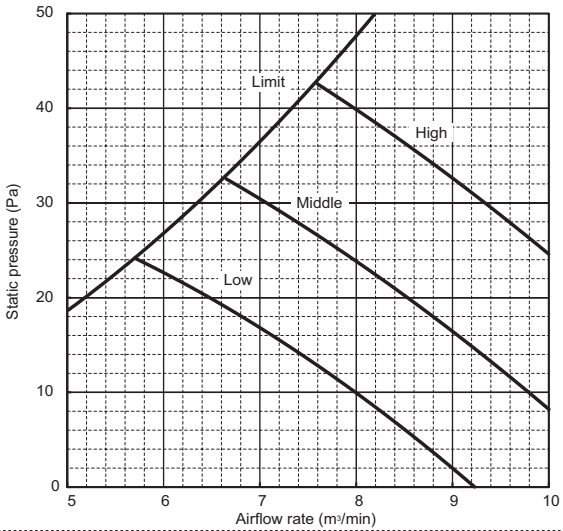
PFFY-WP20VLRMM-E
External static pressure : 60Pa
Power source : 220-230-240V, 50/60Hz



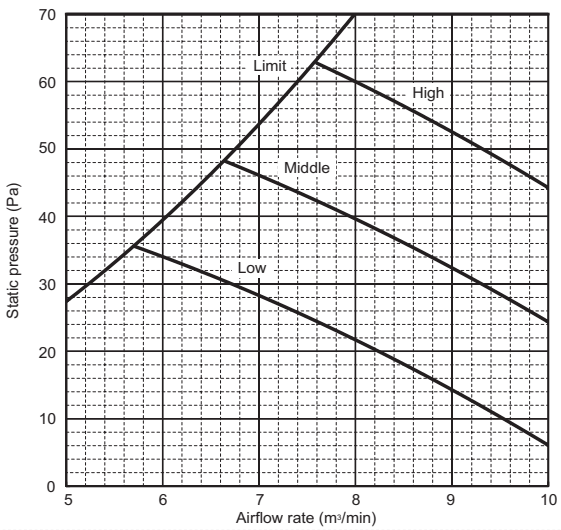
PFFY-WP25VLRMM-E
External static pressure : 20Pa
Power source : 220-230-240V, 50/60Hz



PFFY-WP25VLRMM-E
External static pressure : 40Pa
Power source : 220-230-240V, 50/60Hz

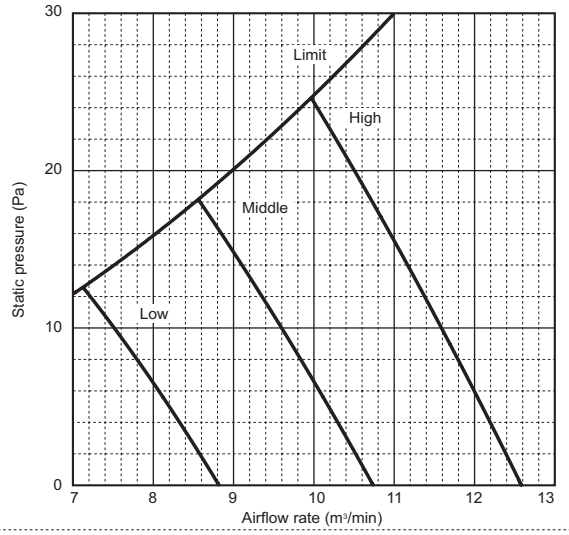


PFFY-WP25VLRMM-E
External static pressure : 60Pa
Power source : 220-230-240V, 50/60Hz

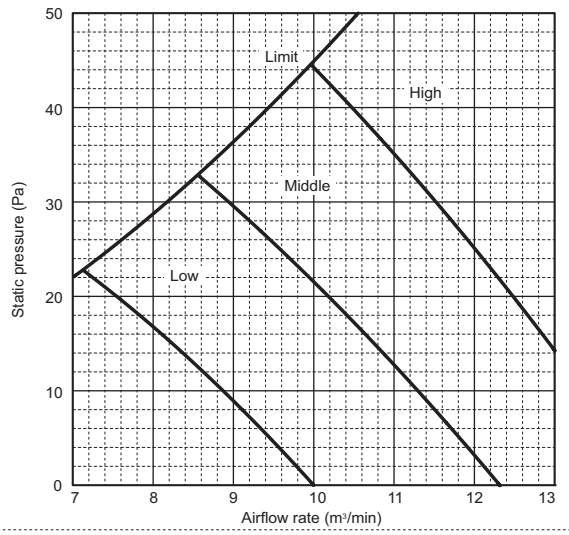


6. FAN CHARACTERISTICS CURVES

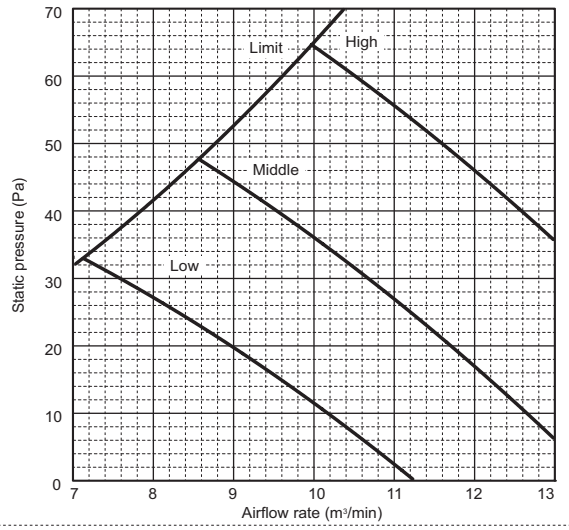
PFFY-WP32VLRMM-E
External static pressure : 20Pa
Power source : 220-230-240V, 50/60Hz



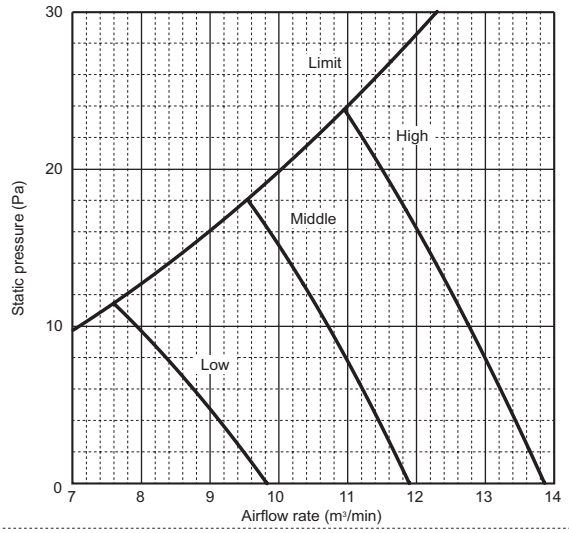
PFFY-WP32VLRMM-E
External static pressure : 40Pa
Power source : 220-230-240V, 50/60Hz



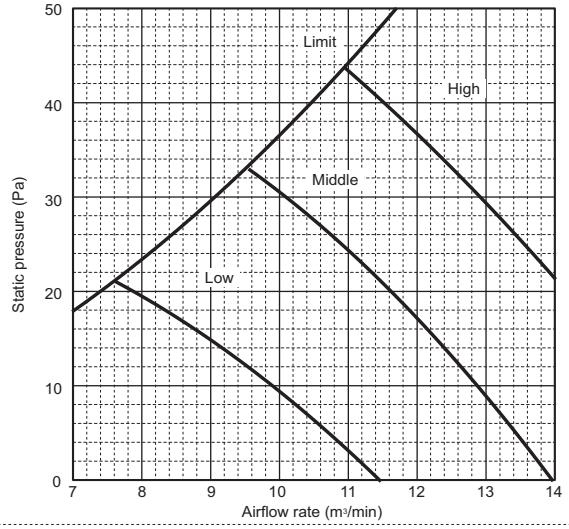
PFFY-WP32VLRMM-E
External static pressure : 60Pa
Power source : 220-230-240V, 50/60Hz



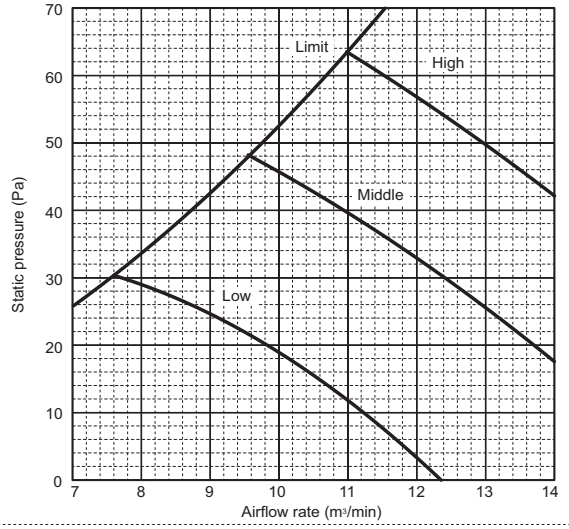
PFFY-WP40VLRMM-E
External static pressure : 20Pa
Power source : 220-230-240V, 50/60Hz



PFFY-WP40VLRMM-E
External static pressure : 40Pa
Power source : 220-230-240V, 50/60Hz

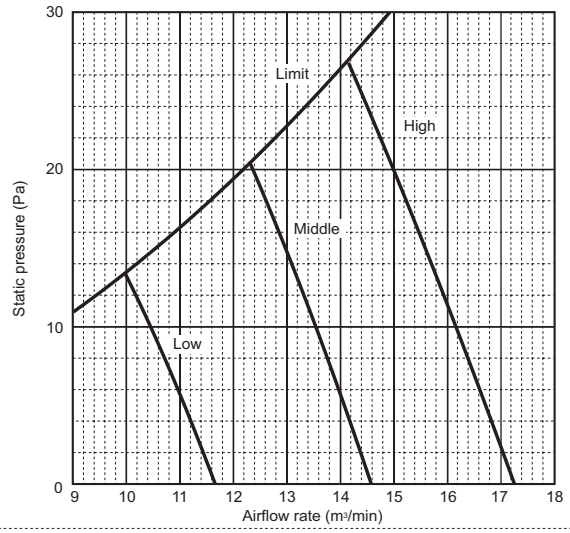


PFFY-WP40VLRMM-E
External static pressure : 60Pa
Power source : 220-230-240V, 50/60Hz

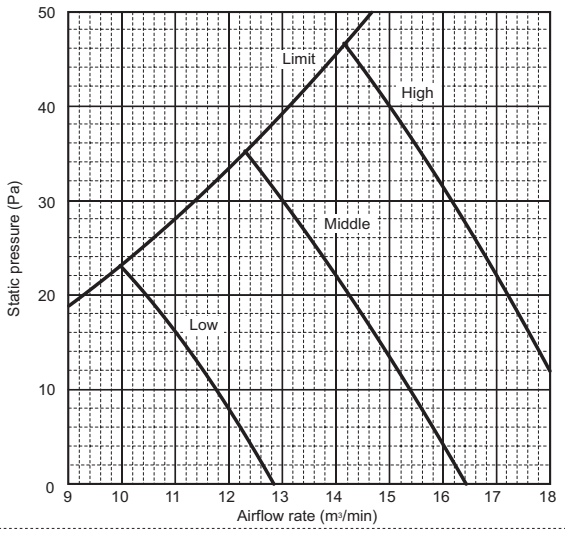


6. FAN CHARACTERISTICS CURVES

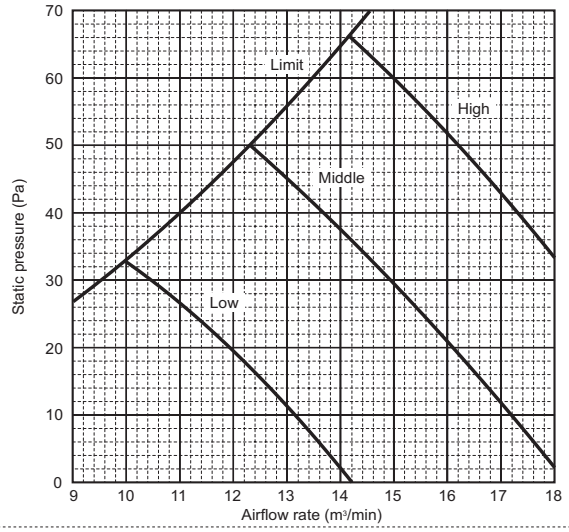
PFFY-WP50VLRMM-E
External static pressure : 20Pa
Power source : 220-230-240V, 50/60Hz



PFFY-WP50VLRMM-E
External static pressure : 40Pa
Power source : 220-230-240V, 50/60Hz



PFFY-WP50VLRMM-E
External static pressure : 60Pa
Power source : 220-230-240V, 50/60Hz



CMB-WP-V-GA1, CMB-WP-V-GB1 (for YLM series only)

1. SPECIFICATIONS

Model name			CMB-WP108V-GA1				
Number of branch			8				
Power source			1-phase 220-230-240 V				
			50 Hz			60 Hz	
Power input	Cooling	kW	0.45/0.46/0.47			0.45/0.46/0.47	
(220/230/240)	Heating	kW	0.45/0.46/0.47			0.45/0.46/0.47	
Current input	Cooling	A	2.89/2.83/2.79			2.89/2.83/2.79	
(220/230/240)	Heating	A	2.89/2.83/2.79			2.89/2.83/2.79	
Sound pressure level (measured in anechoice room)		dB <A>	41				
Applicable temperature range of installation site		°C (D.B.)	0~32				
External finish			Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)				
Connectable outdoor/heat source unit			PURY-P200~500YLM-A1(-BS)/PURY-EP200~500YLM-A1(-BS)/PQRY-P200~500YLM-A(-BS)				
Indoor unit capacity connectable to 1 branch			Model P80 or smaller (Use optional joint pipe combing 2 branches when the total unit capacity exceeds P81)				
External dimension H x W x D		mm	300 x 1,520 x 630				
		in.	11-13/16 x 59-7/8 x 24-13/16				
Refrigerant piping diameter	To outdoor/heat source unit		Connectable outdoor/heat source unit capacity				
			To P200	To P250/300	To P350	To P400 for each	To P450/500 for each
	High press. Pipe	mm (in.) O.D.	15.88 (5/8) Brazed	19.05 (3/4) Brazed	19.05 (3/4) Brazed	15.88 (5/8) Brazed	19.05 (3/4) Brazed
	Low press. Pipe	mm (in.) O.D.	19.05 (3/4) Brazed	22.2 (7/8) Brazed	28.58 (1-1/8) Brazed	19.05 (3/4) Brazed	22.2 (7/8) Brazed
Water piping diameter	To Indoor unit						
	Inlet Pipe	mm (in.) I.D.	20 (3/4)				
	Outlet Pipe	mm (in.) I.D.	20 (3/4)				
Field drain pipe size		mm (in.)	O.D. 32 (1-1/4)				
Net weight		kg (lbs)	86 (190) [96 (212) with water]				
Standard attachment	Document		–				
	Accessory		Drain Connection pipe (with flexible hose and insulation)				
Optional parts			–				

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 HBC CONTROLLER at least 5 m away from any indoor units.)

4.Please install the HBC controller in a place where noise will not be an issue.

5.Please attach an expansion vessel (field supply).

6.Please use copper or plastic pipes for the water circuit. Do not use steel or stainless steel pipework.
Furthermore, when using copper pipework use a non-oxidative brazing method.
Oxidation of the pipework will reduce the pump life.

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

8.Please install an air purge valve where air will gather in the water circuit.

9.Please install a pressure reducing valve and a strainer on the water supply to the HBC controller.

10.Please refer to the databook or the installation manual for the specified water quality.

11.This unit is not designed for outside installations.

12.Please always make water circulate or pull out the circulation water completely when not using it.
*Please do not use it as a drinking water.

13.Please do not use ground water and well water.

14.When installing the HBC unit in an environment which may drop below 0 °C, please add antifreeze to the circulating water.
(Refer to the databook and the installation manual).

1. SPECIFICATIONS

Model name			CMB-WP1016V-GA1				
Number of branch			16				
Power source			1-phase 220-230-240 V				
			50 Hz			60 Hz	
Power input	Cooling	kW	0.45/0.46/0.47			0.45/0.46/0.47	
(220/230/240)	Heating	kW	0.45/0.46/0.47			0.45/0.46/0.47	
Current input	Cooling	A	2.89/2.83/2.79			2.89/2.83/2.79	
(220/230/240)	Heating	A	2.89/2.83/2.79			2.89/2.83/2.79	
Sound pressure level (measured in anechoice room)		dB <A>	41				
Applicable temperature range of installation site		°C (D.B.)	0~32				
External finish			Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)				
Connectable outdoor/heat source unit			PURY-P200~500YLM-A1(-BS)/PURY-EP200~500YLM-A1(-BS)/PQRY-P200~500YLM-A(-BS)				
Indoor unit capacity connectable to 1 branch			Model P80 or smaller (Use optional joint pipe combing 2 branches when the total unit capacity exceeds P81)				
External dimension H x W x D		mm	300 x 1,800 x 630				
		in.	11-13/16 x 70-7/8 x 24-13/16				
Refrigerant piping diameter	To outdoor/heat source unit		Connectable outdoor/heat source unit capacity				
			To P200	To P250/300	To P350	To P400 for each	To P450/500 for each
	High press. Pipe	mm (in.) O.D.	15.88 (5/8) Brazed	19.05 (3/4) Brazed	19.05 (3/4) Brazed	15.88 (5/8) Brazed	19.05 (3/4) Brazed
	Low press. Pipe	mm (in.) O.D.	19.05 (3/4) Brazed	22.2 (7/8) Brazed	28.58 (1-1/8) Brazed	19.05 (3/4) Brazed	22.2 (7/8) Brazed
Water piping diameter	To Indoor unit						
	Inlet Pipe	mm (in.) I.D.	20 (3/4)				
	Outlet Pipe	mm (in.) I.D.	20 (3/4)				
Field drain pipe size		mm (in.)	O.D. 32 (1-1/4)				
Net weight		kg (lbs)	98 (217) [111 (245) with water]				
Standard attachment	Document		–				
	Accessory		Drain Connection pipe (with flexible hose and insulation)				
Optional parts			–				

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 HBC CONTROLLER at least 5 m away from any indoor units.)

4.Please install the HBC controller in a place where noise will not be an issue.

5.Please attach an expansion vessel (field supply).

6.Please use copper or plastic pipes for the water circuit. Do not use steel or stainless steel pipework.
Furthermore, when using copper pipework use a non-oxidative brazing method.
Oxidation of the pipework will reduce the pump life.

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

8.Please install an air purge valve where air will gather in the water circuit.

9.Please install a pressure reducing valve and a strainer on the water supply to the HBC controller.

10.Please refer to the databook or the installation manual for the specified water quality.

11.This unit is not designed for outside installations.

12.Please always make water circulate or pull out the circulation water completely when not using it.
*Please do not use it as a drinking water.

13.Please do not use ground water and well water.

14.When installing the HBC unit in an environment which may drop below 0 °C, please add antifreeze to the circulating water.
(Refer to the databook and the installation manual).

1. SPECIFICATIONS

Model name			CMB-WP108V-GB1				
Number of branch			8				
Power source			1-phase 220-230-240 V				
			50 Hz			60 Hz	
Power input	Cooling	kW	0.01/0.01/0.01			0.01/0.01/0.01	
(220/230/240)	Heating	kW	0.01/0.01/0.01			0.01/0.01/0.01	
Current input	Cooling	A	0.05/0.05/0.05			0.05/0.05/0.05	
(220/230/240)	Heating	A	0.05/0.05/0.05			0.05/0.05/0.05	
Sound pressure level (measured in anechoice room)		dB <A>	–				
Applicable temperature range of installation site		°C (D.B.)	0~32				
External finish			Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)				
Connectable outdoor/heat source unit			–				
Indoor unit capacity connectable to 1 branch			Model P80 or smaller (Use optional joint pipe combing 2 branches when the total unit capacity exceeds P81)				
External dimension H x W x D		mm	300 x 1,520 x 630				
		in.	11-13/16 x 59-7/8 x 24-13/16				
Refrigerant piping diameter	To outdoor/heat source unit		Connectable outdoor/heat source unit capacity				
			–	–	–	–	–
	High press. Pipe	mm (in.) O.D.	–	–	–	–	–
	Low press. Pipe	mm (in.) O.D.	–	–	–	–	–
Water piping diameter	To Indoor unit						
	Inlet Pipe	mm (in.) I.D.	20 (3/4)				
	Outlet Pipe	mm (in.) I.D.	20 (3/4)				
Field drain pipe size		mm (in.)	O.D. 32 (1-1/4)				
Net weight		kg (lbs)	44 (98) [49 (109) with water]				
Standard attachment	Document		–				
	Accessory		Drain Connection pipe (with flexible hose and insulation)				
Optional parts			–				

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 water.

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 Sub HBC CONTROLLER at least 5 m away from any indoor units.)

4.Please install the Sub HBC controller in a place where noise will not be an issue.

5.Please attach an expansion vessel (field supply).

6.Please use copper or plastic pipes for the water circuit. Do not use steel or stainless steel pipework.
Furthermore, when using copper pipework use a non-oxidative brazing method.
Oxidation of the pipework will reduce the pump life.

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

8.Please install an air purge valve where air will gather in the water circuit.

9.Please refer to the databook or the installation manual for the specified water quality.

10.This unit is not designed for outside installations.

11.Please always make water circulate or pull out the circulation water completely when not using it.
*Please do not use it as a drinking water.

12.Please do not use ground water and well water.

13.When installing the Sub HBC unit in an environment which may drop below 0 °C, please add antifreeze to the circulating water.
(Refer to the databook and the installation manual).

14.Can't use singleness. (MAIN HBC CONTROLLER is necessary)

1. SPECIFICATIONS

Model name			CMB-WP1016V-GB1				
Number of branch			16				
Power source			1-phase 220-230-240 V				
			50 Hz			60 Hz	
Power input	Cooling	kW	0.01/0.01/0.01			0.01/0.01/0.01	
(220/230/240)	Heating	kW	0.01/0.01/0.01			0.01/0.01/0.01	
Current input	Cooling	A	0.05/0.05/0.05			0.05/0.05/0.05	
(220/230/240)	Heating	A	0.05/0.05/0.05			0.05/0.05/0.05	
Sound pressure level (measured in anechoice room)		dB <A>	–				
Applicable temperature range of installation site		°C (D.B.)	0~32				
External finish			Galvanized steel plate (Lower part drain pan: Pre-coated galvanized sheets + powder coating)				
Connectable outdoor/heat source unit			–				
Indoor unit capacity connectable to 1 branch			Model P80 or smaller (Use optional joint pipe combing 2 branches when the total unit capacity exceeds P81)				
External dimension H x W x D		mm	300 x 1,520 x 630				
		in.	11-13/16 x 59-7/8 x 24-13/16				
Refrigerant piping diameter	To outdoor/heat source unit		Connectable outdoor/heat source unit capacity				
			–	–	–	–	–
	High press. Pipe	mm (in.) O.D.	–	–	–	–	–
	Low press. Pipe	mm (in.) O.D.	–	–	–	–	–
Water piping diameter	To Indoor unit						
	Inlet Pipe	mm (in.) I.D.	20 (3/4)				
	Outlet Pipe	mm (in.) I.D.	20 (3/4)				
Field drain pipe size		mm (in.)	O.D. 32 (1-1/4)				
Net weight		kg (lbs)	53 (117) [62 (137) with water]				
Standard attachment	Document		–				
	Accessory		Drain Connection pipe (with flexible hose and insulation)				
Optional parts			–				

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 water.

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 Sub HBC CONTROLLER at least 5 m away from any indoor units.)

4.Please install the Sub HBC controller in a place where noise will not be an issue.

5.Please attach an expansion vessel (field supply).

6.Please use copper or plastic pipes for the water circuit. Do not use steel or stainless steel pipework.
Furthermore, when using copper pipework use a non-oxidative brazing method.
Oxidation of the pipework will reduce the pump life.

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

8.Please install an air purge valve where air will gather in the water circuit.

9.Please refer to the databook or the installation manual for the specified water quality.

10.This unit is not designed for outside installations.

11.Please always make water circulate or pull out the circulation water completely when not using it.
*Please do not use it as a drinking water.

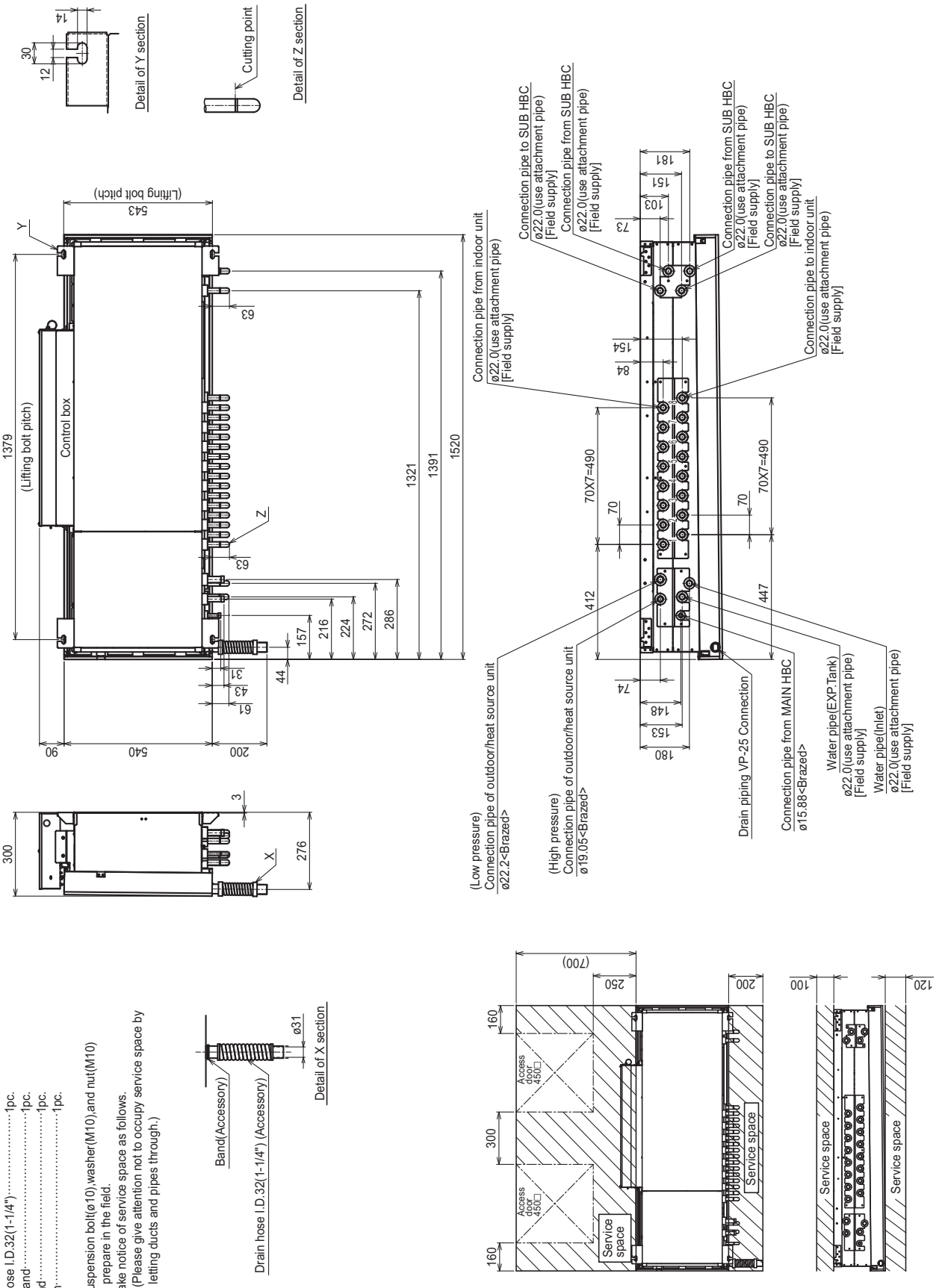
12.Please do not use ground water and well water.

13.When installing the Sub HBC unit in an environment which may drop below 0 °C, please add antifreeze to the circulating water.
(Refer to the databook and the installation manual).

14.Can't use singleness. (MAIN HBC CONTROLLER is necessary)

CMB-WP108V-GA1

Unit : mm

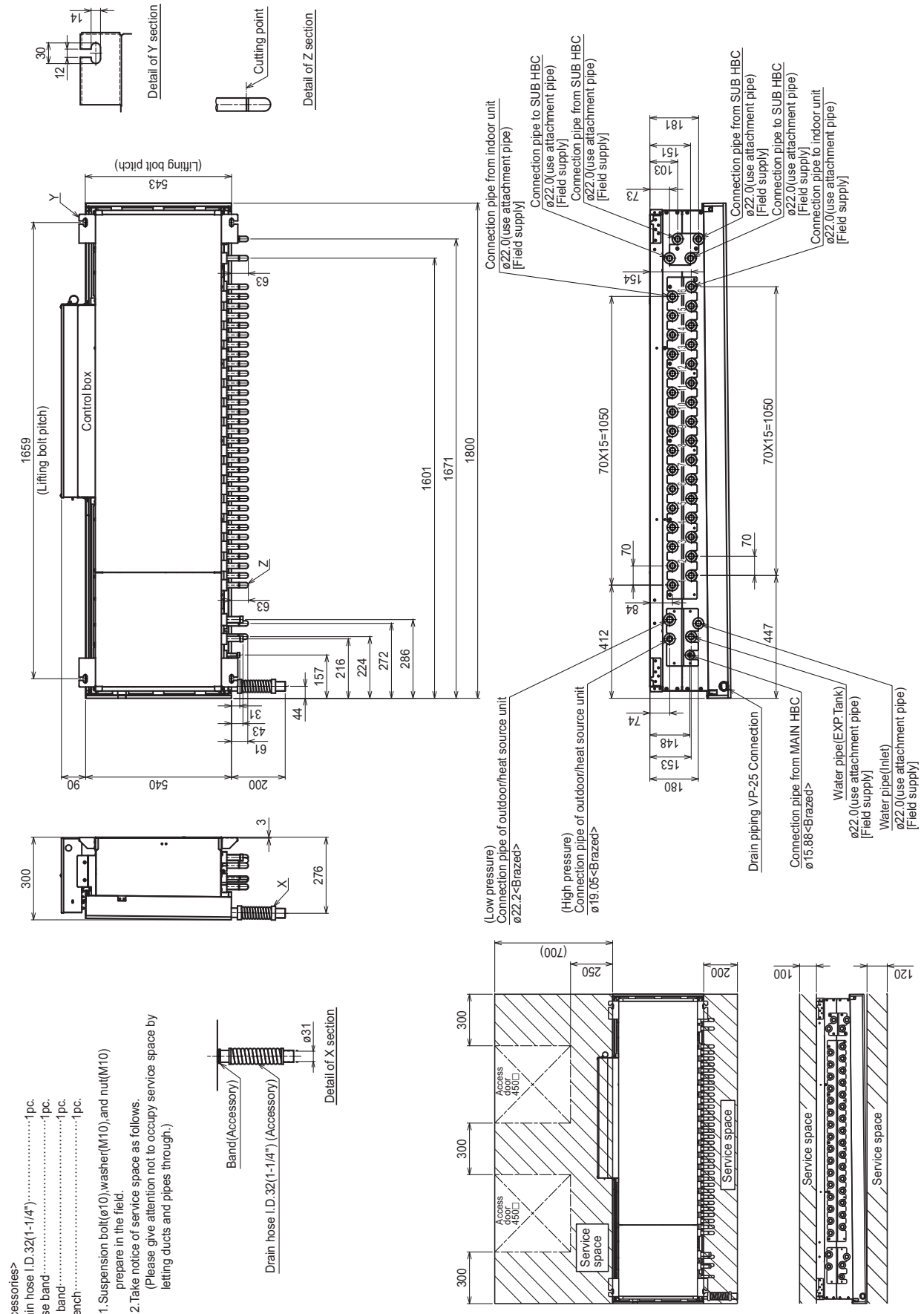


<Accessories>
·Drain hose I.D.32(1-1/4")……1pc.
·Hose band……1pc.
·Tie band……1pc.
·Wrench……1pc.

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.)

CMB-WP1016V-GA1

Unit : mm

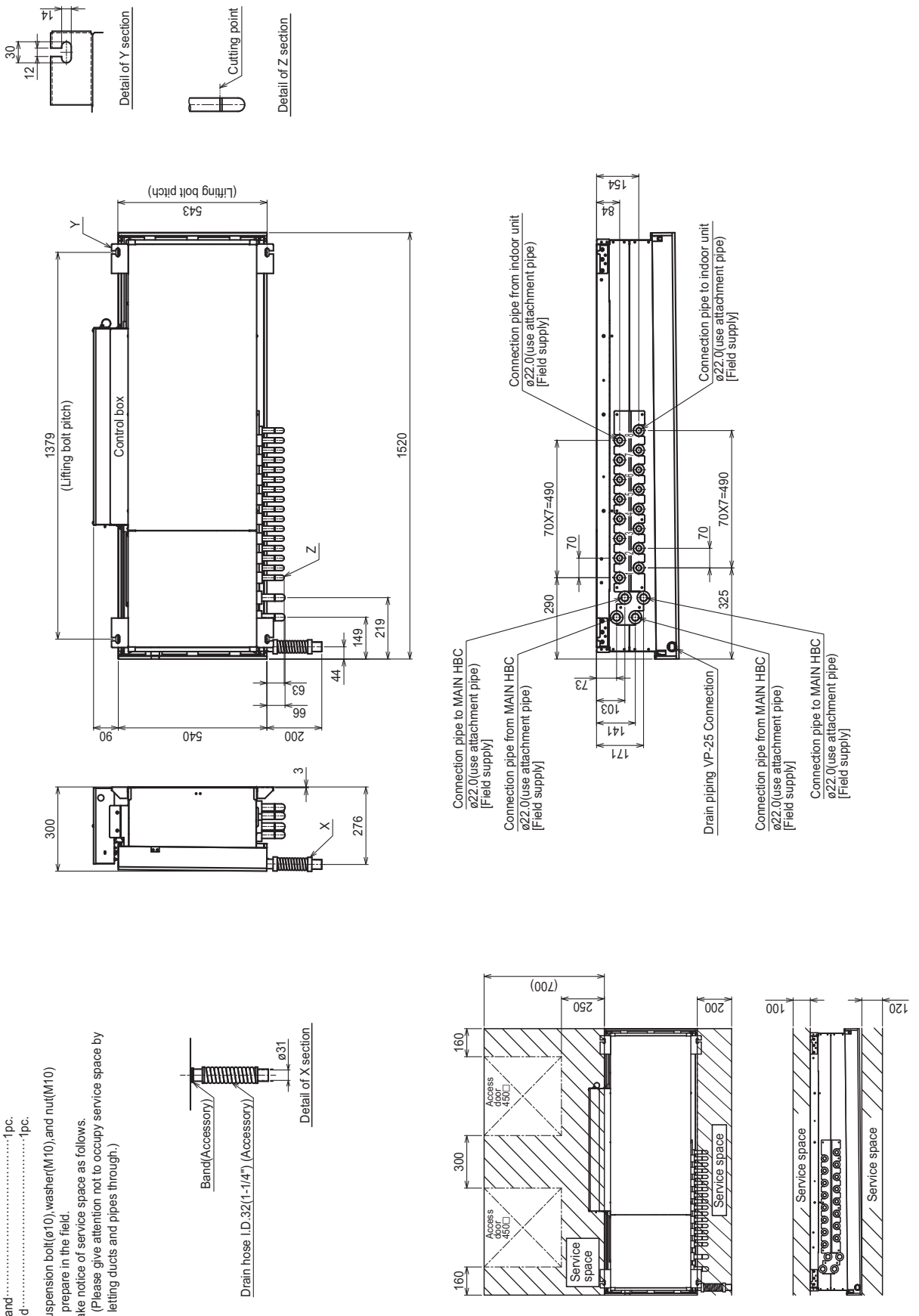


<Accessories>
·Drain hose I.D.32(1-1/4")……1pc.
·Hose band……1pc.
·Tie band……1pc.
·Wrench……1pc.

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.)

CMB-WP108V-GB1

Unit : mm

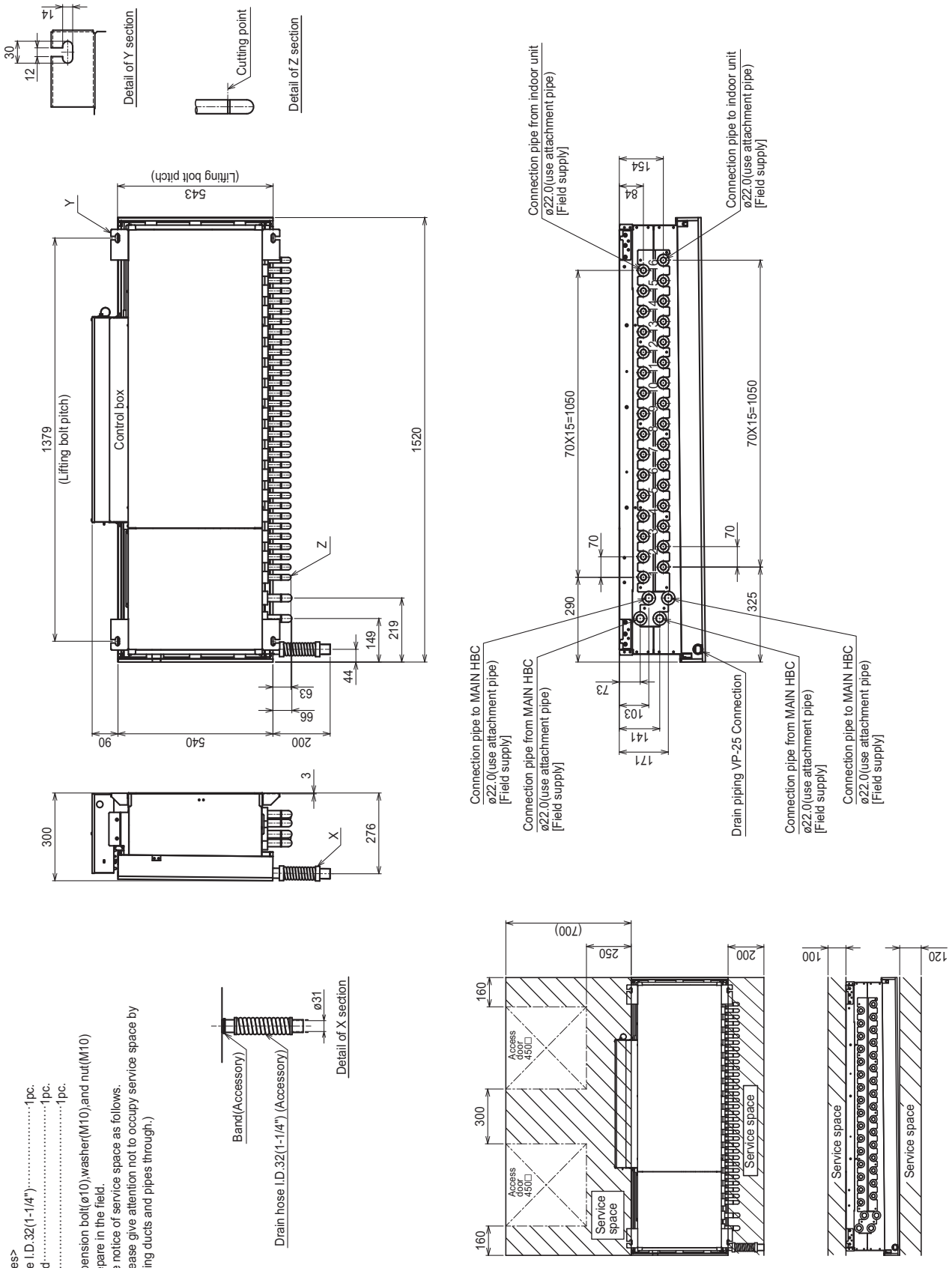


<Accessories>
·Drain hose I.D.32(1-1/4")……1pc.
·Hose band……1pc.
·Tie band……1pc.

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.)

CMB-WP1016V-GB1

Unit : mm

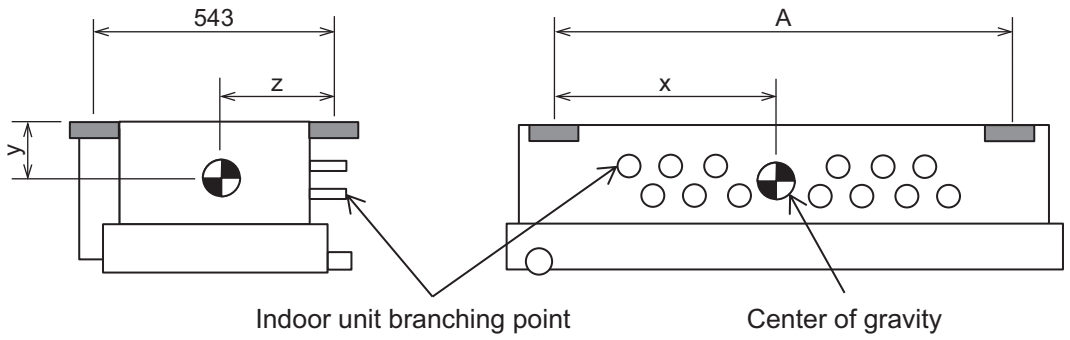


<Accessories>
· Drain hose I.D.32(1-1/4")·····1pc.
· Hose band·····1pc.
· Tie band·····1pc.

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.)

HBC controller

CMB-WP108, 1016V-GA1
CMB-WP108, 1016V-GB1



	CMB-WP108V-GA1	CMB-WP1016V-GA1	CMB-WP108V-GB1	CMB-WP1016V-GB1
A (mm)	1379	1659	1379	1379
x (mm)	680	825	610	680
y (mm)	145	145	145	145
z (mm)	285	285	270	270

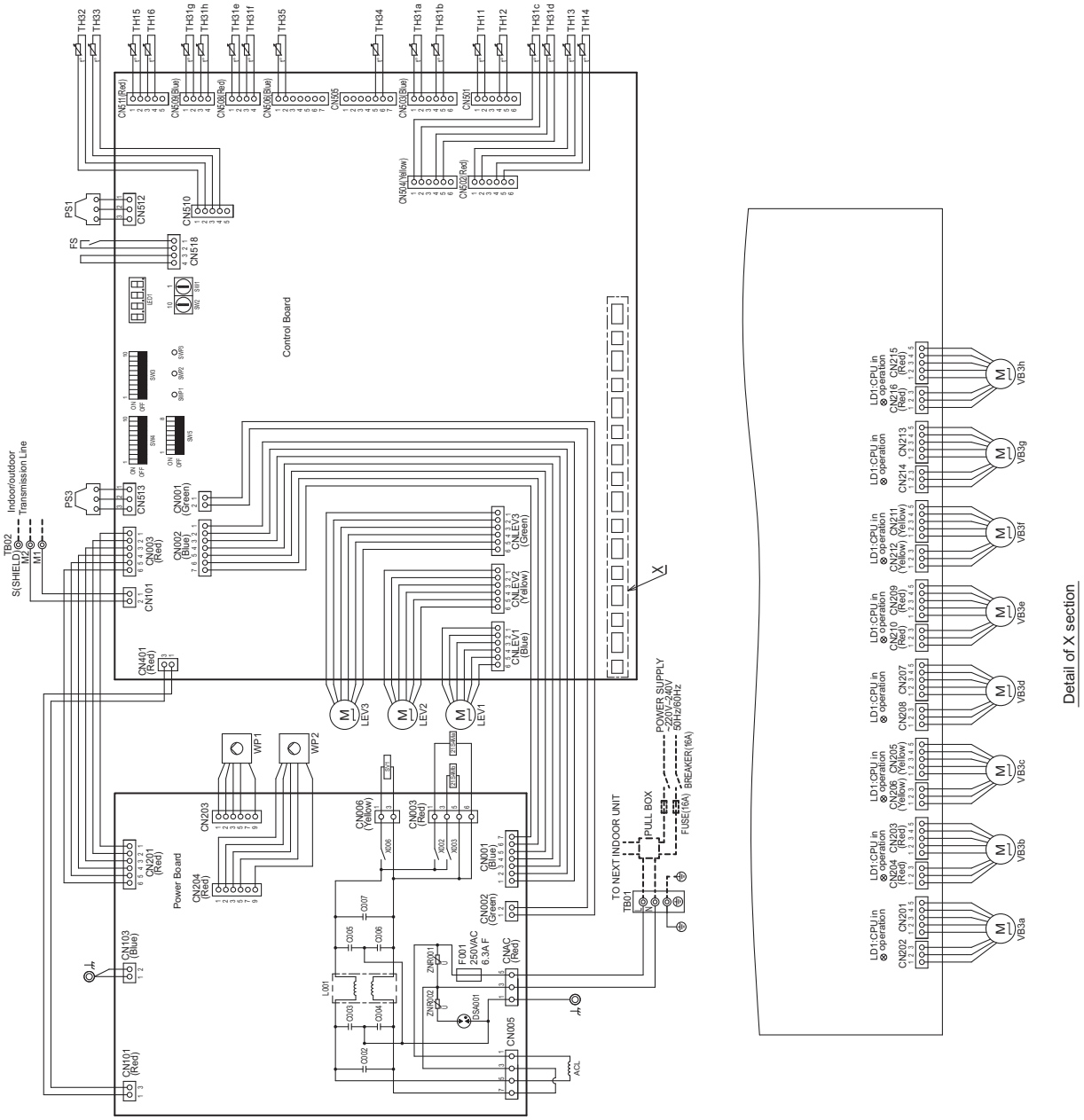
CMB-WP108V-GA1

(Symbol explanation)

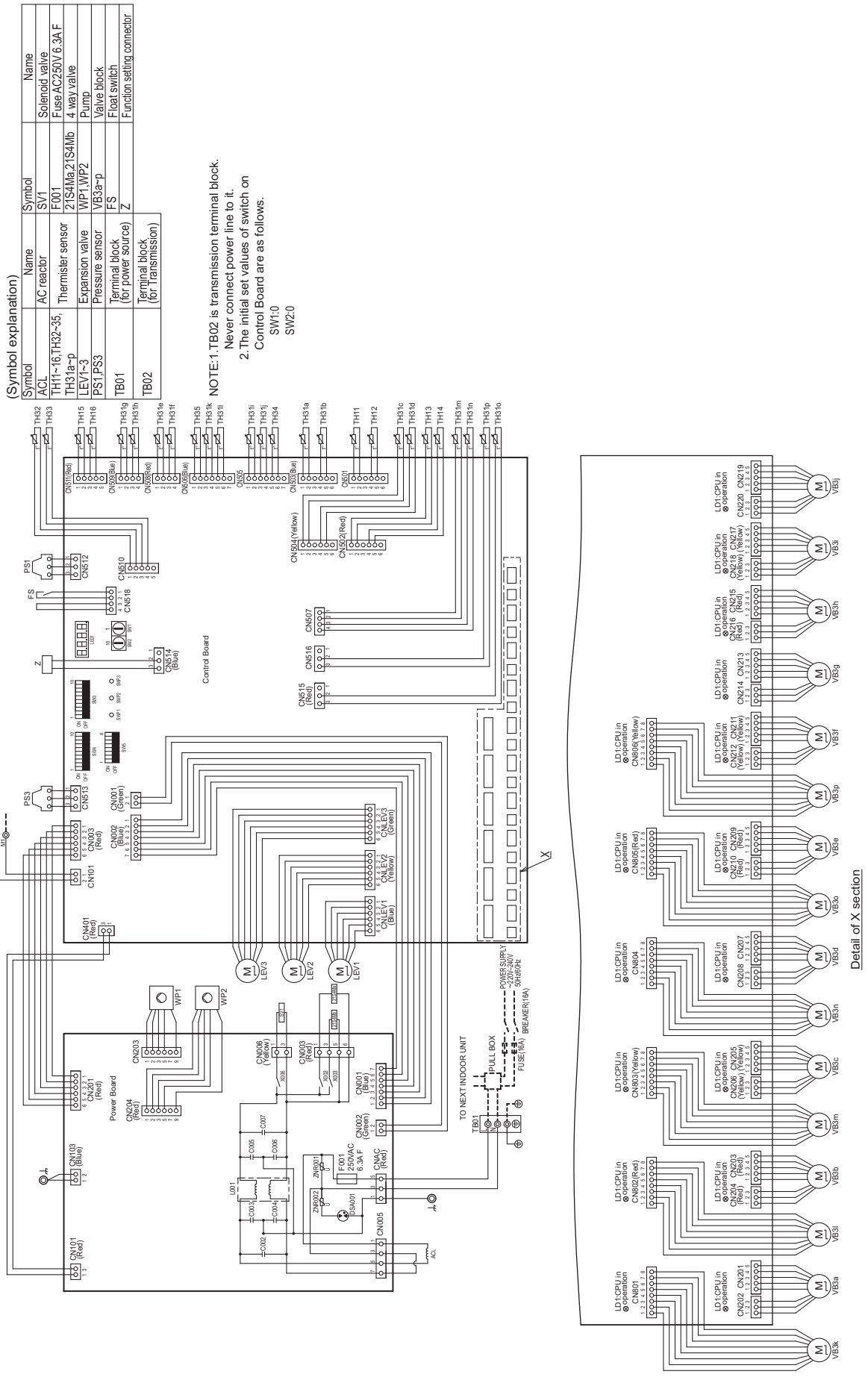
Symbol	Name
ACL	AC reactor
TH11~16,TH32~35,	Thermister sensor
TH31a~h	Expansion valve
LEV1~3	Pressure sensor
PS1,PS3	Terminal block (for power source)
TB01	Terminal block (for Transmission)
TB02	

Symbol	Name
SV1	Solenoid valve
F001	Fuse AC250V 6.3A F
21S4Ma,21S4Mb	4 way valve
WP1,WP2	Pump
VB3a~h	Valve block
FS	Float switch

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



CMB-WP1016V-GA1

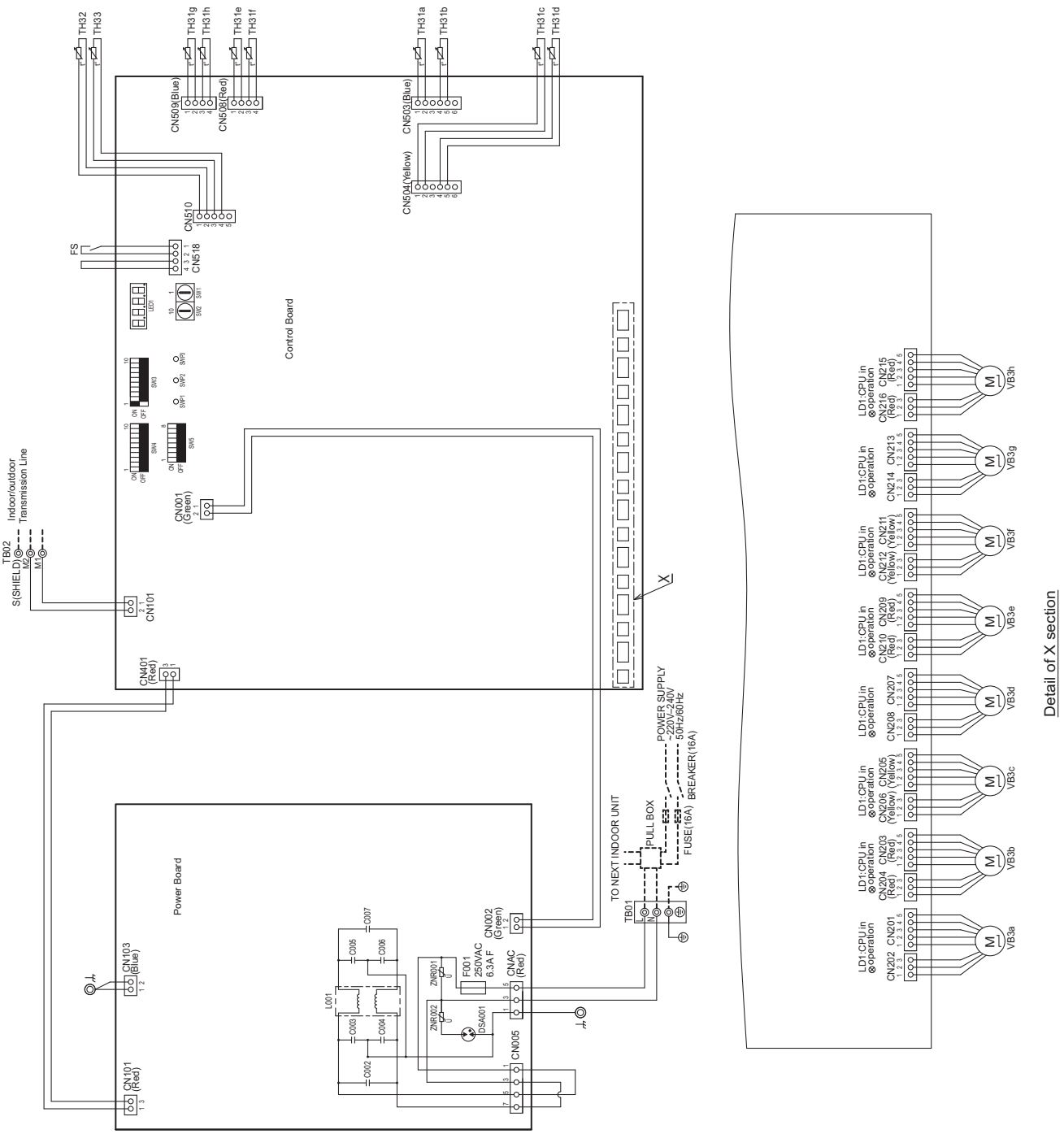


CMB-WP108V-GB1

(Symbol explanation)

Symbol	Name
TH31a~h,TH32,TH33	Thermister sensor
VB3a~h	Valve block
FS	Float switch
TB01	Terminal block (for power source)
TB02	Terminal block (for Transmission)
F001	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 Control Board are as follows.
SW1:0
SW2:0

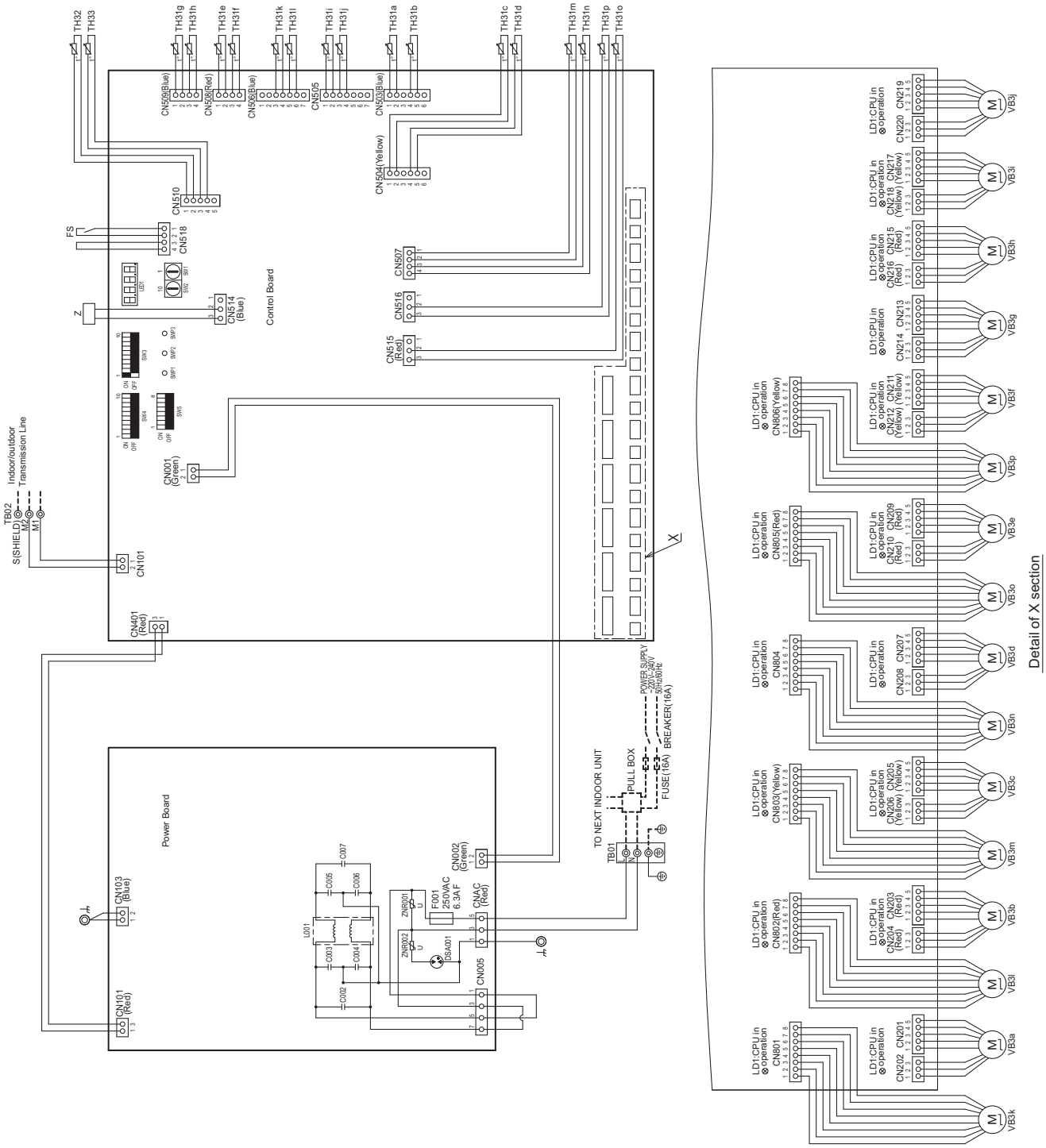


CMB-WP1016V-GB1

(Symbol explanation)

Symbol	Name
TH31a~p,TH32,TH33	Thermister sensor
VB3a~p	Valve block
FS	Float switch
Z	Function setting connector
TB01	Terminal block (for power source)
TB02	Terminal block (for Transmission)
F001	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 Control Board are as follows.
SW1:0
SW2:0

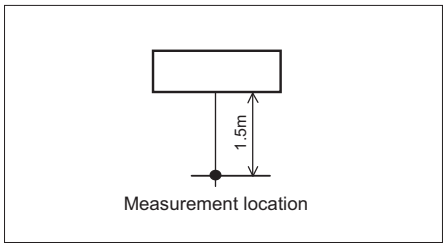


5. SOUND LEVELS

5-1. Sound levels

(Measured point)

CMB-WP108V-GA1
CMB-WP1016V-GA1

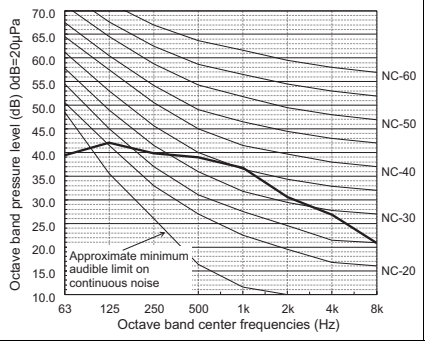


* Measured in anechoic room.

