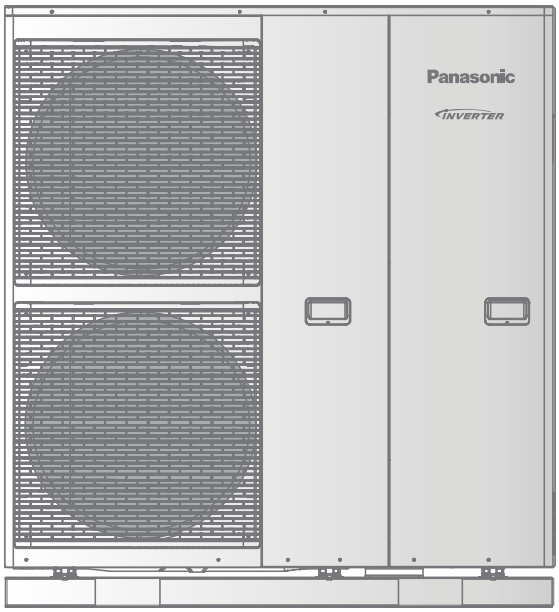
Order No: PAPAMY1505101CE

Service Manual

(Mono bloc) Air-to-Water Heatpump System



Mono bloc Unit
WH-MDC12G6E5
WH-MDC16G6E5

Destination
Europe
Turkey

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

⚠ PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigerant circuit.

Panasonic®

1. Safety Precautions

- Read the following “SAFETY PRECAUTIONS” carefully before installation of (Mono bloc) Air-to-Water Heat pump system (hereafter referred to as “Mono bloc unit”).
- Electrical works and water installation works must be done by licensed electrician and licensed water system installer respectively. Be sure to use the correct rating and main circuit for the model to be installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation due to ignorance or negligence of the instructions will cause harm or damage, and the seriousness is classified by the following indications.

⚠ **WARNING**	This indication shows the possibility of causing death or serious injury.
⚠ **CAUTION**	This indication shows the possibility of causing injury or damage to properties only.

- The items to be followed are classified by the symbols:

⃠	Symbol with white background denotes item that is PROHIBITED from doing.
❗ ⏚	Symbol with dark background denotes item that must be carried out.

- Carry out test run to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.
- If there is any doubt about the installation procedure or operation, always contact the authorized dealer for advice and information.

	⚠ **WARNING**	
1.	Do not install Mono bloc unit near handrail of veranda. When installing Mono bloc unit at veranda of high rise building, child may climb up to Mono bloc unit and cross over the handrail and causing accident.	⃠
2.	Do not use unspecified cord, modified cord, join cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.	⃠
3.	Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen.	⃠
4.	Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.	⃠
5.	Do not sit or step on the unit, you may fall down accidentally.	⃠
6.	Keep plastic bag (packaging material) away from small children, it may cause suffocation.	⃠
7.	Do not use pipe wrench to install refrigerant pipe. It might deform the piping and cause the unit to malfunction.	⃠
8.	Do not purchase unauthorized electrical parts for installation, service, maintenance and etc.. They might cause electrical shock or fire.	⃠
9.	This unit is a multi supply appliances. All circuits must be disconnected before accessing to the unit terminals.	⃠
10.	Do not modify the wiring of Mono bloc unit for installation of other components (i.e. heater, etc.). Overloaded wiring or wire connection points may cause electrical shock or fire.	⃠
11.	Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc.	⃠
12.	For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.	❗
13.	For water circuit installation work, follow to relevant European and national regulations (including EN61770) and local plumbing and building regulation codes.	❗
14.	Must engage an authorized dealer or specialist for installation. If installation is defective, it will cause water leakage, electrical shock or fire.	❗
15.	Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.	❗
16.	Only use the supplied or specified installation parts. Else, it may causes Mono bloc unit vibrate, fall, water leakage, electrical shock or fire.	❗
17.	Install at a flat, strong and firm location which is able to withstand the Mono bloc unit’s weight. If the location is slanting, or strength is not enough the set will fall and cause injury.	❗