5-2. NC curves

CMB-WP108V-GA1,CMB-WP1016V-GA1

Power Source: 230V, 50Hz



Electrical characteristics

1. Power supply for Indoor unit

1-1. Electrical characteristics of Indoor unit

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

PEFY-WP-VMA-E	Power supply			IFM	
	Volts/Hz	Range +-10%	MCA(A)	Output (kW)	FLA(A)
PEFY-WP20VMA-E	220-240V/50Hz 220-240V/60Hz	Max.: 264V Min.: 198V	1.18	0.085	0.95
PEFY-WP25VMA-E			1.43	0.085	1.14
PEFY-WP32VMA-E			1.54	0.085	1.23
PEFY-WP40VMA-E			2.47	0.121	1.98
PEFY-WP50VMA-E			2.47	0.121	1.98

PEFY-WP-VMS1-E	Power supply			IFM	
	Volts/Hz	Range +-10%	MCA(A)	Output (kW)	FLA(A)
PEFY-WP10VMS1-E	220-240V/50Hz 220-240V/60Hz	Max.: 264V Min.: 198V	0.40/0.40	0.096	0.32/0.32
PEFY-WP15VMS1-E			0.63/0.63	0.096	0.50/0.50
PEFY-WP20VMS1-E			0.70/0.70	0.096	0.56/0.56
PEFY-WP25VMS1-E			0.75/0.75	0.096	0.60/0.60
PEFY-WP32VMS1-E			0.83/0.82	0.096	0.66/0.65
PEFY-WP40VMS1-E			1.02/1.00	0.096	0.81/0.80
PEFY-WP50VMS1-E			1.08/1.07	0.096	0.86/0.85

PLFY-WP-VBM-E	Power supply			IFM	
	Volts/Hz	Range +-10%	MCA(A)	Output (kW)	FLA(A)
PLFY-WP32VBM-E	220-240V/50Hz 220-240V/60Hz	Max.: 264V Min.: 198V	0.44	0.050	0.35
PLFY-WP40VBM-E			0.44	0.050	0.35
PLFY-WP50VBM-E			0.57	0.050	0.45

PFFY-WP-VLRMM-E	Power supply			IFM	
	Volts/Hz	Range +-10%	MCA(A)	Output (kW)	FLA(A)
PFFY-WP20VLRMM-E	220-240V/50Hz 220-240V/60Hz	Max.: 264V Min.: 198V	0.61	0.096	0.49
PFFY-WP25VLRMM-E			0.69	0.096	0.55
PFFY-WP32VLRMM-E			0.93	0.096	0.74
PFFY-WP40VLRMM-E			0.93	0.096	0.74
PFFY-WP50VLRMM-E			1.28	0.096	1.02

1-2. Electrical characteristics of HBC controller

Symbols: MCA: Max. Circuit Amps, MFA: Max. Fuse Amps, RLA: Rated Load Amps

HBC controller	Power supply					RLA(A)
	Hz	Volts	Range+-10%	MCA(A)	MFA(A)	
CMB-WP108V-GA1 CMB-WP1016V-GA1	50/60	220	Max.: 264V Min.: 198V	3.49	15	2.89
		230				2.83
		240				2.79
CMB-WP108V-GB1 CMB-WP1016V-GB1	50/60	220	Max.: 264V Min.: 198V	0.06	15	0.05
		230				0.05
		240				0.05

Capacity Tables

1. Cooling [Ceiling concealed (Slim type)]

1-1. Cooling capacity with PURY-(E)P200-250YLM-A1

PEFY-WP-VMS1-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
10 (1.2)	1.1	1.0	1.1	1.0	1.2	1.0	1.2	1.0	1.2	1.0	1.3	1.0	1.4	1.0
15 (1.7)	1.5	1.5	1.6	1.5	1.7	1.5	1.7	1.6	1.7	1.6	1.8	1.6	1.9	1.6
20 (2.2)	2.0	1.7	2.0	1.8	2.1	1.8	2.2	1.9	2.3	1.9	2.4	1.9	2.5	1.8
25 (2.8)	2.5	2.0	2.6	2.1	2.7	2.1	2.8	2.2	2.9	2.2	3.0	2.1	3.2	2.1
32 (3.6)	3.2	2.7	3.3	2.7	3.5	2.7	3.6	2.9	3.7	2.9	3.9	2.8	4.1	2.8
40 (4.5)	4.0	3.2	4.1	3.3	4.4	3.3	4.5	3.5	4.6	3.5	4.9	3.4	5.2	3.4
50 (5.6)	5.0	4.0	5.2	4.2	5.5	4.1	5.6	4.4	5.8	4.4	6.0	4.3	6.4	4.2

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

1-2. Cooling capacity with PURY-(E)P300-400YLM-A1

PEFY-WP-VMS1-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
10 (1.2)	1.1	0.9	1.1	1.0	1.2	1.0	1.2	1.0	1.2	1.0	1.3	1.0	1.4	1.0
15 (1.7)	1.5	1.5	1.5	1.5	1.6	1.5	1.7	1.6	1.7	1.6	1.9	1.6	2.0	1.6
20 (2.2)	2.0	1.7	2.0	1.8	2.1	1.8	2.2	1.9	2.3	1.9	2.4	1.9	2.5	1.8
25 (2.8)	2.5	2.0	2.5	2.1	2.7	2.0	2.8	2.2	2.9	2.2	3.0	2.1	3.2	2.1
32 (3.6)	3.2	2.6	3.3	2.7	3.5	2.7	3.6	2.9	3.7	2.9	3.9	2.8	4.2	2.8
40 (4.5)	4.0	3.2	4.1	3.3	4.3	3.3	4.5	3.5	4.6	3.5	4.9	3.4	5.2	3.4
50 (5.6)	5.0	4.0	5.1	4.1	5.4	4.1	5.6	4.4	5.7	4.4	6.1	4.3	6.5	4.2

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

1-3. Cooling capacity with PURY-(E)P450-500YLM-A1

PEFY-WP-VMS1-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
10 (1.2)	1.1	0.9	1.1	1.0	1.2	1.0	1.2	1.0	1.3	1.0	1.3	1.0	1.4	1.0
15 (1.7)	1.5	1.5	1.5	1.5	1.7	1.5	1.7	1.6	1.8	1.6	1.9	1.6	2.0	1.6
20 (2.2)	2.0	1.7	2.0	1.8	2.1	1.8	2.2	1.9	2.3	1.9	2.5	1.9	2.6	1.9
25 (2.8)	2.5	2.0	2.5	2.1	2.7	2.0	2.8	2.2	2.9	2.2	3.1	2.2	3.3	2.1
32 (3.6)	3.2	2.6	3.3	2.7	3.5	2.7	3.6	2.9	3.8	2.9	4.0	2.9	4.3	2.8
40 (4.5)	4.0	3.2	4.1	3.3	4.4	3.3	4.5	3.5	4.7	3.5	5.0	3.5	5.4	3.4
50 (5.6)	5.0	4.0	5.1	4.1	5.4	4.1	5.6	4.4	5.8	4.4	6.2	4.4	6.7	4.3

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

1-4. Cooling capacity with PQRY-P200-500YLM-A

PEFY-WP-VMS1-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
10 (1.2)	1.1	1.0	1.1	1.0	1.2	1.0	1.2	1.0	1.2	1.0	1.2	1.0	1.2	1.0
15 (1.7)	1.5	1.5	1.6	1.5	1.7	1.5	1.7	1.6	1.7	1.6	1.7	1.5	1.7	1.5
20 (2.2)	2.0	1.7	2.0	1.8	2.1	1.8	2.2	1.9	2.2	1.9	2.2	1.8	2.2	1.7
25 (2.8)	2.5	2.0	2.6	2.1	2.7	2.1	2.8	2.2	2.8	2.1	2.8	2.0	2.8	2.0
32 (3.6)	3.2	2.7	3.3	2.7	3.5	2.7	3.6	2.9	3.6	2.8	3.6	2.7	3.6	2.6
40 (4.5)	4.1	3.2	4.2	3.3	4.4	3.3	4.5	3.5	4.5	3.4	4.5	3.3	4.5	3.1
50 (5.6)	5.0	4.1	5.2	4.2	5.5	4.1	5.6	4.4	5.6	4.3	5.6	4.1	5.6	4.0

* The capacity does not depend on the inlet-water temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

2. Cooling [Ceiling concealed (Middle static pressure type)]

2-1. Cooling capacity with PURY-(E)P200-250YLM-A1

PEFY-WP-VMA-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.8	2.0	1.9	2.1	1.8	2.2	2.0	2.3	2.0	2.4	1.9	2.5	1.9
25 (2.8)	2.5	2.5	2.6	2.6	2.7	2.6	2.8	2.8	2.9	2.7	3.0	2.7	3.2	2.7
32 (3.6)	3.2	3.0	3.3	3.1	3.5	3.1	3.6	3.3	3.7	3.3	3.9	3.3	4.1	3.2
40 (4.5)	4.0	3.8	4.1	3.9	4.4	3.9	4.5	4.2	4.6	4.1	4.9	4.1	5.2	4.0
50 (5.6)	5.0	4.2	5.2	4.3	5.5	4.3	5.6	4.6	5.8	4.6	6.0	4.5	6.4	4.4

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

2-2. Cooling capacity with PURY-(E)P300-400YLM-A1

PEFY-WP-VMA-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.8	2.0	1.8	2.1	1.8	2.2	2.0	2.3	2.0	2.4	1.9	2.5	1.9
25 (2.8)	2.5	2.5	2.5	2.5	2.7	2.5	2.8	2.8	2.9	2.7	3.0	2.7	3.2	2.7
32 (3.6)	3.2	3.0	3.3	3.1	3.5	3.1	3.6	3.3	3.7	3.3	3.9	3.3	4.2	3.2
40 (4.5)	4.0	3.7	4.1	3.9	4.3	3.8	4.5	4.2	4.6	4.1	4.9	4.1	5.2	4.0
50 (5.6)	5.0	4.2	5.1	4.3	5.4	4.3	5.6	4.6	5.7	4.5	6.1	4.5	6.5	4.4

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

2-3. Cooling capacity with PURY-(E)P450-500YLM-A1

PEFY-WP-VMA-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.8	2.0	1.8	2.1	1.8	2.2	2.0	2.3	2.0	2.5	2.0	2.6	1.9
25 (2.8)	2.5	2.5	2.5	2.5	2.7	2.6	2.8	2.8	2.9	2.8	3.1	2.7	3.3	2.7
32 (3.6)	3.2	3.0	3.3	3.1	3.5	3.1	3.6	3.3	3.8	3.3	4.0	3.3	4.3	3.3
40 (4.5)	4.0	3.7	4.1	3.9	4.4	3.9	4.5	4.2	4.7	4.2	5.0	4.1	5.4	4.1
50 (5.6)	5.0	4.2	5.1	4.3	5.4	4.3	5.6	4.6	5.8	4.6	6.2	4.5	6.7	4.5

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

2-4. Cooling capacity with PQRY-P200-500YLM-A

PEFY-WP-VMA-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.8	2.0	1.9	2.1	1.8	2.2	2.0	2.2	1.9	2.2	1.9	2.2	1.8
25 (2.8)	2.5	2.5	2.6	2.6	2.7	2.6	2.8	2.8	2.8	2.7	2.8	2.6	2.8	2.5
32 (3.6)	3.2	3.0	3.3	3.1	3.5	3.1	3.6	3.3	3.6	3.3	3.6	3.2	3.6	3.1
40 (4.5)	4.1	3.8	4.2	3.9	4.4	3.9	4.5	4.2	4.5	4.1	4.5	3.9	4.5	3.8
50 (5.6)	5.0	4.2	5.2	4.4	5.5	4.3	5.6	4.6	5.6	4.5	5.6	4.3	5.6	4.2

* The capacity does not depend on the inlet-water temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

3. Cooling [Ceiling cassette (4-way flow type)]

3-1. Cooling capacity with PURY-(E)P200-250YLM-A1

PLFY-WP-VBM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
32 (3.6)	3.2	3.2	3.3	3.3	3.5	3.3	3.6	3.5	3.7	3.5	3.9	3.5	4.1	3.4
40 (4.5)	4.0	3.6	4.1	3.7	4.4	3.6	4.5	3.9	4.6	3.9	4.9	3.8	5.2	3.8
50 (5.6)	5.0	4.2	5.2	4.4	5.5	4.3	5.6	4.6	5.8	4.6	6.0	4.5	6.4	4.4

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

3-2. Cooling capacity with PURY-(E)P300-400YLM-A1

PLFY-WP-VBM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
32 (3.6)	3.2	3.2	3.3	3.3	3.5	3.3	3.6	3.5	3.7	3.5	3.9	3.5	4.2	3.4
40 (4.5)	4.0	3.5	4.1	3.7	4.3	3.6	4.5	3.9	4.6	3.9	4.9	3.8	5.2	3.8
50 (5.6)	5.0	4.2	5.1	4.3	5.4	4.3	5.6	4.6	5.7	4.6	6.1	4.5	6.5	4.4

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

3-3. Cooling capacity with PURY-(E)P450-500YLM-A1

PLFY-WP-VBM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
32 (3.6)	3.2	3.2	3.3	3.3	3.5	3.3	3.6	3.5	3.8	3.5	4.0	3.5	4.3	3.5
40 (4.5)	4.0	3.5	4.1	3.7	4.4	3.6	4.5	3.9	4.7	3.9	5.0	3.9	5.4	3.8
50 (5.6)	5.0	4.2	5.1	4.3	5.4	4.3	5.6	4.6	5.8	4.6	6.2	4.6	6.7	4.5

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

3-4. Cooling capacity with PQRY-P200-500YLM-A

PLFY-WP-VBM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
32 (3.6)	3.2	3.2	3.3	3.3	3.5	3.3	3.6	3.5	3.6	3.5	3.6	3.4	3.6	3.3
40 (4.5)	4.1	3.6	4.2	3.7	4.4	3.6	4.5	3.9	4.5	3.8	4.5	3.7	4.5	3.6
50 (5.6)	5.0	4.2	5.2	4.4	5.5	4.3	5.6	4.6	5.6	4.5	5.6	4.3	5.6	4.2

* The capacity does not depend on the inlet-water temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

4. Cooling [Floor standing (Concealed type)]

4-1. Cooling capacity with PURY-(E)P200-250YLM-A1

PFFY-WP-VLRMM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.5	2.0	1.6	2.1	1.6	2.2	1.7	2.3	1.7	2.4	1.6	2.5	1.6
25 (2.8)	2.5	2.0	2.6	2.1	2.7	2.1	2.8	2.2	2.9	2.2	3.0	2.2	3.2	2.1
32 (3.6)	3.2	2.5	3.3	2.6	3.5	2.6	3.6	2.7	3.7	2.7	3.9	2.7	4.1	2.6
40 (4.5)	4.0	3.1	4.1	3.2	4.4	3.2	4.5	3.4	4.6	3.4	4.9	3.3	5.2	3.2
50 (5.6)	5.0	3.9	5.2	4.0	5.5	4.0	5.6	4.2	5.8	4.2	6.0	4.1	6.4	4.0

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

4-2. Cooling capacity with PURY-(E)P300-400YLM-A1

PFFY-WP-VLRMM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.5	2.0	1.6	2.1	1.6	2.2	1.7	2.3	1.6	2.4	1.6	2.5	1.6
25 (2.8)	2.5	2.0	2.5	2.1	2.7	2.1	2.8	2.2	2.9	2.2	3.0	2.2	3.2	2.1
32 (3.6)	3.2	2.5	3.3	2.6	3.5	2.6	3.6	2.7	3.7	2.7	3.9	2.7	4.2	2.6
40 (4.5)	4.0	3.1	4.1	3.2	4.3	3.2	4.5	3.4	4.6	3.3	4.9	3.3	5.2	3.3
50 (5.6)	5.0	3.9	5.1	4.0	5.4	3.9	5.6	4.2	5.7	4.2	6.1	4.1	6.5	4.1

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

4-3. Cooling capacity with PURY-(E)P450-500YLM-A1

PFFY-WP-VLRMM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.5	2.0	1.6	2.1	1.6	2.2	1.7	2.3	1.7	2.5	1.7	2.6	1.6
25 (2.8)	2.5	2.0	2.5	2.1	2.7	2.1	2.8	2.2	2.9	2.2	3.1	2.2	3.3	2.2
32 (3.6)	3.2	2.5	3.3	2.6	3.5	2.6	3.6	2.7	3.8	2.7	4.0	2.7	4.3	2.7
40 (4.5)	4.0	3.1	4.1	3.2	4.4	3.2	4.5	3.4	4.7	3.4	5.0	3.3	5.4	3.3
50 (5.6)	5.0	3.9	5.1	4.0	5.4	4.0	5.6	4.2	5.8	4.2	6.2	4.2	6.7	4.1

* The capacity does not depend on the outdoor temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

4-4. Cooling capacity with PQRY-P200-500YLM-A

PFFY-WP-VLRMM-E

CA: Capacity (kW), SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.													
	21.5°C D.B. 15°C W.B.		23°C D.B. 16°C W.B.		25°C D.B. 18°C W.B.		27°C D.B. 19°C W.B.		28°C D.B. 20°C W.B.		30°C D.B. 22°C W.B.		32°C D.B. 24°C W.B.	
	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC	CA	SHC
20 (2.2)	2.0	1.5	2.0	1.6	2.1	1.6	2.2	1.7	2.2	1.6	2.2	1.6	2.2	1.5
25 (2.8)	2.5	2.0	2.6	2.1	2.7	2.1	2.8	2.2	2.8	2.2	2.8	2.1	2.8	2.0
32 (3.6)	3.2	2.5	3.3	2.6	3.5	2.6	3.6	2.7	3.6	2.7	3.6	2.6	3.6	2.5
40 (4.5)	4.1	3.1	4.2	3.2	4.4	3.2	4.5	3.4	4.5	3.3	4.5	3.2	4.5	3.0
50 (5.6)	5.0	3.9	5.2	4.0	5.5	4.0	5.6	4.2	5.6	4.1	5.6	3.9	5.6	3.8

* The capacity does not depend on the inlet-water temperature.

kcal/h = kW x 860, BTU/h = kW x 3,412

5. Heating [All indoor units]

5-1. Heating capacity with PURY-(E)P200-250YLM-A1

All Indoor units SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp. 15°C D.B. SHC	20°C D.B. SHC	25°C D.B. SHC	27°C D.B. SHC
10 (1.4)	1.4	1.4	1.1	1.0
15 (1.9)	1.9	1.9	1.5	1.3
20 (2.5)	2.5	2.5	2.0	1.8
25 (3.2)	3.2	3.2	2.6	2.2
32 (4.0)	4.0	4.0	3.2	2.8
40 (5.0)	5.1	5.0	4.0	3.5
50 (6.3)	6.4	6.3	5.0	4.4

* The capacity does not depend on the outdoor temperature. kcal/h = kW x 860, BTU/h = kW x 3,412

5-2. Heating capacity with PURY-(E)P300-400YLM-A1

All Indoor units SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp. 15°C D.B. SHC	20°C D.B. SHC	25°C D.B. SHC	27°C D.B. SHC
10 (1.4)	1.4	1.4	1.0	0.9
15 (1.9)	1.9	1.9	1.4	1.2
20 (2.5)	2.6	2.5	1.9	1.6
25 (3.2)	3.3	3.2	2.4	2.0
32 (4.0)	4.1	4.0	3.0	2.6
40 (5.0)	5.1	5.0	3.7	3.2
50 (6.3)	6.5	6.3	4.7	4.0

* The capacity does not depend on the outdoor temperature. kcal/h = kW x 860, BTU/h = kW x 3,412

5-3. Heating capacity with PURY-(E)P450-500YLM-A1

All Indoor units SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp. 15°C D.B. SHC	20°C D.B. SHC	25°C D.B. SHC	27°C D.B. SHC
10 (1.4)	1.4	1.4	1.1	1.0
15 (1.9)	1.9	1.9	1.5	1.3
20 (2.5)	2.6	2.5	2.0	1.8
25 (3.2)	3.3	3.2	2.5	2.3
32 (4.0)	4.1	4.0	3.2	2.8
40 (5.0)	5.1	5.0	4.0	3.5
50 (6.3)	6.4	6.3	5.0	4.5

* The capacity does not depend on the outdoor temperature. kcal/h = kW x 860, BTU/h = kW x 3,412

5-4. Heating capacity with PURY-(E)P200-250YLM-A1 "COP priority mode"

All Indoor units SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.			
	15°C D.B.	20°C D.B.	25°C D.B.	27°C D.B.
	SHC	SHC	SHC	SHC
10 (1.4)	1.4	1.4	1.1	1.0
15 (1.9)	1.9	1.9	1.5	1.3
20 (2.5)	2.5	2.5	2.0	1.8
25 (3.2)	3.3	3.2	2.6	2.2
32 (4.0)	4.1	4.0	3.2	2.8
40 (5.0)	5.1	5.0	4.0	3.5
50 (6.3)	6.4	6.3	5.0	4.4

* The capacity does not depend on the outdoor temperature. kcal/h = kW x 860, BTU/h = kW x 3,412

5-5. Heating capacity with PURY-(E)P300-400YLM-A1 "COP priority mode"

All Indoor units SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.			
	15°C D.B.	20°C D.B.	25°C D.B.	27°C D.B.
	SHC	SHC	SHC	SHC
10 (1.4)	1.4	1.4	1.0	0.9
15 (1.9)	1.9	1.9	1.4	1.2
20 (2.5)	2.6	2.5	1.9	1.6
25 (3.2)	3.3	3.2	2.4	2.0
32 (4.0)	4.1	4.0	3.0	2.6
40 (5.0)	5.1	5.0	3.7	3.2
50 (6.3)	6.5	6.3	4.7	4.0

* The capacity does not depend on the outdoor temperature. kcal/h = kW x 860, BTU/h = kW x 3,412

5-6. Heating capacity with PURY-(E)P450-500YLM-A1 "COP priority mode"

All Indoor units SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.			
	15°C D.B.	20°C D.B.	25°C D.B.	27°C D.B.
	SHC	SHC	SHC	SHC
10 (1.4)	1.4	1.4	1.1	1.0
15 (1.9)	2.0	1.9	1.5	1.3
20 (2.5)	2.6	2.5	2.0	1.8
25 (3.2)	3.3	3.2	2.5	2.3
32 (4.0)	4.1	4.0	3.2	2.8
40 (5.0)	5.1	5.0	4.0	3.5
50 (6.3)	6.5	6.3	5.0	4.5

* The capacity does not depend on the outdoor temperature. kcal/h = kW x 860, BTU/h = kW x 3,412

5-7. Heating capacity with PQRY-P200-500YLM-A

All indoor units SHC: Sensible Heat Capacity (kW)

Model size (Rated kW)	Indoor air temp.			
	15°C D.B.	20°C D.B.	25°C D.B.	27°C D.B.
	SHC	SHC	SHC	SHC
10 (1.4)	1.4	1.4	1.2	1.1
15 (1.9)	1.9	1.9	1.6	1.4
20 (2.5)	2.5	2.5	2.1	1.9
25 (3.2)	3.2	3.2	2.6	2.4
32 (4.0)	4.0	4.0	3.3	3.0
40 (5.0)	5.0	5.0	4.1	3.8
50 (6.3)	6.3	6.3	5.2	4.7

* The capacity does not depend on the inlet-water temperature. kcal/h = kW x 860, BTU/h = kW x 3,412

HYBRID CITY MULTI
2. OUTDOOR/HEAT SOURCE UNITS

PURY-P-YLM-A1, PURY-EP-YLM-A1

1. SPECIFICATIONS

Model			PURY-P200YLM-A1 (-BS)	PURY-P250YLM-A1 (-BS)
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity *1		kW	22.4	28.0
(Nominal)		kcal/h	20,000	25,000
*1		BTU/h	76,400	95,500
	Power input	kW	7.00	9.92
	Current input	A	11.8-11.2-10.8	16.7-15.9-15.3
	EER	kW/kW	3.20	2.82
Temp. range of	Indoor	W.B.	15.0~24.0°C (59~75°F)	15.0~24.0°C (59~75°F)
cooling *3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	-5.0~46.0°C (23~115°F)
Heating capacity *2		kW	25.0	31.5
(Nominal)		kcal/h	21,500	27,100
*2		BTU/h	85,300	107,500
	Power input	kW	7.08	10.06
	Current input	A	11.9-11.3-10.9	16.9-16.1-15.5
	COP	kW/kW	3.53	3.13
Temp. range of	Indoor	D.B.	15.0~27.0°C (59~81°F)	15.0~27.0°C (59~81°F)
heating *3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	-20.0~15.5°C (-4~60°F)
Indoor unit	Total capacity		50~150% of outdoor unit capacity	50~150% of outdoor unit capacity
connectable	Model/Quantity		WP15~WP50/2~20	WP15~WP50/3~25
Sound pressure level (measured in anechoic room)		dB <A>	59	60
Sound power level (measured in anechoic room)		dB <A>	82.5	83.5
Refrigerant	High pressure	mm (in.)	15.88 (5/8) Brazed	19.05 (3/4) Brazed
piping diameter	Low pressure	mm (in.)	19.05 (3/4) Brazed	22.2 (7/8) Brazed
FAN	Type x Quantity		Propeller fan x 1	Propeller fan x 1
	Air flow rate	m^3/min	185	185
		L/s	3,083	3,083
		cfm	6,532	6,532
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	Inverter-control, Direct-driven by motor
	Motor output	kW	0.92 x 1	0.92 x 1
*4	External static press.		0 Pa (0 mmH_2O)	0 Pa (0 mmH_2O)
Compressor	Type		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter	Inverter
	Motor output	kW	5.6	6.9
	Case heater	kW	-	-
	Lubricant		MEL32	MEL32
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>
External dimension H x W x D		mm	1,710 (1,650 without legs) x 920 x 740	1,710 (1,650 without legs) x 920 x 740
		in.	67-3/8 (65 without legs) x 36-1/4 x 29-3/16	67-3/8 (65 without legs) x 36-1/4 x 29-3/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		-	-
	Fan motor		-	-
Refrigerant	Type x original charge		R410A x 9.5 kg (21 lbs)	R410A x 9.5 kg (21 lbs)
	Control		HBC controller	HBC controller
Net weight		kg (lbs)	205 (452)	205 (452)
Heat exchanger			Salt-resistant cross fin & copper tube	Salt-resistant cross fin & copper tube
HIC circuit (HIC: Heat Inter-Changer)			-	-
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)	Auto-defrost mode (Reversed refrigerant cycle, Hot gas)
Drawing	External		WKJ94T176	WKJ94T176
	Wiring		WKE94G041	WKE94G041
Standard attachment	Document		Installation Manual	Installation Manual
	Accessory		Refrigerant conn. pipe	Refrigerant conn. pipe
Optional parts			Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1	Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.

Notes:

1.Nominal cooling conditions (subject to JIS B8615-2)
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B./24°CW.B. (95°FD.B./75°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2.Nominal heating conditions (subject to JIS B8615-2)
Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3.-5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.)
with cooling/heating mixed operation.
4.External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			PURY-P300YLM-A1 (-BS)	
Number of HBC controller			Single HBC	Double HBC
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	
Cooling capacity (Nominal)	*1	kW	33.5	
		kcal/h	28,800	
	*1	BTU/h	114,300	
	Power input	kW	13.34	11.31
	Current input	A	22.5-21.3-20.6	19.0-18.1-17.4
	EER	kW/kW	2.51	2.96
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	
*3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	
Heating capacity (Nominal)	*2	kW	37.5	
		kcal/h	32,300	
	*2	BTU/h	128,000	
	Power input	kW	12.71	11.94
	Current input	A	21.4-20.3-19.6	20.1-19.1-18.4
	COP	kW/kW	2.95	3.14
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	
*3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	
Indoor unit connectable	Total capacity		50~150% of outdoor unit capacity	
	Model/Quantity		WP15~WP50/3~30	
Sound pressure level (measured in anechoic room)		dB <A>	62.5	
Sound power level (measured in anechoic room)		dB <A>	86	
Refrigerant piping diameter	High pressure	mm (in.)	19.05 (3/4) Brazed	
	Low pressure	mm (in.)	22.2 (7/8) Brazed	
FAN	Type x Quantity		Propeller fan x 1	
	Air flow rate	m^3/min	230	
		L/s	3,833	
		cfm	8,121	
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	
	Motor output	kW	0.92 x 1	
*4	External static press.		0 Pa (0 mmH_2O)	
Compressor	Type		Inverter scroll hermetic compressor	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	8.1	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	
External dimension H x W x D		mm	1,710 (1,650 without legs) x 1,220 x 740	
		in.	67-3/8 (65 without legs) x 48-1/16 x 29-3/16	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	
	Compressor		-	
	Fan motor		-	
Refrigerant	Type x original charge		R410A x 10.3 kg (23 lbs)	
	Control		HBC controller	
Net weight		kg (lbs)	248 (547)	
Heat exchanger			Salt-resistant cross fin & copper tube	
HIC circuit (HIC: Heat Inter-Changer)			-	
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)	
Drawing	External		WKJ94T177	
	Wiring		WKE94G041	
Standard attachment	Document		Installation Manual	
	Accessory		Refrigerant conn. pipe	
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3. -5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.) with cooling/heating mixed operation.
4. External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			PURY-P350YLM-A1 (-BS)	
Number of HBC controller			**Single HBC**	**Double HBC**
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	
Cooling capacity *1		kW	40.0	
(Nominal)		kcal/h	34,400	
		*1 BTU/h	136,500	
	Power input	kW	17.93	14.59
	Current input	A	30.2-28.7-27.7	24.6-23.3-22.5
	EER	kW/kW	2.23	2.74
Temp. range of	Indoor	W.B.	15.0~24.0°C (59~75°F)	
cooling *3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	
Heating capacity *2		kW	45.0	
(Nominal)		kcal/h	38,700	
		*2 BTU/h	153,500	
	Power input	kW	15.51	14.35
	Current input	A	26.1-24.8-23.9	24.2-23.0-22.1
	COP	kW/kW	2.90	3.13
Temp. range of	Indoor	D.B.	15.0~27.0°C (59~81°F)	
heating *3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	
Indoor unit	Total capacity		50~150% of outdoor unit capacity	
connectable	Model/Quantity		WP15~WP50/4~35	
Sound pressure level (measured in anechoic room)		dB <A>	62.5	
Sound power level (measured in anechoic room)		dB <A>	86	
Refrigerant	High pressure	mm (in.)	19.05 (3/4) Brazed	
piping diameter	Low pressure	mm (in.)	28.58 (1-1/8) Brazed	
FAN	Type x Quantity		Propeller fan x 1	
	Air flow rate	m^3/min	230	
		L/s	3,833	
		cfm	8,121	
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	
	Motor output	kW	0.92 x 1	
*4	External static press.		0 Pa (0 mmH_2O)	
Compressor	Type		Inverter scroll hermetic compressor	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	10.5	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	
External dimension H x W x D		mm	1,710 (1,650 without legs) x 1,220 x 740	
		in.	67-3/8 (65 without legs) x 48-1/16 x 29-3/16	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	
	Compressor		-	
	Fan motor		-	
Refrigerant	Type x original charge		R410A x 10.3 kg (23 lbs)	
	Control		HBC controller	
Net weight		kg (lbs)	248 (547)	
Heat exchanger			Salt-resistant cross fin & copper tube	
HIC circuit (HIC: Heat Inter-Changer)			-	
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)	
Drawing	External		WKJ94T177	
	Wiring		WKE94G041	
Standard attachment	Document		Installation Manual	
	Accessory		Refrigerant conn. pipe	
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3. -5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.) with cooling/heating mixed operation.
4. External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			PURY-P400YLM-A1 (-BS)	PURY-P450YLM-A1 (-BS)
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity (Nominal)	*1	kW	45.0	50.0
		kcal/h	40,000	45,000
	*1	BTU/h	153,500	170,600
	Power input	kW	16.65	17.92
	Current input	A	28.1-26.7-25.7	30.2-28.7-27.7
	EER	kW/kW	2.70	2.79
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	15.0~24.0°C (59~75°F)
*3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	-5.0~46.0°C (23~115°F)
Heating capacity (Nominal)	*2	kW	45.0	56.0
		kcal/h	40,000	50,000
	*2	BTU/h	153,500	191,100
	Power input	kW	13.39	17.39
	Current input	A	22.6-21.4-20.6	29.3-27.8-26.8
	COP	kW/kW	3.36	3.22
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	15.0~27.0°C (59~81°F)
*3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	-20.0~15.5°C (-4~60°F)
Indoor unit connectable	Total capacity		50~150% of outdoor unit capacity	50~150% of outdoor unit capacity
	Model/Quantity		WP15~WP50/4~40	WP15~WP50/5~45
Sound pressure level (measured in anechoic room)		dB <A>	62.5	62.5
Sound power level (measured in anechoic room)		dB <A>	86	86
Refrigerant piping diameter	High pressure	mm (in.)	22.2 (7/8) Brazed	22.2 (7/8) Brazed
	Low pressure	mm (in.)	28.58 (1-1/8) Brazed	28.58 (1-1/8) Brazed
FAN	Type x Quantity		Propeller fan x 1	Propeller fan x 2
	Air flow rate	m^3/min	230	320
		L/s	3,833	5,333
		cfm	8,121	11,299
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	Inverter-control, Direct-driven by motor
	Motor output	kW	0.92 x 1	0.92 x 2
*4	External static press.		0 Pa (0 mmH_2O)	0 Pa (0 mmH_2O)
Compressor	Type		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter	Inverter
	Motor output	kW	10.9	12.4
	Case heater	kW	-	-
	Lubricant		MEL32	MEL32
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>
External dimension H x W x D		mm	1,710 (1,650 without legs) x 1,220 x 740	1,710 (1,650 without legs) x 1,750 x 740
		in.	67-3/8 (65 without legs) x 48-1/16 x 29-3/16	67-3/8 (65 without legs) x 68-15/16 x 29-3/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		-	-
	Fan motor		-	-
Refrigerant	Type x original charge		R410A x 10.3 kg (23 lbs)	R410A x 11.8 kg (27 lbs)
	Control		HBC controller	HBC controller
Net weight		kg (lbs)	246 (543)	321 (708)
Heat exchanger			Salt-resistant cross fin & copper tube	Salt-resistant cross fin & copper tube
HIC circuit (HIC: Heat Inter-Changer)			-	-
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)	Auto-defrost mode (Reversed refrigerant cycle, Hot gas)
Drawing	External		WKJ94T177	WKJ94T178
	Wiring		WKE94G041	WKE94G042
Standard attachment	Document		Installation Manual	Installation Manual
	Accessory		Refrigerant conn. pipe	Refrigerant conn. pipe
Optional parts			Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1	Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B./24°CW.B. (95°FD.B./75°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3. -5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.)
   with cooling/heating mixed operation.
4. External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			**PURY-P500YLM-A1 (-BS)**
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity *1		kW	56.0
(Nominal)		kcal/h	50,000
*1		BTU/h	191,100
	Power input	kW	22.67
	Current input	A	38.2-36.3-35.0
	EER	kW/kW	2.47
Temp. range of	Indoor	W.B.	15.0~24.0°C (59~75°F)
cooling *3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)
Heating capacity *2		kW	58.0
(Nominal)		kcal/h	50,000
*2		BTU/h	197,900
	Power input	kW	17.53
	Current input	A	29.5-28.1-27.0
	COP	kW/kW	3.30
Temp. range of	Indoor	D.B.	15.0~27.0°C (59~81°F)
heating *3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)
Indoor unit	Total capacity		50~150% of outdoor unit capacity
connectable	Model/Quantity		WP15~WP50/5~50
Sound pressure level (measured in anechoic room)		dB <A>	63.5
Sound power level (measured in anechoic room)		dB <A>	87
Refrigerant	High pressure	mm (in.)	22.2 (7/8) Brazed
piping diameter	Low pressure	mm (in.)	28.58 (1-1/8) Brazed
FAN	Type x Quantity		Propeller fan x 2
	Air flow rate	m^3/min	380
		L/s	6,333
		cfm	13,418
	Control, Driving mechanism		Inverter-control, Direct-driven by motor
	Motor output	kW	0.92 x 2
*4	External static press.		0 Pa (0 mmH_2O)
Compressor	Type		Inverter scroll hermetic compressor
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter
	Motor output	kW	13.4
	Case heater	kW	-
	Lubricant		MEL32
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>
External dimension H x W x D		mm	1,710 (1,650 without legs) x 1,750 x 740
		in.	67-3/8 (65 without legs) x 68-15/16 x 29-3/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection
	Compressor		-
	Fan motor		-
Refrigerant	Type x original charge		R410A x 11.8 kg (27 lbs)
	Control		HBC controller
Net weight		kg (lbs)	321 (708)
Heat exchanger			Salt-resistant cross fin & copper tube
HIC circuit (HIC: Heat Inter-Changer)			-
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)
Drawing	External		WKJ94T178
	Wiring		WKE94G042
Standard attachment	Document		Installation Manual
	Accessory		Refrigerant conn. pipe
Optional parts			Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.

Notes:

1.Nominal cooling conditions (subject to JIS B8615-2)
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B./24°CW.B. (95°FD.B./75°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)

2.Nominal heating conditions (subject to JIS B8615-2)
Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)

3.-5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.)
with cooling/heating mixed operation.

4.External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			PURY-EP200YLM-A1 (-BS)	PURY-EP250YLM-A1 (-BS)
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity (Nominal)	*1	kW	22.4	28.0
		kcal/h	20,000	25,000
	*1	BTU/h	76,400	95,500
	Power input	kW	6.27	8.77
	Current input	A	10.5-10.0-9.6	14.8-14.0-13.5
	EER	kW/kW	3.57	3.19
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	15.0~24.0°C (59~75°F)
*3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	-5.0~46.0°C (23~115°F)
Heating capacity (Nominal)	*2	kW	25.0	31.5
		kcal/h	21,500	27,100
	*2	BTU/h	85,300	107,500
	Power input	kW	6.92	9.84
	Current input	A	11.6-11.0-10.6	16.6-15.7-15.2
	COP	kW/kW	3.61	3.20
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	15.0~27.0°C (59~81°F)
*3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	-20.0~15.5°C (-4~60°F)
Indoor unit connectable	Total capacity		50~150% of outdoor unit capacity	50~150% of outdoor unit capacity
	Model/Quantity		WP15~WP50/2~20	WP15~WP50/3~25
Sound pressure level (measured in anechoic room)		dB <A>	59	60
Sound power level (measured in anechoic room)		dB <A>	82.5	83.5
Refrigerant piping diameter	High pressure	mm (in.)	15.88 (5/8) Brazed	19.05 (3/4) Brazed
	Low pressure	mm (in.)	19.05 (3/4) Brazed	22.2 (7/8) Brazed
FAN	Type x Quantity		Propeller fan x 1	Propeller fan x 1
	Air flow rate	m^3/min	185	185
		L/s	3,083	3,083
		cfm	6,532	6,532
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	Inverter-control, Direct-driven by motor
	Motor output	kW	0.92 x 1	0.92 x 1
*4	External static press.		0 Pa (0 mmH_2O)	0 Pa (0 mmH_2O)
Compressor	Type		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter	Inverter
	Motor output	kW	5.6	6.9
	Case heater	kW	-	-
	Lubricant		MEL32	MEL32
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>
External dimension H x W x D		mm	1,710 (1,650 without legs) x 920 x 740	1,710 (1,650 without legs) x 920 x 740
		in.	67-3/8 (65 without legs) x 36-1/4 x 29-3/16	67-3/8 (65 without legs) x 36-1/4 x 29-3/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		-	-
	Fan motor		-	-
Refrigerant	Type x original charge		R410A x 6.0 kg (14 lbs)	R410A x 6.0 kg (14 lbs)
	Control		HBC controller	HBC controller
Net weight		kg (lbs)	202 (446)	202 (446)
Heat exchanger			Salt-resistant cross fin & aluminium tube	Salt-resistant cross fin & aluminium tube
HIC circuit (HIC: Heat Inter-Changer)			-	-
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)	Auto-defrost mode (Reversed refrigerant cycle, Hot gas)
Drawing	External		WKJ94T756	WKJ94T756
	Wiring		WKE94G041	WKE94G041
Standard attachment	Document		Installation Manual	Installation Manual
	Accessory		Refrigerant conn. pipe	Refrigerant conn. pipe
Optional parts			Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1	Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B./24°CW.B. (95°FD.B./75°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3. -5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.)
   with cooling/heating mixed operation.
4. External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			PURY-EP300YLM-A1 (-BS)	
Number of HBC controller			**Single HBC**	**Double HBC**
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	
Cooling capacity *1		kW	33.5	
(Nominal)		kcal/h	28,800	
		*1 BTU/h	114,300	
	Power input	kW	12.05	10.24
	Current input	A	20.3-19.3-18.6	17.2-16.4-15.8
	EER	kW/kW	2.78	3.27
Temp. range of	Indoor	W.B.	15.0~24.0°C (59~75°F)	
cooling *3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	
Heating capacity *2		kW	37.5	
(Nominal)		kcal/h	32,300	
		*2 BTU/h	128,000	
	Power input	kW	11.71	11.12
	Current input	A	19.7-18.7-18.1	18.7-17.8-17.1
	COP	kW/kW	3.20	3.37
Temp. range of	Indoor	D.B.	15.0~27.0°C (59~81°F)	
heating *3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	
Indoor unit	Total capacity		50~150% of outdoor unit capacity	
connectable	Model/Quantity		WP15~WP50/3~30	
Sound pressure level (measured in anechoic room)		dB <A>	62.5	
Sound power level (measured in anechoic room)		dB <A>	86	
Refrigerant	High pressure	mm (in.)	19.05 (3/4) Brazed	
piping diameter	Low pressure	mm (in.)	22.2 (7/8) Brazed	
FAN	Type x Quantity		Propeller fan x 1	
	Air flow rate	m^3/min	230	
		L/s	3,833	
		cfm	8,121	
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	
	Motor output	kW	0.92 x 1	
*4	External static press.		0 Pa (0 mmH_2O)	
Compressor	Type		Inverter scroll hermetic compressor	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	8.1	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	
External dimension H x W x D		mm	1,710 (1,650 without legs) x 1,220 x 740	
		in.	67-3/8 (65 without legs) x 48-1/16 x 29-3/16	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	
	Compressor		-	
	Fan motor		-	
Refrigerant	Type x original charge		R410A x 8.0 kg (18 lbs)	
	Control		HBC controller	
Net weight		kg (lbs)	244 (538)	
Heat exchanger			Salt-resistant cross fin & aluminium tube	
HIC circuit (HIC: Heat Inter-Changer)			-	
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)	
Drawing	External		WKJ94T757	
	Wiring		WKE94G041	
Standard attachment	Document		Installation Manual	
	Accessory		Refrigerant conn. pipe	
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3. -5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.) with cooling/heating mixed operation.
4. External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			PURY-EP350YLM-A1 (-BS)	
Number of HBC controller			**Single HBC**	**Double HBC**
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	
Cooling capacity (Nominal)	*1	kW	40.0	
		kcal/h	34,400	
	*1	BTU/h	136,500	
	Power input	kW	17.16	13.98
	Current input	A	28.9-27.5-26.5	23.6-22.4-21.6
	EER	kW/kW	2.33	2.86
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	
*3	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	
Heating capacity (Nominal)	*2	kW	45.0	
		kcal/h	38,700	
	*2	BTU/h	153,500	
	Power input	kW	15.38	14.28
	Current input	A	25.9-24.6-23.7	24.1-22.9-22.0
	COP	kW/kW	2.92	3.15
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	
*3	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	
Indoor unit connectable	Total capacity		50~150% of outdoor unit capacity	
	Model/Quantity		WP15~WP50/4~35	
Sound pressure level (measured in anechoic room)		dB <A>	62.5	
Sound power level (measured in anechoic room)		dB <A>	86	
Refrigerant piping diameter	High pressure	mm (in.)	19.05 (3/4) Brazed	
	Low pressure	mm (in.)	28.58 (1-1/8) Brazed	
FAN	Type x Quantity		Propeller fan x 1	
	Air flow rate	m^3/min	230	
		L/s	3,833	
		cfm	8,121	
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	
	Motor output	kW	0.92 x 1	
*4	External static press.		0 Pa (0 mmH_2O)	
Compressor	Type		Inverter scroll hermetic compressor	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	10.5	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	
External dimension H x W x D		mm	1,710 (1,650 without legs) x 1,220 x 740	
		in.	67-3/8 (65 without legs) x 48-1/16 x 29-3/16	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	
	Compressor		-	
	Fan motor		-	
Refrigerant	Type x original charge		R410A x 8.0 kg (18 lbs)	
	Control		HBC controller	
Net weight		kg (lbs)	244 (538)	
Heat exchanger			Salt-resistant cross fin & aluminium tube	
HIC circuit (HIC: Heat Inter-Changer)			-	
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle)	
Drawing	External		WKJ94LT757	
	Wiring		WKE94G041	
Standard attachment	Document		Installation Manual	
	Accessory		Refrigerant conn. pipe	
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3. -5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.) with cooling/heating mixed operation.
4. External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model			PURY-EP400YLM-A1 (-BS)	PURY-EP450YLM-A1 (-BS)
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity *1 (Nominal)		kW	45.0	50.0
		kcal/h	40,000	45,000
		*1 BTU/h	153,500	170,600
	Power input	kW	13.88	16.83
	Current input	A	23.4-22.2-21.4	28.4-26.9-26.0
	EER	kW/kW	3.24	2.97
Temp. range of cooling *3	Indoor	W.B.	15.0~24.0°C (59~75°F)	15.0~24.0°C (59~75°F)
	Outdoor	D.B.	-5.0~46.0°C (23~115°F)	-5.0~46.0°C (23~115°F)
Heating capacity *2 (Nominal)		kW	50.0	56.0
		kcal/h	43,000	50,000
		*2 BTU/h	170,600	191,100
	Power input	kW	14.12	16.86
	Current input	A	23.8-22.6-21.8	28.4-27.0-26.0
	COP	kW/kW	3.54	3.32
Temp. range of heating *3	Indoor	D.B.	15.0~27.0°C (59~81°F)	15.0~27.0°C (59~81°F)
	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)	-20.0~15.5°C (-4~60°F)
Indoor unit connectable	Total capacity		50~150% of outdoor unit capacity	50~150% of outdoor unit capacity
	Model/Quantity		WP15~WP50/4~40	WP15~WP50/5~45
Sound pressure level (measured in anechoic room)		dB <A>	62.5	62.5
Sound power level (measured in anechoic room)		dB <A>	86	86
Refrigerant piping diameter	High pressure	mm (in.)	22.2 (7/8) Brazed	22.2 (7/8) Brazed
	Low pressure	mm (in.)	28.58 (1-1/8) Brazed	28.58 (1-1/8) Brazed
FAN	Type x Quantity		Propeller fan x 2	Propeller fan x 2
	Air flow rate	m^3/min	320	320
		L/s	5,333	5,333
		cfm	11,299	11,299
	Control, Driving mechanism		Inverter-control, Direct-driven by motor	Inverter-control, Direct-driven by motor
	Motor output	kW	0.92 x 2	0.92 x 2
*4	External static press.		0 Pa (0 mmH_2O)	0 Pa (0 mmH_2O)
Compressor	Type		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter	Inverter
	Motor output	kW	10.9	12.4
	Case heater	kW	-	-
	Lubricant		MEL32	MEL32
External finish			Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>	Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>
External dimension H x W x D		mm	1,710 (1,650 without legs) x 1,750 x 740	1,710 (1,650 without legs) x 1,750 x 740
		in.	67-3/8 (65 without legs) x 68-15/16 x 29-3/16	67-3/8 (65 without legs) x 68-15/16 x 29-3/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP./FAN)		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		-	-
	Fan motor		-	-
Refrigerant	Type x original charge		R410A x 10.5 kg (24 lbs)	R410A x 11.8 kg (27 lbs)
	Control		HBC controller	HBC controller
Net weight		kg (lbs)	315 (695)	336 (741)
Heat exchanger			Salt-resistant cross fin & aluminium tube	Salt-resistant cross fin & aluminium tube
HIC circuit (HIC: Heat Inter-Changer)			-	-
Defrosting method			Auto-defrost mode (Reversed refrigerant cycle, Hot gas)	Auto-defrost mode (Reversed refrigerant cycle, Hot gas)
Drawing	External		WKJ94T758	WKJ94T758
	Wiring		WKE94G042	WKE94G042
Standard attachment	Document		Installation Manual	Installation Manual
	Accessory		Refrigerant conn. pipe	Refrigerant conn. pipe
Optional parts			Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1	Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.	Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.

Notes:

1.Nominal cooling conditions (subject to JIS B8615-2)
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B./24°CW.B. (95°FD.B./75°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2.Nominal heating conditions (subject to JIS B8615-2)
Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3.-5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.)
with cooling/heating mixed operation.
4.External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

1. SPECIFICATIONS

Model				PURY-EP500YLM-A1 (-BS)
Power source				3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity (Nominal)		*1	kW	56.0
			kcal/h	50,000
		*1	BTU/h	191,100
	Power input		kW	21.22
	Current input		A	35.8-34.0-32.8
	EER		kW/kW	2.63
Temp. range of cooling	Indoor	*3	W.B.	15.0~24.0°C (59~75°F)
	Outdoor	*3	D.B.	-5.0~46.0°C (23~115°F)
Heating capacity (Nominal)		*2	kW	63.0
			kcal/h	54,200
		*2	BTU/h	215,000
	Power input		kW	21.67
	Current input		A	36.5-34.7-33.4
	COP		kW/kW	2.90
Temp. range of heating	Indoor	*3	D.B.	15.0~27.0°C (59~81°F)
	Outdoor	*3	W.B.	-20.0~15.5°C (-4~60°F)
Indoor unit connectable	Total capacity			50~150% of outdoor unit capacity
	Model/Quantity			WP15~WP50/5~50
Sound pressure level (measured in anechoic room)			dB <A>	63.5
Sound power level (measured in anechoic room)			dB <A>	87
Refrigerant piping diameter	High pressure		mm (in.)	22.2 (7/8) Brazed
	Low pressure		mm (in.)	28.58 (1-1/8) Brazed
FAN	Type x Quantity			Propeller fan x 2
	Air flow rate		m^3/min	380
			L/s	6,333
			cfm	13,418
	Control, Driving mechanism			Inverter-control, Direct-driven by motor
	Motor output		kW	0.92 x 2
	External static press.	*4		0 Pa (0 mmH_2O)
Compressor	Type			Inverter scroll hermetic compressor
	Manufacture			AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method			Inverter
	Motor output		kW	13.4
	Case heater		kW	0.045 (240V)
	Lubricant			MEL32
External finish				Pre-coated galvanized steel sheets (+powder coating for -BS type) <MUNSELL 5Y 8/1 or similar>
External dimension H x W x D			mm	1,710 (1,650 without legs) x 1,750 x 740
			in.	67-3/8 (65 without legs) x 68-15/16 x 29-3/16
Protection devices	High pressure protection			High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP./FAN)			Over-heat protection, Over-current protection
	Compressor			-
	Fan motor			-
Refrigerant	Type x original charge			R410A x 11.8 kg (27 lbs)
	Control			HBC controller
Net weight			kg (lbs)	349 (770)
Heat exchanger				Salt-resistant cross fin & aluminium tube
HIC circuit (HIC: Heat Inter-Changer)				-
Defrosting method				Auto-defrost mode (Reversed refrigerant cycle, Hot gas)
Drawing	External			WKJ94T758
	Wiring			WKE94G044
Standard attachment	Document			Installation Manual
	Accessory			Refrigerant conn. pipe
Optional parts				Main HBC controller: CMB-WP108,1016V-GA1 Sub HBC controller: CMB-WP108,1016V-GB1
Remarks				Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice.

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B./24°CW.B. (95°FD.B./75°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
3. -5°CD.B. (23°FD.B.)/-6°CW.B. (21°FW.B.) to 21°CD.B. (70°FD.B.)/15.5°CW.B. (60°FW.B.)
   with cooling/heating mixed operation.
4. External static pressure option is available (30 Pa, 60 Pa/3.1 mmH_2O, 6.1 mmH_2O).

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.

2. CAPACITY TABLES

2-1. Correction by temperature

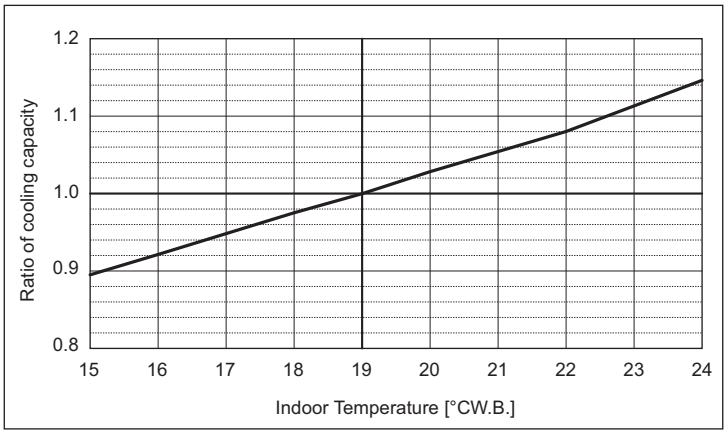
CITY MULTI could have varied capacity at different designing temperature. Using the nominal cooling/heating capacity value and the ratio below, the capacity can be observed at various temperature.

PURY-		P200YLM-A1	P250YLM-A1
Nominal Cooling Capacity	kW	22.4	28.0
	BTU/h	76,400	95,500
Input	kW	7.00	9.92

PURY-		EP200YLM-A1	EP250YLM-A1
Nominal Cooling Capacity	kW	22.4	28.0
	BTU/h	76,400	95,500
Input	kW	6.27	8.77

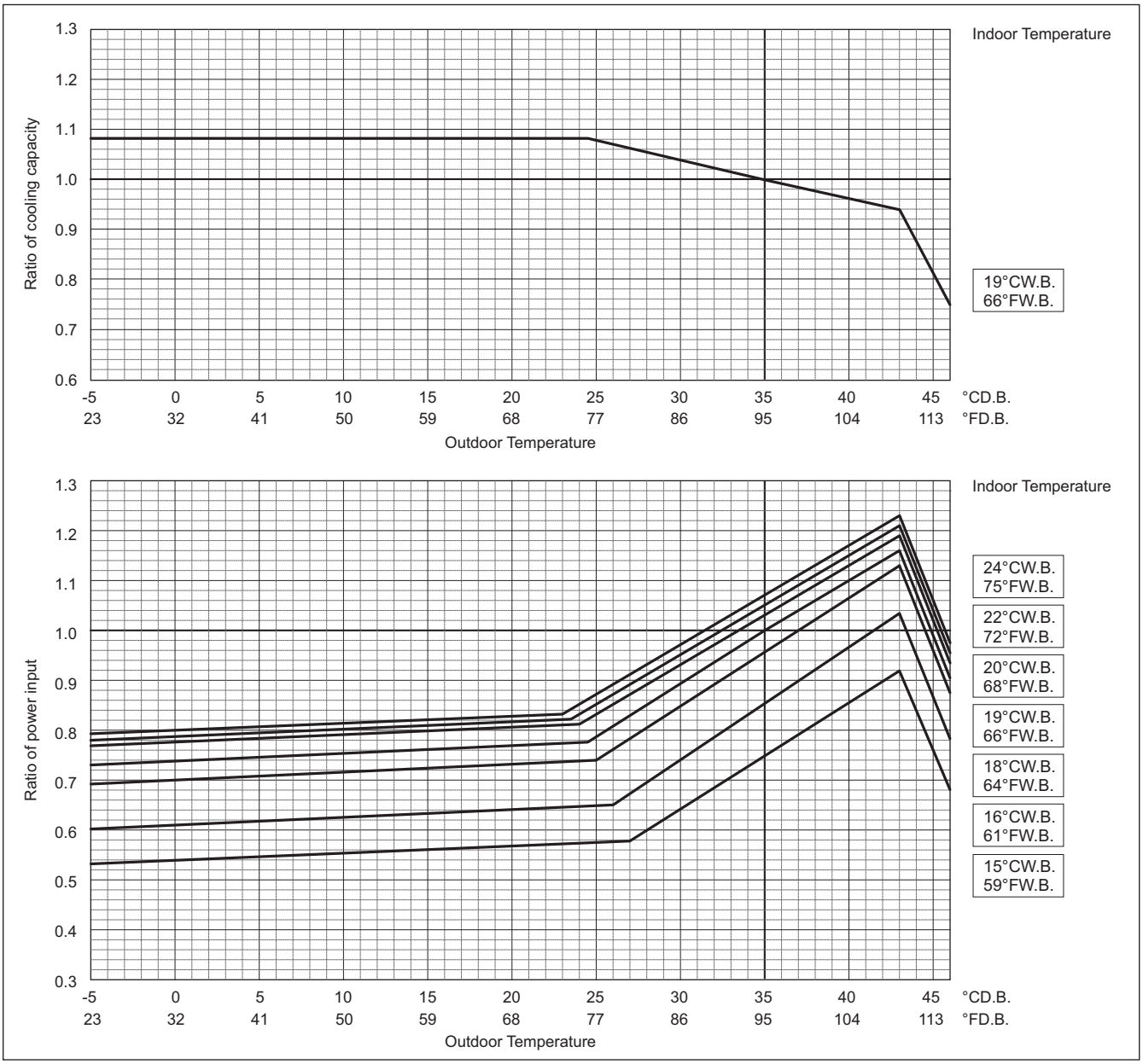
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

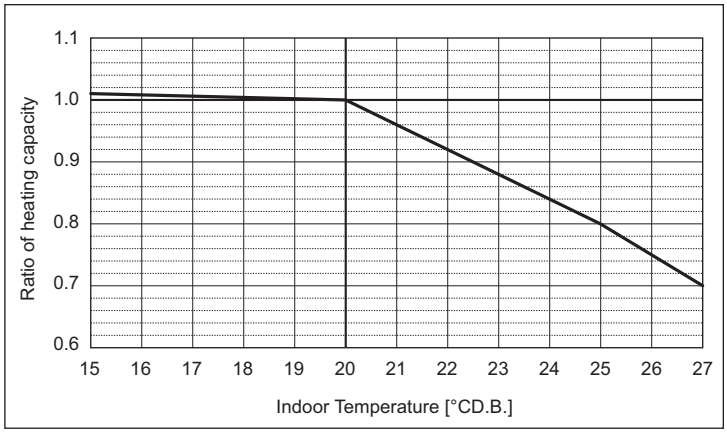
2. CAPACITY TABLES

PURY-		P200YLM-A1	P250YLM-A1
Nominal Heating Capacity	kW	25.0	31.5
	BTU/h	85,300	107,500
Input	kW	7.08	10.06

PURY-		EP200YLM-A1	EP250YLM-A1
Nominal Heating Capacity	kW	25.0	31.5
	BTU/h	85,300	107,500
Input	kW	6.92	9.84

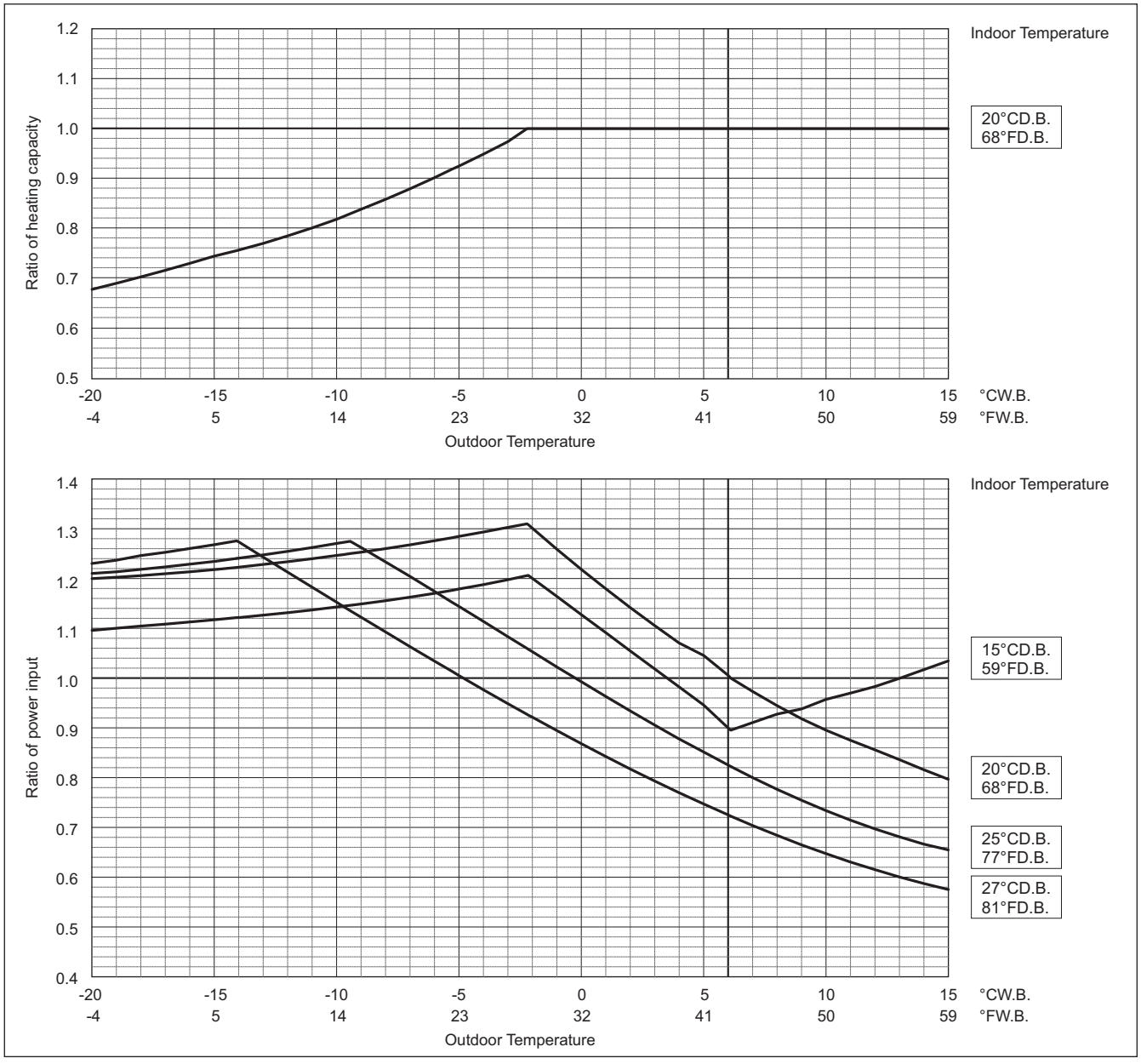
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

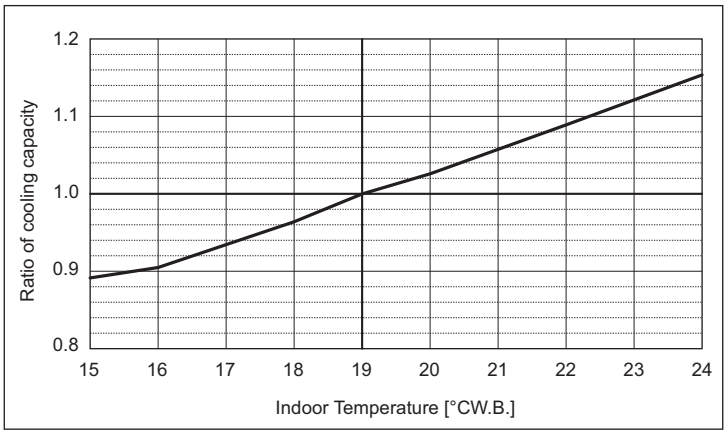
2. CAPACITY TABLES

PURY-		P300YLM-A1	P350YLM-A1	P400YLM-A1
Nominal Cooling Capacity	kW	33.5	40.0	45.0
	BTU/h	114,300	136,500	153,500
Input	kW	13.34	17.93	16.65

PURY-		EP300YLM-A1	EP350YLM-A1	EP400YLM-A1
Nominal Cooling Capacity	kW	33.5	40.0	45.0
	BTU/h	114,300	136,500	153,500
Input	kW	12.05	17.16	13.88

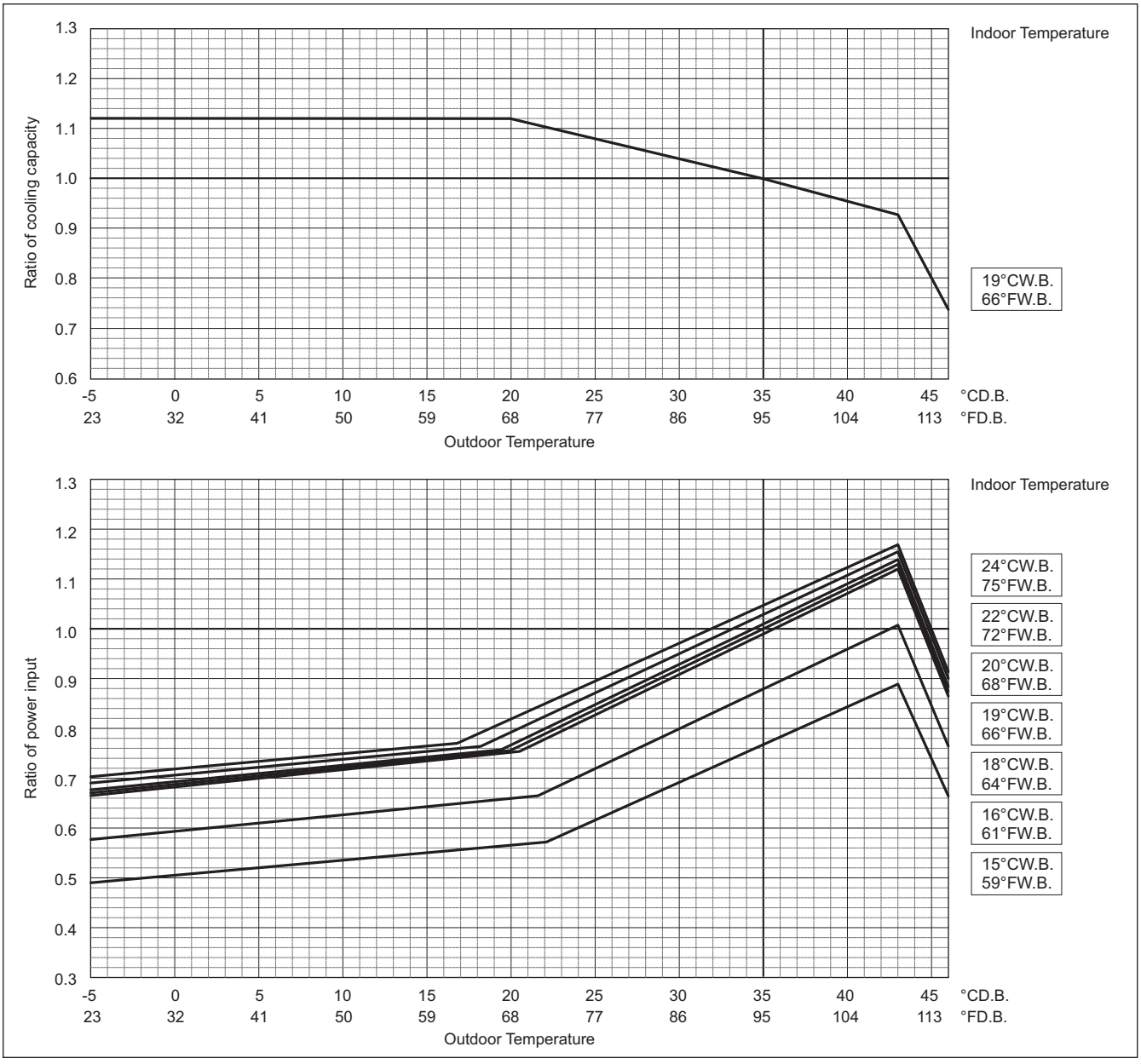
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

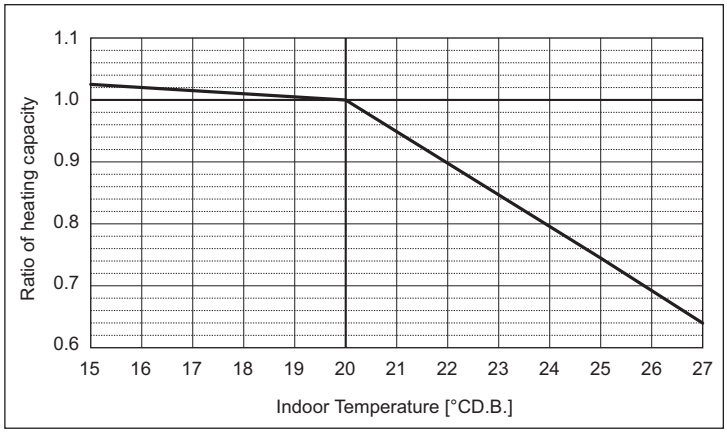
2. CAPACITY TABLES

PURY-		P300YLM-A1	P350YLM-A1	P400YLM-A1
Nominal Heating Capacity	kW	37.5	45.0	45.0
	BTU/h	128,000	153,500	153,500
Input	kW	12.71	15.51	13.39

PURY-		EP300YLM-A1	EP350YLM-A1	EP400YLM-A1
Nominal Heating Capacity	kW	37.5	45.0	50.0
	BTU/h	128,000	153,500	170,600
Input	kW	11.71	15.38	14.12

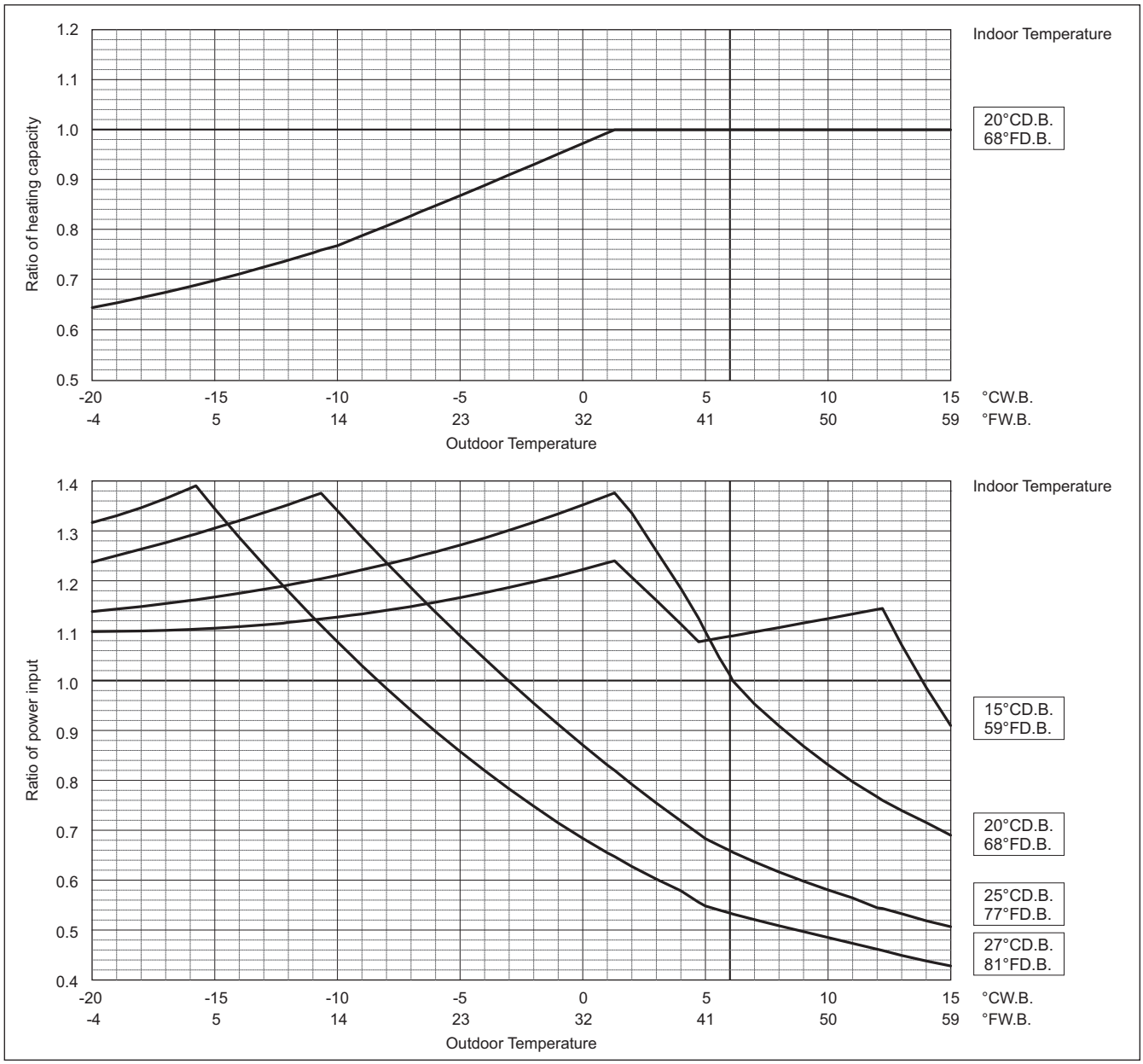
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

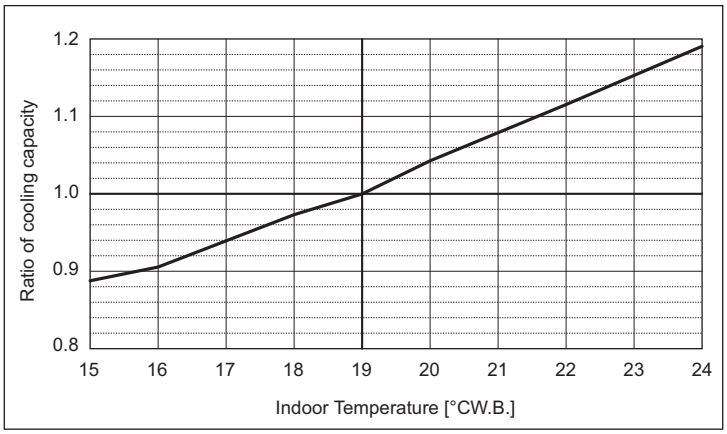
2. CAPACITY TABLES

PURY-		P450YLM-A1	P500YLM-A1
Nominal Cooling Capacity	kW	50.0	56.0
	BTU/h	170,600	191,100
Input	kW	17.92	22.67

PURY-		EP450YLM-A1	EP500YLM-A1
Nominal Cooling Capacity	kW	50.0	56.0
	BTU/h	170,600	191,100
Input	kW	16.83	21.22

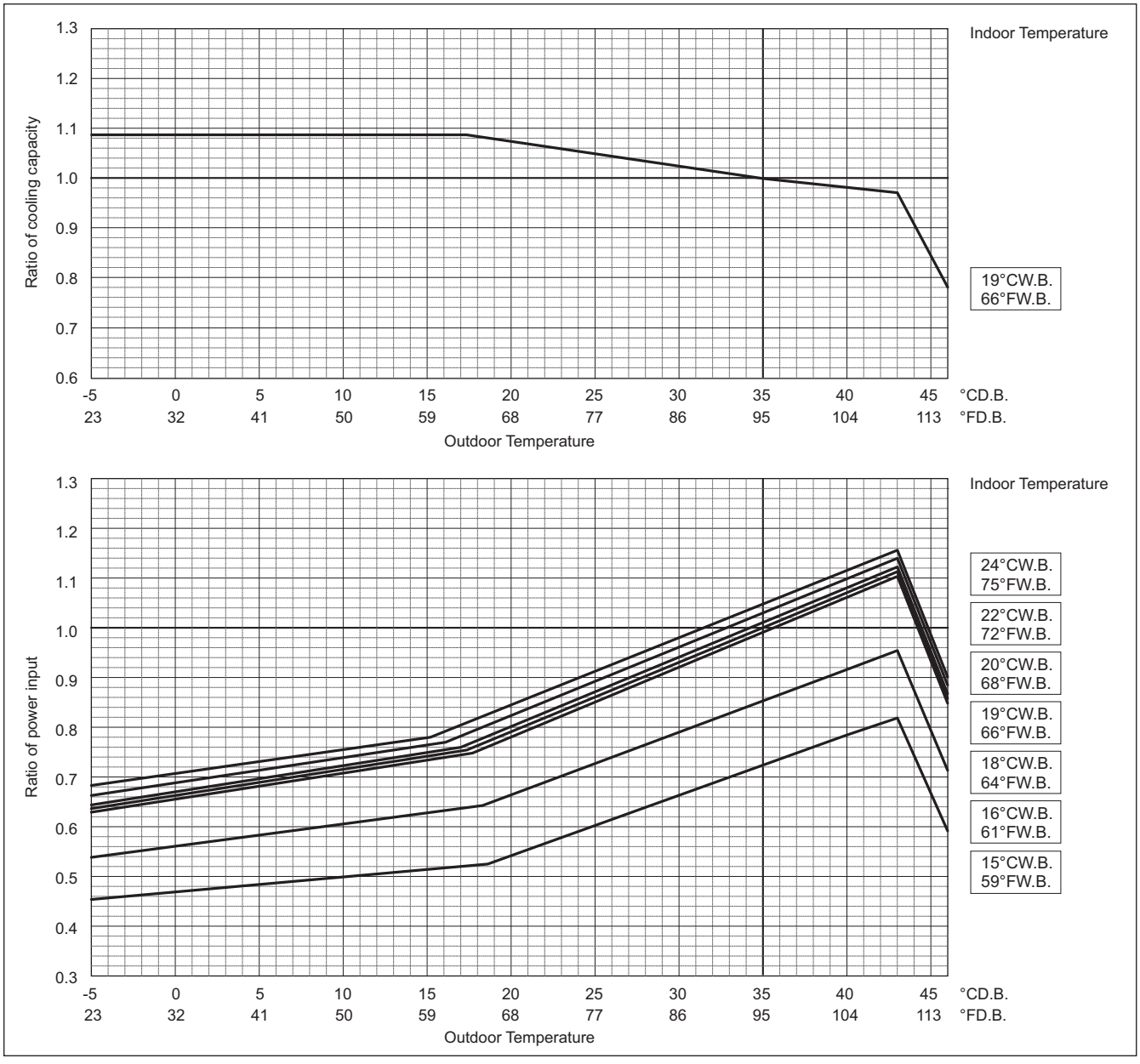
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

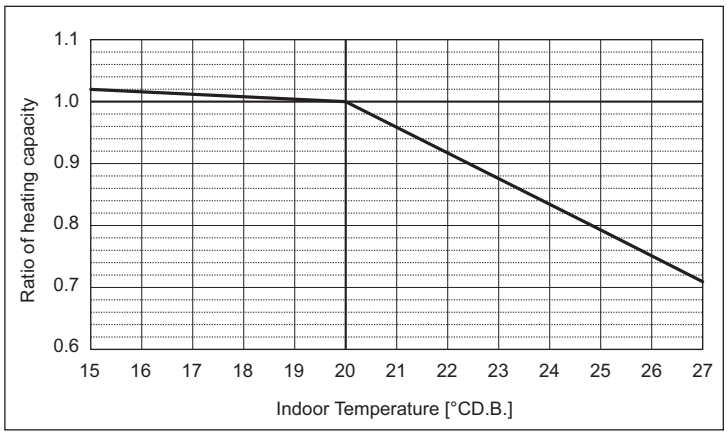
2. CAPACITY TABLES

PURY-		P450YLM-A1	P500YLM-A1
Nominal Heating Capacity	kW	56.0	58.0
	BTU/h	191,100	197,900
Input	kW	17.39	17.53

PURY-		EP450YLM-A1	EP500YLM-A1
Nominal Heating Capacity	kW	56.0	63.0
	BTU/h	191,100	215,000
Input	kW	16.86	21.67

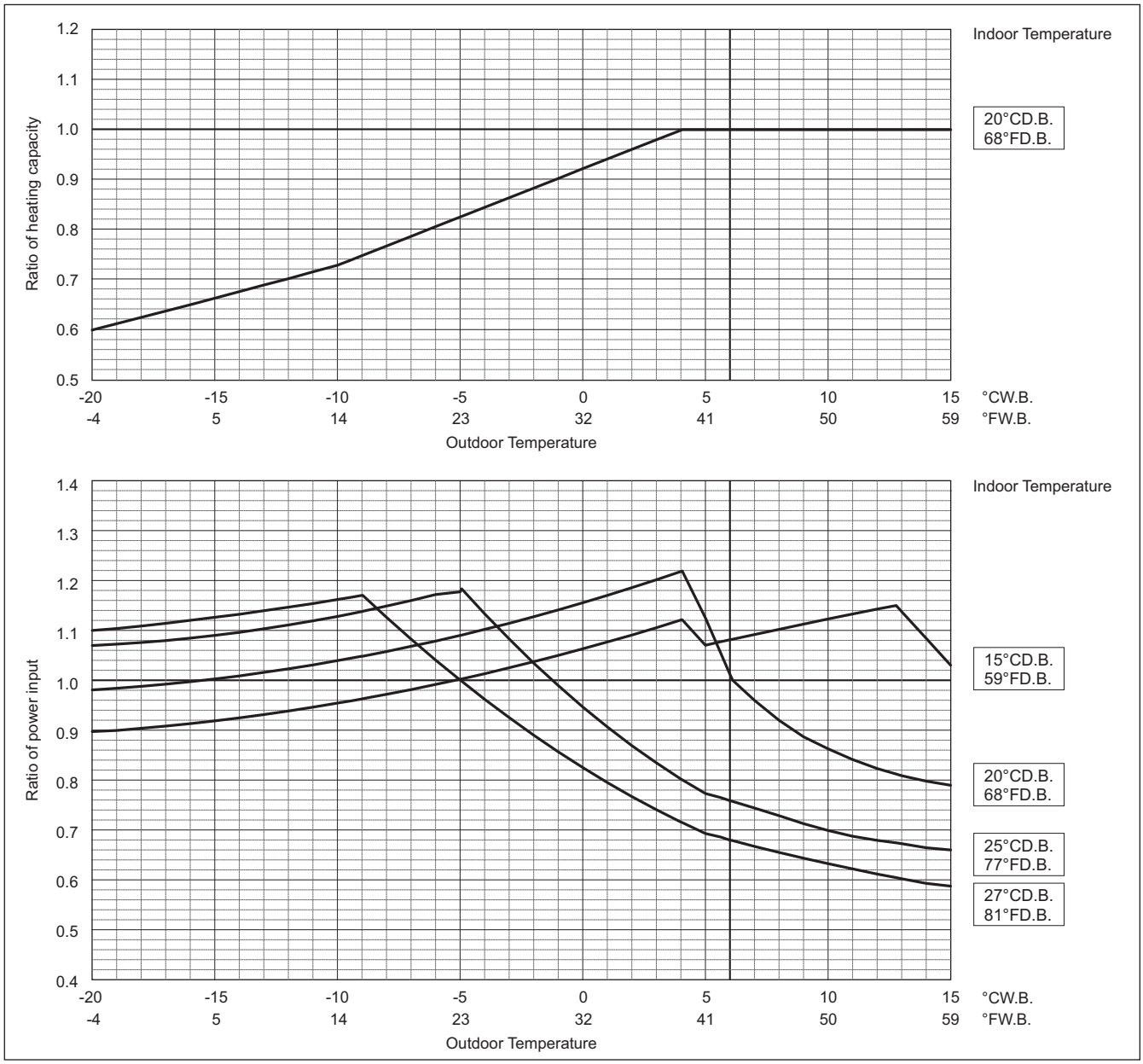
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

2. CAPACITY TABLES

Correction by temperature (COP Priority Mode)

CITY MULTI could have various capacities at different designing temperatures. Using the nominal cooling/heating capacity values and the ratios below, the capacity can be found for various temperatures.

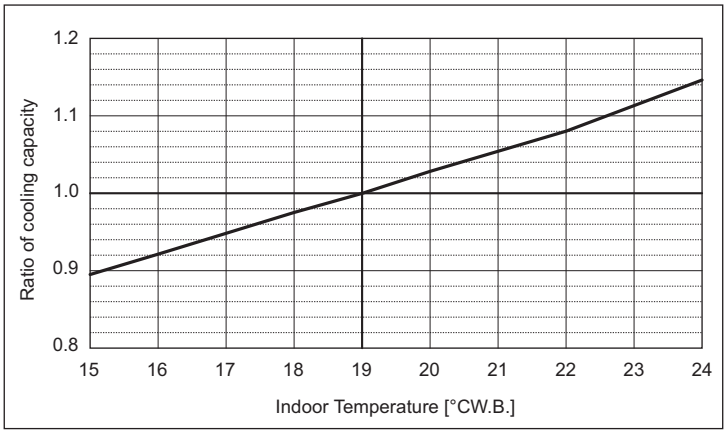
To select COP priority mode, DipSW 3-7 must be set to ON.

PURY-		P200YLM-A1	P250YLM-A1
Nominal Cooling Capacity	kW	22.4	28.0
	BTU/h	76,400	95,500
Input	kW	7.00	9.92

PURY-		EP200YLM-A1	EP250YLM-A1
Nominal Cooling Capacity	kW	22.4	28.0
	BTU/h	76,400	95,500
Input	kW	6.27	8.77

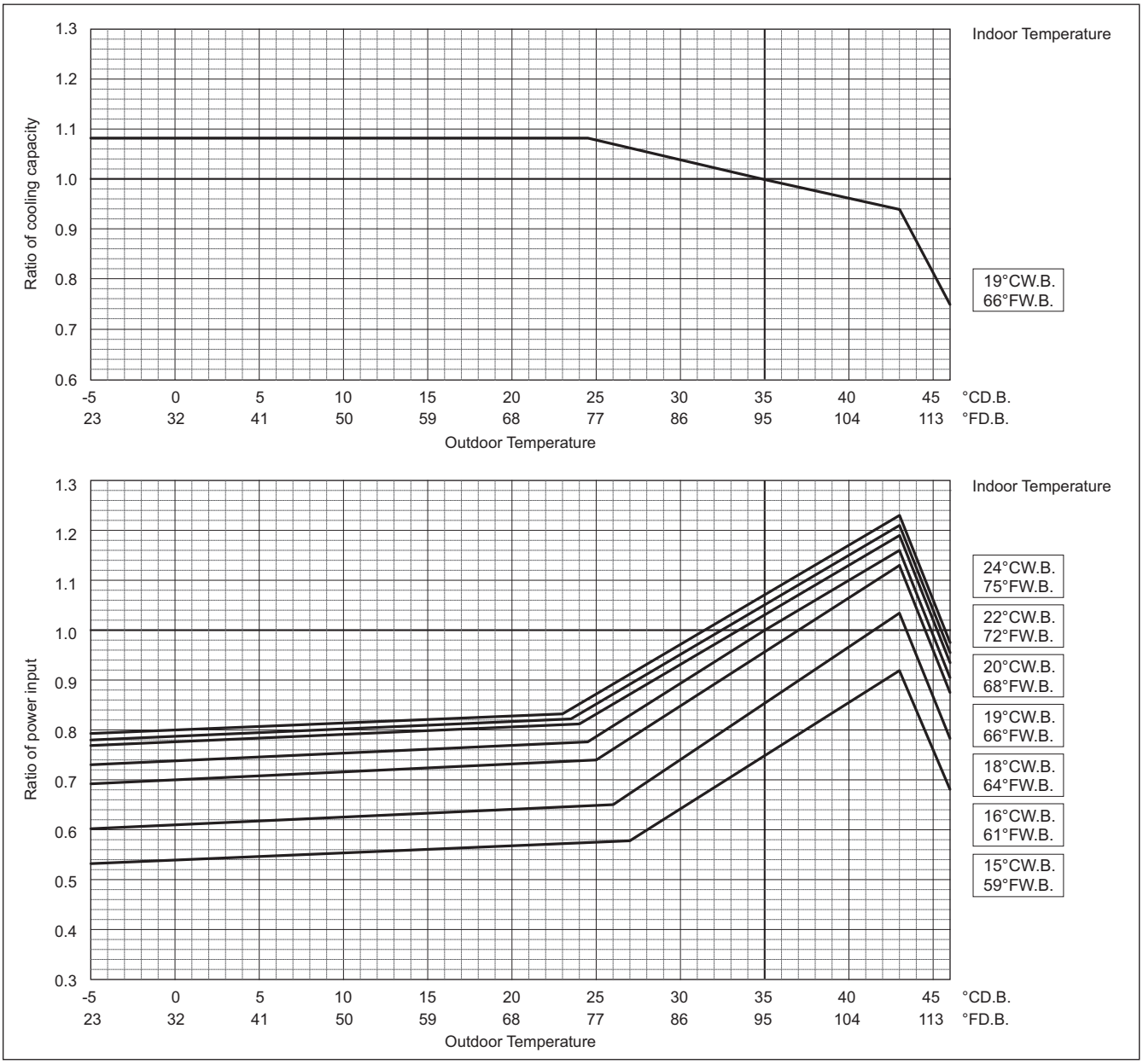
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

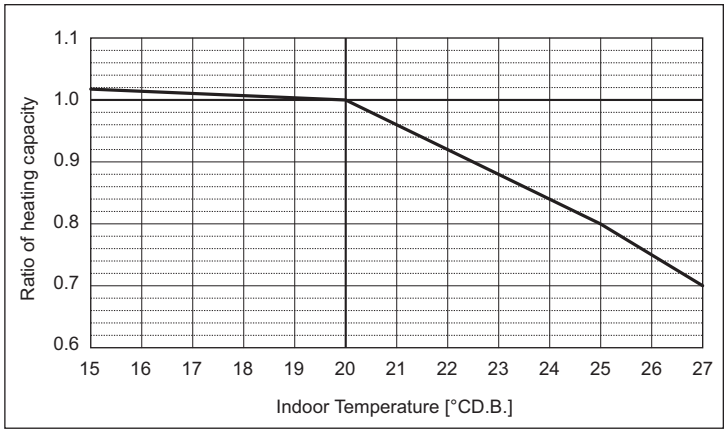
2. CAPACITY TABLES

PURY-		P200YLM-A1	P250YLM-A1
Nominal Heating Capacity	kW	25.0	31.5
	BTU/h	85,300	107,500
Input	kW	7.08	10.06

PURY-		EP200YLM-A1	EP250YLM-A1
Nominal Heating Capacity	kW	25.0	31.5
	BTU/h	85,300	107,500
Input	kW	6.92	9.84

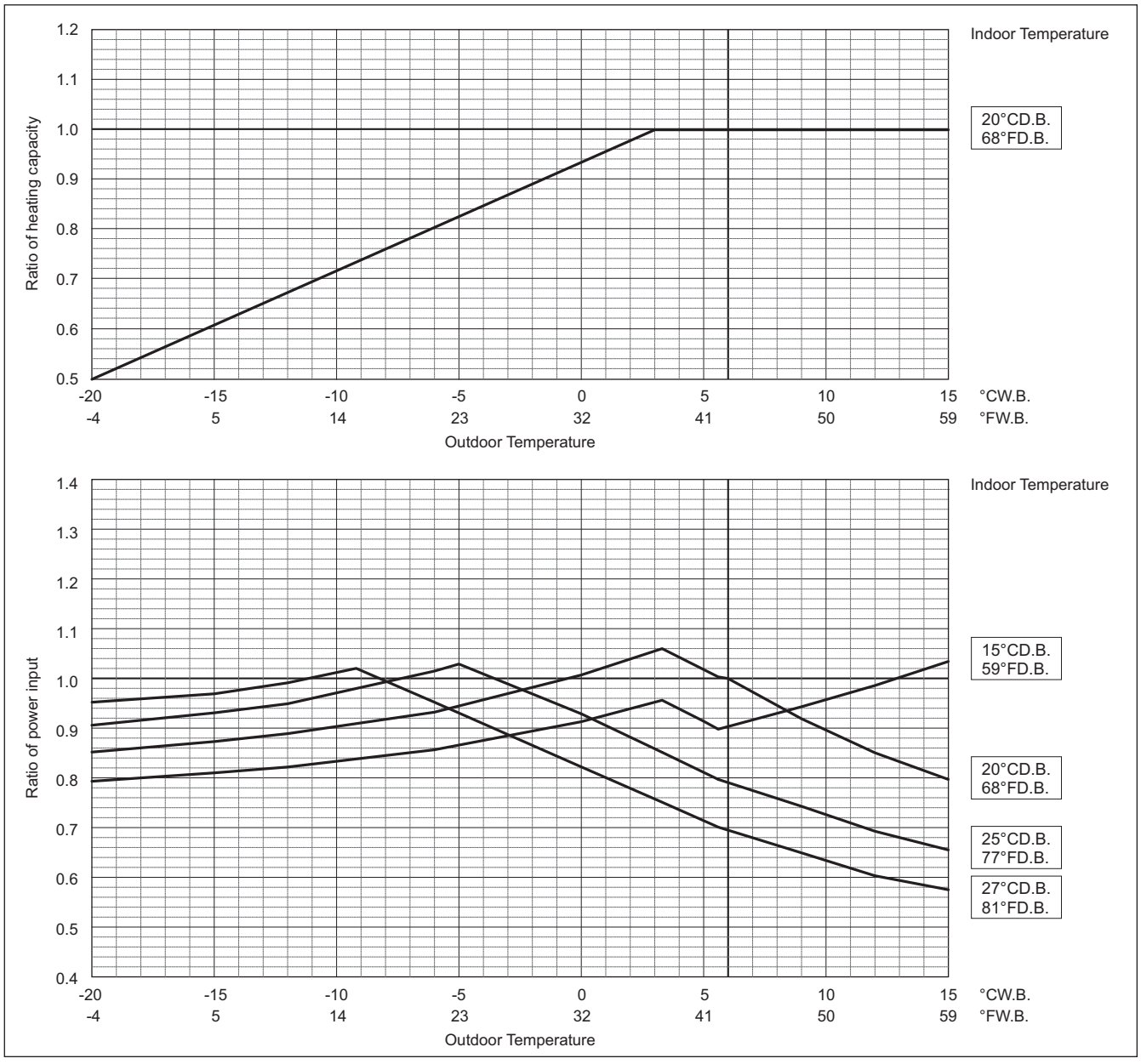
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

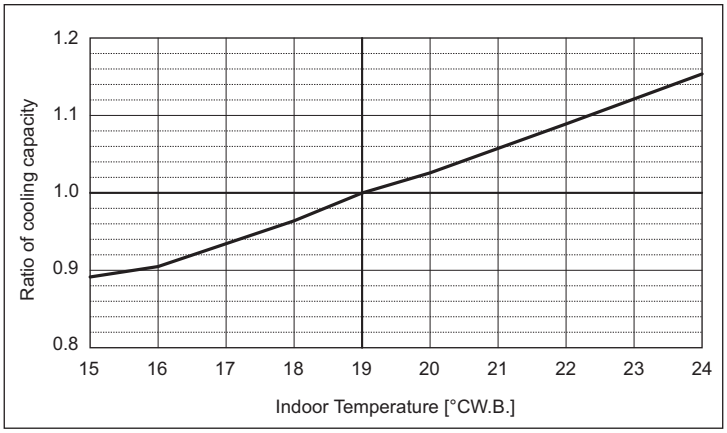
2. CAPACITY TABLES

PURY-		P300YLM-A1	P350YLM-A1	P400YLM-A1
Nominal Cooling Capacity	kW	33.5	40.0	45.0
	BTU/h	114,300	136,500	153,500
Input	kW	13.34	17.93	16.65

PURY-		EP300YLM-A1	EP350YLM-A1	EP400YLM-A1
Nominal Cooling Capacity	kW	33.5	40.0	45.0
	BTU/h	114,300	136,500	153,500
Input	kW	12.05	17.16	13.88

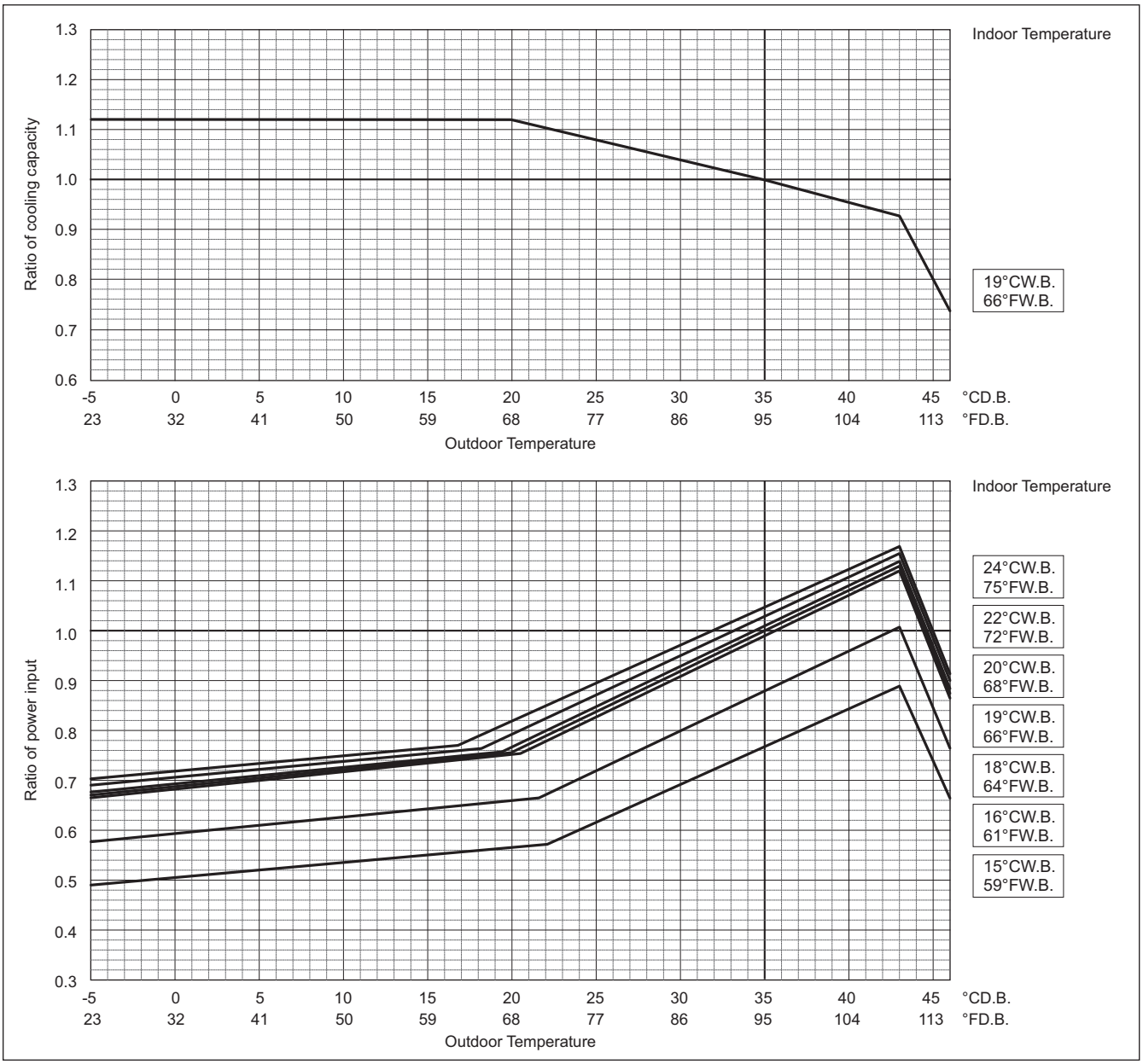
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

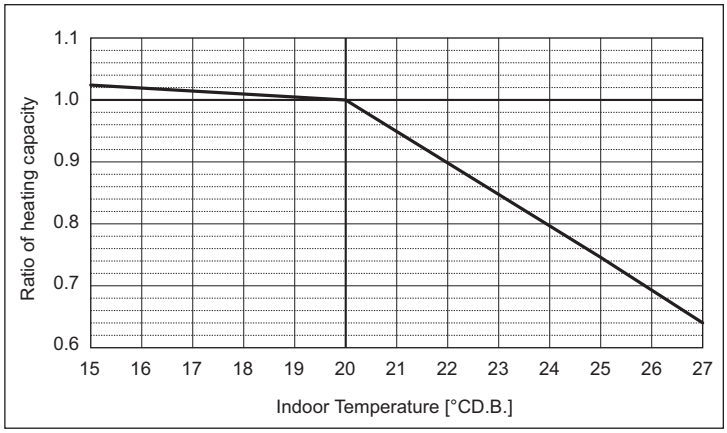
2. CAPACITY TABLES

PURY-		P300YLM-A1	P350YLM-A1	P400YLM-A1
Nominal Heating Capacity	kW	37.5	45.0	45.0
	BTU/h	128,000	153,500	153,500
Input	kW	12.71	15.51	13.39

PURY-		EP300YLM-A1	EP350YLM-A1	EP400YLM-A1
Nominal Heating Capacity	kW	37.5	45.0	50.0
	BTU/h	128,000	153,500	170,600
Input	kW	11.71	15.38	14.12