⚠ WARNING	
18.	This equipment is strongly recommended to be installed with Residual Current Device (RCD) on-site according to the respective national wiring rules or country-specific safety measures in terms of residual current.
19.	The unit is only for use in a closed water system. Utilization in an open water system may lead to excessive corrosion of the water piping and risk of incubating bacteria colonies, particularly Legionella, in water.
20.	If there is any doubt about the installation procedure or operation, always contact the authorized dealer for advice and information.
21.	Select a location where in case of water leakage, the leakage will not cause damage to other properties.
22.	When installing electrical equipment at wooden building of metal lath or wire lath, in accordance with electrical facility standard, no electrical contact between equipment and building is allowed. Insulator must be installed in between.
23.	This installation may be subjected to building regulation approval applicable to respective country that may require to notify the local authority before installation.
24.	Any work carried out on the Mono bloc unit after removing the front panel which is secured by screws, must be carried out under the supervision of authorized dealer and licensed installation contractor.
25.	This unit must be properly earthed, the electrical earth must not be connected to a gas pipe, water pipe, the earth of a lightening rod or a telephone. Otherwise there is a danger of electrical shock in the event of an insulation breakdown or electrical earth fault in the Mono bloc unit.

⚠ CAUTION	
1.	Do not install the Mono bloc unit in areas where there is a risk of flammable gas leakage. There is a risk of fire if flammable gas accumulates near or around the Mono bloc unit.
2.	Do not release refrigerant during piping work for installation, re-installation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
3.	Make sure the power supply cord does not contact with hot part (i.e. water piping). High temperature may cause insulator of power supply cord damage hence electrical shock or fire.
4.	Do not touch the sharp aluminium fin, sharp parts may cause injury.
5.	Do not apply excessive force to water pipes that may damage the pipes. If water leakage occurs, it will cause flooding and damage to other properties.
6.	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water leakage may happen and may cause damage to properties of the user.
7.	The piping installation work must be flushed before the Mono bloc unit is connected to remove contaminants. Contaminants may damage the Mono bloc unit components.
8.	Select an installation location where it is accessible for maintenance.
9.	Power supply connection to Mono bloc unit. • Power supply point should be in easily accessible place for power disconnection in case of emergency. • Must follow local national wiring standard, regulation and this installation instruction. • Strongly recommended to make permanent connection to a circuit breaker. It must be a double pole switch with a minimum 3.0 mm gap. - Power supply 1: Use approved 30A circuit breaker. - Power supply 2: Use approved 30A circuit breaker.
10.	Ensure the correct polarity is maintained throughout all wiring. Otherwise, it will cause electrical shock or fire.
11.	After installation, the installer is obliged to verify correct operation of the Mono bloc unit. Check the connection point for water leakage during test run. If leakage occurs, it will cause damage to other properties.
12.	Installation work. Four or more people are required to carry out the installation work. The weight of Mono bloc unit might cause injury if carried by less than four people.

2.2 WH-MDC16G6E5

Item		Unit	Refrigerant System	
Performance Test Condition			EN 14511	
Condition (Ambient/Water)			A35W7	-
Cooling Capacity		kW	12.20	-
		BTU/h	41600	-
		kcal/h	10490	-
EER		W/W	2.56	-
		kcal/hW	2.20	-
Condition (Ambient/Water)			A7W35	A2W35
Heating Capacity		kW	16.00	13.00
		BTU/h	54600	44300
		kcal/h	13760	11180
COP		W/W	4.28	3.28
		kcal/hW	3.68	2.82
Air Flow		m^3/min (ft^3/min)	Cooling: 97.8 (3450) Heating: 90.0 (3180)	
Refrigeration Control Device			Expansion Valve	
Refrigeration Oil		cm^3	FV50S (1200)	
Refrigerant (R410A)		kg (oz)	2.10 (74.1)	
Compressor	Type		Hermetic Motor (Rotary)	
	Motor Type		Brushless (4-poles)	
	Rated Output	kW	3.00	
Fan	Type		Propeller Fan	
	Material		PP	
	Motor Type		DC (8-poles)	
	Input Power	W	—	
	Output Power	W	60	
	Fan Speed	rpm	Cooling: 600 (Top Fan) 640 (Bottom Fan) Heating: 510 (Top Fan) 550 (Bottom Fan)	
Heat Exchanger	Fin material		Aluminium (Pre Coat)	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 51 × 18	
	Size (W × H × L)	mm	903.7 × 1295.4 × 38.1	