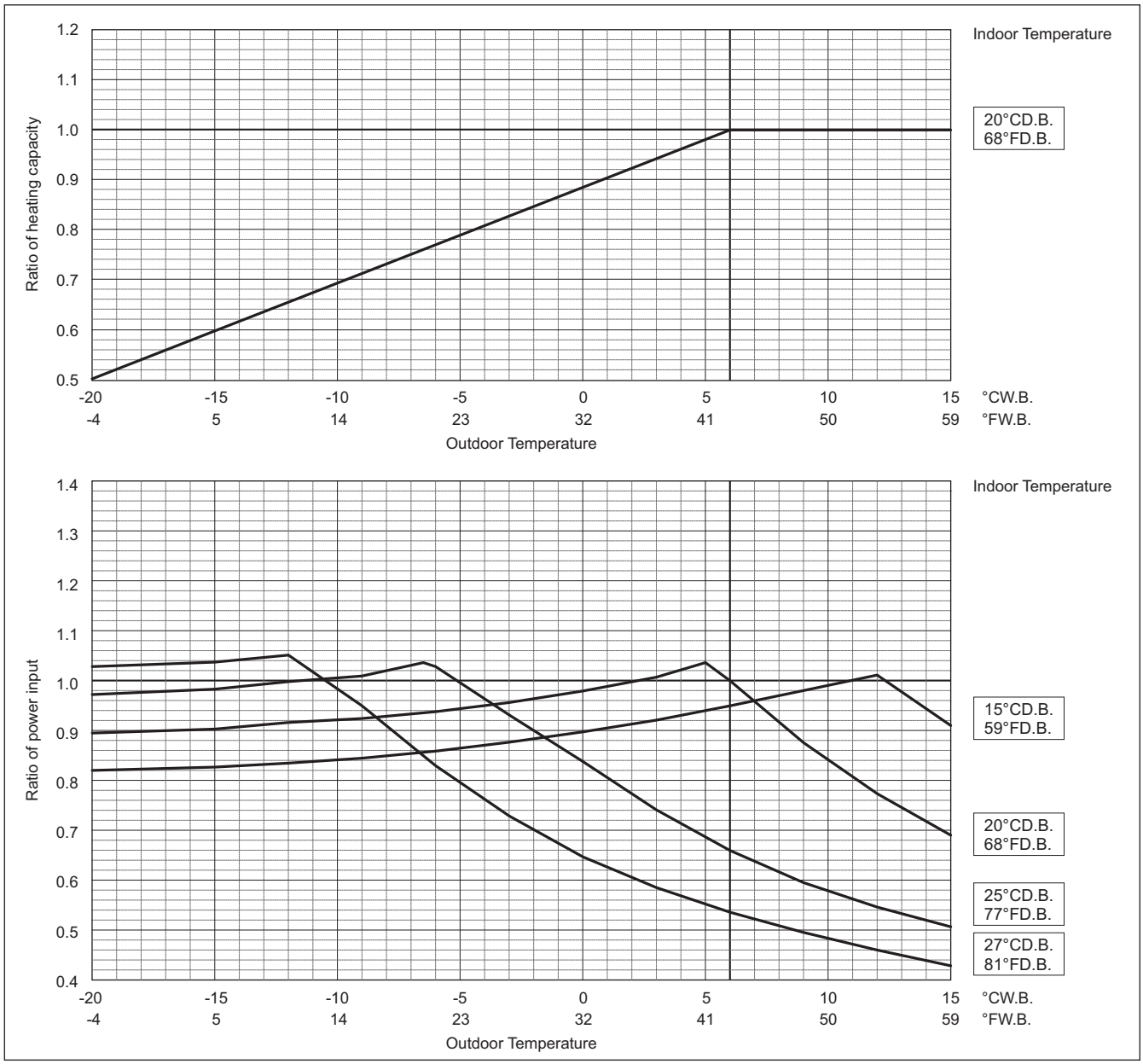
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

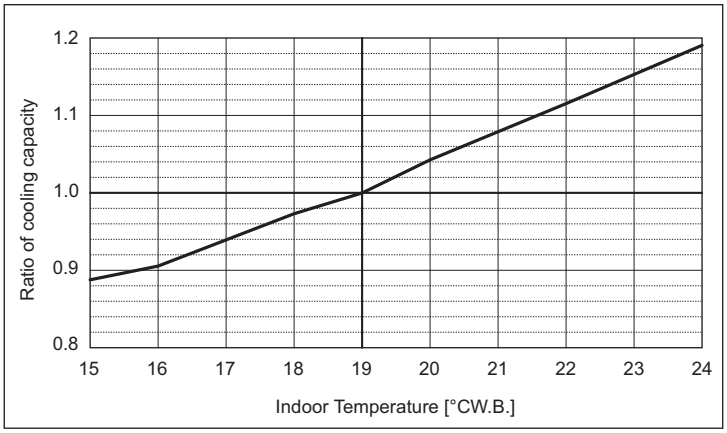
2. CAPACITY TABLES

PURY-		P450YLM-A1	P500YLM-A1
Nominal Cooling Capacity	kW	50.0	56.0
	BTU/h	170,600	191,100
Input	kW	17.92	22.67

PURY-		EP450YLM-A1	EP500YLM-A1
Nominal Cooling Capacity	kW	50.0	56.0
	BTU/h	170,600	191,100
Input	kW	16.83	21.22

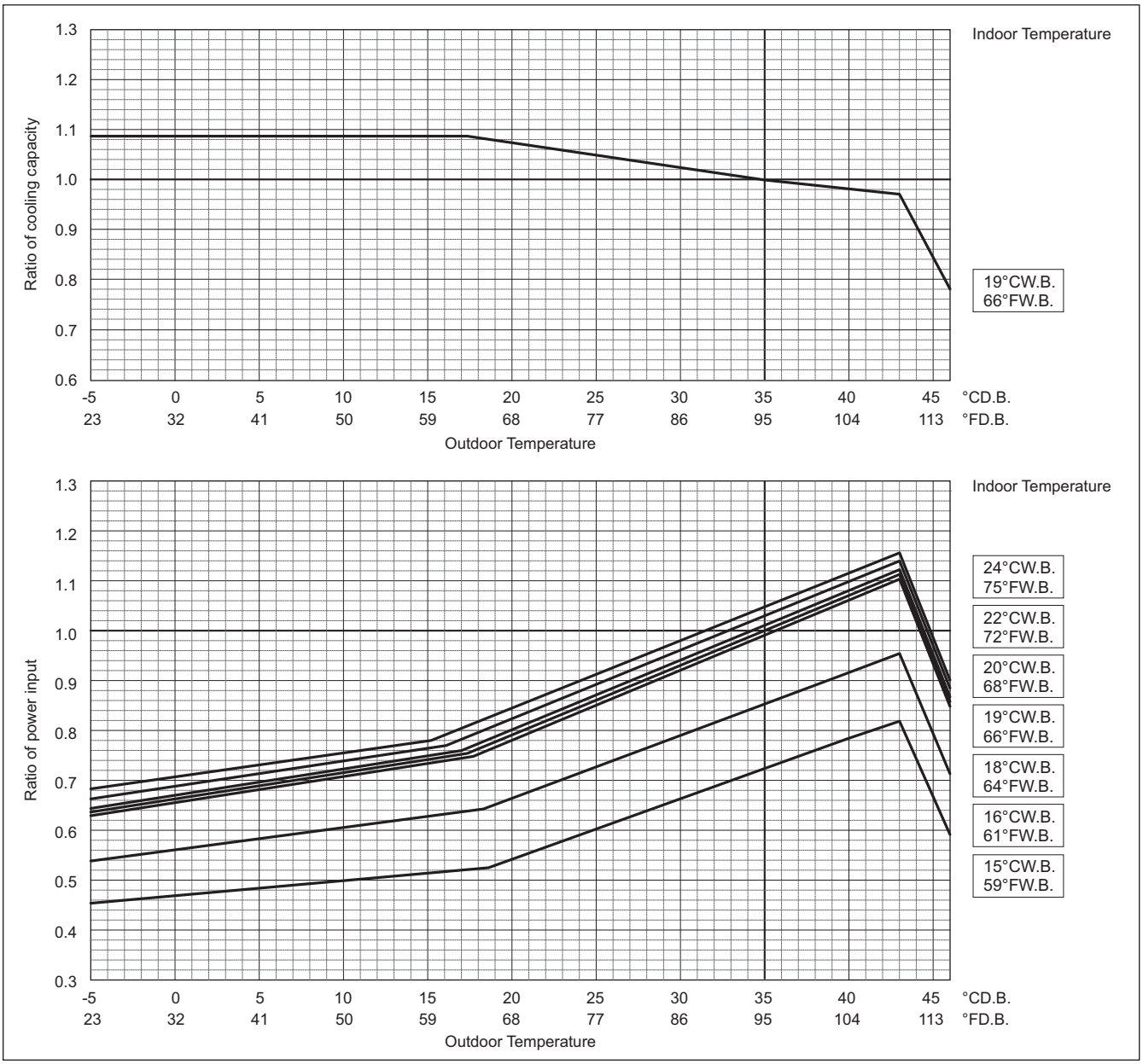
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

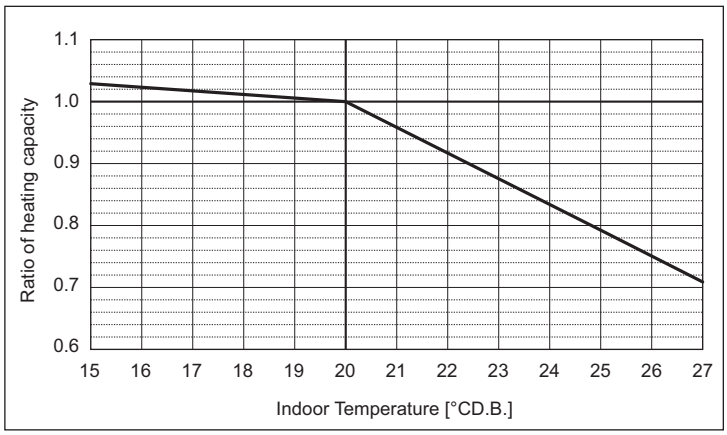
2. CAPACITY TABLES

PURY-		P450YLM-A1	P500YLM-A1
Nominal Heating Capacity	kW	56.0	58.0
	BTU/h	191,100	197,900
Input	kW	17.39	17.53

PURY-		EP450YLM-A1	EP500YLM-A1
Nominal Heating Capacity	kW	56.0	63.0
	BTU/h	191,100	215,000
Input	kW	16.86	21.67

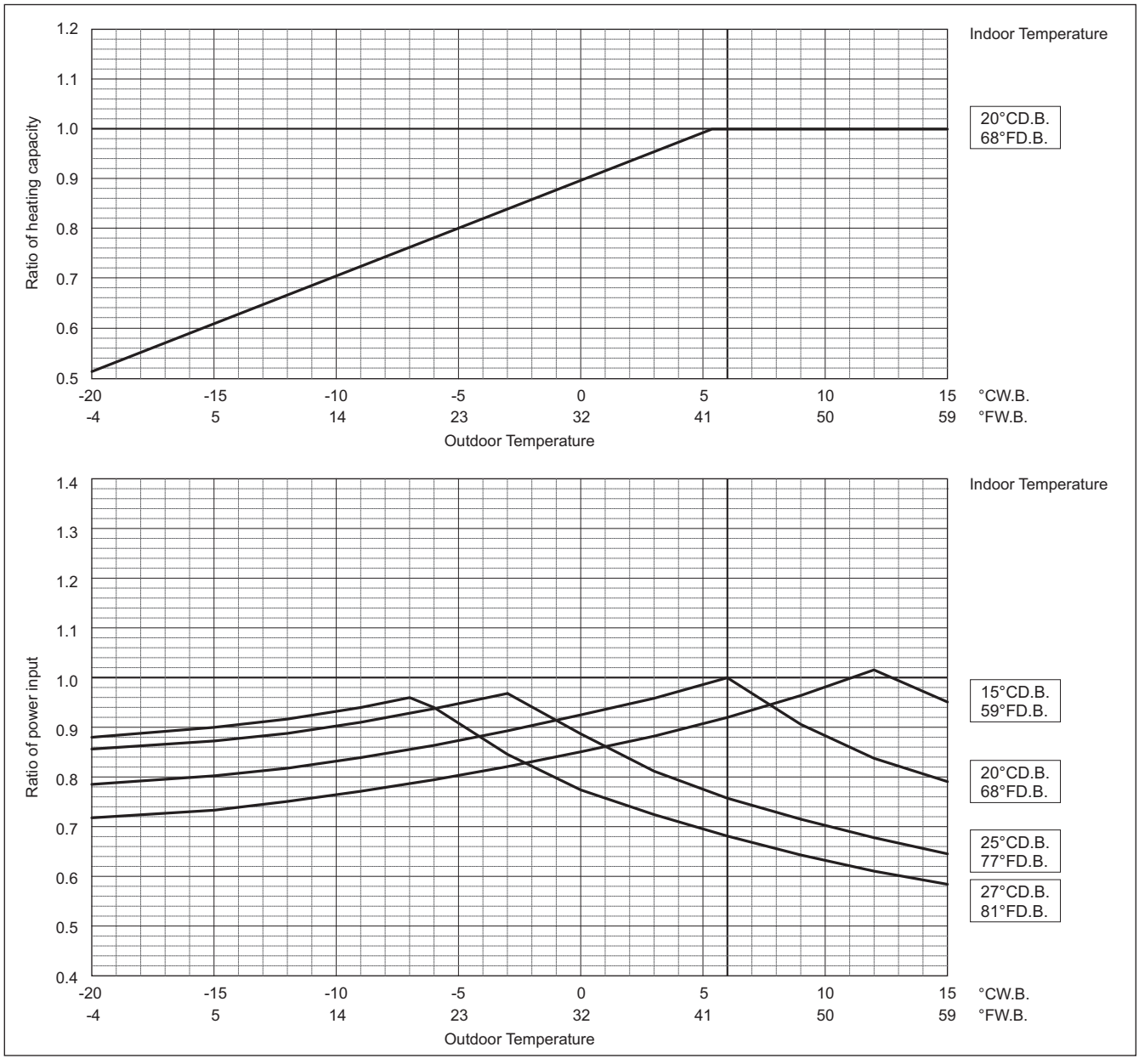
Indoor unit temperature correction

To be used to correct indoor unit capacity only



Outdoor unit temperature correction

To be used to correct outdoor unit only



Outdoor unit power input is affected by the indoor and outdoor temperatures as shown in the graph above. Please consult the sales office for details.

2-2. Correction by total indoor

CITY MULTI system have different capacities and inputs when many combinations of indoor units with different total capacities are connected. Using following tables, the maximum capacity can be found to ensure the system is installed with enough capacity for a particular application.

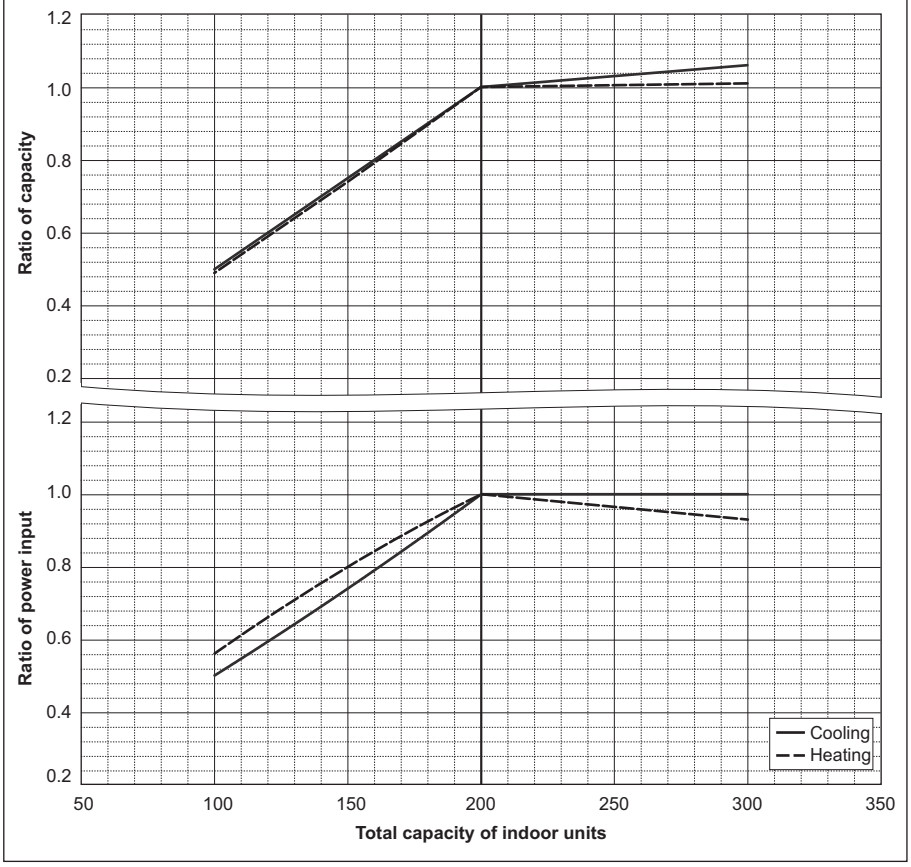
PURY-P200YLM-A1		
Nominal Cooling Capacity	kW	22.4
	BTU/h	76,400
Input	kW	7.00

PURY-P200YLM-A1		
Nominal Heating Capacity	kW	25.0
	BTU/h	85,300
Input	kW	7.08

PURY-EP200YLM-A1		
Nominal Cooling Capacity	kW	22.4
	BTU/h	76,400
Input	kW	6.27

PURY-EP200YLM-A1		
Nominal Heating Capacity	kW	25.0
	BTU/h	85,300
Input	kW	6.92

PURY-(E)P200YLM-A1



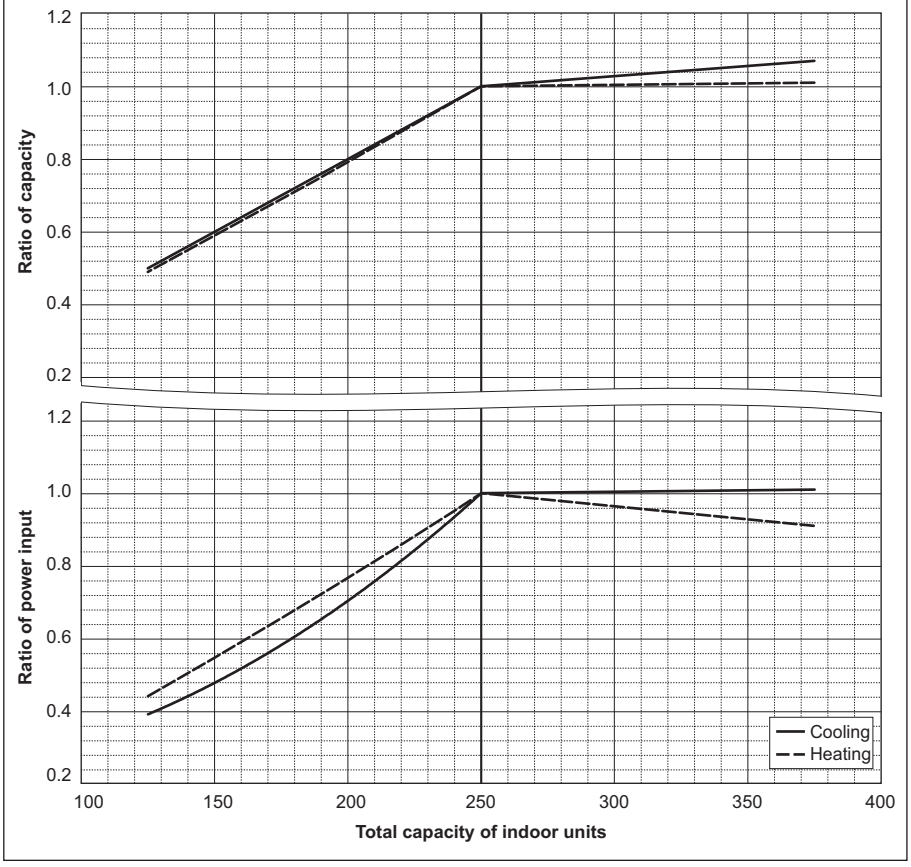
PURY-P250YLM-A1		
Nominal Cooling Capacity	kW	28.0
	BTU/h	95,500
Input	kW	9.92

PURY-P250YLM-A1		
Nominal Heating Capacity	kW	31.5
	BTU/h	107,500
Input	kW	8.77

PURY-EP250YLM-A1		
Nominal Cooling Capacity	kW	28.0
	BTU/h	95,500
Input	kW	10.06

PURY-EP250YLM-A1		
Nominal Heating Capacity	kW	31.5
	BTU/h	107,500
Input	kW	9.84

PURY-(E)P250YLM-A1



2. CAPACITY TABLES

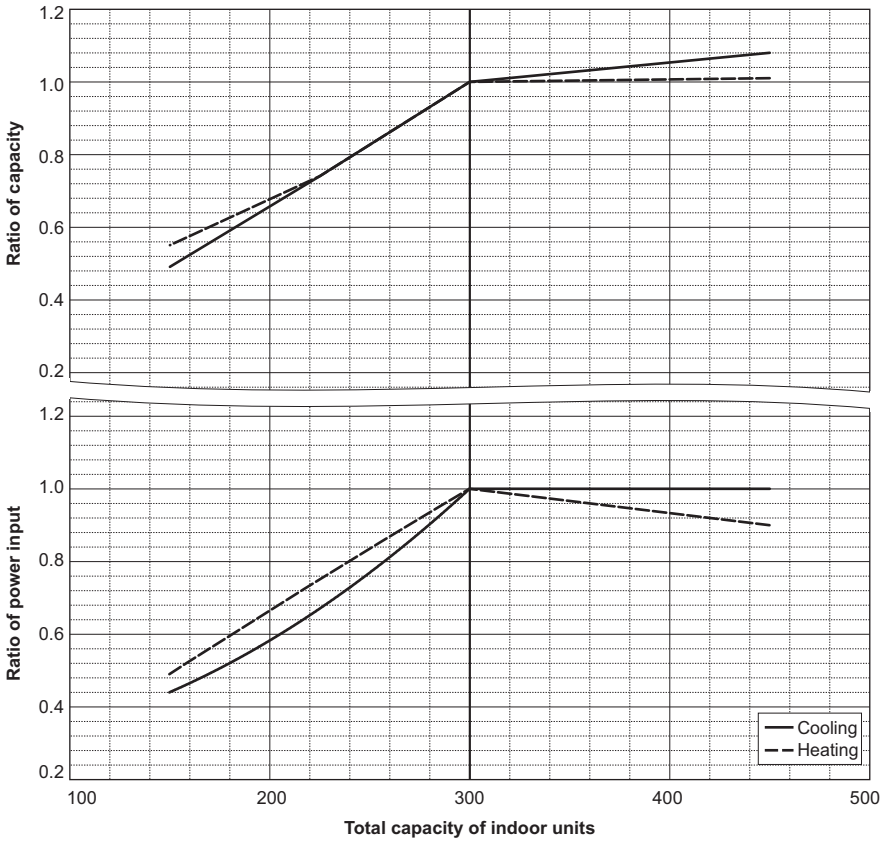
PURY-P300YLM-A1		
Nominal Cooling Capacity	kW	33.5
	BTU/h	114,300
Input	kW	13.34

PURY-P300YLM-A1		
Nominal Heating Capacity	kW	37.5
	BTU/h	128,000
Input	kW	12.71

PURY-EP300YLM-A1		
Nominal Cooling Capacity	kW	33.5
	BTU/h	114,300
Input	kW	12.05

PURY-EP300YLM-A1		
Nominal Heating Capacity	kW	37.5
	BTU/h	128,000
Input	kW	11.71

PURY-(E)P300YLM-A1



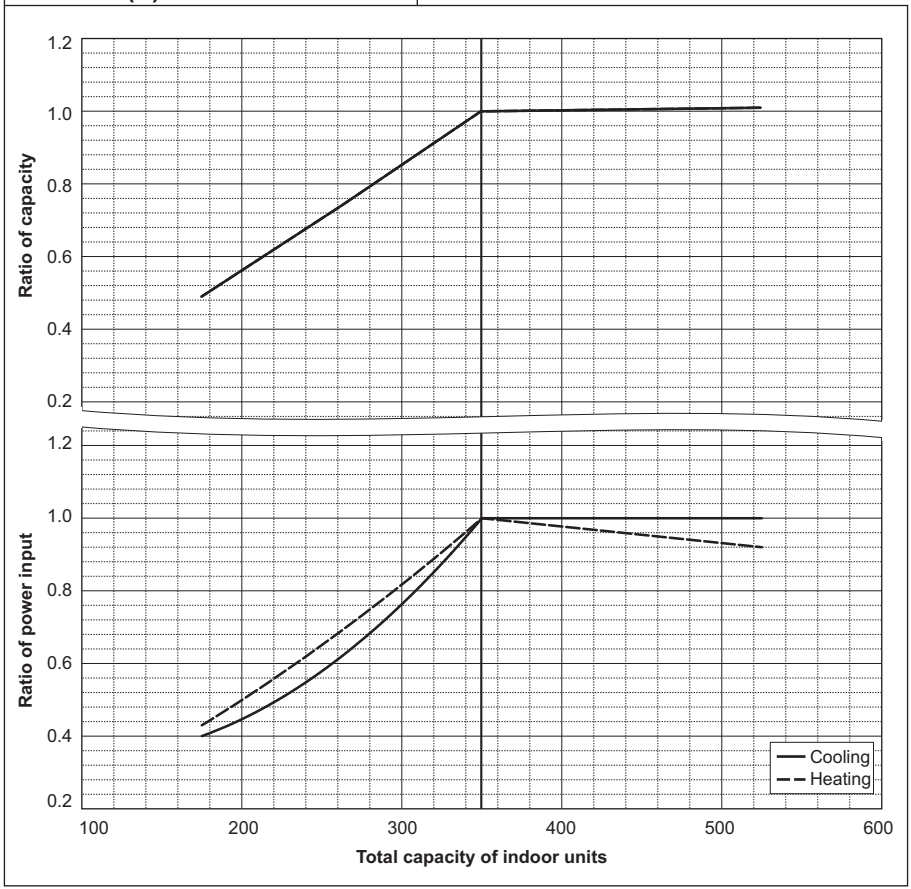
PURY-P350YLM-A1		
Nominal Cooling Capacity	kW	40.0
	BTU/h	136,500
Input	kW	17.93

PURY-P350YLM-A1		
Nominal Heating Capacity	kW	45.0
	BTU/h	153,500
Input	kW	15.51

PURY-EP350YLM-A1		
Nominal Cooling Capacity	kW	40.0
	BTU/h	136,500
Input	kW	17.16

PURY-EP350YLM-A1		
Nominal Heating Capacity	kW	45.0
	BTU/h	153,500
Input	kW	15.38

PURY-(E)P350YLM-A1



2. CAPACITY TABLES

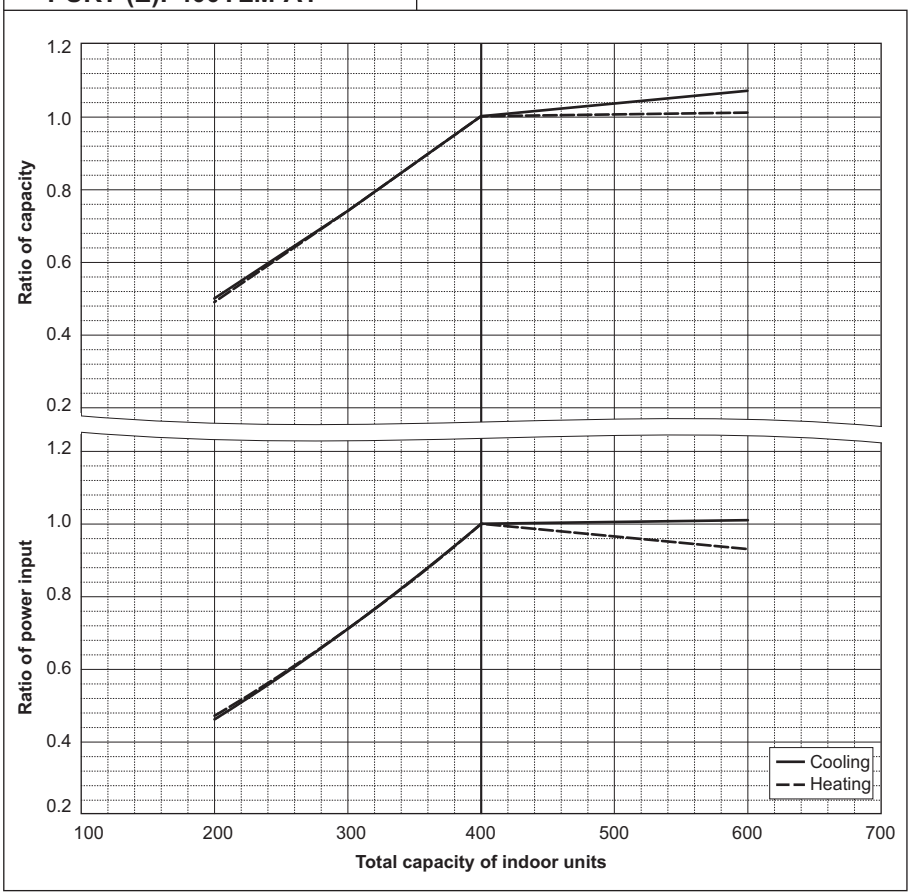
PURY-P400YLM-A1		
Nominal Cooling Capacity	kW	45.0
	BTU/h	153,500
Input	kW	16.65

PURY-P400YLM-A1		
Nominal Heating Capacity	kW	45.0
	BTU/h	153,500
Input	kW	13.39

PURY-EP400YLM-A1		
Nominal Cooling Capacity	kW	45.0
	BTU/h	153,500
Input	kW	13.88

PURY-EP400YLM-A1		
Nominal Heating Capacity	kW	50.0
	BTU/h	170,600
Input	kW	14.12

PURY-(E)P400YLM-A1



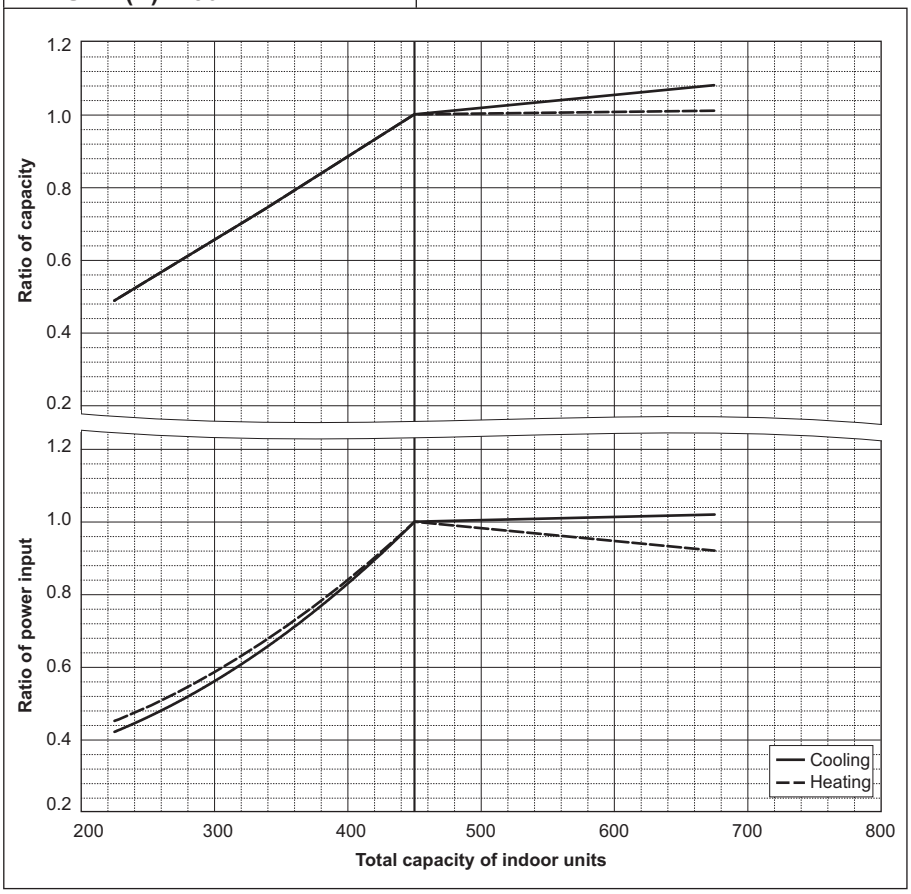
PURY-P450YLM-A1		
Nominal Cooling Capacity	kW	50.0
	BTU/h	170,600
Input	kW	17.92

PURY-P450YLM-A1		
Nominal Heating Capacity	kW	56.0
	BTU/h	191,100
Input	kW	17.39

PURY-EP450YLM-A1		
Nominal Cooling Capacity	kW	50.0
	BTU/h	170,600
Input	kW	16.83

PURY-EP450YLM-A1		
Nominal Heating Capacity	kW	56.0
	BTU/h	191,100
Input	kW	16.86

PURY-(E)P450YLM-A1



2. CAPACITY TABLES

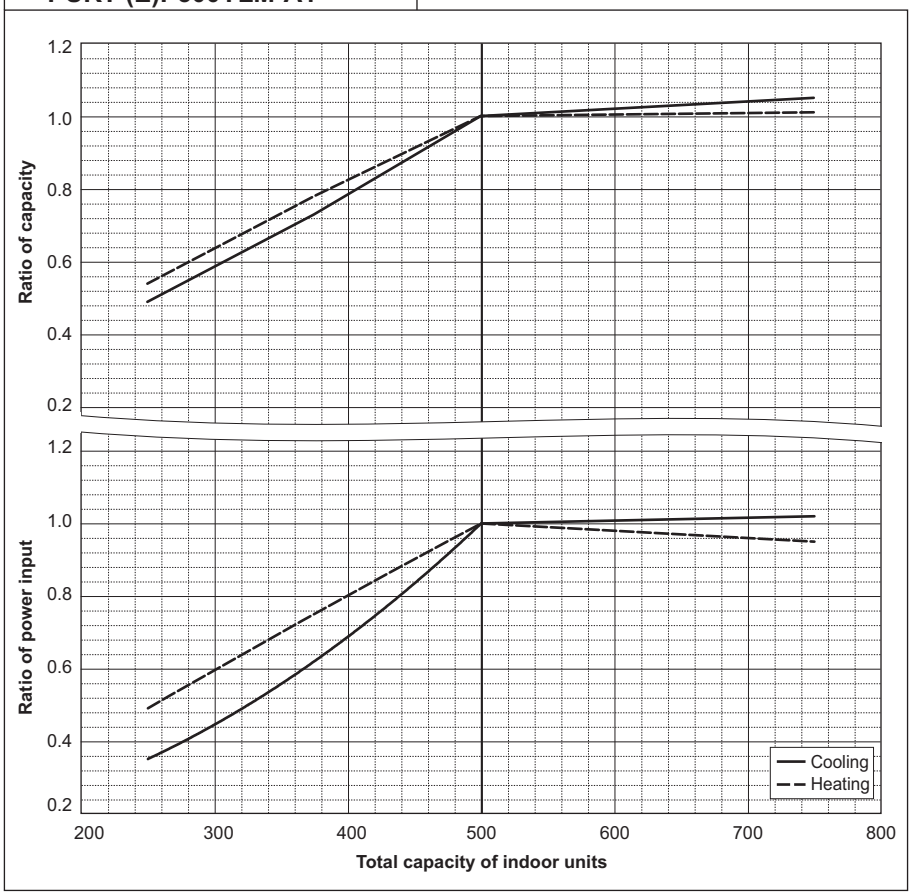
PURY-P500YLM-A1		
Nominal Cooling Capacity	kW	56.0
	BTU/h	191,100
Input	kW	22.67

PURY-P500YLM-A1		
Nominal Heating Capacity	kW	58.0
	BTU/h	197,900
Input	kW	17.53

PURY-EP500YLM-A1		
Nominal Cooling Capacity	kW	56.0
	BTU/h	191,100
Input	kW	21.22

PURY-EP500YLM-A1		
Nominal Heating Capacity	kW	63.0
	BTU/h	215,000
Input	kW	21.67

PURY-(E)P500YLM-A1



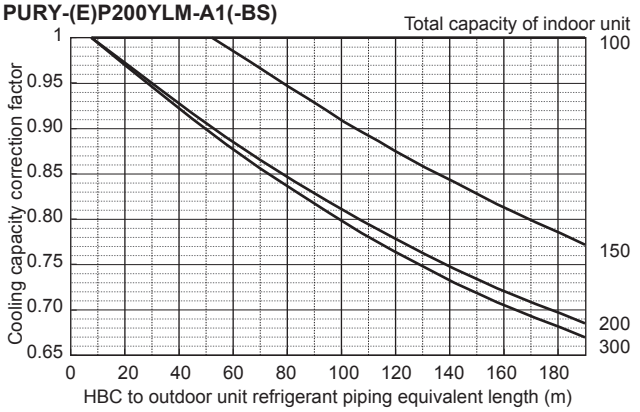
2. CAPACITY TABLES

2-3. Correction by piping length

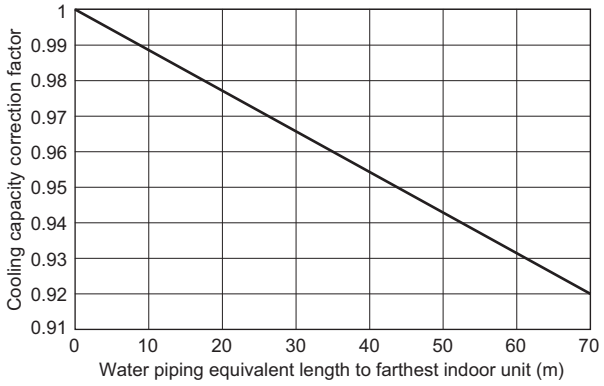
A decrease in cooling/heating capacity will occur due to piping length increase. Using the following correction factors according to the equivalent length of the piping shown at 2-3-1 and 2-3-2 the capacity can be calculated. 2-3-3 shows how to obtain the equivalent length of piping. Refrigerant piping and water piping have separate correction factors.

2-3-1. Cooling capacity correction

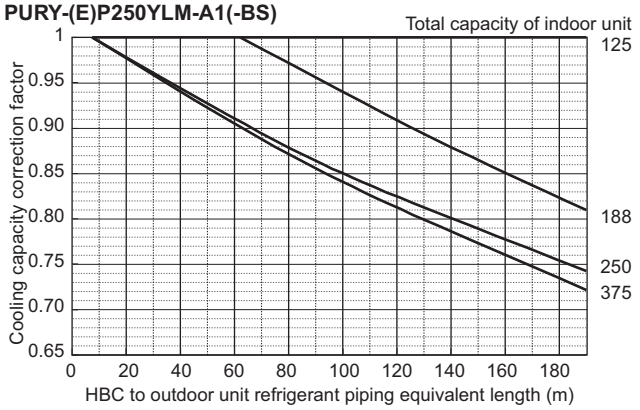
PURY-(E)P200YLM-A1(-BS)



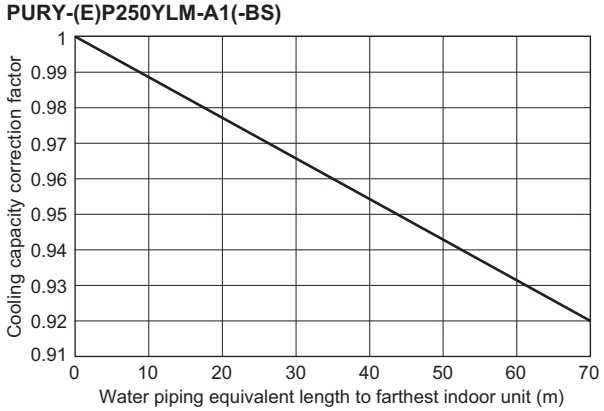
PURY-(E)P200YLM-A1(-BS)



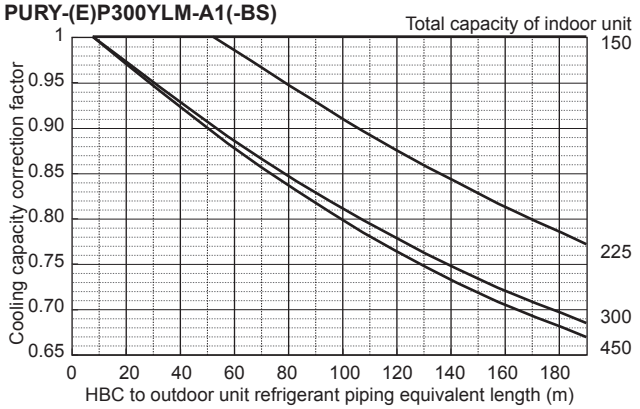
PURY-(E)P250YLM-A1(-BS)



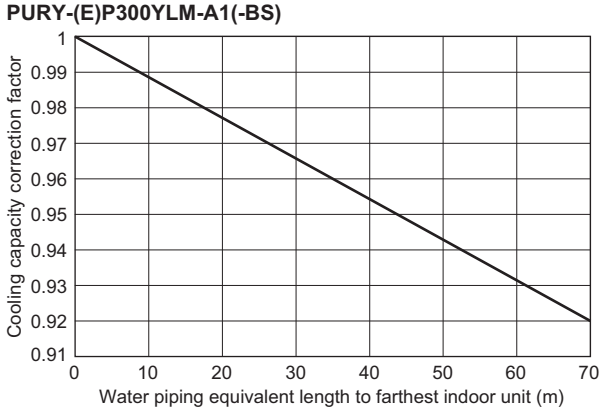
PURY-(E)P250YLM-A1(-BS)



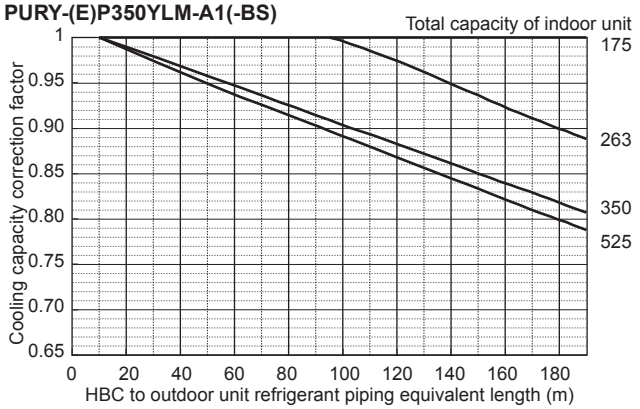
PURY-(E)P300YLM-A1(-BS)



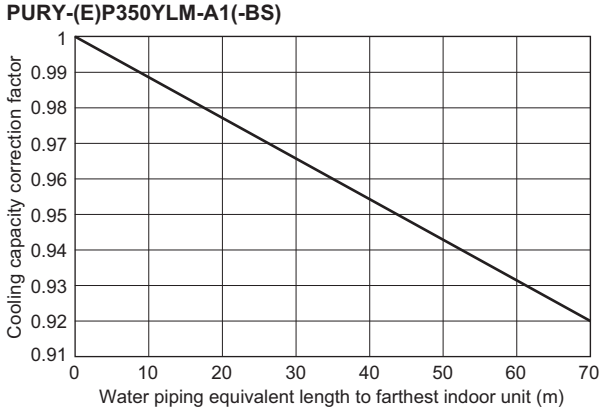
PURY-(E)P300YLM-A1(-BS)



PURY-(E)P350YLM-A1(-BS)

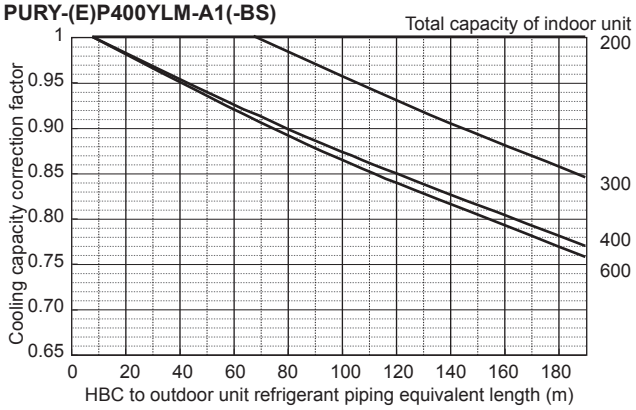


PURY-(E)P350YLM-A1(-BS)

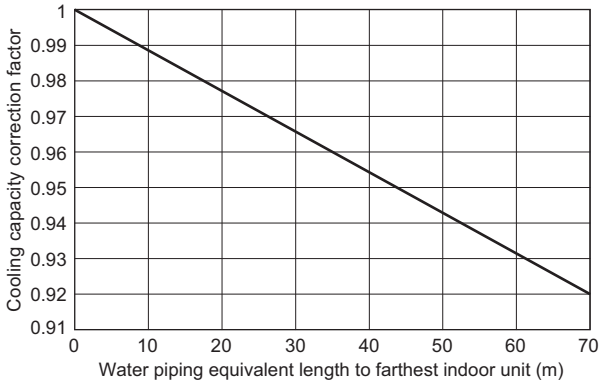


2. CAPACITY TABLES

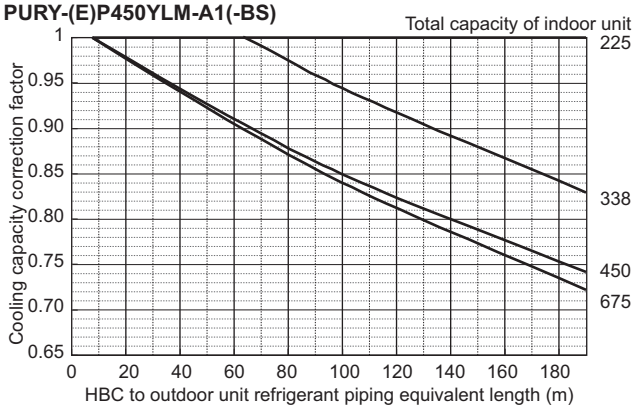
PURY-(E)P400YLM-A1(-BS)



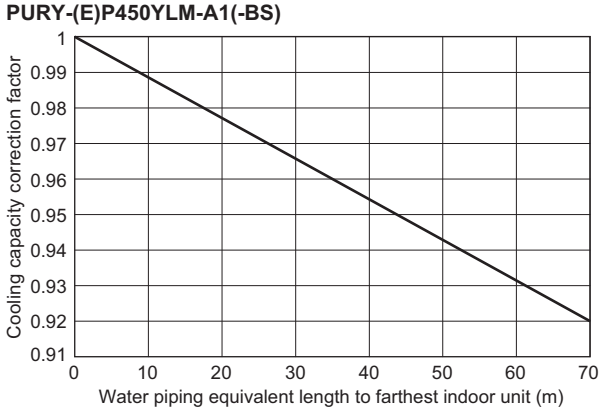
PURY-(E)P400YLM-A1(-BS)



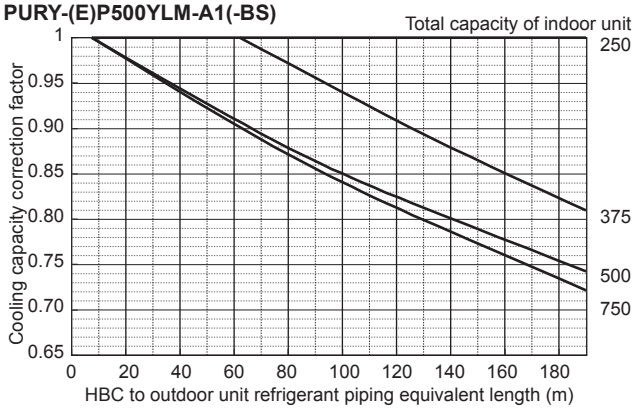
PURY-(E)P450YLM-A1(-BS)



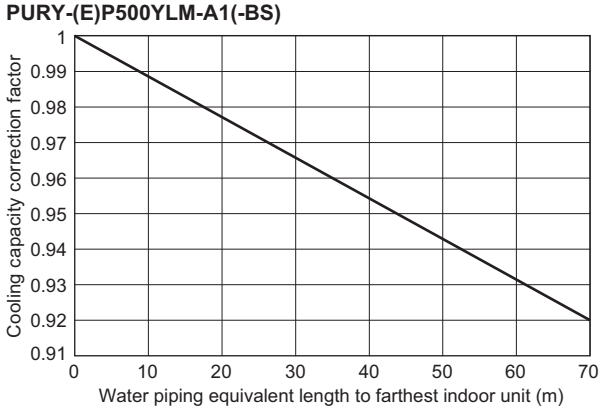
PURY-(E)P450YLM-A1(-BS)



PURY-(E)P500YLM-A1(-BS)



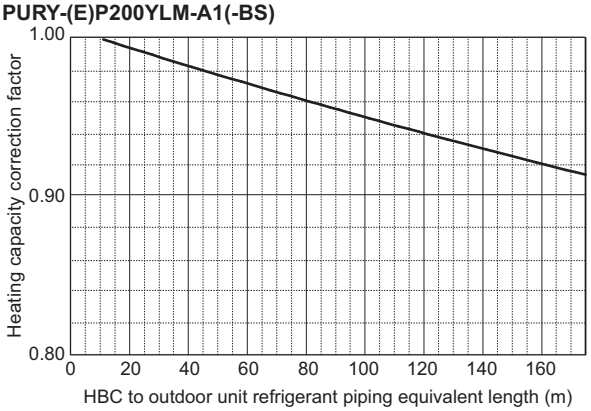
PURY-(E)P500YLM-A1(-BS)



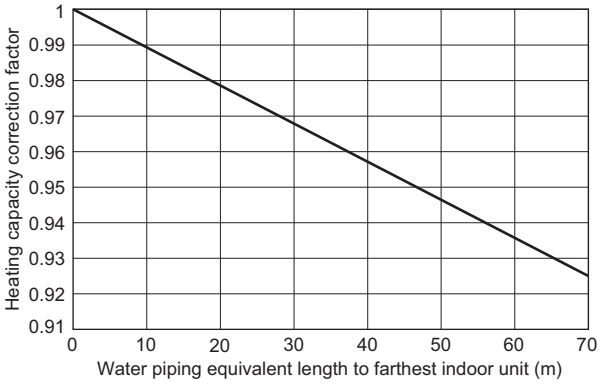
2. CAPACITY TABLES

2-3-2. Heating capacity correction

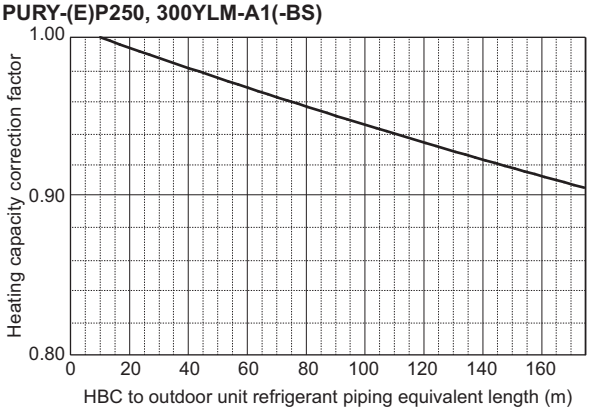
PURY-(E)P200YLM-A1(-BS)



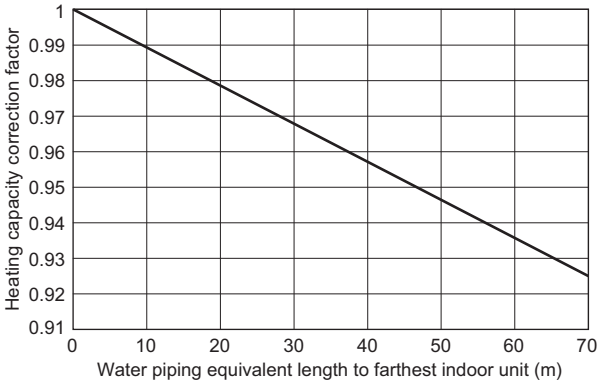
PURY-(E)P200YLM-A1(-BS)



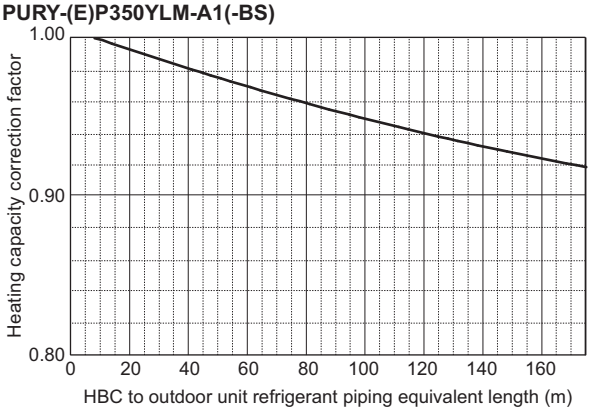
PURY-(E)P250, 300YLM-A1(-BS)



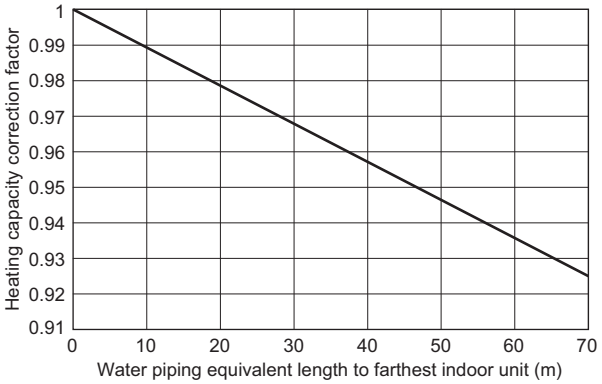
PURY-(E)P250, 300YLM-A1(-BS)



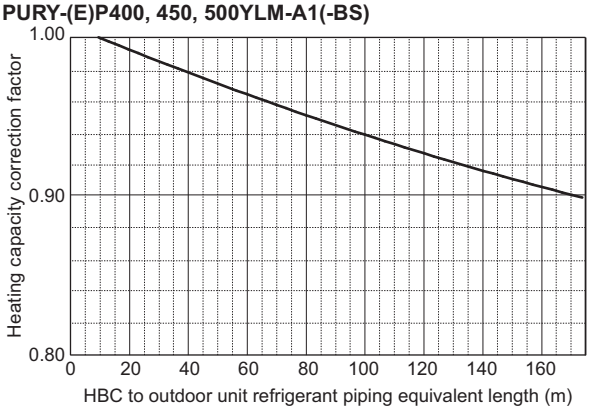
PURY-(E)P350YLM-A1(-BS)



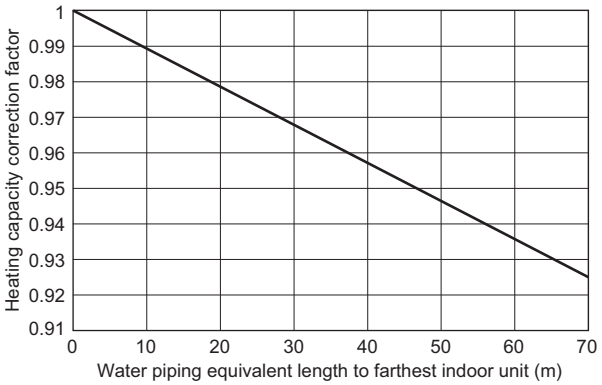
PURY-(E)P350YLM-A1(-BS)



PURY-(E)P400, 450, 500YLM-A1(-BS)



PURY-(E)P400, 450, 500YLM-A1(-BS)



2-3-3. How to obtain the equivalent piping length

Refrigerant pipe

1. PURY-(E)P200YLM-A1(-BS)

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.35 × number of bends in the piping) [m]

2. PURY-(E)P250, 300YLM-A1(-BS)

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.42 × number of bends in the piping) [m]

3. PURY-(E)P350YLM-A1(-BS)

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.47 × number of bends in the piping) [m]

4. PURY-(E)P400, 450, 500YLM-A1(-BS)

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.50 × number of bends in the piping) [m]

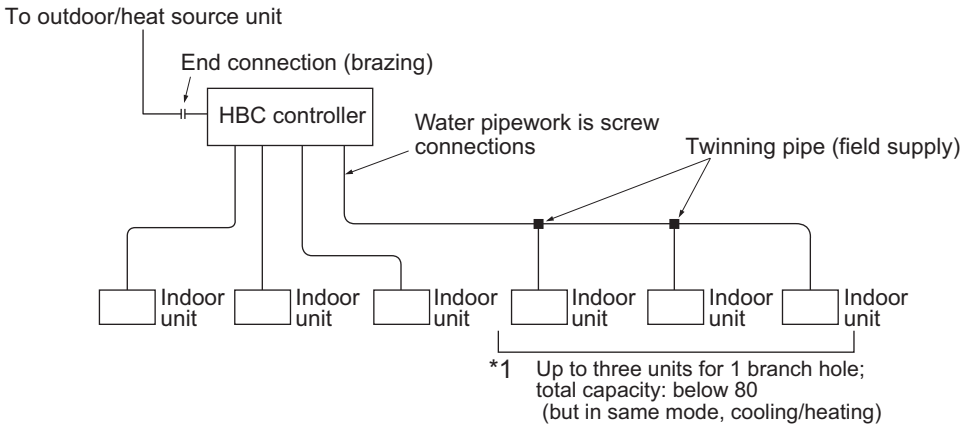
Water pipe

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.55 × number of bends in the piping) [m]

Water piping design

HBC water pipe connection sizes and pipe sizes.

Indoor unit	Connection size		Pipe size	
	Water inlet	Water outlet	Water out	Water return
PEFY-WP-VMS1 PEFY-WP-VMA PLFY-WP-VBM PFFY-WP-VLRMM	Rc 3/4 screw	Rc 3/4 screw	I.D.20mm	I.D.20mm



Note:

***1. Connection of multiple indoor units with one connection (or joint pipe)**

- Total capacity of connectable indoor units: Less than 80
- Number of connectable indoor units: Maximum 3 Sets
- Selection of water piping
  Select the size according to the total capacity of indoor units to be installed downstream.
- Please group units that operate on 1 branch.

2-4. Correction at frost and defrost

Due to frost at the outdoor heat exchanger and the automatic defrost operation, the heating capacity of the outdoor unit can be calculated by multiplying the correction factor shown in the table below.

Table of correction factor at frost and defrost

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-(E)P200YLM-A1(-BS)	1.00	0.95	0.84	0.83	0.83	0.87	0.90	0.95	0.95	0.95	0.95
PURY-(E)P250YLM-A1(-BS)	1.00	0.95	0.84	0.83	0.83	0.87	0.90	0.95	0.95	0.95	0.95
PURY-(E)P300YLM-A1(-BS)	1.00	0.93	0.82	0.80	0.82	0.86	0.90	0.90	0.95	0.95	0.95
PURY-(E)P350YLM-A1(-BS)	1.00	0.93	0.85	0.83	0.84	0.86	0.90	0.90	0.95	0.95	0.95
PURY-(E)P400YLM-A1(-BS)	1.00	0.95	0.90	0.87	0.88	0.89	0.90	0.95	0.95	0.95	0.95
PURY-(E)P450YLM-A1(-BS)	1.00	0.98	0.89	0.87	0.89	0.90	0.92	0.95	0.95	0.95	0.95
PURY-(E)P500YLM-A1(-BS)	1.00	0.98	0.89	0.86	0.89	0.90	0.92	0.95	0.95	0.95	0.95

2-5. Correction by antifreeze solution concentration

In HYBRID CITY MULTI system, antifreeze solution should be used to prevent the system from freezing. Refer to the following graphs for the capacity correction by antifreeze solution. Refer to 2-5-1 for antifreeze solution concentration, 2-5-2 and 2-5-3 for capacity correction by antifreeze solution concentration.

2-5-1. Antifreeze solution concentration

Use propylene glycol solution for antifreeze.
Refer to the following graph to estimate the antifreeze solution concentration required for freeze protection.
DipSW setting (SW5-4 and 5-5) is required in HBC unit depending on the antifreeze solution concentration.
Refer the table A for the setting.

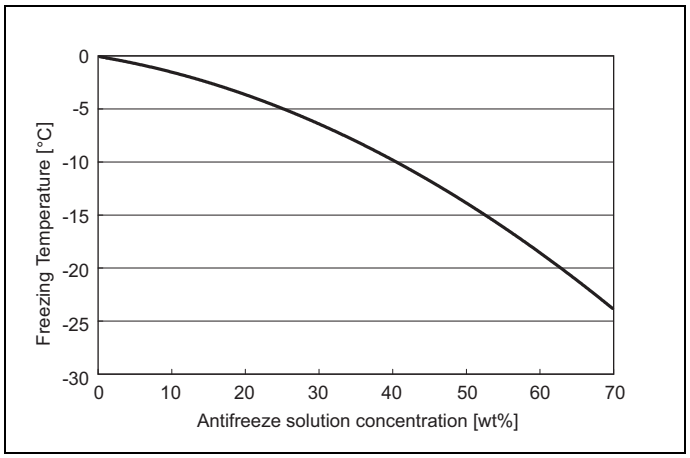
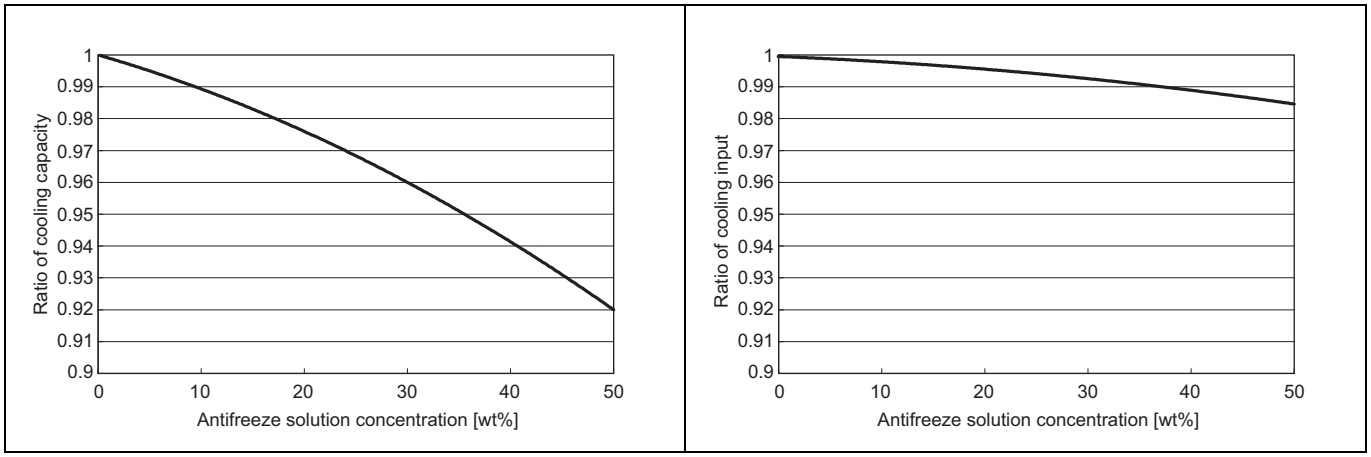


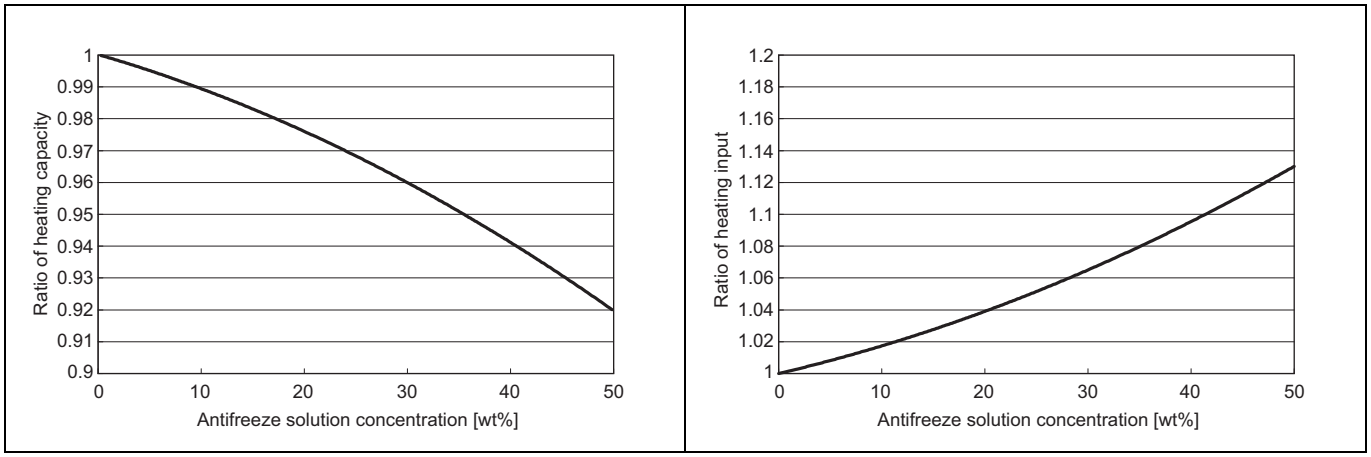
Table A

Brine concentration [%]		0 to 29%	30 to 49%	50 to 59%	60 to 70%
DipSW5-4		OFF	OFF	ON	ON
DipSW5-5		OFF	ON	OFF	ON
7seg LED	LD2	OFF	OFF	1	1
	LD3	OFF	1	OFF	1

2-5-2. Capacity correction by antifreeze solution concentration (cooling)

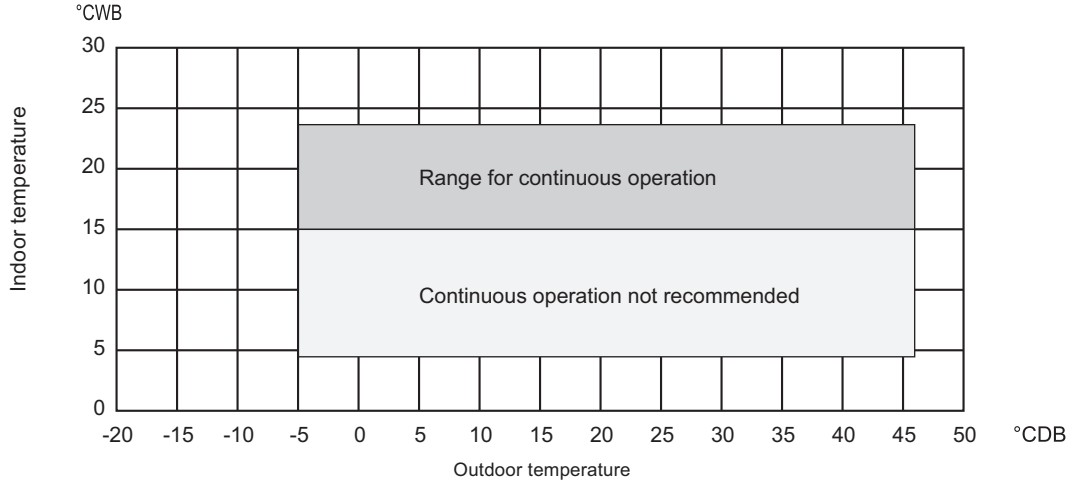


2-5-3. Capacity correction by antifreeze solution concentration (heating)

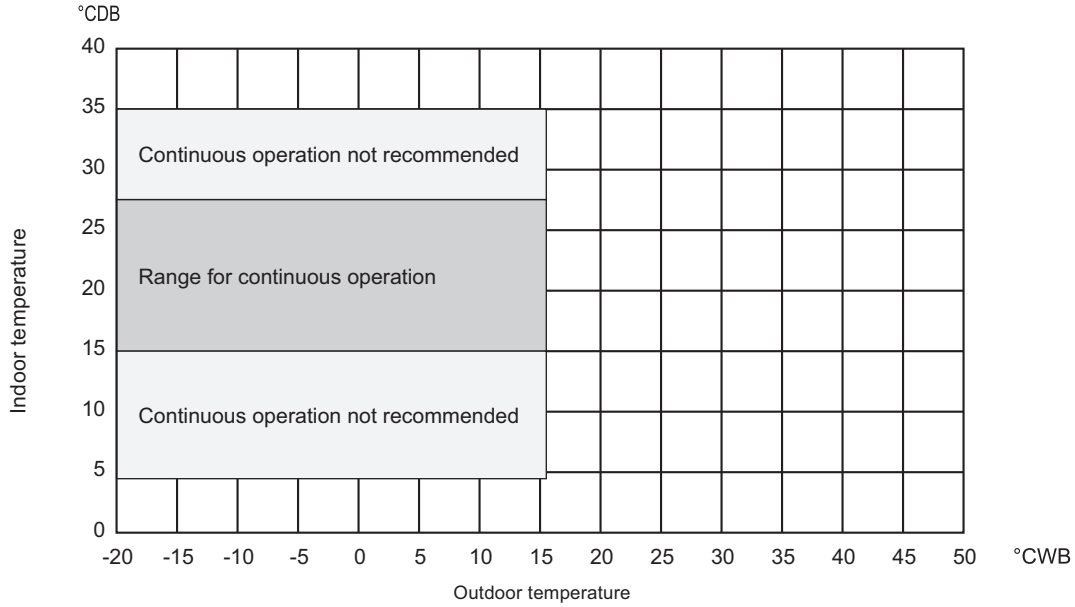


2-6. Operation temperature range

• Cooling only



• Heating only



• Combination of cooling/heating operation (Cooling main or Heating main)

Outdoor temperature	Indoor temperature	
	Cooling	Heating
-10 to 21˚CDB (14 to 70˚FDB)	——	15 to 27˚CDB (59 to 81˚FDB)
-11 to 15.5˚CWB (12.2 to 60˚FWB)	15 to 24˚CWB (59 to 75˚FWB)	——

PQRY-P-YLM-A

1. SPECIFICATIONS

Model			PQRY-P200YLM-A	PQRY-P250YLM-A
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity (Nominal)	*1	kW	22.4	28.0
		kcal/h	19,300	24,100
	*1	BTU/h	76,400	95,500
	Power input	kW	3.97	5.44
	Current input	A	6.7-6.3-6.1	9.1-8.7-8.4
	EER	kW/kW	5.64	5.14
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	15.0~24.0°C (59~75°F)
	Circulating water	°C	10.0~45.0°C (50~113°F)	10.0~45.0°C (50~113°F)
Heating capacity (Nominal)	*2	kW	25.0	31.5
		kcal/h	21,500	27,100
	*2	BTU/h	85,300	107,500
	Power input	kW	4.04	5.41
	Current input	A	6.8-6.4-6.2	9.1-8.6-8.3
	COP	kW/kW	6.18	5.82
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	15.0~27.0°C (59~81°F)
	Circulating water	°C	10.0~45.0°C (50~113°F)	10.0~45.0°C (50~113°F)
Indoor unit connectable	Total capacity		50~150% of heat source unit capacity	50~150% of heat source unit capacity
	Model/Quantity		WP15~WP50/2~20	WP15~WP50/3~25
Sound pressure level (measured in anechoic room)		dB <A>	46	48
Sound power level (measured in anechoic room)		dB <A>	60	62
Refrigerant piping diameter	High pressure	mm (in.)	15.88 (5/8) Brazed	19.05 (3/4) Brazed
	Low pressure	mm (in.)	19.05 (3/4) Brazed	22.2 (7/8) Brazed
Circulating water	Water flow rate	m^3/h	5.76	5.76
		L/min	96	96
		cfm	3.4	3.4
	Pressure drop	kPa	24	24
	Operating volume range	m^3/h	3.0 ~ 7.2	3.0 ~ 7.2
Compressor	Type		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter	Inverter
	Motor output	kW	4.8	6.2
	Case heater	kW	-	-
	Lubricant		MEL32	MEL32
External finish			Galvanized steel sheets	Galvanized steel sheets
External dimension H x W x D		mm	1,100 x 880 x 550	1,100 x 880 x 550
		in.	43-5/16 x 34-11/16 x 21-11/16	43-5/16 x 34-11/16 x 21-11/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP.)		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		Over-heat protection	Over-heat protection
Refrigerant	Type x original charge		R410A x 5.0 kg (12 lbs)	R410A x 5.0 kg (12 lbs)
	Control		HBC controller	HBC controller
Net weight		kg (lbs)	172 (380)	172 (380)
Heat exchanger			plate type	plate type
	Water volume in plate	l	5.0	5.0
	Water pressure Max.	MPa	2.0	2.0
HIC circuit (HIC: Heat Inter-Changer)			-	-
Drawing	External		WKS94C743	WKS94C743
	Wiring		WKE94G131	WKE94G131
Standard attachment	Document		Installation Manual	Installation Manual
	Accessory		Refrigerant conn. pipe	Refrigerant conn. pipe
Optional parts			Main HBC controller: CMB-WP108, 1016-GA1 Sub HBC controller: CMB-WP108, 1016-GB1	Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice. The ambient temperature of the heat source unit needs to be kept below 40°C D.B. The ambient relative humidity of the heat source unit needs to be kept below 80%. The heat source unit should not be installed at outdoor. Be sure to mount a strainer (more than 50 meshes) at the water inlet piping of the unit. Be sure to provide interlocking for the unit operation and water circuit. Install the supplied insulation material to the unused drain-socket. When installing insulation material around both water and refrigerant piping, follow the installation manual.	

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Water temperature: 30°C (86°F)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Water temperature: 20°C (68°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)

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.

1. SPECIFICATIONS

Model			PQRY-P300YLM-A	
Number of HBC controller			**Single HBC**	**Double HBC**
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	
Cooling capacity (Nominal)	*1	kW	33.5	
		kcal/h	28,800	
	*1	BTU/h	114,300	
	Power input	kW	7.55	6.71
	Current input	A	12.7-12.1-11.6	11.3-10.7-10.3
	EER	kW/kW	4.43	4.99
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	
	Circulating water	°C	10.0~45.0°C (50~113°F)	
Heating capacity (Nominal)	*2	kW	37.5	
		kcal/h	32,300	
	*2	BTU/h	128,000	
	Power input	kW	7.13	6.79
	Current input	A	12.0-11.4-11.0	11.4-10.8-10.4
	COP	kW/kW	5.25	5.52
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	
	Circulating water	°C	10.0~45.0°C (50~113°F)	
Indoor unit connectable	Total capacity		50~150% of heat source unit capacity	
	Model/Quantity		WP15~WP50/3~30	
Sound pressure level (measured in anechoic room)		dB <A>	54	
Sound power level (measured in anechoic room)		dB <A>	68	
Refrigerant piping diameter	High pressure	mm (in.)	19.05 (3/4) Brazed	
	Low pressure	mm (in.)	22.2 (7/8) Brazed	
Circulating water	Water flow rate	m^3/h	5.76	
		L/min	96	
		cfm	3.4	
	Pressure drop	kPa	24	
	Operating volume range	m^3/h	3.0 ~ 7.2	
Compressor	Type		Inverter scroll hermetic compressor	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	7.7	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Galvanized steel sheets	
External dimension H x W x D		mm	1,100 x 880 x 550	
		in.	43-5/16 x 34-11/16 x 21-11/16	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP.)		Over-heat protection, Over-current protection	
	Compressor		Over-heat protection	
Refrigerant	Type x original charge		R410A x 5.0 kg (12 lbs)	
	Control		HBC controller	
Net weight		kg (lbs)	172 (380)	
Heat exchanger			plate type	
	Water volume in plate	l	5.0	
	Water pressure Max.	MPa	2.0	
HIC circuit (HIC: Heat Inter-Changer)			-	
Drawing	External		WKS94C743	
	Wiring		WKE94G131	
Standard attachment	Document		Installation Manual	
	Accessory		Refrigerant conn. pipe	
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice. The ambient temperature of the heat source unit needs to be kept below 40°C D.B. The ambient relative humidity of the heat source unit needs to be kept below 80%. The heat source unit should not be installed at outdoor. Be sure to mount a strainer (more than 50 meshes) at the water inlet piping of the unit. Be sure to provide interlocking for the unit operation and water circuit. Install the supplied insulation material to the unused drain-socket. When installing insulation material around both water and refrigerant piping, follow the installation manual.	

Notes:

1.Nominal cooling conditions (subject to JIS B8615-2)
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Water temperature: 30°C (86°F)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2.Nominal heating conditions (subject to JIS B8615-2)
Indoor: 20°CD.B. (68°FD.B.), Water temperature: 20°C (68°FD.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)

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.

1. SPECIFICATIONS

Model			PQRY-P350YLM-A	
Number of HBC controller			**Single HBC**	**Double HBC**
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	
Cooling capacity (Nominal)	*1	kW	40.0	
		kcal/h	34,400	
	*1	BTU/h	136,500	
	Power input	kW	9.98	8.72
	Current input	A	16.8-16.0-15.4	14.7-13.9-13.4
	EER	kW/kW	4.00	4.58
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	
	Circulating water	°C	10.0~45.0°C (50~113°F)	
Heating capacity (Nominal)	*2	kW	45.0	
		kcal/h	38,700	
	*2	BTU/h	153,500	
	Power input	kW	8.87	8.25
	Current input	A	14.9-14.2-13.7	13.9-13.2-12.7
	COP	kW/kW	5.07	5.45
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	
	Circulating water	°C	10.0~45.0°C (50~113°F)	
Indoor unit connectable	Total capacity		50~150% of heat source unit capacity	
	Model/Quantity		WP15~WP50/4~35	
Sound pressure level (measured in anechoic room)		dB <A>	52	
Sound power level (measured in anechoic room)		dB <A>	66	
Refrigerant piping diameter	High pressure	mm (in.)	22.2 (7/8) Brazed	
	Low pressure	mm (in.)	28.58 (1-1/8) Brazed	
Circulating water	Water flow rate	m^3/h	7.20	
		L/min	120	
		cfm	4.2	
	Pressure drop	kPa	44	
	Operating volume range	m^3/h	4.5 ~ 11.6	
Compressor	Type		Inverter scroll hermetic compressor	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	9.5	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Galvanized steel sheets	
External dimension H x W x D		mm	1,450 x 880 x 550	
		in.	57-1/8 x 34-11/16 x 21-11/16	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP.)		Over-heat protection, Over-current protection	
	Compressor		Over-heat protection	
Refrigerant	Type x original charge		R410A x 6.0 kg (14 lbs)	
	Control		HBC controller	
Net weight		kg (lbs)	216 (477)	
Heat exchanger			plate type	
	Water volume in plate	l	5.0	
	Water pressure Max.	MPa	2.0	
HIC circuit (HIC: Heat Inter-Changer)			-	
Drawing	External		WKS94C744	
	Wiring		WKE94G131	
Standard attachment	Document		Installation Manual	
	Accessory		Refrigerant conn. pipe	
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice. The ambient temperature of the heat source unit needs to be kept below 40°C D.B. The ambient relative humidity of the heat source unit needs to be kept below 80%. The heat source unit should not be installed at outdoor. Be sure to mount a strainer (more than 50 meshes) at the water inlet piping of the unit. Be sure to provide interlocking for the unit operation and water circuit. Install the supplied insulation material to the unused drain-socket. When installing insulation material around both water and refrigerant piping, follow the installation manual.	

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Water temperature: 30°C (86°F)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Water temperature: 20°C (68°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)

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.

1. SPECIFICATIONS

Model			PQRY-P400YLM-A	PQRY-P450YLM-A
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity (Nominal)	*1	kW	45.0	50.0
		kcal/h	38,700	43,000
	*1	BTU/h	153,500	170,600
	Power input	kW	10.05	12.05
	Current input	A	16.9-16.1-15.5	20.3-19.3-18.6
	EER	kW/kW	4.47	4.14
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	15.0~24.0°C (59~75°F)
	Circulating water	°C	10.0~45.0°C (50~113°F)	10.0~45.0°C (50~113°F)
Heating capacity (Nominal)	*2	kW	50.0	56.0
		kcal/h	43,000	48,200
	*2	BTU/h	170,600	191,100
	Power input	kW	9.45	11.11
	Current input	A	15.9-15.1-14.6	18.7-17.8-17.1
	COP	kW/kW	5.29	5.04
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	15.0~27.0°C (59~81°F)
	Circulating water	°C	10.0~45.0°C (50~113°F)	10.0~45.0°C (50~113°F)
Indoor unit connectable	Total capacity		50~150% of heat source unit capacity	50~150% of heat source unit capacity
	Model/Quantity		WP15~WP50/4~40	WP15~WP50/5~45
Sound pressure level (measured in anechoic room)		dB <A>	52	54
Sound power level (measured in anechoic room)		dB <A>	66	70
Refrigerant piping diameter	High pressure	mm (in.)	22.2 (7/8) Brazed	22.2 (7/8) Brazed
	Low pressure	mm (in.)	28.58 (1-1/8) Brazed	28.58 (1-1/8) Brazed
Circulating water	Water flow rate	m^3/h	7.20	7.20
		L/min	120	120
		cfm	4.2	4.2
	Pressure drop	kPa	44	44
	Operating volume range	m^3/h	4.5 ~ 11.6	4.5 ~ 11.6
Compressor	Type		Inverter scroll hermetic compressor	Inverter scroll hermetic compressor
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	AC&R Works, MITSUBISHI ELECTRIC CORPORATION
	Starting method		Inverter	Inverter
	Motor output	kW	10.7	11.6
	Case heater	kW	-	-
	Lubricant		MEL32	MEL32
External finish			Galvanized steel sheets	Galvanized steel sheets
External dimension H x W x D		mm	1,450 x 880 x 550	1,450 x 880 x 550
		in.	57-1/8 x 34-11/16 x 21-11/16	57-1/8 x 34-11/16 x 21-11/16
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter circuit (COMP.)		Over-heat protection, Over-current protection	Over-heat protection, Over-current protection
	Compressor		Over-heat protection	Over-heat protection
Refrigerant	Type x original charge		R410A x 6.0 kg (14 lbs)	R410A x 6.0 kg (14 lbs)
	Control		HBC controller	HBC controller
Net weight		kg (lbs)	216 (477)	216 (477)
Heat exchanger			plate type	plate type
	Water volume in plate	l	5.0	5.0
	Water pressure Max.	MPa	2.0	2.0
HIC circuit (HIC: Heat Inter-Changer)			-	-
Drawing	External		WKS94C744	WKS94C744
	Wiring		WKE94G131	WKE94G131
Standard attachment	Document		Installation Manual	Installation Manual
	Accessory		Refrigerant conn. pipe	Refrigerant conn. pipe
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice. The ambient temperature of the heat source unit needs to be kept below 40°C D.B. The ambient relative humidity of the heat source unit needs to be kept below 80%. The heat source unit should not be installed at outdoor. Be sure to mount a strainer (more than 50 meshes) at the water inlet piping of the unit. Be sure to provide interlocking for the unit operation and water circuit. Install the supplied insulation material to the unused drain-socket. When installing insulation material around both water and refrigerant piping, follow the installation manual.	

Notes:

1.Nominal cooling conditions (subject to JIS B8615-2)
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Water temperature: 30°C (86°F)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2.Nominal heating conditions (subject to JIS B8615-2)
Indoor: 20°CD.B. (68°FD.B.), Water temperature: 20°C (68°FD.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)

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.

1. SPECIFICATIONS

Model			PQRY-P500YLM-A	
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz	
Cooling capacity (Nominal)	*1	kW	56.0	
		kcal/h	48,200	
	*1	BTU/h	191,100	
	Power input	kW	14.58	
	Current input	A	24.6-23.3-22.5	
	EER	kW/kW	3.84	
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)	
	Circulating water	°C	10.0~45.0°C (50~113°F)	
Heating capacity (Nominal)	*2	kW	63.0	
		kcal/h	54,200	
	*2	BTU/h	215,000	
	Power input	kW	13.07	
	Current input	A	22.0-20.9-20.2	
	COP	kW/kW	4.82	
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)	
	Circulating water	°C	10.0~45.0°C (50~113°F)	
Indoor unit connectable	Total capacity		50~150% of heat source unit capacity	
	Model/Quantity		WP15~WP50/5~50	
Sound pressure level (measured in anechoic room)		dB <A>	54	
Sound power level (measured in anechoic room)		dB <A>	70.5	
Refrigerant piping diameter	High pressure	mm (in.)	22.2 (7/8) Brazed	
	Low pressure	mm (in.)	28.58 (1-1/8) Brazed	
Circulating water	Water flow rate	m^3/h	7.20	
		L/min	120	
		cfm	4.2	
	Pressure drop	kPa	44	
	Operating volume range	m^3/h	4.5 ~ 11.6	
Compressor	Type		Inverter scroll hermetic compressor	
	Manufacture		AC&R Works, MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Motor output	kW	13.0	
	Case heater	kW	-	
	Lubricant		MEL32	
External finish			Galvanized steel sheets	
External dimension H x W x D		mm	1,450 x 880 x 550	
		in.	57-1/8 x 34-11/16 x 21-11/16	
Protection devices	High pressure protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter circuit (COMP.)		Over-heat protection, Over-current protection	
	Compressor		Over-heat protection	
Refrigerant	Type x original charge		R410A x 6.0 kg (14 lbs)	
	Control		HBC controller	
Net weight		kg (lbs)	216 (477)	
Heat exchanger			plate type	
	Water volume in plate	l	5.0	
	Water pressure Max.	MPa	2.0	
HIC circuit (HIC: Heat Inter-Changer)			-	
Drawing	External		WKS94C744	
	Wiring		WKE94G131	
Standard attachment	Document		Installation Manual	
	Accessory		Refrigerant conn. pipe	
Optional parts			Main HBC controller: CMB-WP108, 1016V-GA1 Sub HBC controller: CMB-WP108, 1016V-GB1	
Remarks			Details on foundation work, duct work, insulation work, electrical wiring, power source switch, and other items shall be referred to the Installation Manual. Due to continuing improvement, above specifications may be subject to change without notice. The ambient temperature of the heat source unit needs to be kept below 40°C D.B. The ambient relative humidity of the heat source unit needs to be kept below 80%. The heat source unit should not be installed at outdoor. Be sure to mount a strainer (more than 50 meshes) at the water inlet piping of the unit. Be sure to provide interlocking for the unit operation and water circuit. Install the supplied insulation material to the unused drain-socket. When installing insulation material around both water and refrigerant piping, follow the installation manual.	

Notes:

1. Nominal cooling conditions (subject to JIS B8615-2)
   Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Water temperature: 30°C (86°F)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
2. Nominal heating conditions (subject to JIS B8615-2)
   Indoor: 20°CD.B. (68°FD.B.), Water temperature: 20°C (68°FD.B.)
   Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)

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.

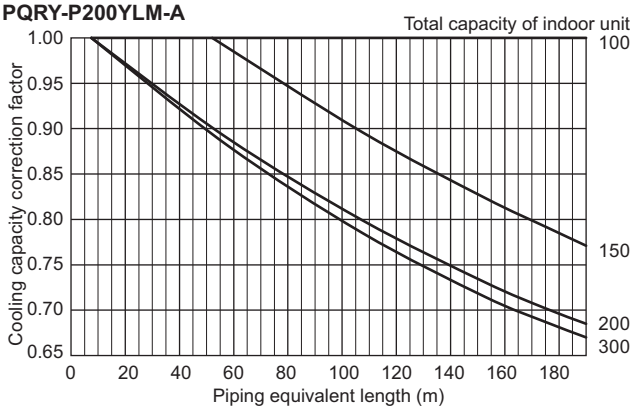
2. CAPACITY TABLES

2-1. Correction by piping length

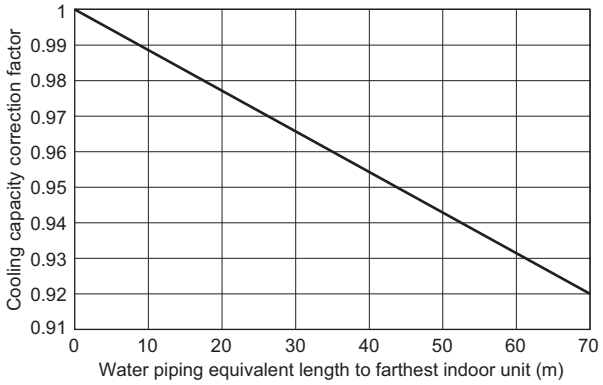
A decrease in cooling/heating capacity will occur due to piping length increase. Using the following correction factors according to the equivalent length of the piping shown at 2-1-1 and 2-1-2 the capacity can be calculated. 2-1-3 shows how to obtain the equivalent length of piping. Refrigerant piping and water piping have separate correction factors.

2-1-1. Cooling capacity correction

PQRY-P200YLM-A



PQRY-P200YLM-A



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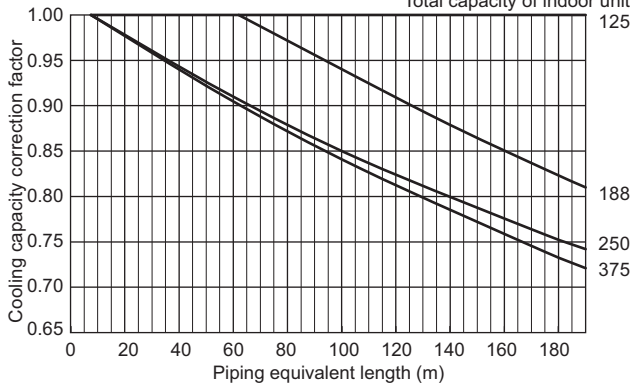

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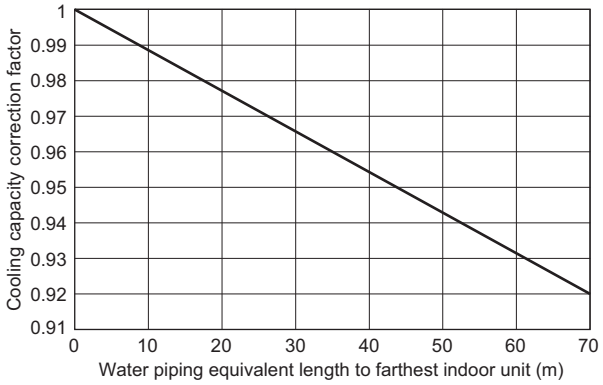

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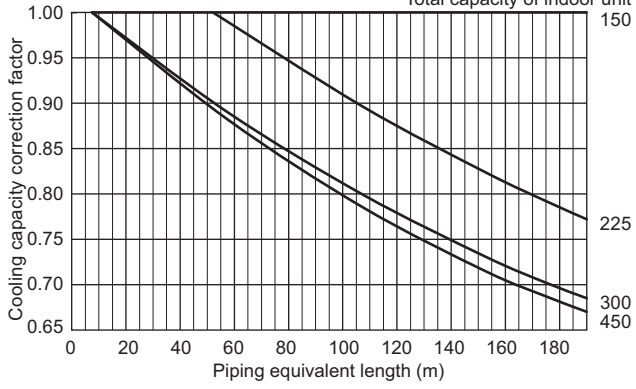

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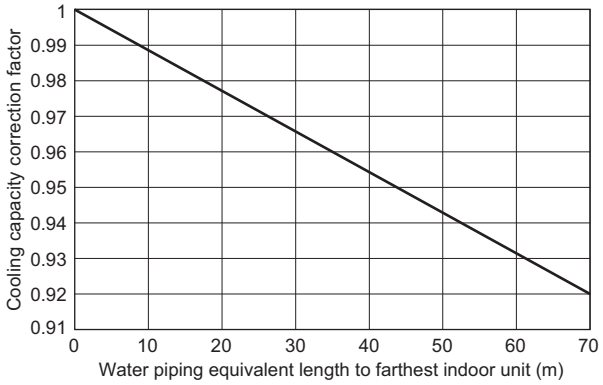
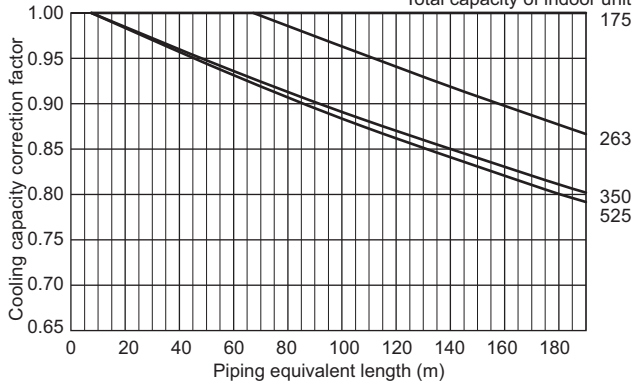


PQRY-P350YLM-A



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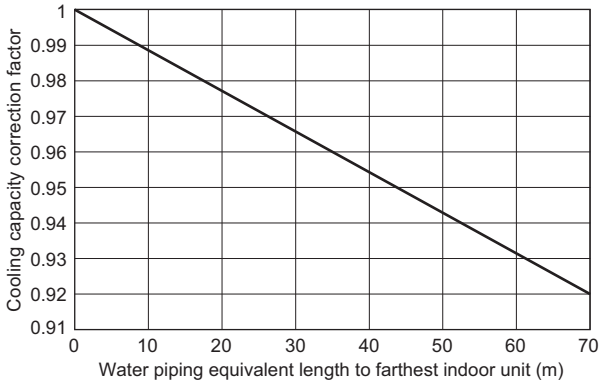
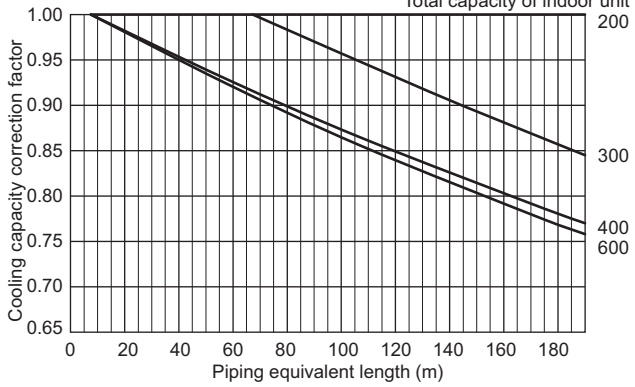
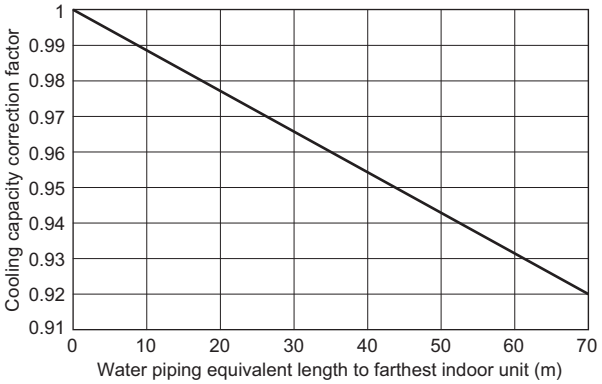


2. CAPACITY TABLES

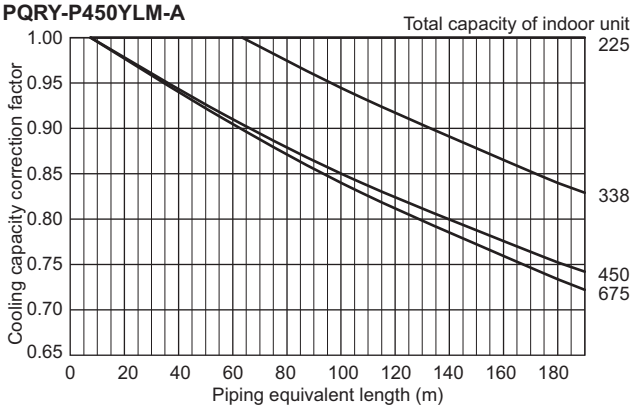
PQRY-P400YLM-A



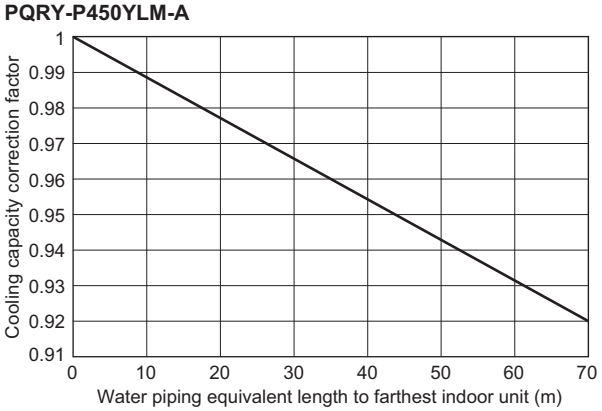
PQRY-P400YLM-A



PQRY-P450YLM-A



PQRY-P450YLM-A



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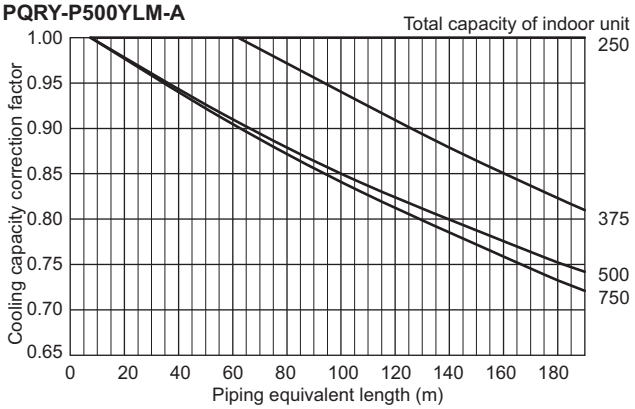

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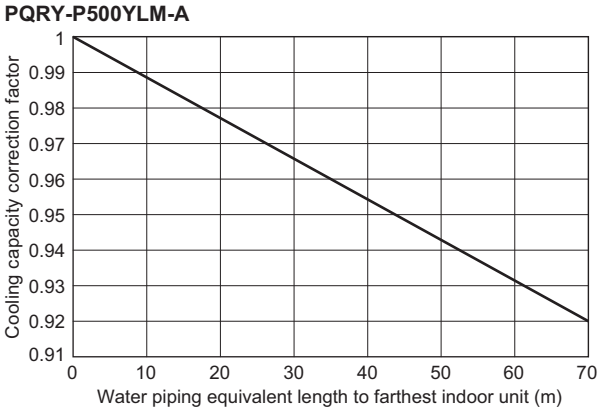
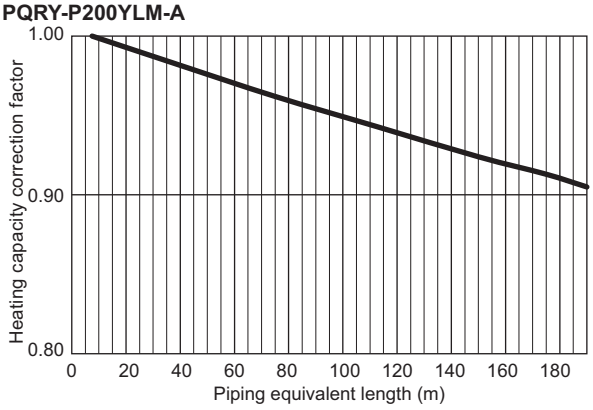


2-1-2. Heating capacity correction

PQRY-P200YLM-A



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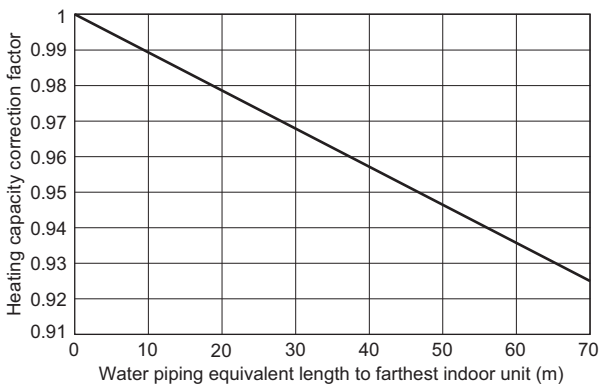
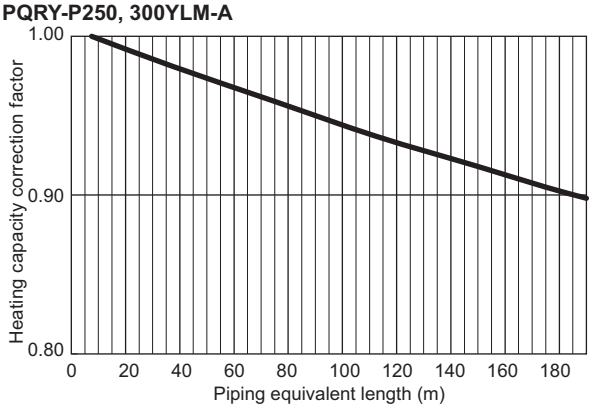
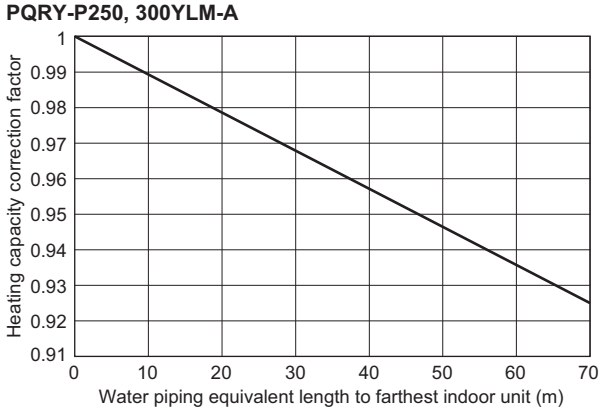


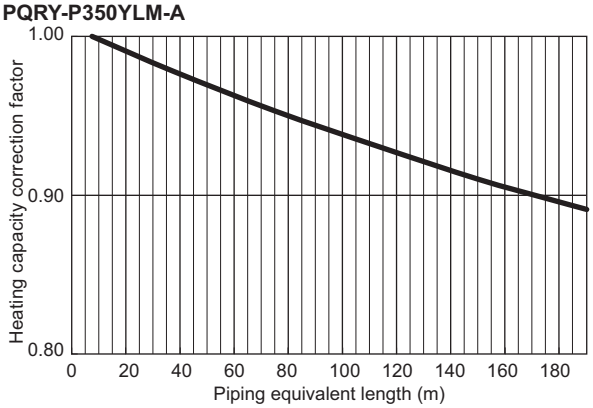
PQRY-P250, 300YLM-A



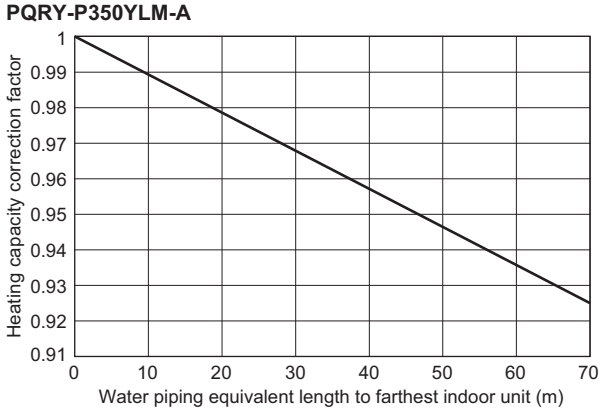
PQRY-P250, 300YLM-A



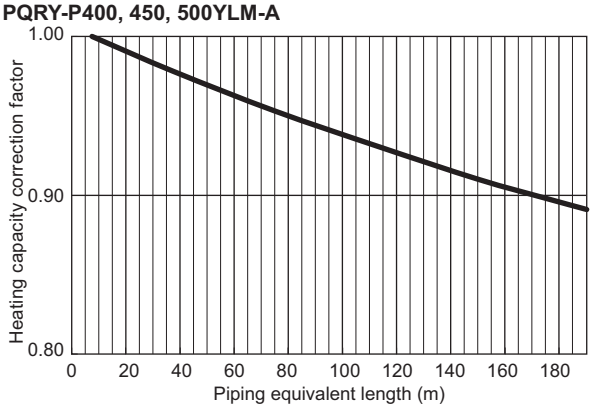
PQRY-P350YLM-A



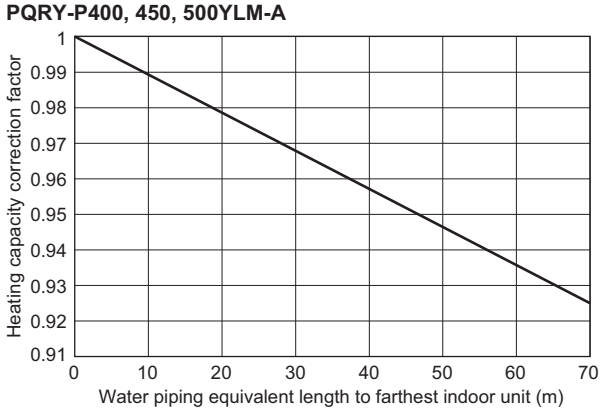
PQRY-P350YLM-A



PQRY-P400, 450, 500YLM-A



PQRY-P400, 450, 500YLM-A



2-1-3. How to obtain the equivalent piping length

Refrigerant pipe

1. PQRY-P200YLM-A

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.35 × number of bends in the piping) [m]

2. PQRY-P250, 300YLM-A

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.42 × number of bends in the piping) [m]

3. PQRY-P350YLM-A

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.47 × number of bends in the piping) [m]

4. PQRY-P400, 450, 500YLM-A

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.50 × number of bends in the piping) [m]

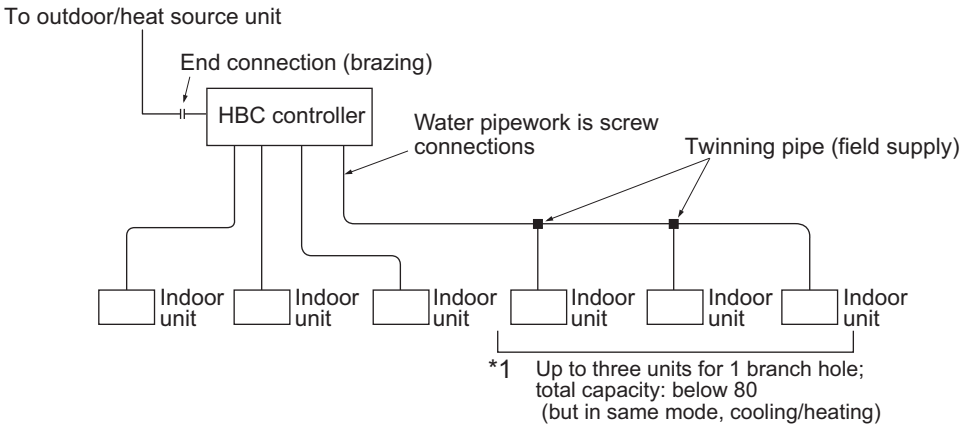
Water pipe

Equivalent length = (Actual piping length to the farthest indoor unit) + (0.55 × number of bends in the piping) [m]

Water piping design

HBC water pipe connection sizes and pipe sizes.

Indoor unit	Connection size		Pipe size	
	Water inlet	Water outlet	Water out	Water return
PEFY-WP-VMS1 PEFY-WP-VMA PLFY-WP-VBM PFFY-WP-VLRMM	Rc 3/4 screw	Rc 3/4 screw	I.D.20mm	I.D.20mm



Note:

***1. Connection of multiple indoor units with one connection (or joint pipe)**

- Total capacity of connectable indoor units: Less than 80
- Number of connectable indoor units: Maximum 3 Sets
- Selection of water piping
  Select the size according to the total capacity of indoor units to be installed downstream.
- Please group units that operate on 1 branch.

2-2. Correction by antifreeze solution concentration

In HYBRID CITY MULTI system, antifreeze solution should be used to prevent the system from freezing. Refer to the following graphs for the capacity correction by antifreeze solution. Refer to 2-2-1 for antifreeze solution concentration, 2-2-2 and 2-2-3 for capacity correction by antifreeze solution concentration.

2-2-1. Antifreeze solution concentration

Use propylene glycol solution for antifreeze.
Refer to the following graph to estimate the antifreeze solution concentration required for freeze protection.
DipSW setting (SW5-4 and 5-5) is required in HBC unit depending on the antifreeze solution concentration.
Refer the table A for the setting.

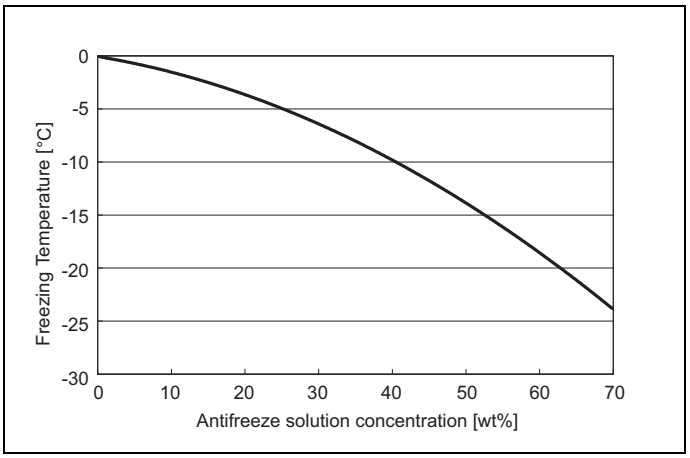
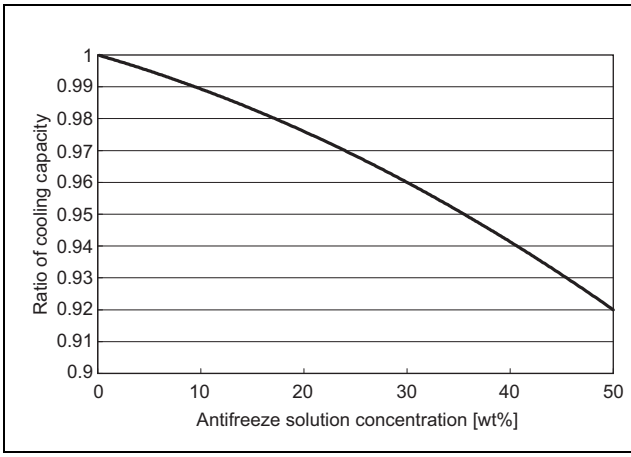
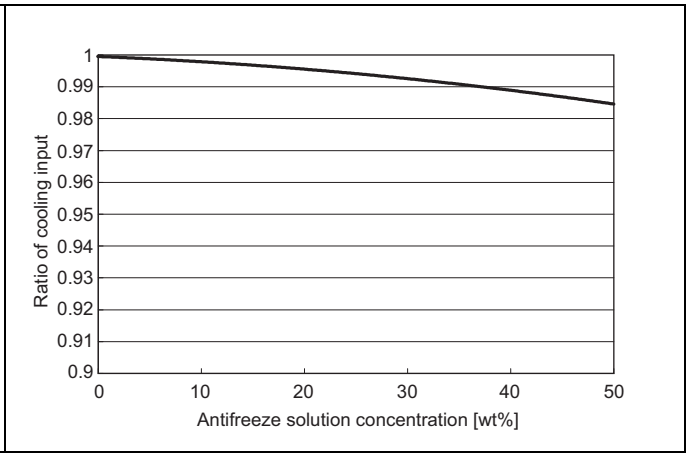


Table A

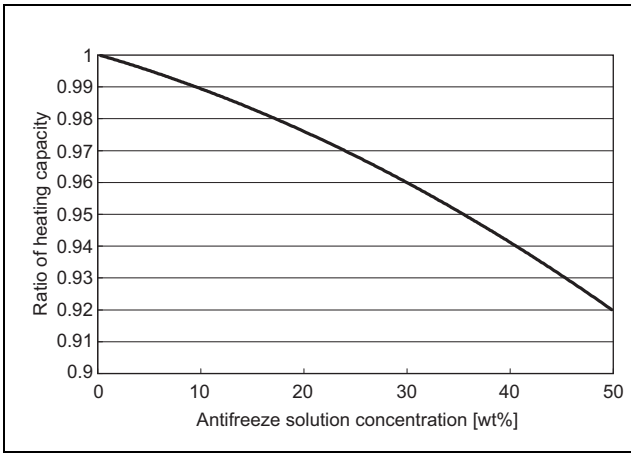
Brine concentration [%]		0 to 29%	30 to 49%	50 to 59%	60 to 70%
DipSW5-4		OFF	OFF	ON	ON
DipSW5-5		OFF	ON	OFF	ON
7seg LED	LD2	OFF	OFF	1	1
	LD3	OFF	1	OFF	1

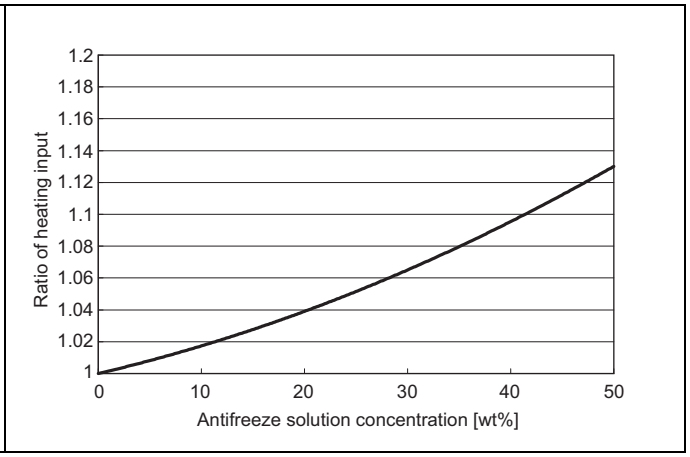
2-2-2. Capacity correction by antifreeze solution concentration (cooling)





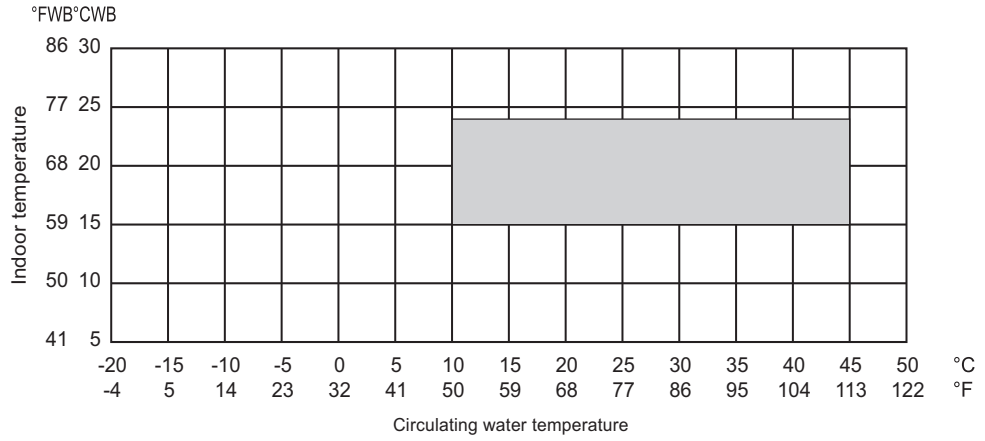
2-2-3. Capacity correction by antifreeze solution concentration (heating)



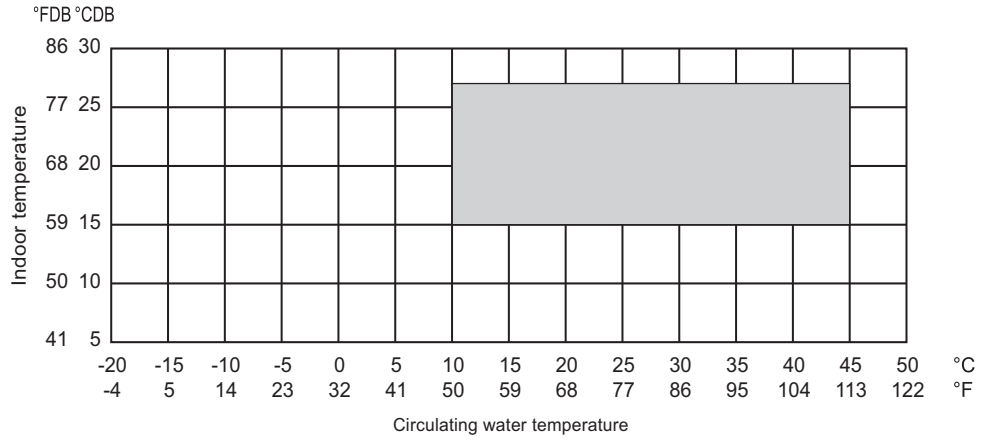


2-3. Operation temperature range

• Cooling



• Heating



• Combination of cooling/heating operation (Cooling main or Heating main)

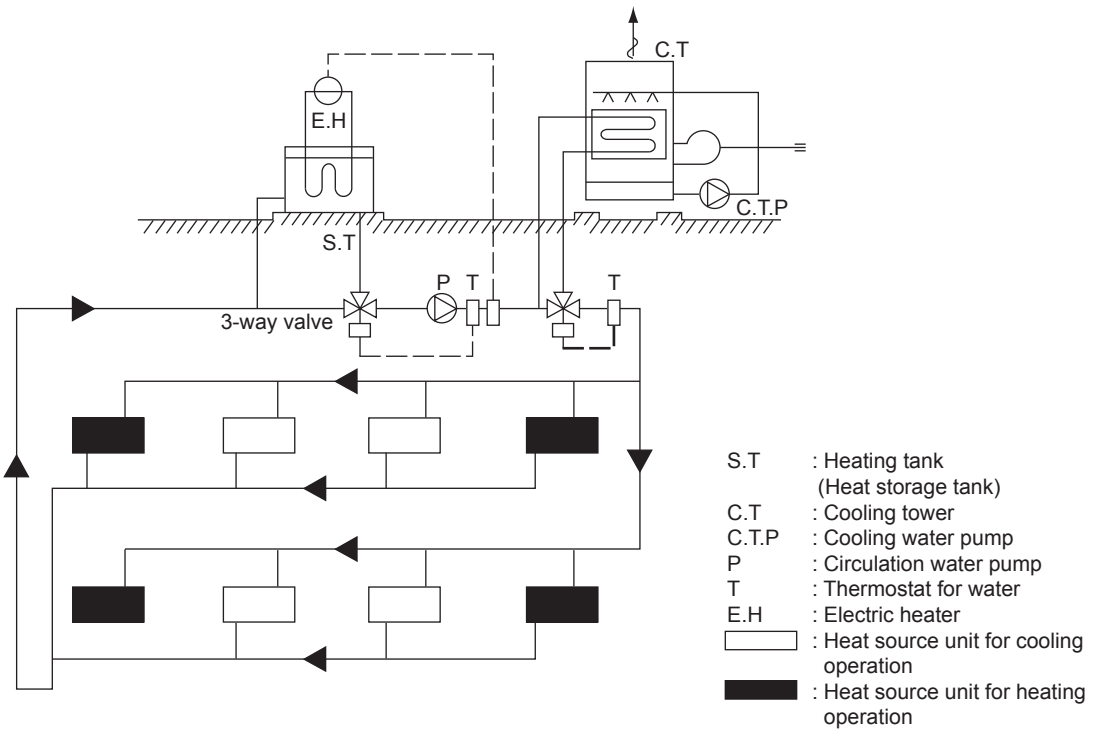
Water temperature	Indoor temperature	
	Cooling	Heating
10 to 45˚C (50 to 113˚F)	15 to 24˚CWB (59 to 75˚FWB)	15 to 27˚CDB (59 to 81˚FDB)

3-1. Designing of water circuit system

1) Example of basic water circuit

The water circuit of the water heat source HYBRID CITY MULTI connects the heat source unit with the cooling tower/auxiliary heat source/heat storage tank/circulation pump with a single system water piping as shown in the figure below. The selector valve automatically controls to circulate water toward the cooling tower in the cooling season, while toward the heat storage tank in the heating season. If the circulation water temperature is kept in a range of 10~45°C [50~113°F] regardless of the building load, the water heat source HYBRID CITY MULTI can be operated for either cooling or heating. Therefore in the summer when only cooling load exists, the temperature rise of circulation water will be suppressed by operating the cooling tower. While in the winter when heating load increases, the temperature of circulation water may be dropped below 10°C [50°F]. Under such situation, the circulation water will be heated with the auxiliary heat source if it drops below a certain temperature.
When the thermal balance between cooling and heating operation is in a correct proportion, the operation of the auxiliary heat source and cooling tower is not required.
In order to control the above thermal balance properly and use thermal energy effectively, utilizing of heat storage tanks, and night-time discounted electric power as a auxiliary heat source will be economical.
Meantime as this system uses plural sets of heat source unit equipped with water heat exchangers, water quality control is important. Therefore it is recommended to use closed type cooling towers as much as possible to prevent the circulation water from being contaminated.
When open type cooling towers are used, it is essential to provide proper maintenance control such as that to install water treatment system to prevent troubles caused by contaminated circulation water.

Example of basic water circuit for water heat source HYBRID CITY MULTI



The indoor unit and refrigerant piping system are excluded in this figure.

2) Cooling tower

a) Types of cooling tower

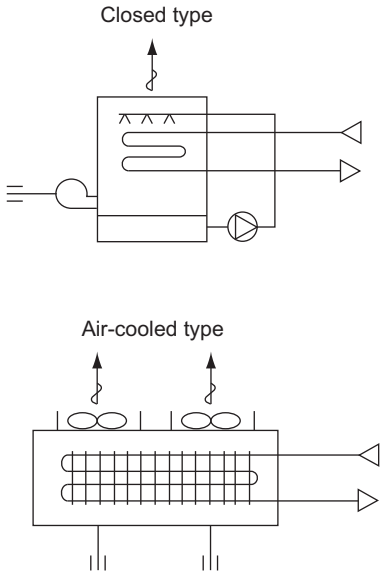
The cooling towers presently used include the open type cooling tower, open type cooling tower + heat exchanger, closed type cooling tower, and air-cooled type cooling tower. However, as the quality control of circulation water is essential when units are installed in decentralized state inside a building, the closed type cooling tower is generally employed in such case.

Although the circulation water will not be contaminated by atmospheric air, it is recommended to periodically blow water inside the system and replenish fresh water instead.

In a district where the coil may be frozen in the winter, it is necessary to apply antifreeze solution to the circulation water, or take freeze protection measures such as to automatically discharge water inside the cooling coil at the stopping of the pump.

When the open type cooling tower is used, be sure to install a water quality control device in addition to the freeze protection measures, as the water may be deteriorated by atmospheric contaminants entered into the cooling tower and dissolved into the circulation water.

Types of cooling towers



b) Calculation method of cooling tower capacity

All units of the water heat source HYBRID CITY MULTI may possibly be in cooling operation temporarily (at pulling down) in the summer, however, it is not necessary to determine the capacity according to the total cooling capacity of all HYBRID CITY MULTI units as this system has a wide operating water temperature range.

It is determined in accordance with the value obtained by adding the maximum cooling load of an actual building, the input heat equivalent value of all HYBRID CITY MULTI units, and the cooling load of the circulating pumps. Please check for the values of the cooling water volume and circulation water volume.

$$\text{Cooling tower capacity} = \frac{Qc + 860 \times (\Sigma Qw + Pw)}{3{,}900} \text{ (Refrigeration ton)}$$

Qc : Maximum cooling load under actual state (kcal/h)
Qw : Total input of water heat source HYBRID CITY MULTI at simultaneous operation under maximum state (kW)
Pw : Shaft power of circulation pumps (kW)

$$\text{Cooling tower capacity} = \frac{Qc + 3{,}412 \times (\Sigma Qw + Pw)}{15{,}500} \text{ (Refrigeration ton)}$$

Qc : Maximum cooling load under actual state (BTU/h)
Qw : Total input of water heat source HYBRID CITY MULTI at simultaneous operation under maximum state (kW)
Pw : Shaft power of circulation pumps (kW)

* 1 Refrigerant ton of cooling tower capacity ≈ US refrigerant ton × (1 + 0.3)
= 3,900 kcal/h = 15,500 BTU/h

3) Auxiliary heat source and heat storage tank

When the heating load is larger than the cooling load, the circulation water temperature lowers in accordance with the heat balance of the system. It should be heated by the auxiliary heat source in order to keep the inlet water temperature within the operating range of the water heat source HYBRID CITY MULTI.

Further in order to operate the water heat source HYBRID CITY MULTI effectively, it is recommended to utilize the heat storage tank to cover the warming up load in the morning and the insufficient heat amount.
Effective heat utilization can be expected to cover insufficient heat at the warming up in the next morning or peak load time by storing heat by installing a heat storage tank or operating a low load auxiliary heat source at the stopping of the water heat source HYBRID CITY MULTI. As it can also be possible to reduce the running cost through the heat storage by using the discounted night-time electric power, using both auxiliary heat source and heat storage tank together is recommended. The effective temperature difference of an ordinary heat storage tank shows about 5°C [41°F] even with the storing temperature at 45°C [113°F].
However with the water heat source HYBRID CITY MULTI, it can be utilized as heating heat source up to 15°C [59°F] with an effective temperature of a high 30°C [54°F] approximately, thus the capacity of the heat storage tank can be minimized.

a) Auxiliary heat source

The following can be used as the auxiliary heat source.

- Boiler (Heavy oil, kerosine, gas, electricity)
- Electric heat (Insertion of electric heater into heat storage tank)
- Outdoor air (Air-heat source heat pump chiller)
- Warm discharge water (Exhaust water heat from machines inside building and hot water supply)
- Utilization of night-time lighting
- Solar heat

Please note that the auxiliary heat source should be selected after studying your operating environment and economical feasibility.

Determining the auxiliary heat source capacity

For the HYBRID CITY MULTI water heat source system, a heat storage tank is recommended to use. When employment of the heat storage tank is difficult, the warming up operation should be arranged to cover the starting up heating load. Since the holding water inside the piping circuit owns heat capacity and the warming up operation can be assumed for about one hour except that in a cold region, the heat storage tank capacity is required to be that at the maximum daily heating load including the warming up load at the next morning of the holiday. However the auxiliary heat source capacity should be determined by the daily heating load including warming up load on the week day.
For the load at the next morning of the holiday, heat storage is required by operating the auxiliary heat source even outside of the ordinary working hour.

When heat storage tank is not used

$$QH = HC_T \left(1 - \frac{1}{COP_h}\right) - 1000 \times Vw \times \Delta T - 860 \times Pw$$

QH	: Auxiliary heat source capacity	(kcal/h)
HC_T	: Total heating capacity of each water heat source HYBRID CITY MULTI	(kcal/h)
COP_H	: COP of water heat source HYBRID CITY MULTI at heating	
Vw	: Holding water volume inside piping	(m^3)
ΔT	: Allowable water temperature drop = $T_{WH} - T_{WL}$	(°C)
T_{WH}	: Heat source water temperature at high temperature side	(°C)
T_{WL}	: Heat source water temperature at low temperature side	(°C)
Pw	: Heat source water pump shaft power	(kW)

$$QH = HC_T \left(1 - \frac{1}{COP_h}\right) - 8.343 \times Vw \times \Delta T - 3412 \times Pw$$

QH	: Auxiliary heat source capacity	(BTU/h)
HC_T	: Total heating capacity of each water heat source HYBRID CITY MULTI	(BTU/h)
COP_H	: COP of water heat source HYBRID CITY MULTI at heating	
Vw	: Holding water volume inside piping	(G)
ΔT	: Allowable water temperature drop = $T_{WH} - T_{WL}$	(°F)
T_{WH}	: Heat source water temperature at high temperature side	(°F)
T_{WL}	: Heat source water temperature at low temperature side	(°F)
Pw	: Heat source water pump shaft power	(kW)

When heat storage tank is not used

$$QH = \frac{HQ_{1T} \cdot \left(1 - \frac{1}{COP_h}\right) - 860 \times Pw \times T_2}{T1} \times K \quad \text{(kcal)}$$

QH_{1T}	: Total of heating load on weekday including warming up	(kcal/day)
T_1	: Operating hour of auxiliary heat source	(h)
T_2	: Operating hour of heat source water pump	(h)
K	: Allowance factor (Heat storage tank, piping loss, etc.)	1.05~1.10

HQ_{1T} is calculated from the result of steady state load calculation similarly by using the equation below.

$$HQ_{1T} = 1.15 \times (\Sigma Q'a + \Sigma Q'b + \Sigma Q'c + \Sigma Q'd + \Sigma Q'f)\, T_2 - \psi\, (\Sigma Qe_1 + \Sigma Qe_2 + \Sigma Qe_3)\, (T2 - 1)$$

Q'a	: Thermal load from external wall/roof in each zone	(kcal/h)
Q'b	: Thermal load from glass window in each zone	(kcal/h)
Q'c	: Thermal load from partition/ceiling/floor in each zone	(kcal/h)
Q'd	: Thermal load by infiltration in each zone	(kcal/h)
Q'f	: Fresh outdoor air load in each zone	(kcal/h)
$Q'e_1$	: Thermal load from human body in each zone	(kcal/h)
$Q'e_2$	: Thermal load from lighting fixture in each zone	(kcal/h)
$Q'e_3$	: Thermal load from equipment in each zone	(kcal/h)
ψ	: Radiation load rate	0.6~0.8
T2	: Air conditioning hour	

$$QH = \frac{HQ_{1T} \cdot \left(1 - \frac{1}{COP_h}\right) - 3{,}412 \times Pw \times T_2}{T1} \times K \quad \text{(BTU)}$$

QH_{1T}	: Total of heating load on weekday including warming up	(BTU/day)
T_1	: Operating hour of auxiliary heat source	(h)
T_2	: Operating hour of heat source water pump	(h)
K	: Allowance factor (Heat storage tank, piping loss, etc.)	1.05~1.10

HQ_{1T} is calculated from the result of steady state load calculation similarly by using the equation below.

$$HQ_{1T} = 1.15 \times (\Sigma Q'a + \Sigma Q'b + \Sigma Q'c + \Sigma Q'd + \Sigma Q'f)\, T_2 - \psi\, (\Sigma Qe_1 + \Sigma Qe_2 + \Sigma Qe_3)\, (T2 - 1)$$

Q'a	: Thermal load from external wall/roof in each zone	(BTU/h)
Q'b	: Thermal load from glass window in each zone	(BTU/h)
Q'c	: Thermal load from partition/ceiling/floor in each zone	(BTU/h)
Q'd	: Thermal load by infiltration in each zone	(BTU/h)
Q'f	: Fresh outdoor air load in each zone	(BTU/h)
$Q'e_1$	: Thermal load from human body in each zone	(BTU/h)
$Q'e_2$	: Thermal load from lighting fixture in each zone	(BTU/h)
$Q'e_3$	: Thermal load from equipment in each zone	(BTU/h)
ψ	: Radiation load rate	0.6~0.8
T2	: Air conditioning hour	

b) Heat storage tank

Heat storage tank can be classified by types into the open type heat storage tank exposed to atmosphere, and the closed type heat storage tank with structure separated from atmosphere. Although the size of the tank and its installation place should be taken into account, the closed type tank is being usually employed by considering corrosion problems.

The capacity of heat storage tanks is determined in accordance with the daily maximum heating load that includes warming up load to be applied for the day after the holiday.

When auxiliary heat source is operated during operation and even after stopping of water heat source HYBRID CITY MULTI unit

$$V = \frac{HQ_{2T}\left(1 - \frac{1}{COP_h}\right) - 860 \times Pw \times T_2 - QH \times T_2}{\Delta T \times 1{,}000 \times \eta V} \quad \text{(ton)}$$

HQ_{2T} : Maximum heating load including load required for the day after the holiday (kcal/day)
ΔT : Temperature difference utilized by heat storage tank (°C)
ηV : Heat storage tank efficiency

HQ_{2T} : $1.3 \times (\Sigma Q'a + \Sigma Q'c + \Sigma Q'd + \Sigma Q'f)\, T_2 - \psi\, (\Sigma Qe2 + \Sigma Qe3)\, (T2 - 1)$

$$V = \frac{HQ_{2T}\left(1 - \frac{1}{COP_h}\right) - 3{,}412 \times Pw \times T_2 - QH \times T_2}{\Delta T \times \eta V} \quad \text{(lbs)}$$

HQ_{2T} : Maximum heating load including load required for the day after the holiday (BTU/day)
ΔT : Temperature difference utilized by heat storage tank (°F)
ηV : Heat storage tank efficiency

HQ_{2T} : $1.3 \times (\Sigma Q'a + \Sigma Q'c + \Sigma Q'd + \Sigma Q'f)\, T_2 - \psi\, (\Sigma Qe2 + \Sigma Qe3)\, (T2 - 1)$

When auxiliary heat source is operated after stopping of water heat source HYBRID CITY MULTI unit

$$V = \frac{HQ_{2T}\left(1 - \frac{1}{COP_h}\right) - 860 \times Pw \times T_2}{\Delta T \times 1{,}000 \times \eta V} \quad \text{(ton)}$$

HQ_{2T} : Maximum heating load including load required for the day after the holiday (kcal/day)
ΔT : Temperature difference utilized by heat storage tank (°C)
ηV : Heat storage tank efficiency

HQ_{2T} : $1.3 \times (\Sigma Q'a + \Sigma Q'c + \Sigma Q'd + \Sigma Q'f)\, T_2 - \psi\, (\Sigma Qe2 + \Sigma Qe3)\, (T2 - 1)$

$$V = \frac{HQ_{2T}\left(1 - \frac{1}{COP_h}\right) - 3{,}412 \times Pw \times T_2}{\Delta T \times \eta V} \quad \text{(lbs)}$$

HQ_{2T} : Maximum heating load including load required for the day after the holiday (BTU/day)
ΔT : Temperature difference utilized by heat storage tank (°F)
ηV : Heat storage tank efficiency

HQ_{2T} : $1.3 \times (\Sigma Q'a + \Sigma Q'c + \Sigma Q'd + \Sigma Q'f)\, T_2 - \psi\, (\Sigma Qe2 + \Sigma Qe3)\, (T2 - 1)$

4) Piping system

The following items should be kept in your mind in planning / designing water circuits.

a) All units should be constituted in a single circuit in principle.

b) When plural numbers of the water heat source HYBRID CITY MULTI unit are installed, the rated circulating water flow rate should be kept by making the piping resistance to each unit almost same value. As an example, the reverse return system as shown below may be employed.

c) Depending on the structure of a building, the water circuit may be prefabricated by making the layout uniform.

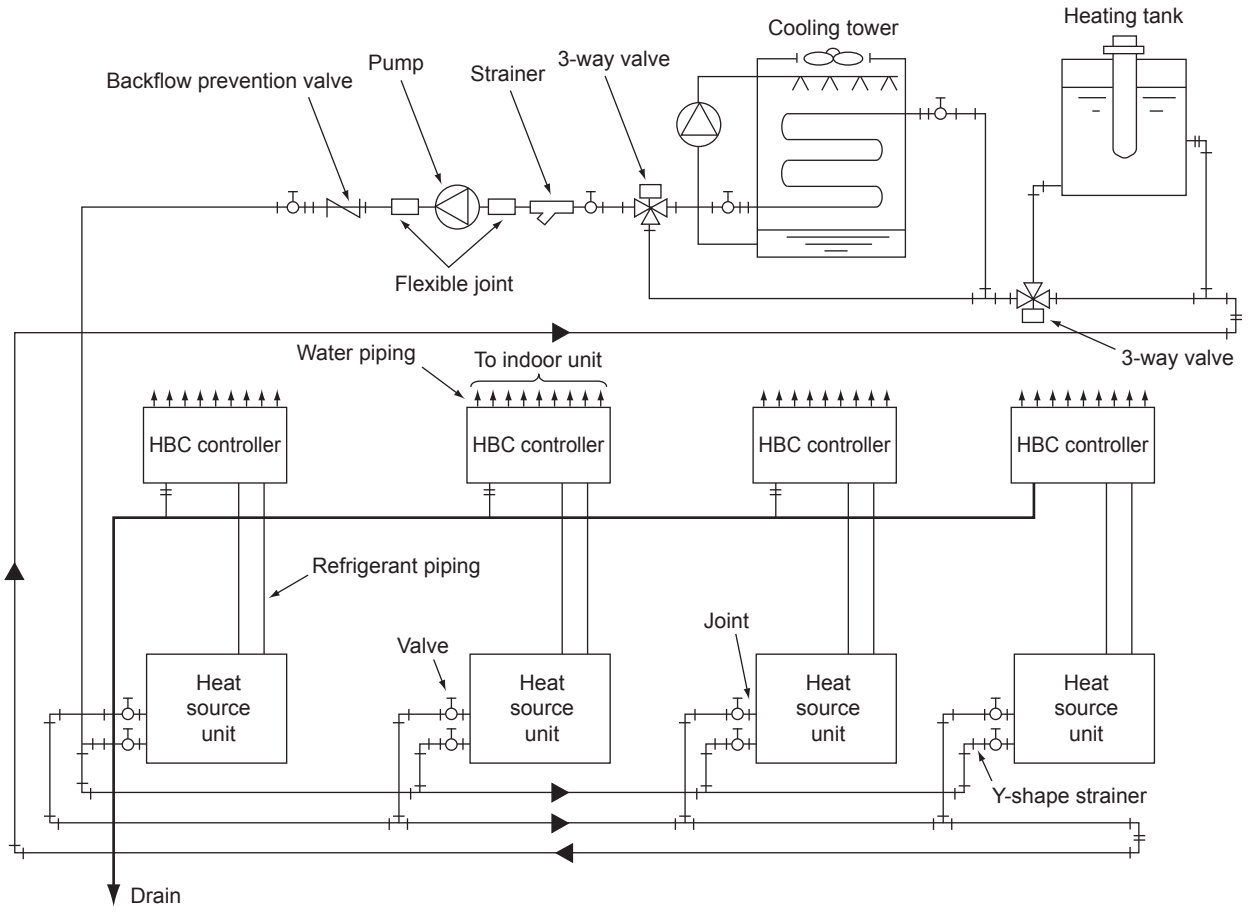
d) When a closed type piping circuit is constructed, install an expansion tank usable commonly for a make-up water tank to absorb the expansion/contraction of water caused by temperature fluctuation.

e) If the operating temperature range of circulation water stays within the temperature near the normal temperature (summer :29.4°C [85°F], winter :21.1°C [70°F]), thermal insulation or anti-sweating work is not required for the piping inside buildings.

In case of the conditions below, however, thermal insulation is required.

- When well water is used for heat source water.
- When piped to outdoor or a place where freezing may be caused.
- When vapor condensation may be generated on piping due to an increase in dry bulb temperature caused by the entry of fresh outdoor air.

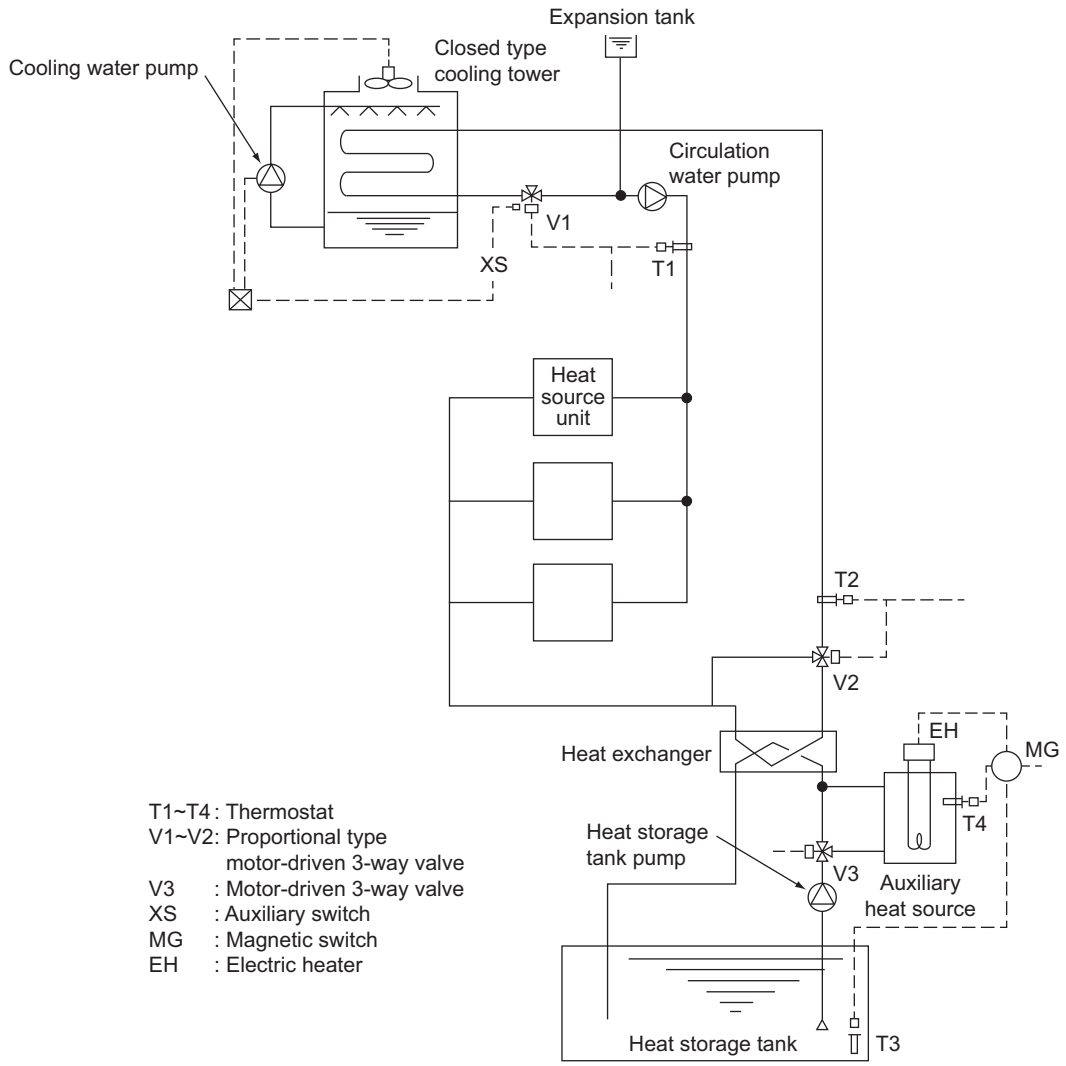
System example of water circuit



5) Practical System Examples and Circulation Water Control

Since the water heat source HYBRID CITY MULTI is of water heat source system, versatile systems can be constituted by combining it with various heat sources.
The practical system examples are given below.
Either cooling or heating operation can be performed if the circulation water temperature of the water heat source HYBRID CITY MULTI stays within a range of 15~45°C [59~113°F]. However, the circulation water temperature near 32°C [90°F] for cooling and 20°C [68°F] for heating is recommended by taking the life, power consumption and capacity of the air conditioning units into consideration. The detail of the control is also shown below.

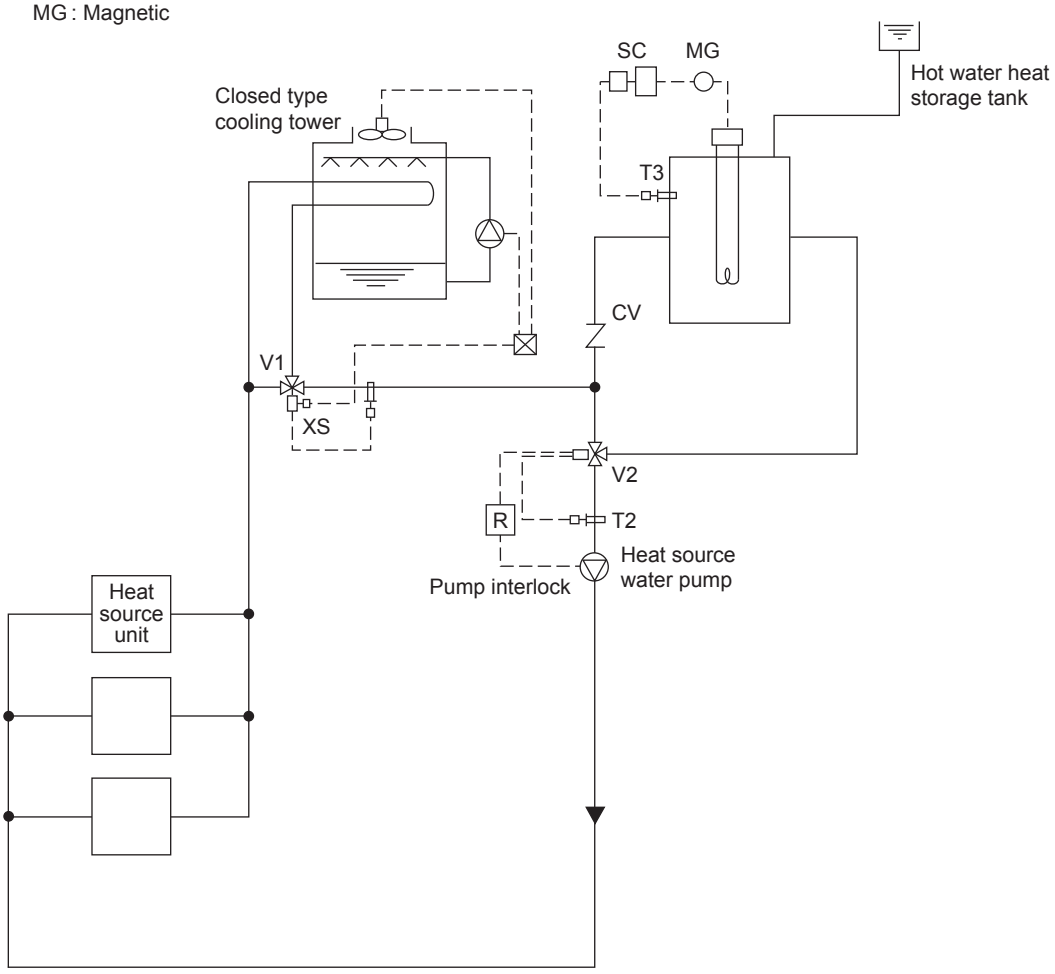
Example-1 Combination of closed type cooling tower and hot water heat storage tank (using underground hollow slab)



By detecting the circulation water temperature of the water heat source HYBRID CITY MULTI system with T1 (around 32°C [90°F]) and T2 (around 20°C [68°F]), the temperature will be controlled by opening/closing V1 in the summer and V2 in the winter.
In the summer, as the circulation water temperature rises exceeding the set temperature of T1, the bypass port of V1 will open to lower the circulation water temperature. While in the winter, as the circulation water temperature drops, V2 will open following the command of T2 to rise the circulation water temperature.
The water inside the heat storage tank will be heated by the auxiliary heat source by V3 being opened with timer operation in the night-time. The electric heater of the auxiliary heat source will be controlled by T3 and the timer.
The start/stop control of the fan and pump of the closed type cooling tower is applied with the step control of the fan and pump following the command of the auxiliary switch XS of V1, that operates only the fan at the light load while the fan and pump at the maximum load thus controlling water temperature and saving motor power.

Example-2 Combination of closed type cooling tower and hot water heat storage tank

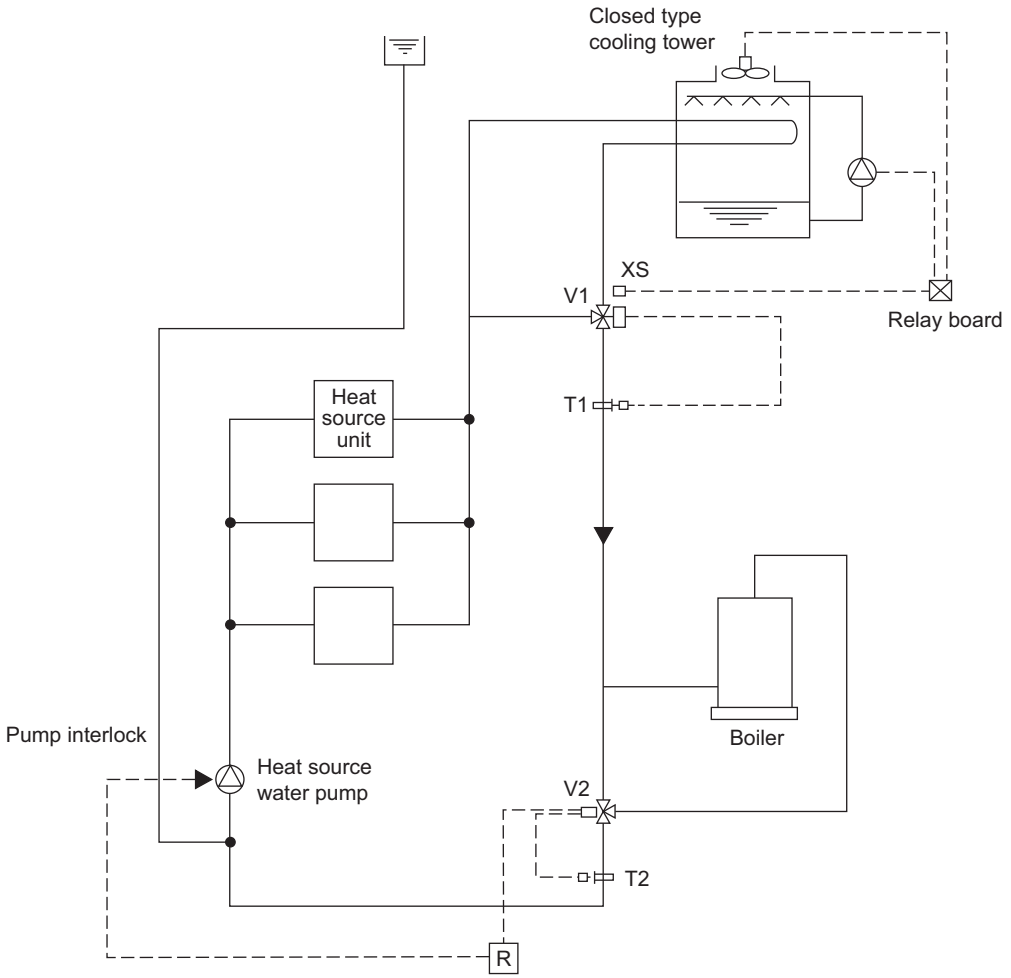
T1 : Proportional type, insertion system thermostat
T2 : Proportional type, insertion system thermostat
T3 : Proportional type, insertion system thermostat
V1 : Proportional type, motor-driven 3-way valve
V2 : Proportional type, motor-driven 3-way valve
XS : Auxiliary switch (Duplex switch type)
SC : Step controller
R : Relay
MG : Magnetic



In the summer, as the circulation water temperature rises exceeding the set temperature of T1, the bypass port of V1 will open to lower the circulation water temperature. In the winter, if the circulation water temperature stays below 25°C [77°F], V2 will open/close by the command of T2 to keep the circulation water temperature constant.
The temperature of the hot water inside the heat storage tank will be controlled through the step control of the electric heater by step controller operation following the command of T3.
During the stopping of the heat source water pump, the bypass port of V2 will be closed fully by interlocking thus preventing the high temperature water from entering into the system at the starting of the pump.
The start/stop control of the fan and pump of the closed type cooling tower is applied with the step control of the fan and pump following the command of the auxiliary switch XS of V1, that operates only the fan at the light load while the fan and pump at the maximum load thus controlling water temperature and saving motor power.

Example-3 Combination of closed type cooling tower and boiler

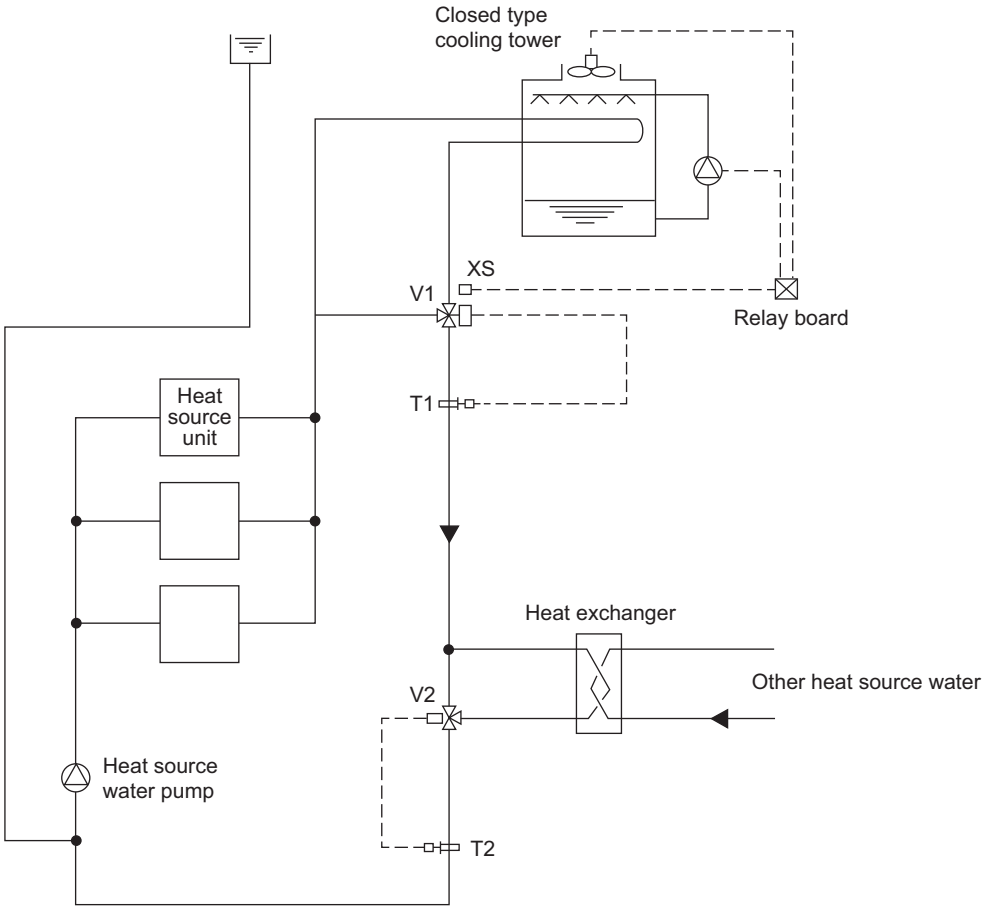
T1 : Proportional type, insertion system thermostat
T2 : Proportional type, insertion system thermostat
T3 : Proportional type, insertion system thermostat
V1 : Proportional type, motor-driven 3-way valve
S : Selector switch
R : Relay
XS : Auxiliary switch (Duplex switch type)



In the summer, as the circulation water temperature rises exceeding the set temperature of T1, the bypass port of V1 will close to lower the circulation water temperature. In the winter, if the circulation water temperature drops below 25°C [77°F], V2 will conduct water temperature control to keep the circulation water temperature constant.
During the stopping of the heat source water pump, the bypass port of V2 will be closed fully by interlocking.
The start/stop control of the fan and pump of the closed type cooling tower is applied with the step control following the command of the auxiliary switch XS of V1, thus controlling water temperature and saving motor power.

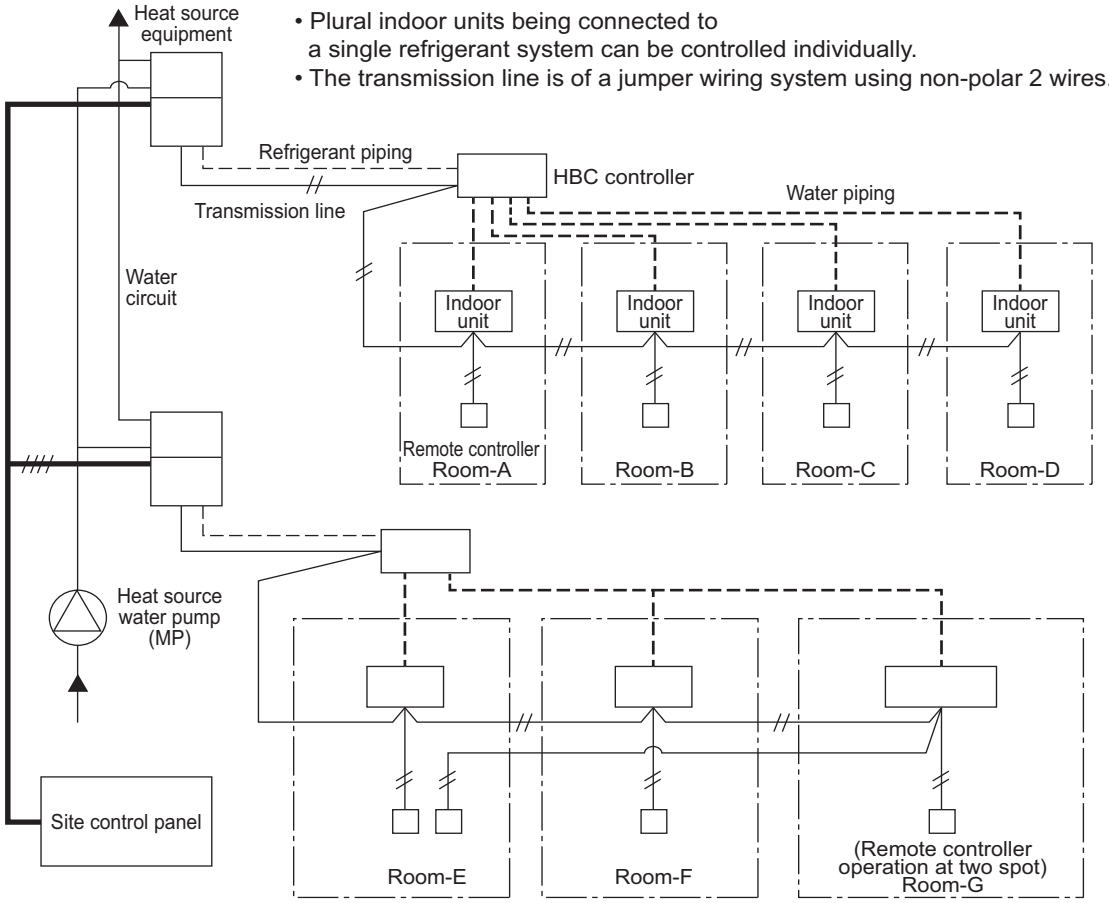
Example-4 Combination of closed type cooling tower and heat exchanger (of other heat source)

T1 : Proportional type, insertion system thermostat
T2 : Proportional type, insertion system thermostat
V1 : Proportional type, motor-driven 3-way valve
V2 : Proportional type, motor-driven 3-way valve
S : Selector switch
R : Relay
XS : Auxiliary switch (Duplex switch type)



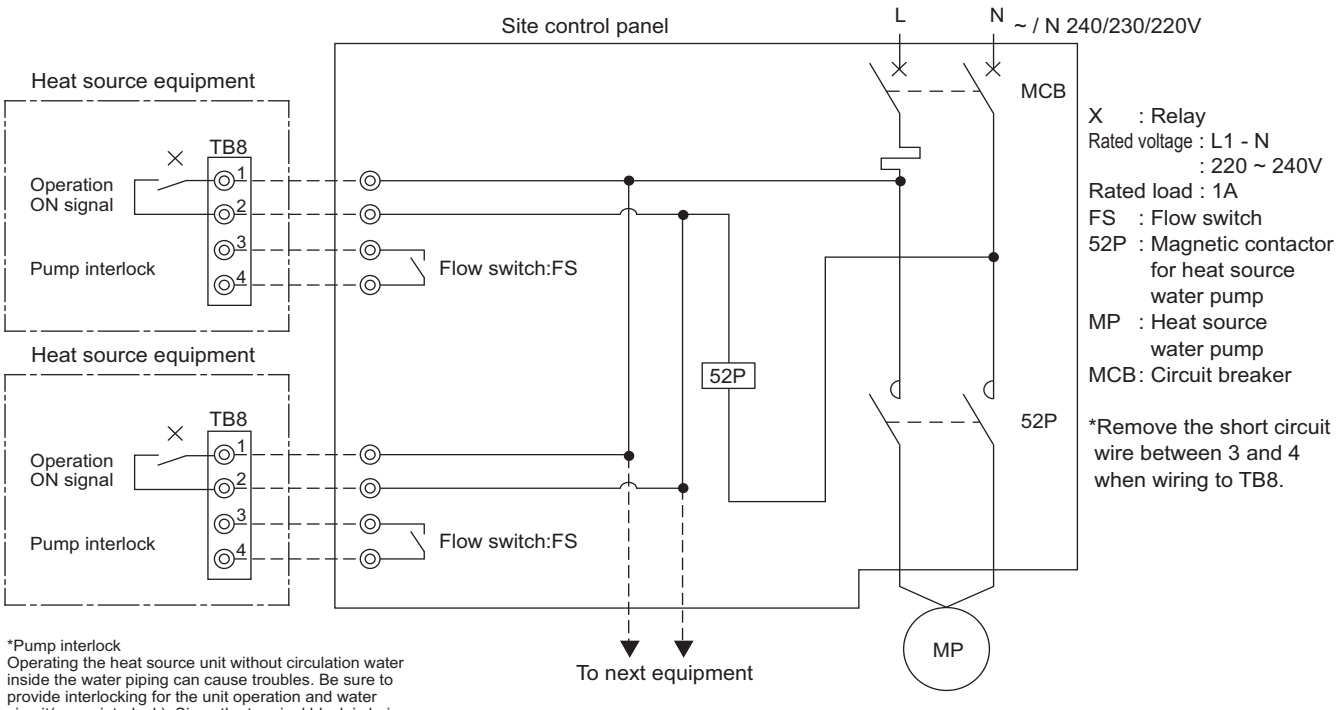
In the summer, as the circulation water temperature rises exceeding the set temperature of T1, the bypass port of V1 will close to lower the circulation water temperature. In the winter, if the circulation water temperature drops below 26°C [79°F], V2 will conduct water temperature control to keep the circulation water temperature constant.
During the stopping of the heat source water pump, the bypass port of V2 will be closed fully by interlocking.
The start/stop control of the fan and pump of the closed type cooling tower is applied with the step control following the command of the auxiliary switch XS of V1, thus controlling water temperature and saving motor power.

6) Pump interlock circuit



Wiring diagram

This circuit uses the "Terminal block for pump interlock (TB8)" inside the electrical parts box of the heat source equipment. This circuit is for interlocking of the heat source equipment operation and the heat source water pump.



*Pump interlock
Operating the heat source unit without circulation water inside the water piping can cause troubles. Be sure to provide interlocking for the unit operation and water circuit(pump interlock). Since the terminal block is being provided inside the unit, use it as required.

Use the flow switch (FS)

Operation ON signal

Terminal No.	TB8-1, 2
Output	Relay contacts output Rated voltage : L1 - N : 220 ~ 240V Rated load : 1A
Operation	• When setting No.917 for Dip switch 4 (Dip switch 6-10 is ON) is OFF. The relay closes during compressor operation.

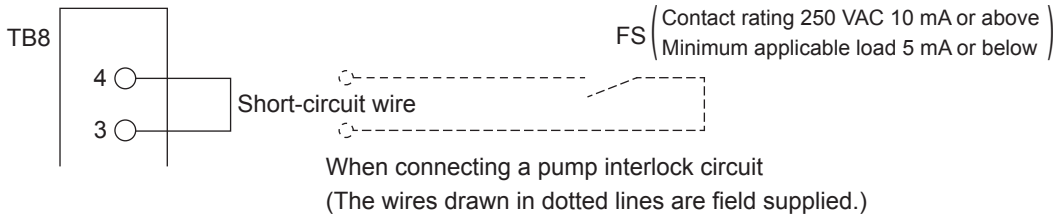
SW4 0: OFF, 1: ON									
1	2	3	4	5	6	7	8	9	10
1	0	1	0	1	0	0	1	1	1

• When setting No.917 for Dip switch 4 (Dip switch 6-10 is ON) is ON.
The relay closes during reception of cooling or the heating operation signal from the controller.
(Note : It is output even if the thermostat is OFF (when the compressor is stopped).)

Pump Interlock

Terminal No.	TB8-3, 4
Input	Level signal
Operation	If the circuit between TB8-3 and TB8-4 is open, compressor operation is prohibited.

*Remove the short circuit wire between 3 and 4 when wiring to TB8.
To prevent a false detection of error resulting from contact failure, use a flow switch with a minimum guaranteed current of 5 mA or below for FS.



When connecting a pump interlock circuit
(The wires drawn in dotted lines are field supplied.)

3-2. Water piping work

Although the water piping for the HYBRID CITY MULTI WR2 system does not differ from that for ordinary air conditioning systems, pay special attention to the items below in conducting the piping work.

1) Items to be observed on installation work

- In order to equalize piping resistance for each unit, adapt the reverse return system.
- Mount a joint and a valve onto the water outlet/inlet of the unit to allow for maintenance, inspection and replacement work. Be sure to mount a strainer at the water inlet piping of the unit. (The strainer is required at the circulation water inlet to protect the heat source unit.)

* The installation example of the heat source unit is shown right.

- Be sure to provide an air relief opening on the water piping properly, and purge air after feeding water to the piping system.
- Condensate will generate at the low temperature part inside the heat source equipment. Connect drain piping to the drain piping connection located at the bottom of the heat source equipment to discharge it outside the equipment.
- At the center of the header of the heat exchanger water inlet inside the unit, a plug for water discharge is being provided.
  Use it for maintenance work or the like.
- Mount a backflow prevention valve and a flexible joint for vibration control onto the pump.
- Provide a sleeve to the penetrating parts of the wall to prevent the piping.
- Fasten the piping with metal fitting, arrange the piping not to expose to cutting or bending force, and pay sufficient care for possible vibration.
- Be careful not to erroneously judge the position of the inlet and outlet of water.
  (Lower position : Inlet, Upper position : Outlet)
- When connecting heat source unit water piping and water piping on site, apply liquid sealing material for water piping over the sealing tape before connection. (for Maximum water pressure above 1.0MPa)
- Wrap the sealing tape as follows.

a) Wrap the joint with sealing tape in the direction of the threads (clockwise), and do not let the tape run over the edge.

b) Overlap the sealing tape by two-thirds to three-fourths of its width on each turn. Press the tape with your fingers so that it is pressed firmly against each thread.

c) Leave the 1.5th through 2nd farthest threads away from the pipe end unwrapped.

- Hold the pipe on the unit side in place with a spanner when installing the pipes or strainer. Tighten screws to a torque of 150N·m.

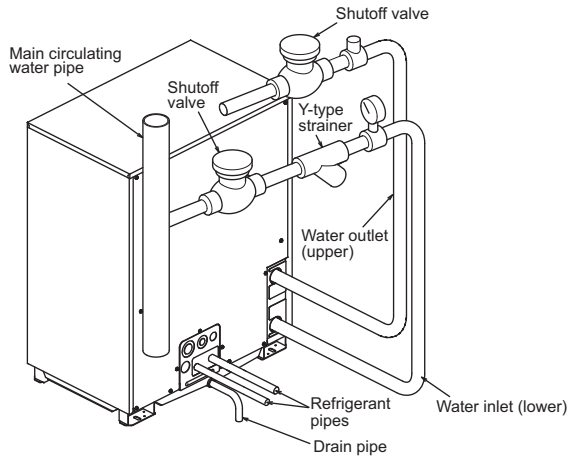
2) Thermal insulation work

Thermal insulation or anti sweating work is not required for the piping inside buildings in the case of the HYBRID CITY MULTI WR2 system if the operating temperature range of circulation water stays within the temperature near the normal (summer : 29.4°C[85°F], winter : 21.1°C[70°F]).

In case of the conditions below, however, thermal insulation is required.

- Use of well water for heat source water
- Outdoor piping portions
- Indoor piping portions where freezing may be caused in winter
- A place where vapor condensation may be generated on piping due to an increase in dry bulb temperature inside the ceiling caused by the entry of fresh outdoor air
- Drain piping portions

Installation example of heat source unit



3) Water treatment and water quality control

For the circulation water cooling tower of the HYBRID CITY MULTI WR2 system, employment of the closed type is recommended to keep water quality. However, in the case that an open type cooling tower is employed or the circulating water quality is inferior, scale will adhere onto the water heat exchanger leading to the decreased heat exchange capacity or the corrosion of the heat exchanger. Be sufficiently careful for water quality control and water treatment at the installation of the circulation water system

- Removal of impurities inside piping
  Be careful not to allow impurities such as welding fragment, remaining sealing material and rust from mixing into the piping during installation work.
- Water treatment
  The water quality standards have been established by the industry (Japan Refrigeration, Air Conditioning Industry Association, in case of Japan) for water treatment to be applied.

Items			Lower mid-range temperature water system		Tendency	
			Recirculating water [20<T<60°C] [68<T<140°F]	Make-up water	Corrosive	Scale-forming
Standard items	pH (25°C[77°F])		7.0 ~ 8.0	7.0 ~ 8.0	○	○
	Electric conductivity	(mS/m) (25°C[77°F]) (μS/cm) (25°C[77°F])	30 or less [300 or less]	30 or less [300 or less]	○	○
	Chloride ion	(mg Cl⁻/ℓ)	50 or less	50 or less	○	
	Sulfate ion	(mg SO_4^{2-}/ℓ)	50 or less	50 or less	○	
	Acid consumption (pH4.8)	(mg $CaCO_3$/ℓ)	50 or less	50 or less		○
	Total hardness	(mg $CaCO_3$/ℓ)	70 or less	70 or less		○
	Calcium hardness	(mg $CaCO_3$/ℓ)	50 or less	50 or less		○
	Ionic silica	(mg SiO_2/ℓ)	30 or less	30 or less		○
Reference items	Iron	(mg Fe/ℓ)	1.0 or less	0.3 or less	○	○
	Copper	(mg Cu/ℓ)	1.0 or less	0.1 or less	○	
	Sulfide ion	(mg S^{2-}/ℓ)	not to be detected	not to be detected	○	
	Ammonium ion	(mg NH_4^+/ℓ)	0.3 or less	0.1 or less	○	
	Residual chlorine	(mg Cl/ℓ)	0.25 or less	0.3 or less	○	
	Free carbon dioxide	(mg CO_2/ℓ)	0.4 or less	4.0 or less	○	
	Ryzner stability index		–	–	○	○

Reference : Guideline of Water Quality for Refrigeration and Air Conditioning Equipment. (JRA GL02E-1994)

In order to keep the water quality within such standards, you are kindly requested to conduct bleeding-off by overflow and periodical water quality tests, and use inhibitors to suppress condensation or corrosion. Since piping may be corroded by some kinds of inhibitor, consult an appropriate water treatment expert for proper water treatment.

4) Pump interlock

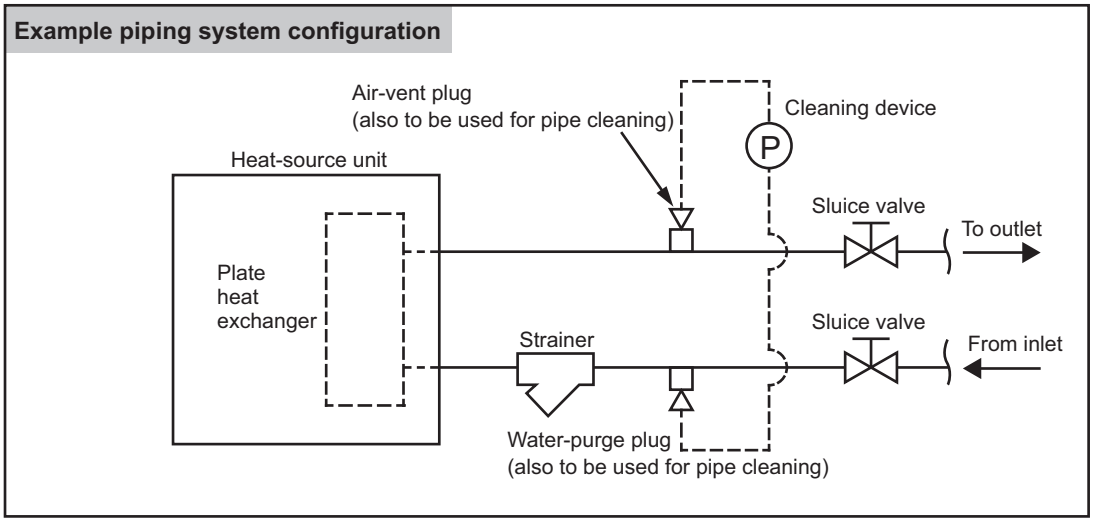
Operating the heat source unit without circulation water inside the water piping can cause a trouble. Be sure to provide interlocking for the unit operation and water circuit. Since the terminal block is being provided inside the unit, use it as required.

5) Handling plate heat exchangers for heat-source units

<Designing the piping system>

- Install a strainer (50 mesh or finer recommended) near the heat-source unit on the inlet side of the hot/cold water pipe and cooling-water pipe (hereafter referred to as water pipes) to prevent an infiltration of foreign materials of solid nature, such as dirt and sand, into the plate heat exchanger.
- Depending on the water quality, scale may form inside plate heat exchangers. Plate heat exchangers must be chemically cleaned regularly to remove scale formation. Install sluice valves on the water pipes, and provide ports for connecting a pipe between the sluice valves and the heat-source unit for chemical cleaning.
- On both the inlet and outlet sides of water pipes, provide a plug to remove trapped air and water (also to be used for cleaning heat-source units and for purging water before a period of nonuse in winter or at the end of an air conditioning season). Also, provide automatic air-vent valves where air is likely to be trapped (such as a pipe that runs vertically).
- In addition to installing the above-mentioned strainers, install a cleanable strainer near the pump pipe inlet.
- Keep the pipes properly insulated and take an appropriate measure against humidity to minimize heat loss and prevent freeze damage in severe cold climate.
- If the system is stopped during winter or at night in subfreezing temperatures, take appropriate measures to protect pipes from freezing (i.e., pipe purging and use of water-circulation pump or heater) and prevent resultant damage to the plate heat exchanger.

Example piping system configuration



<Test run>

- Before performing a test run, check that the piping system is properly installed, especially the strainers, air-vents, automatic water-supply valves, expansion tanks, and systems.
- After the pipe system is filled with water, first, operate the pump alone to check the system for trapped air and adjust the water flow rate to prevent the plate heat exchanger from freezing. Take into consideration the water pressure loss before and after each heat-source unit, and make sure the water flow rate falls within the design water flow rate range. Stop the test run and correct any problems found, if any.
- At the completion of a test run, check the strainer at the inlet pipe of the heat-source unit and clean it as necessary.

<Daily maintenance>

- Controlling the water quality
  Plate heat exchangers cannot be disassembled for cleaning and have no replaceable parts. Watch the water quality to prevent corrosion and scale formation. The quality of the water to be used for plate heat exchangers must meet the water quality guidelines JRA GL-02-1994 specified by Japan Refrigeration and Air conditioning Industry Association (JRAIA). (Refer to section 3) Water treatment and water quality control.)
- Controlling the circulation water flow rate
  Insufficient water rate will cause freeze damage to plate heat exchangers. Check for insufficient water flow caused by clogged strainer, trapped air in the system, or malfunction of the circulation water pump. Flow rate can also be checked by measuring the temperature or pressure difference between the inlet and outlet of plate heat exchangers.
  If the temperature or pressure difference goes outside of the specified range, stop the operation, remove the cause of the problem, and resume operation.
- What to do when the freeze protection trips
  If the freeze protection trips during operation, be sure to remove its cause before resuming operation. Tripped freeze protection indicates that the system is partially frozen, and resuming operation without removing the cause of the problem will result in freeze damage to plate heat exchangers and/or pipes as well as resultant refrigerant leaks and infiltration of water into the refrigerant circuit.

<Maintaining plate heat exchangers>

Plate heat exchangers must be maintained in a planned and periodical manner to prevent scale formation, which may cause performance loss or decrease water flow rate that result in freeze damage to the plate heat exchanger.

- Check the following items before the operating season.
  1. Check that the water quality meets the specified water quality.
  2. Clean the strainers.
  3. Check that the water flow rate is adequate.
  4. Check for proper operation (e.g., pressure, flow rate, inlet/outlet temperatures).

- Plate heat exchangers cannot be disassembled for cleaning. Clean them in the following way.
  1. Make sure that there is a pipe connection port on the water inlet pipe.
     Use formic acid, citric acid, oxalic acid, acetic acid, or phosphoric acid diluted to 5% to clean plate heat exchangers.
     Do not use highly corrosive acids, such as hydrochloric acid, sulfuric acid, or nitric acid.
  2. Make sure that valves are installed before the inlet connection port and after the outlet connection port.
  3. Connect a pipe for circulating cleaning solution to the inlet/outlet pipes of the plate heat exchanger, fill the plate heat exchanger with cleaning solution at a temperature between 50 and 60°C, and circulate the cleaning solution with a pump for 2 to 5 hours. The cleaning time will depend on the temperature of the cleaning solution and the degree of scale formation. Use the color of the cleaning solution as a guide to determine how long the system needs to be cleaned.
  4. When done, discharge the cleaning solution out of the plate heat exchanger, fill it with sodium hydrate (NaOH) or sodium bicarbonate ($NaHCO_3$) diluted with water to 1 to 2%, and let the solution be circulated for 15 to 20 minutes until the cleaning solution is neutralized.
  5. After neutralizing the cleaning solution, thoroughly rinse the plate heat exchanger with clean water.
  6. When using a commercially available cleaning solution, make sure to use a solution not corrosive to stainless steel or copper.
  7. Consult the cleaning solution manufacture for details.

- At the completion of cleaning, check the system for proper operation.

HYBRID CITY MULTI
3. SYSTEM DESIGN

HYBRID CITY MULTI
SYSTEM DESIGN YLM R2 SERIES

1. Electrical work

1-1. Power supply for Outdoor unit

1-1-1. Electrical characteristics of the outdoor unit in cooling mode

Symbols: MCA: Max Circuit Amps
RLA: Rated Load Amps SC: Starting Current

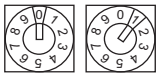
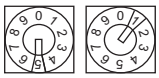
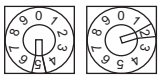
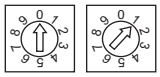
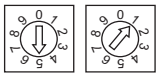
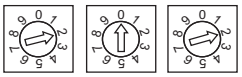
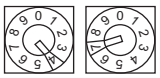
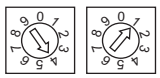
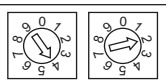
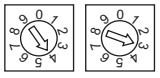
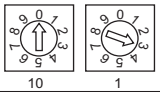
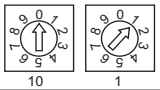
PURY-P-YLM-A1	Unit Combination	Units			Power supply	Compressor		FAN	RLA(A)(50/60Hz)	
		Hz	Volts	Voltage range	MCA(A)	Output (kW)	SC(A)	Output(kW)	Cooling	Heating
PURY-P200YLM-A1(-BS)	-	50/60	380 400 415	Max:456V Min:342V	16.1	5.6	8	0.92	8.9/8.4/8.1	9.2/8.8/8.4
PURY-P250YLM-A1(-BS)	-				17.3	6.9	8	0.92	11.7/11.1/10.7	12.3/11.7/11.3
PURY-P300YLM-A1(-BS)	-				22.2	8.1	8	0.92	15.3/14.5/14.0	15.8/15.0/14.4
PURY-P350YLM-A1(-BS)	-				27.8	10.5	8	0.92	19.8/18.8/18.1	19.5/18.5/17.9
PURY-P400YLM-A1(-BS)	-				32.4	10.9	8	0.92	23.1/21.9/21.1	19.2/18.3/17.6
PURY-P450YLM-A1(-BS)	-				35.3	12.4	8	0.92	24.1/22.9/22.1	25.2/23.9/23.0
PURY-P500YLM-A1(-BS)	-				41.9	13.4	8	0.92	29.9/28.4/27.4	27.1/25.7/24.8

PURY-EP-YLM-A1	Unit Combination	Units			Power supply	Compressor		FAN	RLA(A)(50/60Hz)	
		Hz	Volts	Voltage range	MCA(A)	Output (kW)	SC(A)	Output(kW)	Cooling	Heating
PURY-EP200YLM-A1(-BS)	-	50/60	380 400 415	Max:456V Min:342V	16.1	5.6	8	0.92	9.2/8.7/8.4	10.8/10.2/9.9
PURY-EP250YLM-A1(-BS)	-				19.9	6.9	8	0.92	12.2/11.6/11.2	14.2/13.5/13.0
PURY-EP300YLM-A1(-BS)	-				23.6	8.1	8	0.92	15.5/14.7/14.2	16.8/15.9/15.4
PURY-EP350YLM-A1(-BS)	-				30.6	10.5	8	0.92	21.2/20.1/19.4	21.8/20.7/19.9
PURY-EP400YLM-A1(-BS)	-				31.7	10.9	8	0.92	21.2/20.1/19.4	22.6/21.4/20.7
PURY-EP450YLM-A1(-BS)	-				37.4	12.4	8	0.92	25.0/23.7/22.9	26.7/25.4/24.5
PURY-EP500YLM-A1(-BS)	-				46.1	13.4	8	0.92	31.4/29.8/28.7	32.9/31.3/30.2

2. M-NET control

2-1. Address setting

2-1-1. Rule of setting address

Unit		Address setting	Example	Note
Indoor unit		01 ~ 50	 10 1	Use the most recent address within the same group of indoor units.
Outdoor unit		51 ~ 99, 100 (Note1)	 10 1	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, OS1 and OS2 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"
HBC controller		52 ~ 99, 100	 10 1	The address of the smallest address of indoor unit connected to the HBC controller +50 * 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 Remote controller (Main)	101 ~ 150	1 Fixed  10 1	The smallest address of indoor unit in the group + 100 * The place of "100" is fixed to "1"
	ME Remote controller (Sub)	151 ~ 199, 200	1 Fixed  10 1	The address of main remote controller + 50 * The address automatically becomes "200" if it is set as "00"
System controller	ON/OFF remote controller	201 ~ 250	 100 10 1	The smallest group No. to be managed + 200 * The smallest group No. to be managed is changeable.
	AE-200E/AE-50E AG-150A EW-50E AT-50B	000, 201 ~ 250	0,2 0~5 0~9 100 10 1	* AT-50B cannot be set to "000".
	PAC-YG50ECA	000, 201 ~ 250	0,2 0~5 0~9 100 10 1	* Settings are made on the initial screen of AG-150A.
	BAC-HD150	000, 201 ~ 250	0,2 0~5 0~9 100 10 1	* Settings are made with setting tool of BM ADAPTER.
	LMAP04-E	201 ~ 250	2 Fixed  10 1	
PI, AI, DIDO	PAC-YG60MCA	01 ~ 50	 10 1	
	PAC-YG63MCA	01 ~ 50	 10 1	
	PAC-YG66DCA	01 ~ 50	 10 1	
Lossnay, OA processing unit		01 ~ 50	 10 1	After setting the addresses of all the indoor units, assign an arbitrary address.
PAC-IF01AHC		201 ~ 250	2 Fixed  10 1	

Note1: To set the address to "100", set it to "50"
Note2: Outdoor units OC, OS1 and OS2 in one refrigerant circuit system are automatically detected. OC, OS1 and OS2 are ranked in descending order of capacity. If units are the same capacity, they are ranked in ascending order of their address.

3-1. R410A Piping material

Refrigerant pipe for HYBRID 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 radical thickness.

The maximum operation pressure of R410A air conditioner is 4.30 MPa [623psi]. The refrigerant piping should ensure the safety under the maximum operation pressure. MITSUBISHI ELECTRIC recommends pipe size as Table 3-1, or You shall follow the local industrial standard. Pipes of radical thickness 0.7mm or less shall not be used.

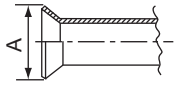
Table 3-1. Copper pipe size and radial thickness for R410A HYBRID CITY MULTI.

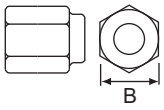
Size (mm)	Size (inch)	Radial thickness (mm)	Radial thickness (mil)	Pipe type
ø6.35	ø1/4"	0.8	[32]	Type-O
ø9.52	ø3/8"	0.8	[32]	Type-O
ø12.7	ø1/2"	0.8	[32]	Type-O
ø15.88	ø5/8"	1.0	[40]	Type-O
ø19.05	ø3/4"	1.2	[48]	Type-O
ø19.05	ø3/4"	1.0	[40]	Type-1/2H or H
ø22.2	ø7/8"	1.0	[40]	Type-1/2H or H
ø25.4	ø1"	1.0	[40]	Type-1/2H or H
ø28.58	ø1-1/8"	1.0	[40]	Type-1/2H or H
ø31.75	ø1-1/4"	1.1	[44]	Type-1/2H or H
ø34.93	ø1-3/8"	1.2	[48]	Type-1/2H or H
ø41.28	ø1-5/8"	1.4	[56]	Type-1/2H or H

* For pipe sized ø19.05 (3/4") for R410A air conditioner, choice of pipe type is up to you.
* The figures in the radial thickness column are based on the Japanese standards and provided only as a reference. Use pipes that meet the local standards.

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.

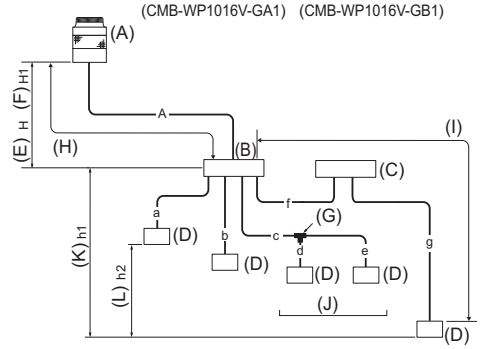
Flare pipe	Pipe size	A (For R410A) (mm[in.])
	ø6.35 [1/4"]	9.1
	ø9.52 [3/8"]	13.2
	ø12.70 [1/2"]	16.6
	ø15.88 [5/8"]	19.7
	ø19.05 [3/4"]	24.0

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

3-2. Piping Design

3-2-1. Restrictions on pipe length

CMB-WP108V-GA1 + CMB-WP108V-GB1
(CMB-WP1016V-GA1) (CMB-WP1016V-GB1)



(A) Outdoor unit (~(E)P350) (B) Main-HBC controller
(C) Sub-HBC controller (D) Indoor unit
(E) Less than H=50 m (when the outdoor unit is higher than HBC)
(F) Less than H1=40 m (when the outdoor unit is lower than HBC)
(G) Twinning pipe (field supply)
(H) Less than 110 m (I) Less than 60 m
(J) Up to three units for 1 branch port
Total capacity: less than 80 (but in same mode, cooling/heating)
(K) Less than 15 m (L) Less than 15 m

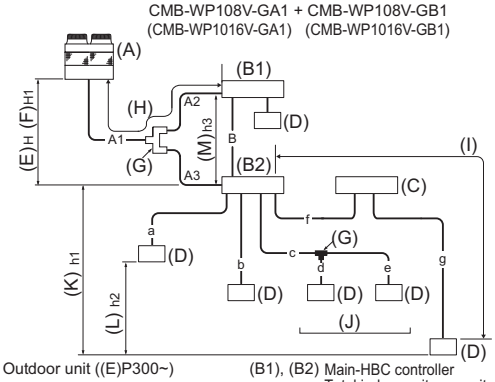
Note:1.
Indoor units that are connected to the same branch joint cannot be simultaneously operated in different operation modes.

(Unit: m)

	Item		Piping portion	Allowable value
Pipe Lengths	Between outdoor unit and HBC controller (refrigerant pipework)		A	110 or less
	Water pipework between indoor units and HBC controller		f + g	60 or less
Difference of elevation	Between HBC and outdoor units	Outdoor unit above HBC	H	50 or less
		Outdoor unit below HBC	H1	40 or less
	Between indoor units and HBC controller		h1	15(10) or less*1
	Between indoor units		h2	15(10) or less*1

*1. Values in ( ) are applied when indoor total capacity exceeds 130% of outdoor unit capacity

CMB-WP108V-GA1 + CMB-WP108V-GB1
(CMB-WP1016V-GA1) (CMB-WP1016V-GB1)



(A) Outdoor unit ((E)P300~) (B1), (B2) Main-HBC controller
Total indoor units capacity: P375 or less
(C) Sub-HBC controller
Total indoor units capacity (B2)+(C): P375 or less
(D) Indoor unit
(E) Less than H=50 m (when the outdoor unit is higher than HBC)
(F) Less than H1=40 m (when the outdoor unit is lower than HBC)
(G) Twinning pipe (field supply)
(H) Less than 110 m (I) Less than 60 m
(J) Up to three units for 1 branch port
Total capacity: less than 80 (but in same mode, cooling/heating)
(K) Less than 15 m (L) Less than 15 m
(M) Less than 15 m

(Unit: m)

	Item		Piping portion	Allowable value
Pipe Lengths	Between outdoor unit and HBC controller (refrigerant pipework)		A1 + A2 + A3	110 or less
	Water pipework between indoor units and HBC controller		f + g	60 or less
	Between HBC controllers		B	40 or less
Difference of elevation	Between HBC and outdoor units	Outdoor unit above HBC	H	50 or less
		Outdoor unit below HBC	H1	40 or less
	Between indoor units and HBC controller		h1	15(10) or less*1
	Between indoor units		h2	15(10) or less*1
	Between HBC controllers		h3	15(10) or less*1

*1. Values in ( ) are applied when indoor total capacity exceeds 130% of outdoor unit capacity

3. Piping Design

1. Refrigerant and water pipe size

(1) Refrigerant pipe between outdoor unit and HBC controller (Part A, A1, A2, and A3)

Use of one HBC controller

		HBC CONTROLLER		
Unit model		Model name	High pressure side	Low pressure side
Outdoor unit side	PURY-(E)P200	(HBC CONTROLLER) CMB-WP108V-GA1 CMB-WP1016V-GA1 *1	ø15.88 (Brazing)	ø19.05 (Brazing)
	PURY-(E)P250		ø19.05 (Brazing)	ø22.2 (Brazing)
	PURY-(E)P300		ø19.05 (Brazing)	ø22.2 (Brazing)
	PURY-(E)P350		ø19.05 (Brazing)	ø28.58 (Brazing)

Use of two HBC controllers

		HBC CONTROLLER			
Unit model		Model name	Between outdoor unit and twining pipe		Between twining pipe and HBC	
			High pressure side	Low pressure side	High pressure side	Low pressure side
Outdoor unit side	PURY-(E)P300	(HBC CONTROLLER) CMB-WP108V-GA1 CMB-WP1016V-GA1 *1	ø19.05 (Brazing)	ø22.2 (Brazing)	ø15.88 (Brazing) for each HBC	ø19.05 (Brazing) for each HBC
	PURY-(E)P350		ø19.05 (Brazing)	ø28.58 (Brazing)	ø15.88 (Brazing) for each HBC	ø19.05 (Brazing) for each HBC
	PURY-(E)P400		ø22.2 (Brazing)	ø28.58 (Brazing)	ø15.88 (Brazing) for each HBC	ø19.05 (Brazing) for each HBC
	PURY-(E)P450		ø22.2 (Brazing)	ø28.58 (Brazing)	ø19.05 (Brazing) for each HBC	ø22.2 (Brazing) for each HBC
	PURY-(E)P500		ø22.2 (Brazing)	ø28.58 (Brazing)	ø19.05 (Brazing) for each HBC	ø22.2 (Brazing) for each HBC

***1. PURY-(E)P400YLM model or larger requires a connection of two main-HBC controllers in parallel.**

(2) Water pipe between HBC controller and indoor units (Sections a, b, c, d, e, and g)

Indoor unit	Inlet pipe size	Outlet pipe size
P10 - P50	20A	20A

***Water Pipe size between HBC controller and joint is also 20A.**

(3) Water pipe between HBC controller and Sub-HBC

	Inlet pipe size	Outlet pipe size
Cold-water side	20A	20A
Hot-water side	20A	20A

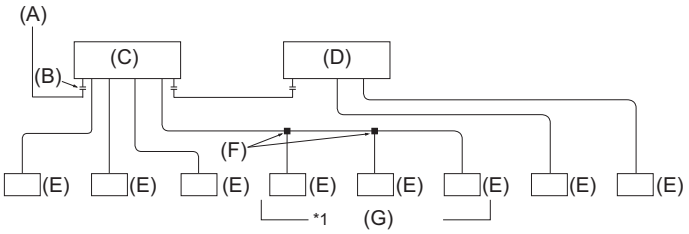
(4) Refrigerant pipe between HBC controller and HBC controller

Unit: mm [inch]

ø15.88 [5/8"] (Brazed connection)

2. Connecting the HBC controller

(1) Size of the pipe that fits the standard HBC controller ports



(A) To outdoor unit
(B) End connection (brazing)
(C) Main-HBC controller
(D) Sub-HBC controller
(E) Indoor unit
(F) Twinning pipe (field supply)
(G) Up to three units for 1 branch hole; total capacity: below 80 (but same in cooling/heating mode)

Note:

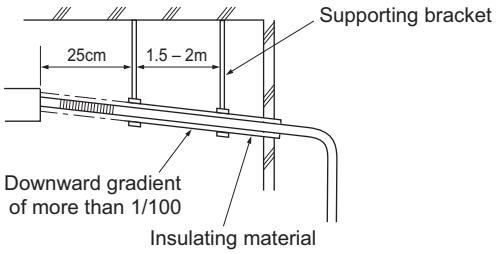
1) To connect multiple indoor units to a port
- Maximum total capacity of connected indoor units: P80 or below
- Maximum number of connectable indoor units: 3 units
- Branch joints are field-supplied.
  All the indoor units that are connected to the same port must be in the same group and Thermo-ON/OFF operation simultaneously. For all the indoor units in the group, the room temperature needs to be monitored via the connected remote controller.

3-2-2. Drain piping work

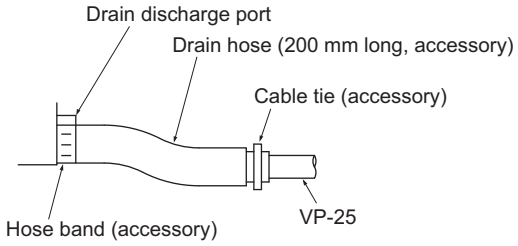
1. Drain piping work

- Ensure that the drain piping is sloped downward (sloped gradient of more than 1/100) toward the discharge side. If it is impossible to take any downward pitch, use an optionally available drain pump to obtain a downward pitch of more than 1/100.
- Ensure that any horizontal drain piping sections that are longer than 20 m are supported with metal brackets to prevent it from bending, warping, or vibrating.
- Connect the supplied drain hose to the discharge port on the unit. Use hardvinyl 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 need to be removed for servicing at a later date.)
- Do not use any odor trap around the discharge port.

1

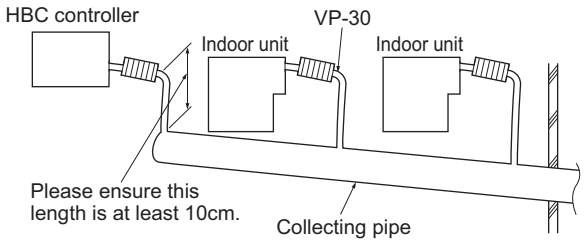


2



- As shown in 3, install a collecting pipe about 10 cm 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 the drain piping into any drain where ionic gases are generated.
- Drain piping may be installed in any direction. However, please be sure to observe the above instructions.

3



2. Discharge test

After completing drain piping work, open the HBC controller panel, and test drain discharge using a small amount of water. Also, check to see that there is no water leakage from the connections.

3. Insulating drain pipes

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

⚠CAUTION

Be sure to provide drain piping with heat insulation in order to prevent excess condensation. Without drain piping, water may leak from the unit causing damage to your property.

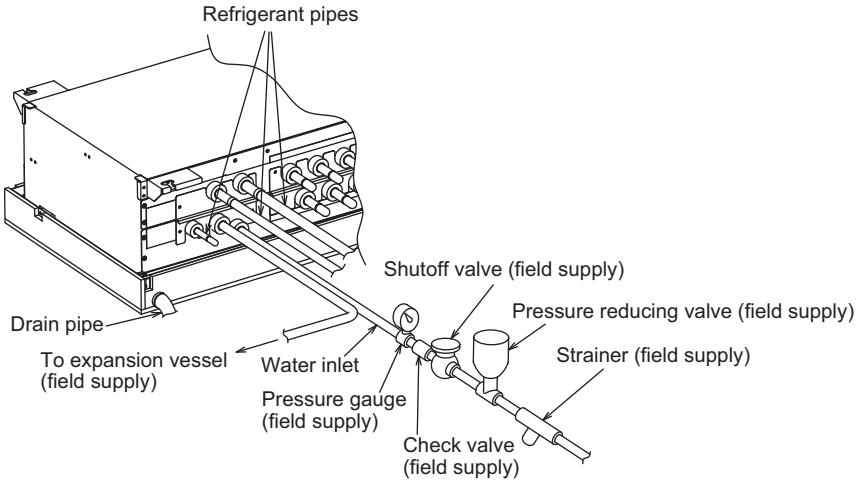
3-2-3. Connecting water pipework

Please observe the following precautions during installation.

3-2-3-1 Important notes on water pipework installation

- The design pressure of the HBC water system is 0.6MPa.
- Use water pipe-work with a design pressure of at least 1.0MPa.
- When performing a water leak check, please do not allow the water pressure to go above 0.3MPa.
- Please connect the water pipework of each indoor unit to the correct port on the HBC. Failure to do so will result in incorrect running.
- Please list the indoor units on the naming plate in the HBC unit with addresses and end connection numbers.
- If the number of indoor units are less than the number of ports on the HBC, the unused ports must be capped. Without a cap, water will leak.
- Use the reverse-return method to insure proper pipe resistance to each unit.
- Provide some joints and valves around inlet/outlet of each unit for easy maintenance, checkup, and replacement.
- Install a suitable air vent on the water pipe. After flowing water through the pipe, vent any excess air.
- Secure the pipes with metal fittings, positioning them in locations to protect pipes against breakage and bending.
- Do not confuse the water intake and outlet piping. (Error code 5102 will appear on the remote controller if a test run is performed with the pipe-work installed incorrectly (inlet connected to outlet and vice versa).)
- This unit doesn't include a heater to prevent freezing within the pipe work. If the system is stopped for an extended period during low ambient conditions, drain the water out.
- The unused knockout holes should be closed and the refrigerant pipes, water pipes, power source and transmission wires access holes should be filled with putty.
- Install water pipe so that the water flow rate will be maintained.
- Wrap sealing tape as follows.
  1. Wrap the joint with sealing tape following the direction of the threads (clockwise), do not wrap the tape over the edge.
  2. Overlap the sealing tape by two-thirds to three-fourths of its width on each turn. Press the tape with your fingers so that it is tight against each thread.
  3. Do not wrap the 1.5th through 2nd farthest threads away from the pipe end.
- Hold the pipe on the unit side in place with a spanner when installing the pipes or strainer. Tighten screws to a torque of 40 N·m.
- If there is a risk of freezing, take precautions to prevent this happening.
- When connecting the HBC unit water piping and on site water piping, apply liquid sealing material for water piping over the sealing tape before connection.
- Please use copper or plastic pipes for the water circuit. Do not use steel or stainless steel pipework. Furthermore, when using copper pipe-work, use a non-oxidative brazing method. Oxidation of the pipe-work will reduce the pump life.

Example of heat source unit installation (using left piping)



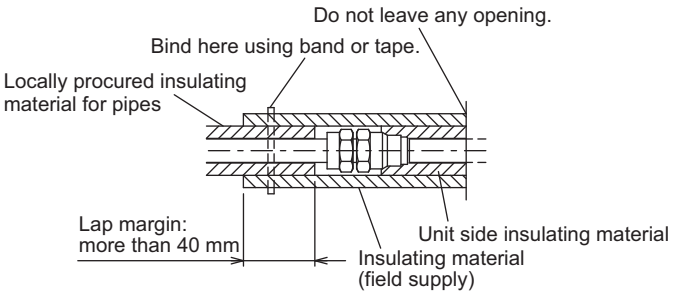
HBC controller sample installation (*1)

*1. Connect the pipes to the water pipes according to the local regulations.

- **The HBC system must be serviced at least once a year.**

3-2-3-2 Water pipe insulation

1. Connect the water pipes of each indoor unit to the same (correct) end connection numbers as indicated on the indoor unit connection section of each HBC 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 HBC controller control box (for identification purposes), and HBC controller end connection numbers and address numbers in the name plate on the indoor unit side.
   Seal unused end connections using cover caps (field supply, dezincification resistant brass (DZR) or bronze only). Not replacing the rubber end caps will lead to water leakage.
3. Be sure to add insulation work to water piping by covering water pipework separately with enough thickness heat-resistant polyethylene, so that no gap is observed in the joint between indoor unit and insulating material, and insulating materials themselves. When insulation work is insufficient, there is a possibility of condensation, etc. Pay special attention to insulation work in the ceiling plenum.



- Insulation materials for the pipes to be added on site must meet the following specifications:

HBC controller -indoor unit	20 mm or more

- This specification is based on copper for water piping. When using plastic pipework, choose a thickness based on the plastic pipe performance.
- Installation of pipes in a high-temperature high-humidity environment, such as the top floor of a building, may require the use of insulation materials thicker than the ones specified in the chart above.
- When certain specifications presented by the client must be met, ensure that they also meet the specifications on the chart above.

4. Expansion vessel
   - Install an expansion tank to accommodate expanded water.

   Expansion vessel selection criteria:
   - The water containment volume of the HBC, the indoor units, and pipe work.

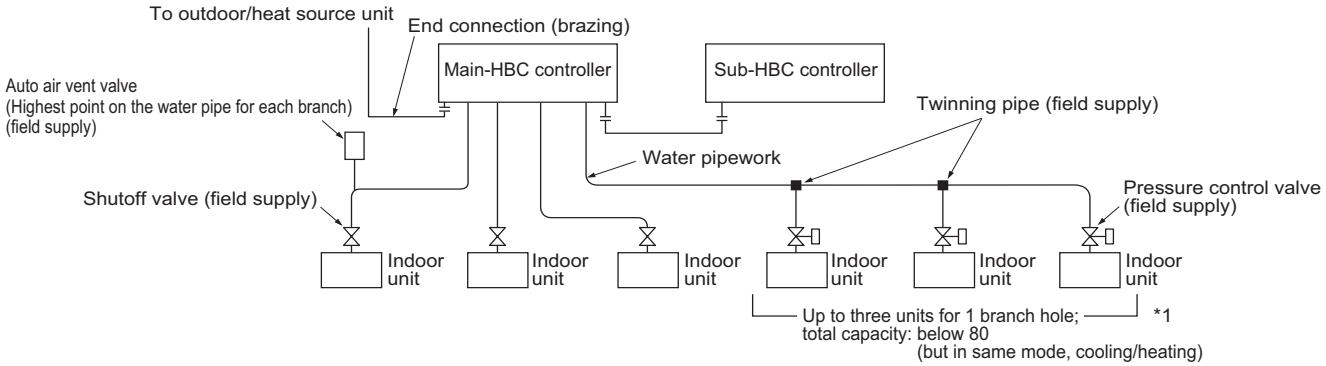
(Unit: L)

Unit model	Water volume
CMB-WP108V-GA1	10
CMB-WP1016V-GA1	13
CMB-WP108V-GB1	5
CMB-WP1016V-GB1	9
PEFY-WP10VMS1	0.4
PEFY-WP15VMS1	0.7
PEFY-WP20VMS1	0.9
PEFY-WP25VMS1	
PEFY-WP32VMS1	1.0
PEFY-WP40VMS1	
PEFY-WP50VMS1	1.7
PEFY-WP20VMA	0.7
PEFY-WP25VMA	1
PEFY-WP32VMA	
PEFY-WP40VMA	1.8
PEFY-WP50VMA	
PLFY-WP32VBM-E	1.5
PLFY-WP40VBM-E	
PLFY-WP50VBM-E	
PFFY-WP20VLRMM-E	0.9
PFFY-WP25VLRMM-E	1.3
PFFY-WP32VLRMM-E	
PFFY-WP40VLRMM-E	1.5
PFFY-WP50VLRMM-E	

   - The maximum water temperature is 60°C.
   - The minimum water temperature is 5°C.
   - The circuit protection valve set pressure is 370-490kPa.
   - The circulation pump head pressure is 0.24MPa.

5. Leakproof the water pipework, valves and drain pipework. Leakproof all the way to, and include pipe ends so that condensation cannot enter the insulated pipework.
6. Apply caulking around the ends of the insulation to prevent condensation getting between the pipework and insulation.
7. Add a drain valve so that the unit and pipework can be drained.
8. Ensure there are no gaps in the pipework insulation. Insulate the pipework right up to the unit.
9. Ensure that the gradient of the drain pan pipework is such that discharge can only flow out.
10. HBC water pipe connection sizes and pipe sizes.

	Connection size		Pipe size	
	Water inlet	Water outlet	Water out	Water return
Indoor unit	Rc 3/4 screw	Rc 3/4 screw	I.D. 20 mm	I.D. 20 mm

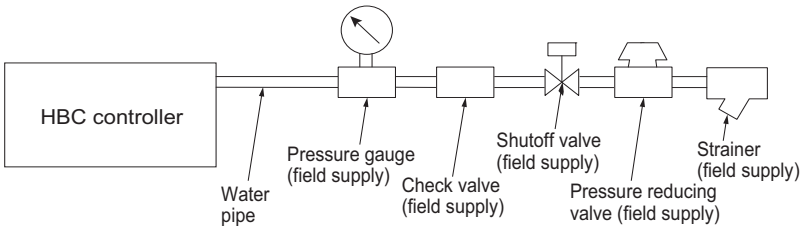


Note:

***1. Connection of multiple indoor units with one connection (or joint pipe)**

- Total capacity of connectable indoor units: Less than 80
- Number of connectable indoor units: Maximum 3 units
- Selection of water piping
  Select the size according to the total capacity of indoor units to be installed downstream.
- Please group units that operate on 1 branch.

11. Please refer to the figure below when connecting the water supply.



12. Use formula $0.1 \leq 0.01 + 0.01 \times A \leq 0.16$ for the supply pressure range to be used.
    (A: Head pressure (m) between the HBC and the highest indoor unit)
    If the supply pressure is greater than 0.16 MPa, use a pressure reducing valve to keep the pressure within the range.
    If the head pressure is unknown, set it to 0.16 MPa.
13. Install a shut off valve and strainer in a place that is easy to operate and makes maintenance work easy.
14. Apply insulation to the indoor unit pipework, strainer, shut off valve, and pressure reducing valve.
15. Please do not use a corrosion inhibitor in the water system.
16. When installing the HBC unit in an environment which may drop below 0°C, please add antifreeze (Propylene Glycol only) to the circulating water. For the brine selection, refer to 2-5. "Correction by antifreeze solution concentration" in chapter "OUTDOOR UNITS".

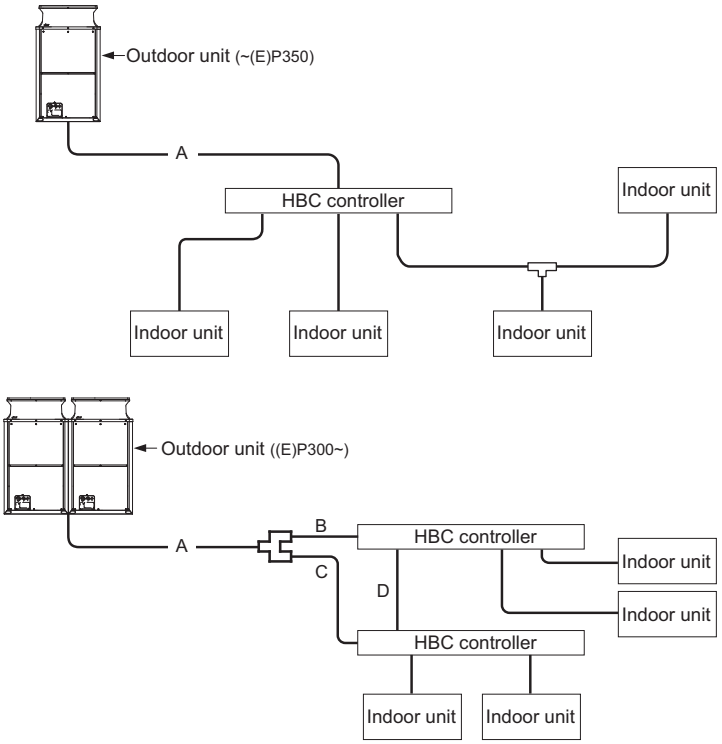
3-2-3-3 Water treatment and quality control

To preserve water quality, use the closed type of water circuit. When the circulating water quality is poor, the water heat exchanger can develop scale, leading to a reduction in heat-exchange power and possible corrosion. Pay careful attention to water processing and water quality control when installing the water circulation system.

- Removing of foreign objects or impurities within the pipes.
  During installation, make sure that foreign objects, such as welding fragments, sealant particles, or rust, do not enter the pipes.
- Water Quality Processing
  Depending on the quality of the cold-temperature water used in the airconditioner, the copper piping of the heat exchanger may corrode. Regular water quality processing is recommended. If a water supply tank is installed, keep air contact to a minimum, and keep the level of dissolved oxygen in the water no higher than 1mg/ℓ.

3-3. Refrigerant charging calculation

Example



■ Sample calculation

Indoor 1: 50 A: ø19.05 42 m
2: 50
3: 50
4: 40
Outdoor P250

The total length of each liquid line is as follows:
ø19.05: A = 42 m, α_1 = 3.0
Therefore,
<Calculation example>
Additional refrigerant charge
= 42 × 0.14 + 3.0
= 8.88 kg
≒ 8.9 kg
* All pipe work except A is water pipe work.

Indoor 1: 50 A:ø22.20 18 m
2: 50 B:ø15.88 5 m
3: 50 C:ø15.88 10 m
4: 50 D:ø15.88 8 m
Outdoor P400

The total length of each liquid line is as follows:
ø22.20: A = 18 m, ø15.88: B + C + D = 23m, α_1 = 3.0 × 2
Therefore,
<Calculation example>
Additional refrigerant charge
= 18 × 0.23+ (5 + 10 + 8) × 0.11 + 3.0 × 2
= 12.67 kg
≒ 12.7 kg
* All pipe work except A, B, C, D is water pipe work.

<Amount of refrigerant to be added>

The amount of refrigerant that is shown in the table below is factory-charged to the outdoor units.
The amount necessary for extended pipe (field piping) is not included and must be added on site.

Outdoor unit model	Amount of pre-charged refrigerant in the outdoor unit (kg)	Outdoor unit model	Amount of pre-charged refrigerant in the outdoor unit (kg)
P200YLM	9.5	P400YLM	10.3
P250YLM	9.5	P450YLM	11.8
P300YLM	10.3	P500YLM	11.8
P350YLM	10.3		

Outdoor unit model	Amount of pre-charged refrigerant in the outdoor unit (kg)
EP200YLM	6.0
EP250YLM	6.0
EP300YLM	8.0
EP350YLM	8.0
EP400YLM	10.5
EP450YLM	11.8
EP500YLM	11.8

■ Calculation formula

The amount of refrigerant to be added depends on the size and the length of field piping. (unit in m[ft])

1) When the distance between HBC and outdoor unit is longer than 30.5m:
Amount of added refrigerant (kg) = $(0.21 \times L_1)+(0.14 \times L_2)+(0.1 \times L_3)+\alpha_1$
2) When the distance between HBC and outdoor unit is 30.5m or shorter:
Amount of added refrigerant (kg) = $(0.23 \times L_1)+(0.16 \times L_2)+(0.11 \times L_3)+\alpha_1$

L_1 : Length of ø22.20 [7/8"] high pressure pipe (m)
L_2 : Length of ø19.05 [3/4"] high pressure pipe (m)
L_3 : Length of ø15.88 [5/8"] high pressure pip (m)
α_1 : Refer to the table below.

Use of one HBC controller

Outdoor unit index	Diameter of high-pressure pipe
(E)P200	ø15.88
(E)P250	ø19.05
(E)P300	ø19.05
(E)P350	ø19.05

Amount for the HBC controller
α_1 (kg)
3.0

Use of two HBC controllers

Outdoor unit index	Diameter of high-pressure pipe
(E)P300	ø19.05
(E)P350	ø19.05
(E)P400	ø22.20
(E)P450	ø22.20
(E)P500	ø22.20

Amount for the HBC controller
α_1 (kg)
3.0

× 2

Round up the calculation result to the nearest 0.1kg. (Example: 18.04kg to 18.1kg)

3-4. Water piping

3-4-1. Precautions for water piping

Consider the following when installing a water piping system.

1. Design pressure of the water piping
   Use a water pipe that is strong enough to withstand the design pressure (1.0 MPa).
2. Water pipe type
   Use of plastic pipe is recommended.
   When using copper pipes, be sure to braze the pipes under a nitrogen purge. (Oxidation during may shorten the life of the pump.)
3. Expansion vessel
   Install an expansion vessel to accommodate expanded water.
4. Drain piping
   Install the drain pipe with a downward inclination of between 1/100 and 1/200. To prevent drain water from freezing in winter, install the drain pipe as steep an angle as practically possible and minimize the straight line. For cold climate installation, take an appropriate measure (e.g., drain heater) to prevent the drain water from freezing.
5. Insulation
   Cover the water pipe with insulating materials with the specified thickness or more to prevent thermal loss or condensation from collecting.
6. Air vent valve
   Install air vent valves to the highest places where air can accumulate.
7. Maintenance valve
   It is recommended to install valves on the inlet/outlet for each HBC controller branch for maintenance.
8. Water pressure gauge
   Install a water pressure gauge to check the charged pressure.

3-4-2. Notes on corrosion

1. Water quality

It is important to check the water quality beforehand. See table below (Circulating water/Makeup Water Quality Standards).

Items		Lower mid-range temperature water system		Tendency	
		Recirculating water [20<T<60°C] [68<T<140°F]	Make-up water	Corrosive	Scale-forming
Standard items	pH (25°C[77°F])	7.0 ~ 8.0	7.0 ~ 8.0	○	○
	Electric conductivity (mS/m) (25°C[77°F]) (μS/cm) (25°C[77°F])	30 or less [300 or less]	30 or less [300 or less]	○	○
	Chloride ion (mg Cl^-/ ℓ)	50 or less	50 or less	○	
	Sulfate ion (mg SO_4^{2-}/ ℓ)	50 or less	50 or less	○	
	Acid consumption (pH4.8) (mg $CaCO_3$/ ℓ)	50 or less	50 or less		○
	Total hardness (mg $CaCO_3$/ ℓ)	70 or less	70 or less		○
	Calcium hardness (mg $CaCO_3$/ ℓ)	50 or less	50 or less		○
	Ionic silica (mg SiO_2/ ℓ)	30 or less	30 or less		○
Reference items	Iron (mg Fe/ ℓ)	1.0 or less	0.3 or less	○	○
	Copper (mg Cu/ ℓ)	1.0 or less	0.1 or less	○	
	Sulfide ion (mg S^{2-}/ ℓ)	not to be detected	not to be detected	○	
	Ammonium ion (mg NH_4^+/ ℓ)	0.3 or less	0.1 or less	○	
	Residual chlorine (mg Cl/ ℓ)	0.25 or less	0.3 or less	○	
	Free carbon dioxide (mg CO_2/ ℓ)	0.4 or less	4.0 or less	○	
	Ryzner stability index	–	–	○	○

Reference : Guideline of Water Quality for Refrigeration and Air Conditioning Equipment. (JRA GL02E-1994)

2. Debris in the water

Sand, pebbles, suspended solids, and corrosion products in water can damage the metal pipe and heat exchanger on the HBC controller and may cause corrosion. When installing, prevent debris from entering the water. If there is debris in the water, perform debris removal operation after test run by cleaning the strainers inside the HBC controller. (Refer to other sections for how to perform a test run.)

3. Connecting pipes made of different materials

Connecting pipes used for HBC controller and indoor unit are copper alloy pipes. If steel pipes are connected to the pipes, the contact surface will corrode. Do not use steel pipes to avoid corrosion.

4. Residual air

Residual air in the pipe results in water pump malfunction, noise, or water pipe corrosion in the water circuit. Ensure air is purged before use. (Refer to other sections for how to perform air vent operation.)

HYBRID CITY MULTI
SYSTEM DESIGN YLM WR2 SERIES

1. Electrical work

1-1. Power supply for Heat source unit

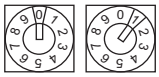
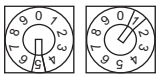
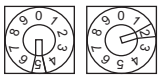
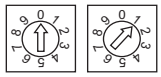
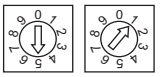
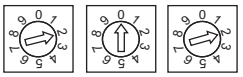
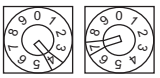
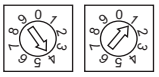
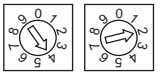
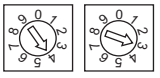
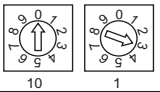
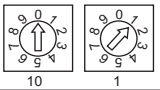
1-1-1. Electrical characteristics of Heat source unit at cooling mode

Symbols: MCA (Max Circuit Amps)
RLA (Rated Load Amps), SC (Starting Current)

PQRY-P-Y(S)LM	Unit combination	Heat source units				Compressor		RLA(A)	
		Hz	Volts	Voltage range	MCA(A)	Output (kW)	SC(A)	Cooling 380/400/415V	Heating 380/400/415V
PQRY-P200YLM-A	-	50/60	380 400 415	Max:456 Min:342	16.1	4.8	8	6.2/5.9/5.7	6.7/6.3/6.1
PQRY-P250YLM-A	-				16.1	6.2		8.2/7.8/7.5	8.5/8.1/7.8
PQRY-P300YLM-A	-				18.6	7.7		10.1/9.6/9.3	10.5/10.0/9.6
PQRY-P350YLM-A	-				23.1	9.5		12.0/11.4/11.0	12.7/12.0/11.6
PQRY-P400YLM-A	-				27.6	10.7		13.5/12.8/12.4	14.1/13.4/12.9
PQRY-P450YLM-A	-				32.9	11.6		15.6/14.8/14.3	16.5/15.7/15.1
PQRY-P500YLM-A	-				39.2	13.0		18.8/17.9/17.2	19.2/18.3/17.6

2-1. Address setting

2-1-1. Rule of setting address

Unit		Address setting	Example	Note
Indoor unit		01 ~ 50	 10 1	Use the most recent address within the same group of indoor units.
Heat source unit		51 ~ 99, 100 (Note1)	 10 1	The smallest address of indoor unit in same refrigerant system + 50 Assign sequential address numbers to the heat source 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"
HBC controller		52 ~ 99, 100	 10 1	The address of the smallest address of indoor unit connected to the HBC controller +50 ∗ 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 Remote controller (Main)	101 ~ 150	1 Fixed  10 1	The smallest address of indoor unit in the group + 100 ∗ The place of "100" is fixed to "1"
	ME Remote controller (Sub)	151 ~ 199, 200	1 Fixed  10 1	The address of main remote controller + 50 ∗ The address automatically becomes "200" if it is set as "00"
System controller	ON/OFF remote controller	201 ~ 250	 100 10 1	The smallest group No. to be managed + 200 ∗ The smallest group No. to be managed is changeable.
	AE-200E/AE-50E AG-150A EW-50E AT-50B	000, 201 ~ 250	0,2 0~5 0~9 100 10 1	∗ AT-50B cannot be set to "000".
	PAC-YG50ECA	000, 201 ~ 250	0,2 0~5 0~9 100 10 1	∗ Settings are made on the initial screen of AG-150A.
	BAC-HD150	000, 201 ~ 250	0,2 0~5 0~9 100 10 1	∗ Settings are made with setting tool of BM ADAPTER.
	LMAP04-E	201 ~ 250	2 Fixed  10 1	
PI, AI, DIDO	PAC-YG60MCA	01 ~ 50	 10 1	
	PAC-YG63MCA	01 ~ 50	 10 1	
	PAC-YG66DCA	01 ~ 50	 10 1	
Lossnay, OA processing unit		01 ~ 50	 10 1	After setting the addresses of all the indoor units, assign an arbitrary address.
PAC-IF01AHC		201 ~ 250	2 Fixed  10 1	

Note1: To set the address to "100", set it to "50"
Note2: Heat source 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. Piping Design

3-1. R410A Piping material

Refrigerant pipe for HYBRID 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 radical thickness.

The maximum operation pressure of R410A air conditioner is 4.30 MPa [623psi]. The refrigerant piping should ensure the safety under the maximum operation pressure. MITSUBISHI ELECTRIC recommends pipe size as Table 3-1, or You shall follow the local industrial standard. Pipes of radical thickness 0.7mm or less shall not be used.

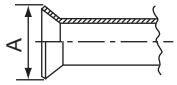
Table 3-1. Copper pipe size and radial thickness for R410A HYBRID CITY MULTI.

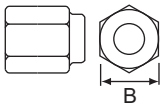
Size (mm)	Size (inch)	Radial thickness (mm)	Radial thickness (mil)	Pipe type
ø6.35	ø1/4"	0.8	[32]	Type-O
ø9.52	ø3/8"	0.8	[32]	Type-O
ø12.7	ø1/2"	0.8	[32]	Type-O
ø15.88	ø5/8"	1.0	[40]	Type-O
ø19.05	ø3/4"	1.2	[48]	Type-O
ø19.05	ø3/4"	1.0	[40]	Type-1/2H or H
ø22.2	ø7/8"	1.0	[40]	Type-1/2H or H
ø25.4	ø1"	1.0	[40]	Type-1/2H or H
ø28.58	ø1-1/8"	1.0	[40]	Type-1/2H or H
ø31.75	ø1-1/4"	1.1	[44]	Type-1/2H or H
ø34.93	ø1-3/8"	1.2	[48]	Type-1/2H or H
ø41.28	ø1-5/8"	1.4	[56]	Type-1/2H or H

* For pipe sized ø19.05 (3/4") for R410A air conditioner, choice of pipe type is up to you.
* The figures in the radial thickness column are based on the Japanese standards and provided only as a reference. Use pipes that meet the local standards.

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.

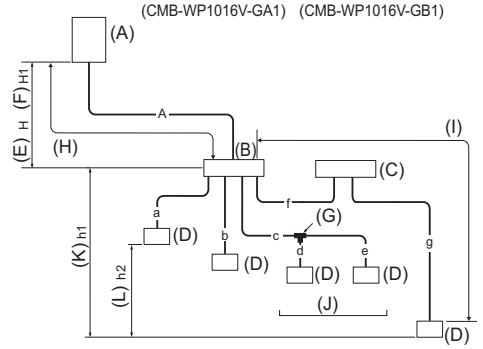
Flare pipe	Pipe size	A (For R410A) (mm[in.])
	ø6.35 [1/4"]	9.1
	ø9.52 [3/8"]	13.2
	ø12.70 [1/2"]	16.6
	ø15.88 [5/8"]	19.7
	ø19.05 [3/4"]	24.0

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

3-2. Piping Design

3-2-1. Restrictions on pipe length

CMB-WP108V-GA1 + CMB-WP108V-GB1
(CMB-WP1016V-GA1) (CMB-WP1016V-GB1)



(A) Heat source unit (B) Main-HBC controller
(C) Sub-HBC controller (D) Indoor unit
(E) Less than H=50 m (when the heat source unit is higher than HBC)
(F) Less than H1=40 m (when the heat source unit is lower than HBC)
(G) Twinning pipe (field supply)
(H) Less than 110 m (I) Less than 60 m
(J) Up to three units for 1 branch port
Total capacity: less than 80 (but in same mode, cooling/heating)
(K) Less than 15 m (L) Less than 15 m

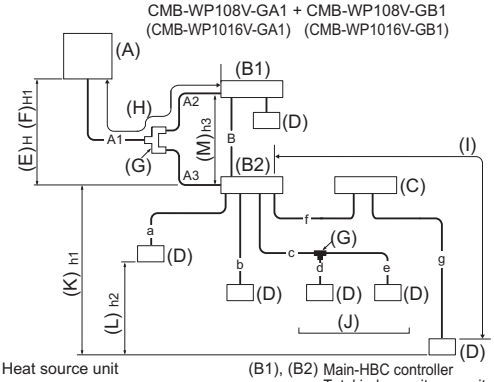
Note: 1.
Indoor units that are connected to the same branch joint cannot be simultaneously operated in different operation modes.

(Unit: m)

	Item		Piping portion	Allowable value
Pipe Lengths	Between heat source unit and HBC controller (refrigerant pipework)		A	110 or less
	Water pipework between indoor units and HBC controller		f + g	60 or less
Difference of elevation	Between HBC and heat source units	Heat source unit above HBC	H	50 or less
		Heat source unit below HBC	H1	40 or less
	Between indoor units and HBC controller		h1	15(10) or less*1
	Between indoor units		h2	15(10) or less*1

*1. Values in ( ) are applied when indoor total capacity exceeds 130% of heat source unit capacity

CMB-WP108V-GA1 + CMB-WP108V-GB1
(CMB-WP1016V-GA1) (CMB-WP1016V-GB1)



(A) Heat source unit (B1), (B2) Main-HBC controller
(C) Sub-HBC controller Total indoor units capacity: P375 or less
Total indoor units capacity (B2)+(C): P375 or less
(D) Indoor unit
(E) Less than H=50 m (when the heat source unit is higher than HBC)
(F) Less than H1=40 m (when the heat source unit is lower than HBC)
(G) Twinning pipe (field supply)
(H) Less than 110 m (I) Less than 60 m
(J) Up to three units for 1 branch port
Total capacity: less than 80 (but in same mode, cooling/heating)
(K) Less than 15 m (L) Less than 15 m
(M) Less than 15 m

(Unit: m)

	Item		Piping portion	Allowable value
Pipe Lengths	Between heat source unit and HBC controller (refrigerant pipework)		A1 + A2 + A3	110 or less
	Water pipework between indoor units and HBC controller		f + g	60 or less
	Between HBC controllers		B	40 or less
Difference of elevation	Between HBC and heat source units	Heat source unit above HBC	H	50 or less
		Heat source unit below HBC	H1	40 or less
	Between indoor units and HBC controller		h1	15(10) or less*1
	Between indoor units		h2	15(10) or less*1
	Between HBC controllers		h3	15(10) or less*1

*1. Values in ( ) are applied when indoor total capacity exceeds 130% of heat source unit capacity

3. Piping Design

1. Refrigerant and water pipe size

(1) Refrigerant pipe between heat source unit and HBC controller (Part A, A1, A2, and A3)

Use of one HBC controller

		HBC CONTROLLER		
Unit model		Model name	High pressure side	Low pressure side
Heat source unit side	PQRY-P200	(HBC CONTROLLER) CMB-WP108V-GA1 CMB-WP1016V-GA1 *1	ø15.88 (Brazing)	ø19.05 (Brazing)
	PQRY-P250		ø19.05 (Brazing)	ø22.2 (Brazing)
	PQRY-P300		ø19.05 (Brazing)	ø22.2 (Brazing)
	PQRY-P350		ø19.05 (Brazing)	ø28.58 (Brazing)

Use of two HBC controllers

		HBC CONTROLLER			
Unit model		Model name	Between outdoor unit and twining pipe		Between twining pipe and HBC	
			High pressure side	Low pressure side	High pressure side	Low pressure side
Heat source unit side	PQRY-P300	(HBC CONTROLLER) CMB-WP108V-GA1 CMB-WP1016V-GA1 *1	ø19.05 (Brazing)	ø22.2 (Brazing)	ø15.88 (Brazing) for each HBC	ø19.05 (Brazing) for each HBC
	PQRY-P350		ø19.05 (Brazing)	ø28.58 (Brazing)	ø15.88 (Brazing) for each HBC	ø19.05 (Brazing) for each HBC
	PQRY-P400		ø22.2 (Brazing)	ø28.58 (Brazing)	ø15.88 (Brazing) for each HBC	ø19.05 (Brazing) for each HBC
	PQRY-P450		ø22.2 (Brazing)	ø28.58 (Brazing)	ø19.05 (Brazing) for each HBC	ø22.2 (Brazing) for each HBC
	PQRY-P500		ø22.2 (Brazing)	ø28.58 (Brazing)	ø19.05 (Brazing) for each HBC	ø22.2 (Brazing) for each HBC

***1. PQRY-P400YLM model or larger requires a connection of two main-HBC controllers in parallel.**

(2) Water pipe between HBC controller and indoor units (Sections a, b, c, d, e, and g)

Indoor unit	Inlet pipe size	Outlet pipe size
P10 - P50	20A	20A

***Water Pipe size between HBC controller and joint is also 20A.**

(3) Water pipe between HBC controller and Sub-HBC

	Inlet pipe size	Outlet pipe size
Cold-water side	20A	20A
Hot-water side	20A	20A

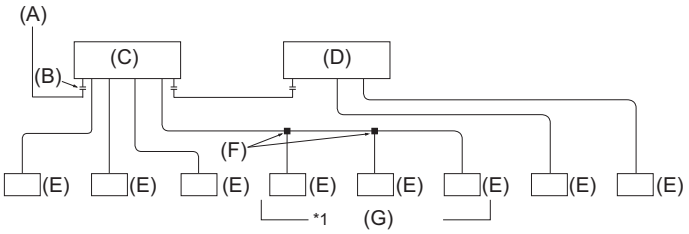
(4) Refrigerant pipe between HBC controller and HBC controller

Unit: mm [inch]

ø15.88 [5/8"] (Brazed connection)

2. Connecting the HBC controller

(1) Size of the pipe that fits the standard HBC controller ports



(A) To heat source unit
(B) End connection (brazing)
(C) Main-HBC controller
(D) Sub-HBC controller
(E) Indoor unit
(F) Twinning pipe (field supply)
(G) Up to three units for 1 branch hole; total capacity: below 80 (but same in cooling/heating mode)

Note:

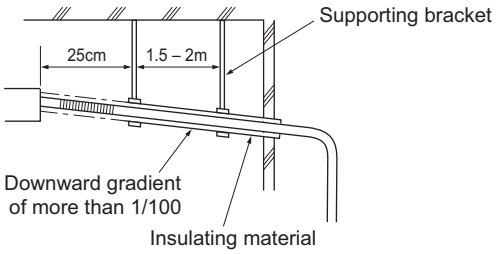
1) To connect multiple indoor units to a port
- Maximum total capacity of connected indoor units: P80 or below
- Maximum number of connectable indoor units: 3 units
- Branch joints are field-supplied.
  All the indoor units that are connected to the same port must be in the same group and Thermo-ON/OFF operation simultaneously. For all the indoor units in the group, the room temperature needs to be monitored via the connected remote controller.

3-2-2. Drain piping work

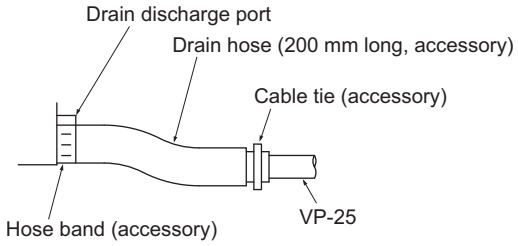
1. Drain piping work

- Ensure that the drain piping is sloped downward (sloped gradient of more than 1/100) toward the discharge side. If it is impossible to take any downward pitch, use an optionally available drain pump to obtain a downward pitch of more than 1/100.
- Ensure that any horizontal drain piping sections that are longer than 20 m are supported with metal brackets to prevent it from bending, warping, or vibrating.
- Connect the supplied drain hose to the discharge port on the unit. Use hardvinyl 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 need to be removed for servicing at a later date.)
- Do not use any odor trap around the discharge port.

1

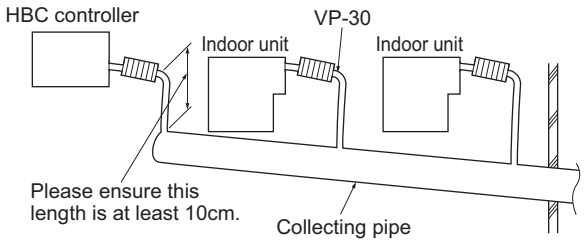


2



- As shown in 3, install a collecting pipe about 10 cm 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 the drain piping into any drain where ionic gases are generated.
- Drain piping may be installed in any direction. However, please be sure to observe the above instructions.

3



2. Discharge test

After completing drain piping work, open the HBC controller panel, and test drain discharge using a small amount of water. Also, check to see that there is no water leakage from the connections.

3. Insulating drain pipes

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

⚠CAUTION

Be sure to provide drain piping with heat insulation in order to prevent excess condensation. Without drain piping, water may leak from the unit causing damage to your property.

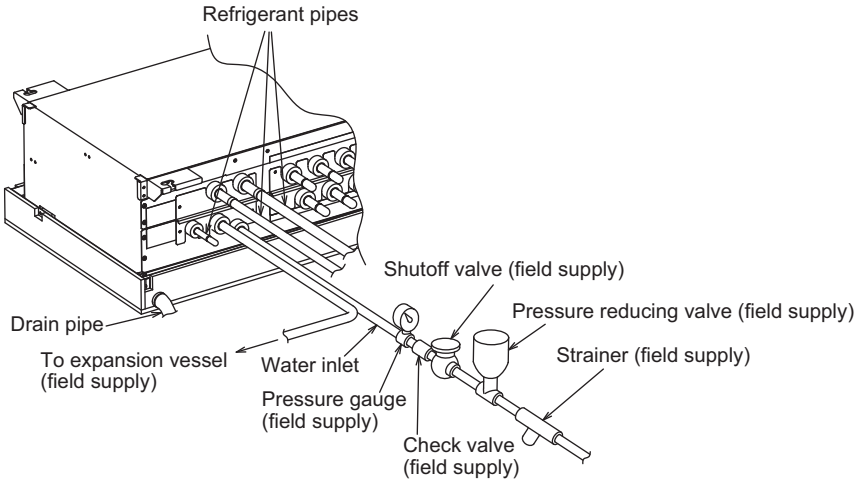
3-2-3. Connecting water pipework

Please observe the following precautions during installation.

3-2-3-1 Important notes on water pipework installation

- The design pressure of the HBC water system is 0.6MPa.
- Use water pipe-work with a design pressure of at least 1.0MPa.
- When performing a water leak check, please do not allow the water pressure to go above 0.3MPa.
- Please connect the water pipework of each indoor unit to the correct port on the HBC. Failure to do so will result in incorrect running.
- Please list the indoor units on the naming plate in the HBC unit with addresses and end connection numbers.
- If the number of indoor units are less than the number of ports on the HBC, the unused ports must be capped. Without a cap, water will leak.
- Use the reverse-return method to insure proper pipe resistance to each unit.
- Provide some joints and valves around inlet/outlet of each unit for easy maintenance, checkup, and replacement.
- Install a suitable air vent on the water pipe. After flowing water through the pipe, vent any excess air.
- Secure the pipes with metal fittings, positioning them in locations to protect pipes against breakage and bending.
- Do not confuse the water intake and outlet piping. (Error code 5102 will appear on the remote controller if a test run is performed with the pipe-work installed incorrectly (inlet connected to outlet and vice versa).)
- This unit doesn't include a heater to prevent freezing within the pipe work. If the system is stopped for an extended period during low ambient conditions, drain the water out.
- The unused knockout holes should be closed and the refrigerant pipes, water pipes, power source and transmission wires access holes should be filled with putty.
- Install water pipe so that the water flow rate will be maintained.
- Wrap sealing tape as follows.
  1. Wrap the joint with sealing tape following the direction of the threads (clockwise), do not wrap the tape over the edge.
  2. Overlap the sealing tape by two-thirds to three-fourths of its width on each turn. Press the tape with your fingers so that it is tight against each thread.
  3. Do not wrap the 1.5th through 2nd farthest threads away from the pipe end.
- Hold the pipe on the unit side in place with a spanner when installing the pipes or strainer. Tighten screws to a torque of 40 N·m.
- If there is a risk of freezing, take precautions to prevent this happening.
- When connecting the HBC unit water piping and on site water piping, apply liquid sealing material for water piping over the sealing tape before connection.
- Please use copper or plastic pipes for the water circuit. Do not use steel or stainless steel pipework. Furthermore, when using copper pipe-work, use a non-oxidative brazing method. Oxidation of the pipe-work will reduce the pump life.

Example of heat source unit installation (using left piping)



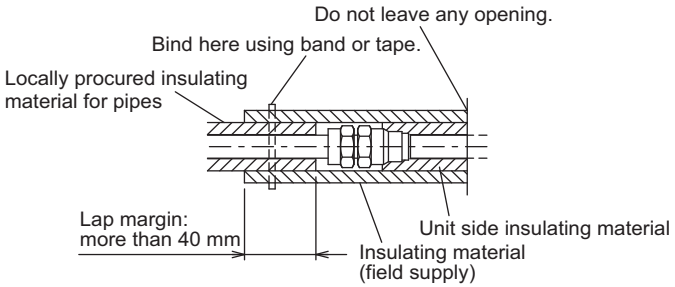
HBC controller sample installation (*1)

*1. Connect the pipes to the water pipes according to the local regulations.

- **The HBC system must be serviced at least once a year.**

3-2-3-2 Water pipe insulation

1. Connect the water pipes of each indoor unit to the same (correct) end connection numbers as indicated on the indoor unit connection section of each HBC 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 HBC controller control box (for identification purposes), and HBC controller end connection numbers and address numbers in the name plate on the indoor unit side.
   Seal unused end connections using cover caps (field supply, dezincification resistant brass (DZR) or bronze only). Not replacing the rubber end caps will lead to water leakage.
3. Be sure to add insulation work to water piping by covering water pipework separately with enough thickness heat-resistant polyethylene, so that no gap is observed in the joint between indoor unit and insulating material, and insulating materials themselves. When insulation work is insufficient, there is a possibility of condensation, etc. Pay special attention to insulation work in the ceiling plenum.



- Insulation materials for the pipes to be added on site must meet the following specifications:

HBC controller -indoor unit	20 mm or more

- This specification is based on copper for water piping. When using plastic pipework, choose a thickness based on the plastic pipe performance.
- Installation of pipes in a high-temperature high-humidity environment, such as the top floor of a building, may require the use of insulation materials thicker than the ones specified in the chart above.
- When certain specifications presented by the client must be met, ensure that they also meet the specifications on the chart above.

4. Expansion vessel
   - Install an expansion tank to accommodate expanded water.

   Expansion vessel selection criteria:
   - The water containment volume of the HBC, the indoor units, and pipe work.

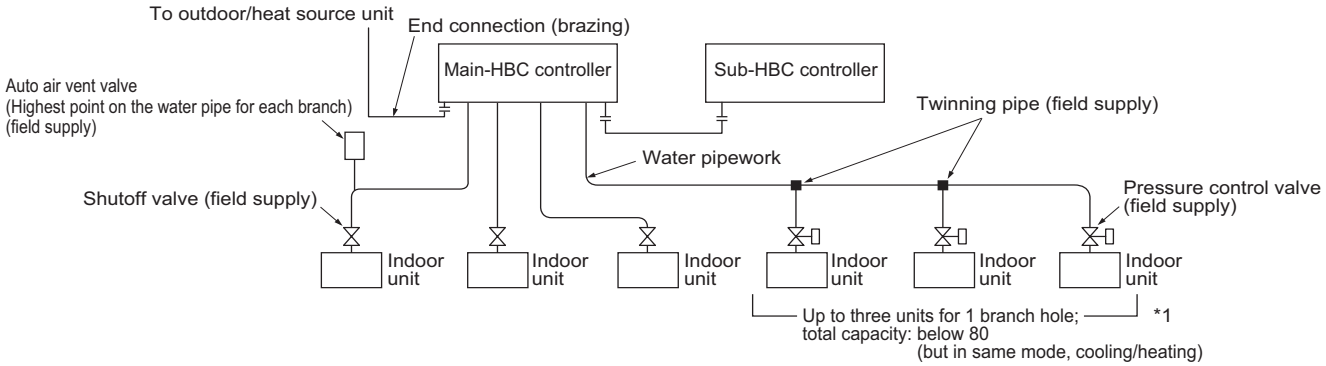
(Unit: L)

Unit model	Water volume
CMB-WP108V-GA1	10
CMB-WP1016V-GA1	13
CMB-WP108V-GB1	5
CMB-WP1016V-GB1	9
PEFY-WP10VMS1	0.4
PEFY-WP15VMS1	0.7
PEFY-WP20VMS1	0.9
PEFY-WP25VMS1	
PEFY-WP32VMS1	1.0
PEFY-WP40VMS1	
PEFY-WP50VMS1	1.7
PEFY-WP20VMA	0.7
PEFY-WP25VMA	1
PEFY-WP32VMA	
PEFY-WP40VMA	1.8
PEFY-WP50VMA	
PLFY-WP32VBM-E	1.5
PLFY-WP40VBM-E	
PLFY-WP50VBM-E	
PFFY-WP20VLRMM-E	0.9
PFFY-WP25VLRMM-E	1.3
PFFY-WP32VLRMM-E	
PFFY-WP40VLRMM-E	1.5
PFFY-WP50VLRMM-E	

- The maximum water temperature is 60°C.
- The minimum water temperature is 5°C.
- The circuit protection valve set pressure is 370-490kPa.
- The circulation pump head pressure is 0.24MPa.

5. Leakproof the water pipework, valves and drain pipework. Leakproof all the way to, and include pipe ends so that condensation cannot enter the insulated pipework.
6. Apply caulking around the ends of the insulation to prevent condensation getting between the pipework and insulation.
7. Add a drain valve so that the unit and pipework can be drained.
8. Ensure there are no gaps in the pipework insulation. Insulate the pipework right up to the unit.
9. Ensure that the gradient of the drain pan pipework is such that discharge can only flow out.
10. HBC water pipe connection sizes and pipe sizes.

	Connection size		Pipe size	
	Water inlet	Water outlet	Water out	Water return
Indoor unit	Rc 3/4 screw	Rc 3/4 screw	I.D. 20 mm	I.D. 20 mm

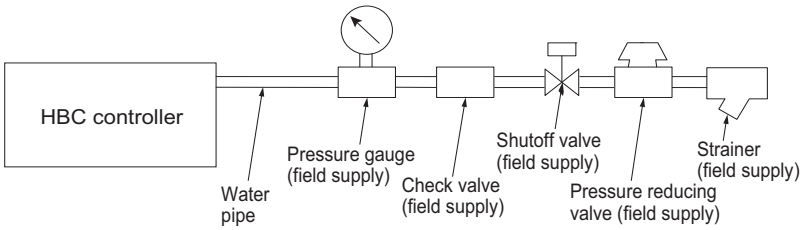


Note:

***1. Connection of multiple indoor units with one connection (or joint pipe)**

- Total capacity of connectable indoor units: Less than 80
- Number of connectable indoor units: Maximum 3 units
- Selection of water piping
  Select the size according to the total capacity of indoor units to be installed downstream.
- Please group units that operate on 1 branch.

11. Please refer to the figure below when connecting the water supply.



12. Use formula 0.1 ≤ 0.01 + 0.01 × A ≤ 0.16 for the supply pressure range to be used.
    (A: Head pressure (m) between the HBC and the highest indoor unit)
    If the supply pressure is greater than 0.16 MPa, use a pressure reducing valve to keep the pressure within the range.
    If the head pressure is unknown, set it to 0.16 MPa.
13. Install a shut off valve and strainer in a place that is easy to operate and makes maintenance work easy.
14. Apply insulation to the indoor unit pipework, strainer, shut off valve, and pressure reducing valve.
15. Please do not use a corrosion inhibitor in the water system.
16. When installing the HBC unit in an environment which may drop below 0°C, please add antifreeze (Propylene Glycol only) to the circulating water. For the brine selection, refer to 2-2. "Correction by antifreeze solution concentration" in chapter "HEAT SOURCE UNITS".

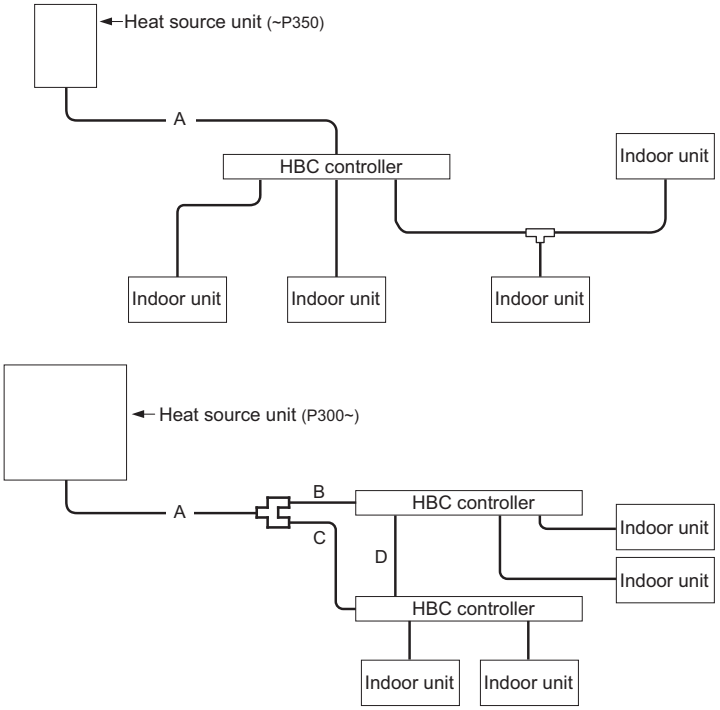
3-2-3-3 Water treatment and quality control

To preserve water quality, use the closed type of water circuit. When the circulating water quality is poor, the water heat exchanger can develop scale, leading to a reduction in heat-exchange power and possible corrosion. Pay careful attention to water processing and water quality control when installing the water circulation system.

- Removing of foreign objects or impurities within the pipes.
  During installation, make sure that foreign objects, such as welding fragments, sealant particles, or rust, do not enter the pipes.
- Water Quality Processing
  Depending on the quality of the cold-temperature water used in the airconditioner, the copper piping of the heat exchanger may corrode. Regular water quality processing is recommended. If a water supply tank is installed, keep air contact to a minimum, and keep the level of dissolved oxygen in the water no higher than 1mg/ℓ.

3-3. Refrigerant charging calculation

Example



■ Sample calculation

Indoor 1: 50 A: ø19.05 42 m
2: 50
3: 50
4: 40
Heat source P250

The total length of each liquid line is as follows:
ø19.05: A = 42 m, α1 = 3.0
Therefore,
<Calculation example>
Additional refrigerant charge
= 42 × 0.14 + 3.0
= 8.88 kg
≒ 8.9 kg
* All pipe work except A is water pipe work.

Indoor 1: 50 A:ø22.20 18 m
2: 50 B:ø15.88 5 m
3: 50 C:ø15.88 10 m
4: 50 D:ø15.88 8 m
Heat source P400

The total length of each liquid line is as follows:
ø22.20: A = 18 m, ø15.88: B + C + D = 23m, α1 = 3.0 × 2
Therefore,
<Calculation example>
Additional refrigerant charge
= 18 × 0.23+ (5 + 10 + 8) × 0.11 + 3.0 × 2
= 12.67 kg
≒ 12.7 kg
* All pipe work except A, B, C, D is water pipe work.

<Amount of refrigerant to be added>

The amount of refrigerant that is shown in the table below is factory-charged to the heat source units.
The amount necessary for extended pipe (field piping) is not included and must be added on site.

Heat source unit model	Amount of pre-charged refrigerant in the heat source unit (kg)	Heat source unit model	Amount of pre-charged refrigerant in the heat source unit (kg)
P200YLM	5.0	P400YLM	6.0
P250YLM	5.0	P450YLM	6.0
P300YLM	5.0	P500YLM	6.0
P350YLM	6.0		

■ Calculation formula

The amount of refrigerant to be added depends on the size and the length of field piping. (unit in m[ft])

1) When the distance between HBC and heat source unit is longer than 30.5m:
Amount of added refrigerant (kg) = $(0.21xL_1)+(0.14xL_2)+(0.1xL_3)+\alpha_1$
2) When the distance between HBC and heat source unit is 30.5m or shorter:
Amount of added refrigerant (kg) = $(0.23xL_1)+(0.16xL_2)+(0.11xL_3)+\alpha_1$

L_1 : Length of ø22.20 [7/8"] high pressure pipe (m)
L_2 : Length of ø19.05 [3/4"] high pressure pipe (m)
L_3 : Length of ø15.88 [5/8"] high pressure pip (m)
α_1 : Refer to the table below.

Use of one HBC controller

Heat source unit index	Diameter of high-pressure pipe
P200	ø15.88
P250	ø19.05
P300	ø19.05
P350	ø19.05

Amount for the HBC controller
α1 (kg)
3.0

Use of two HBC controllers

Heat source unit index	Diameter of high-pressure pipe
P300	ø19.05
P350	ø19.05
P400	ø22.20
P450	ø22.20
P500	ø22.20

Amount for the HBC controller
α1 (kg)
3.0

× 2

Round up the calculation result to the nearest 0.1kg. (Example: 18.04kg to 18.1kg)

3-4. Water piping

3-4-1. Precautions for water piping

Consider the following when installing a water piping system.

1. Design pressure of the water piping
   Use a water pipe that is strong enough to withstand the design pressure (1.0 MPa).
2. Water pipe type
   Use of plastic pipe is recommended.
   When using copper pipes, be sure to braze the pipes under a nitrogen purge. (Oxidation during may shorten the life of the pump.)
3. Expansion vessel
   Install an expansion vessel to accommodate expanded water.
4. Drain piping
   Install the drain pipe with a downward inclination of between 1/100 and 1/200. To prevent drain water from freezing in winter, install the drain pipe as steep an angle as practically possible and minimize the straight line. For cold climate installation, take an appropriate measure (e.g., drain heater) to prevent the drain water from freezing.
5. Insulation
   Cover the water pipe with insulating materials with the specified thickness or more to prevent thermal loss or condensation from collecting.
6. Air vent valve
   Install air vent valves to the highest places where air can accumulate.
7. Maintenance valve
   It is recommended to install valves on the inlet/outlet for each HBC controller branch for maintenance.
8. Water pressure gauge
   Install a water pressure gauge to check the charged pressure.

3-4-2. Notes on corrosion

1. Water quality

It is important to check the water quality beforehand. See table below (Circulating water/Makeup Water Quality Standards).

Items		Lower mid-range temperature water system		Tendency	
		Recirculating water [20<T<60°C] [68<T<140°F]	Make-up water	Corrosive	Scale-forming
Standard items	pH (25°C[77°F])	7.0 ~ 8.0	7.0 ~ 8.0	○	○
	Electric conductivity (mS/m) (25°C[77°F]) (μS/cm) (25°C[77°F])	30 or less [300 or less]	30 or less [300 or less]	○	○
	Chloride ion (mg Cl^-/ ℓ)	50 or less	50 or less	○	
	Sulfate ion (mg SO_4^{2-}/ ℓ)	50 or less	50 or less	○	
	Acid consumption (pH4.8) (mg $CaCO_3$/ ℓ)	50 or less	50 or less		○
	Total hardness (mg $CaCO_3$/ ℓ)	70 or less	70 or less		○
	Calcium hardness (mg $CaCO_3$/ ℓ)	50 or less	50 or less		○
	Ionic silica (mg SiO_2/ ℓ)	30 or less	30 or less		○
Reference items	Iron (mg Fe/ ℓ)	1.0 or less	0.3 or less	○	○
	Copper (mg Cu/ ℓ)	1.0 or less	0.1 or less	○	
	Sulfide ion (mg S^{2-}/ ℓ)	not to be detected	not to be detected	○	
	Ammonium ion (mg NH_4^+/ ℓ)	0.3 or less	0.1 or less	○	
	Residual chlorine (mg Cl/ ℓ)	0.25 or less	0.3 or less	○	
	Free carbon dioxide (mg CO_2/ ℓ)	0.4 or less	4.0 or less	○	
	Ryzner stability index	–	–	○	○

Reference : Guideline of Water Quality for Refrigeration and Air Conditioning Equipment. (JRA GL02E-1994)

2. Debris in the water

Sand, pebbles, suspended solids, and corrosion products in water can damage the metal pipe and heat exchanger on the HBC controller and may cause corrosion. When installing, prevent debris from entering the water. If there is debris in the water, perform debris removal operation after test run by cleaning the strainers inside the HBC controller. (Refer to other sections for how to perform a test run.)

3. Connecting pipes made of different materials

Connecting pipes used for HBC controller and indoor unit are copper alloy pipes. If steel pipes are connected to the pipes, the contact surface will corrode. Do not use steel pipes to avoid corrosion.

4. Residual air

Residual air in the pipe results in water pump malfunction, noise, or water pipe corrosion in the water circuit. Ensure air is purged before use. (Refer to other sections for how to perform air vent operation.)

HYBRID CITY MULTI
INSTALLATION INFORMATION

1. Installation information

1-1. General precautions

1-1-1. Usage

- The air-conditioning system described in this Data Book is designed for human comfort.
- This product is not designed for preservation of food, animals, plants, precision equipment, or art objects. To prevent quality loss, do not use the product for purposes other than what it is designed for.
- To reduce the risk of water leakage and electric shock, do not use the product for air-conditioning vehicles or vessels.

1-1-2. Installation environment

- Do not install any unit other than the dedicated unit in a place where the voltage changes a lot, large amounts of mineral oil (e.g., cutting oil) are present, cooking oil may splash, or a large quantity of steam can be generated such as a kitchen.
- Do not install the unit in acidic or alkaline environment.
- Installation should not be performed in the locations exposed to chlorine or other corrosive gases. Avoid near a sewer.
- To reduce the risk of fire, do not install the unit in a place where flammable gas may be leaked or inflammable material is present.
- This air conditioning unit has a built-in microcomputer. Take the noise effects into consideration when deciding the installation position. Especially in a place where antenna or electronic device are installed, it is recommended that the air conditioning unit be installed away from them.
- Install the unit on a solid foundation according to the local safety measures against typhoons, wind gusts, and earth-quakes to prevent the unit from being damaged, toppling over, and falling.

1-1-3. Backup system

- In a place where air conditioner's malfunctions may exert crucial influence, it is recommended to have two or more systems of single outdoor/heat source units with multiple indoor units.

1-1-4. Unit characteristics

- Heat pump efficiency of outdoor unit depends on outdoor temperature. In the heating mode, performance drops as the outside air temperature drops. In cold climates, performance can be poor. Warm air would continue to be trapped near the ceiling and the floor level would continue to stay cold. In this case, heat pumps require a supplemental heating system or air circulator. Before purchasing them, consult your local distributor for selecting the unit and system.
- When the outdoor temperature is low and the humidity is high, the heat exchanger on the outdoor unit side tends to collect frost, which reduces its heating performance. To remove the frost, Auto-defrost function will be activated and the heating mode will temporarily stop for 3-10 minutes. Heating mode will automatically resume upon completion of defrost process.
- Air conditioner with a heat pump requires time to warm up the whole room after the heating operation begins, because the system circulates warm air in order to warm up the whole room.
- The sound levels were obtained in an anechoic room. The sound levels during actual operation are usually higher than the simulated values due to ambient noise and echoes. Refer to the section on "SOUND LEVELS" for the measurement location.
- Depending on the operation conditions, the unit generates noise caused by valve actuation, refrigerant flow, and pressure changes even when operating normally. Please consider to avoid location where quietness is required. For BC/HBC controller, it is recommended to unit to be installed in places such as ceilings of corridor, restrooms and plant rooms.
- The total capacity of the connected indoor units can be greater than the capacity of the outdoor/heat source unit. However, when the connected indoor units operate simultaneously, each unit's capacity may become smaller than the rated capacity.
- When the unit is started up for the first time within 12 hours after power on or after power failure, it performs initial startup operation (capacity control operation) to prevent damage to the compressor. The initial startup operation requires 90 minutes maximum to complete, depending on the operation load.

1-1-5. Relevant equipment

- Use an earth leakage breaker (ELB) with medium sensitivity, and an activation speed of 0.1 second or less.
- Consult your local distributor or a qualified technician when installing an earth leakage breaker.
- If the unit is inverter type, select an earth leakage breaker for handling high harmonic waves and surges.
- Leakage current is generated not only through the air conditioning unit but also through the power wires. Therefore, the leakage current of the main power supply is greater than the total leakage current of each unit. Take into consideration the capacity of the earth leakage breaker or leakage alarm when installing one at the main power supply. To measure the leakage current simply on site, use a measurement tool equipped with a filter, and clamp all the four power wires together. The leakage current measured on the ground wire may not accurate because the leakage current from other systems may be included to the measurement value.
- Do not install a phase advancing capacitor on the unit connected to the same power system with an inverter type unit and its equipment.
- If a large current flows due to the product malfunctions or faulty wiring, both the earth leakage breaker on the product side and the upstream overcurrent breaker may trip almost at the same time. Separate the power system or coordinate all the breakers depending on the system's priority level.

1-1-6. Unit installation

- Your local distributor or a qualified technician must read the Installation Manual that is provided with each unit carefully before performing installation work.
- Consult your local distributor or a qualified technician when installing the unit. Improper installation by an unqualified person may result in water leakage, electric shock, or fire.
- Ensure there is enough space around each unit.

1-1-7. Optional accessories

- Only use accessories recommended by Mitsubishi Electric. Consult your local distributor or a qualified technician when installing them. Improper installation by an unqualified person may result in water leakage, electric leakage, system breakdown, or fire.
- Some optional accessories may not be compatible with the air conditioning unit to be used or may not suitable for the installation conditions. Check the compatibility when considering any accessories.
- Note that some optional accessories may affect the air conditioner's external form, appearance, weight, operating sound, and other characteristics.

1-1-8. Operation/Maintenance

- Read the Instruction Book that is provided with each unit carefully prior to use.
- Maintenance or cleaning of each unit may be risky and require expertise. Read the Instruction Book to ensure safety. Consult your local distributor or a qualified technician when special expertise is required such as when the indoor unit needs to be cleaned.

1-2. Precautions for Indoor unit and HBC controller

1-2-1. Operating environment

- The refrigerant (R410A) used for air conditioner is non-toxic and nonflammable. However, if the refrigerant leaks, the oxygen level may drop to harmful levels. If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.
- If the units operate in the cooling mode at the humidity above 80%, condensation may collect and drip from the indoor units.

1-2-2. Unit characteristics

- The return air temperature display on the remote controller may differ from the ones on the other thermometers.
- The clock on the remote controller may be displayed with a time lag of approximately one minute every month.
- The temperature using a built-in temperature sensor on the remote controller may differ from the actual room temperature due to the effect of the wall temperature.
- Use a built-in thermostat on the remote controller or a separately-sold thermostat when indoor units installed on or in the ceiling operate the automatic cooling/heating switchover.
- The room temperature may rise drastically due to Thermo OFF in the places where the air conditioning load is large such as computer rooms.
- Be sure to use a regular filter. If an irregular filter is installed, the unit may not operate properly, and the operation noise may increase.
- The room temperature may rise over the preset temperature in the environment where the heating air conditioning load is small.

1-2-3. Unit installation

- For 16HP outdoor/heat source unit model or above, 2 HBCs must be connected. The GB- and HB-type HBC controllers (sub) cannot be connected to the outdoor/heat source unit directly, and be sure to use them with HBC controllers (main).
- The insulation for low pressure pipe between the HBC controller and outdoor/heat source unit shall be at least 20 mm thick. If the unit is installed on the top floor or in a high-temperature, high-humidity environment, thicker insulation may be necessary.
- Do not have any branching points on the downstream of the refrigerant pipe header.
- When a field-supplied external thermistor is installed or when a device for the demand control is used, abnormal stop of the unit or damage of the electromagnetic contactor may occur. Consult your local distributor for details.

1-3. Precautions for Outdoor unit/Heat source unit

1-3-1. Installation environment

- Outdoor unit with salt-resistant specification is recommended to use in a place where it is subject to salt air.
- Even when the unit with salt-resistant specification is used, it is not completely protected against corrosion. Be sure to follow the directions or precautions described in Instructions Book and Installation Manual for installation and maintenance. The salt-resistant specification is referred to the guidelines published by JRAIA (JRA9002).
- Install the unit in a place where the flow of discharge air is not obstructed. If not, the short-cycling of discharge air may occur.
- Provide proper drainage around the unit base, because the condensation may collect and drip from the outdoor units. Provide water-proof protection to the floor when installing the units on the rooftop.
- In a region where snowfall is expected, install the unit so that the outlet faces away from the direction of the wind, and install a snow guard to protect the unit from snow. Install the unit on a base approximately 50 cm higher than the expected snowfall. Close the openings for pipes and wiring, because the ingress of water and small animals may cause equipment damage. If SUS snow guard is used, refer to the Installation Manual that comes with the snow guard and take caution for the installation to avoid the risk of corrosion.
- When the unit is expected to operate continuously for a long period of time at outside air temperatures of below 0ºC, take appropriate measures, such as the use of a unit base heater, to prevent icing on the unit base. (Not applicable to the PUMY series)
- Install the snow guard so that the outlet/inlet faces away from the direction of the wind.
- When the snow accumulates approximately 50 cm or more on the snow guard, remove the snow from the guard. Install a roof that is strong enough to withstand snow loads in a place where snow accumulates.
- Provide proper protection around the outdoor units in places such as schools to avoid the risk of injury.
- A cooling tower and heat source water circuit should be a closed circuit that water is not exposed to the atmosphere. When a tank is installed to ensure that the circuit has enough water, minimize the contact with outside air so that the oxygen from being dissolved in the water should be 1 mg/L or less.
- Install a strainer (50 mesh or more recommended) on the water pipe inlet on the heat source unit.
- Interlock the heat source unit and water circuit pump.
- Note the followings to prevent the freeze bursting of pipe when the heat source unit is installed in a place where the ambient temperature can be 0ºC or below.
  - Keep the water circulating to prevent it from freezing when the ambient temperature is 0ºC or below.
  - Before a long period of non use, be sure to purge the water out of the unit.
- Salt-resistant unit is resistant to salt corrosion, but not salt-proof.

Please note the following when installing and maintaining outdoor units in marine atmosphere.

1. Install the salt-resistant unit out of direct exposure to sea breeze, and minimize the exposure to salt water mist.
2. Avoid installing a sun shade over the outdoor unit, so that rain will wash away salt deposits off the unit.
3. Install the unit horizontally to ensure proper water drainage from the base of the unit. Accumulation of water in the base of the outdoor unit will significantly accelerate corrosion.
4. Periodically wash salt deposits off the unit, especially when the unit is installed in a coastal area.
5. Repair all noticeable scratches after installation and during maintenance.
6. Periodically check the unit, and apply anti-rust agent and replace corroded parts as necessary.

1-3-2. Circulating water

- Follow the guidelines published by JRAIA (JRA-GL02-1994) to check the water quality of the water in the heat source unit regularly.
- A cooling tower and heat source water circuit should be a closed circuit that water is not exposed to the atmosphere. When a tank is installed to ensure that the circuit has enough water, minimize the contact with outside air so that the oxygen from being dissolved in the water should be 1 mg/L or less.

1-3-3. Unit characteristics

- When the Thermo ON and OFF is frequently repeated on the indoor unit, the operation status of outdoor/heat source units may become unstable.

1-3-4. Relevant equipment

- Provide grounding in accordance with the local regulations.

1-4. Precautions for Control-related items

1-4-1. Product specification

- To introduce the MELANS system, a consultation with us is required in advance. Especially to introduce the electricity charge apportioning function or energy-save function, further detailed consultation is required. Consult your local distributor for details.
- Billing calculation for AE-200E/AE-50E/EW-50E/AG-150A/EB-50GU-J/TG-2000A, or the billing calculation unit is unique and based on our original method. (Backup operation is included.) It is not based on the metering method, and do not use it for official business purposes. It is not the method that the amount of electric power consumption (input) by air conditioner is calculated. Note that the electric power consumption by air conditioner is apportioned by using the ratio corresponding to the operation status (output) for each air conditioner (indoor unit) in this method.
- In the apportioned billing function for AE-200E/AE-50E/EW-50E/AG-150A and EB-50GU-J, use separate watthour meters for A-control units, K-control units, and packaged air conditioner for City Multi air conditioners. It is recommended to use an individual watthour meter for the large-capacity indoor unit (with two or more addresses).
- When using the peak cut function on the AE-200E/AE-50E/EW-50E/AG-150A or EB-50GU-J, note that the control is performed once every minute and it takes time to obtain the effect of the control. Take appropriate measures such as lowering the criterion value. Power consumption may exceed the limits if AE-200E/AE-50E/EW-50E/AG-150A or EB-50GU-J malfunctions or stops. Provide a back-up remedy as necessary.
- The controllers cannot operate while the indoor unit is OFF. (No error)
  Turn ON the power to the indoor unit when operating the controllers.
- When using the interlocked control function on the AE-200E/AE-50E/EW-50E/AG-150A/EB-50GU-J/PAC-YG66DCA or PAC-YG63MCA, do not use it for the control for the fire prevention or security. (This function should never be used in the way that would put people's lives at risk.) Provide any methods or circuit that allow ON/OFF operation using an external switch in case of failure.

1-4-2. Installation environment

- The surge protection for the transmission line may be required in areas where lightning strikes frequently occur.
- A receiver for a wireless remote controller may not work properly due to the effect of general lighting. Leave a space of at least 1 m between the general lighting and receiver.
- When the Auto-elevating panel is used and the operation is made by using a wired remote controller, install the wired remote controller to the place where all air conditioners controlled (at least the bottom part of them) can be seen from the wired remote controller. If not, the descending panel may cause damage or injury, and be sure to use a wireless remote controller designed for use with elevating panel (sold separately).
- Install the wired remote controller (switch box) to the place where the following conditions are met.
  - Where installation surface is flat
  - Where the remote controller can detect an accurate room temperature
    The temperature sensors that detect a room temperature are installed both on the remote controller and indoor unit. When a room temperature is detected using the sensor on the remote controller, the main remote controller is used to detect a room temperature. In this case, follow the instructions below.
    - Install the controller in a place where it is not subject to the heat source.
      (If the remote controller faces direct sunlight or supply air flow direction, the remote controller cannot detect an accurate room temperature.)
    - Install the controller in a place where an average room temperature can be detected.
    - Install the controller in a place where no other wires are present around the temperature sensor.
      (If other wires are present, the remote controller cannot detect an accurate room temperature.)
- To prevent unauthorized access, always use a security device such as a VPN router when connecting AE-200E/AE-50E/EW-50E/AG-150A/EB-50GU-J or TG-2000A to the Internet.

HYBRID CITY MULTI
CAUTION FOR REFRIGERANT LEAKAGE

1. 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.

1-1. 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

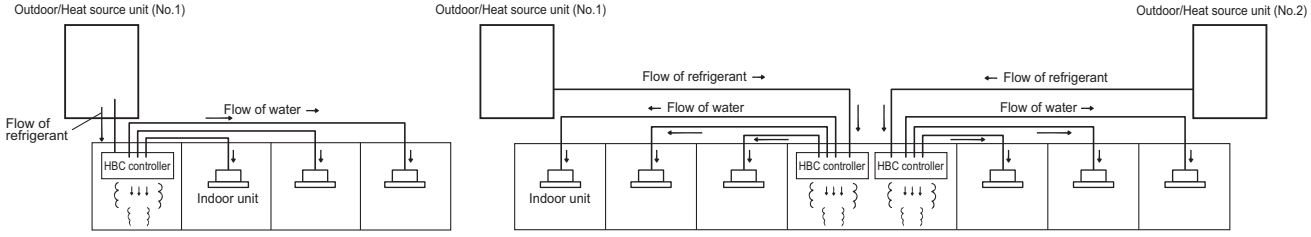
Critical concentration hereby is the refrigerant concentration in which no human body would be hurt if immediate measures can be taken when refrigerant leakage happens.

Critical concentration of R410A: 0.44kg/m^3
(The weight of refrigeration gas per 1 m^3 air conditioning space.);
* The Critical concentration is subject to ISO5149, EN378-1.

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

1-2. 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.1-1. The refrigerant of Outdoor/Heat source unit here includes its original charge and additional charge at the site.
The additional charge is calculated according to the refrigerant charging calculation of each kind of Outdoor/Heat source unit, and shall not be over charged at the site. Procedure 1-2-1~3 tells how to confirm maximum refrigerant leakage concentration (Rmax) and how to take countermeasures against a possible leakage.



Maximum refrigerant leakage concentration (Rmax)
Rmax=Wmax / V (kg/m^3)

Maximum refrigerant leakage concentration (Rmax)
Rmax=Wmax / V (kg/m^3) W1: Refrigerant weight of Outdoor/Heat source unit No.1
where, Wmax=W1+W2 W2: Refrigerant weight of Outdoor/Heat source unit No.2

Fig. 1-1 The maximum refrigerant leakage concentration

1-2-1.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.
1-2-2.Find the possible maximum leakage (Wmax) in the room.If a room has HBC(s) from more than 1 Outdoor/Heat source unit, add up the refrigerant of the Outdoor/Heat source units.
1-2-3.Divide (Wmax) by (V) to get the maximum refrigerant leakage concentration (Rmax).
1-2-4.Find if there is any room in which the maximum refrigerant leakage concentration (Rmax) is over 0.44kg/m^3.
If no, then the HYBRID 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/Heat source unit to one room.
e.g.Using smaller model size but more Outdoor/Heat source 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.1-2~4.

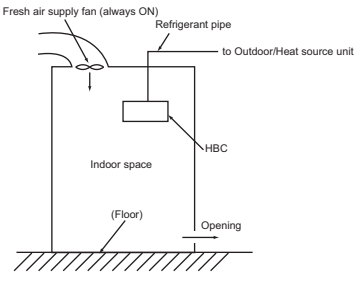


Fig.1-2.Fresh air supply always ON

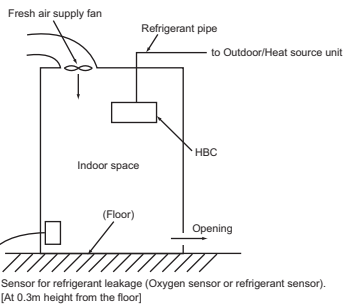


Fig.1-3.Fresh air supply upon sensor action

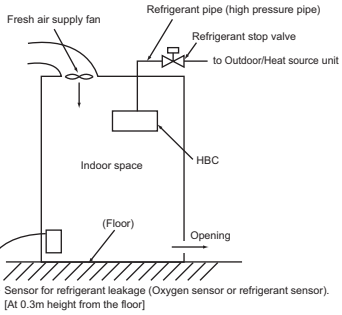


Fig.1-4.Fresh air supply and refrigerant shut-off upon sensor action

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.

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.

■ Our air-conditioning equipments and heat pumps contain a fluorinated greenhouse gas, R410A.

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