Item		Unit	Mono Bloc Unit	
Dimension	Height	mm (inch)	1410 (55-1/2)	
	Width	mm (inch)	1283 (50-1/2)	
	Depth	mm (inch)	320 (12-19/32)	
Net Weight		kg (lbs)	147 (324)	
Noise Level		dB-A	Cooling: 54 Heating: 53	Cooling: - Heating: -
		Power Level dB	Cooling: 72 Heating: 70	Cooling: - Heating: -
Power Source (Phase, Voltage, Cycle)		ø	Single	
		V	230	
		Hz	50	
Input Power		kW	Cooling: 4.76 Heating: 3.74	Cooling: - Heating: 3.96
Maximum Input Power For Mono Bloc Unit		kW	5.62	
Power Supply 1: Phase (ø) / Max. Current (A) / Max. Input Power (W)			Single / 26.0 / 5.62k	
Power Supply 2: Phase (ø) / Max. Current (A) / Max. Input Power (W)			Single / 26.0 / 6.00k	
Power Supply 3: Phase (ø) / Max. Current (A) / Max. Input Power (W)			- / - / -	

Item		Unit	Mono Bloc Unit	
Starting Current		A	22.0	
Running Current		A	Cooling: 22.0 Heating: 17.3	Cooling: - Heating: 18.3
Maximum Current For Mono Bloc Unit		A	26.0	
Power Factor		%	Cooling: 94 Heating: 94	Cooling: - Heating: 94
Power factor means total figure of compressor and outdoor fan motor.				
Power Cord	Number of core		-	
	Length	m (ft)	-	
Thermostat			Electronic Control	
Protection Device			Electronic Control	

Item		Unit	Water System
Performance Test Condition			EN 14511
Operation Range	Outdoor Ambient	°C	Cooling: 16 ~ 43 Heating: -20 ~ 35
	Water Outlet	°C	Cooling: 5 ~ 20 Heating: 25 ~ 55
Internal Pressure Differential		kPa	Cooling: 42.2 Heating: 72.0
Water Pipe Diameter	Inlet	mm (inch)	30 (1-3/16)
	Outlet	mm (inch)	30 (1-3/16)
Water Drain Hose Inner Diameter		mm (inch)	15.00 (19/32)
Pump	Motor Type		DC Motor
	No. of Speed		7 (software selection)
	Input Power	W	112
Hot Water Coil	Type		Brazed Plate
	No. of Plates		36
	Size (H × W × L)	mm	65 × 120 × 376
	Water Flow Rate	l/min (m^3/h)	Cooling: 35.0 (2.1) Heating: 45.9 (2.8)
Pressure Relief Valve Water Circuit		kPa	Open: 300, Close: 265 and below
Flow Switch			Magnetic Lead Switch
Protection Device		A	Residual Current Circuit Breaker (30)
Expansion Vessel	Volume	l	10
	MWP	bar	3
Capacity of Integrated Electric Heater		kW	6.00

Note:

- Cooling capacities are based on outdoor air temperature of 35°C Dry Bulb with controlled water inlet temperature of 12°C and water outlet temperature of 7°C.
- Heating capacities are based on outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb) with controlled water inlet temperature of 30°C and water outlet temperature of 35°C.
- Specification are subjected to change without prior notice for further improvement.

3. Features

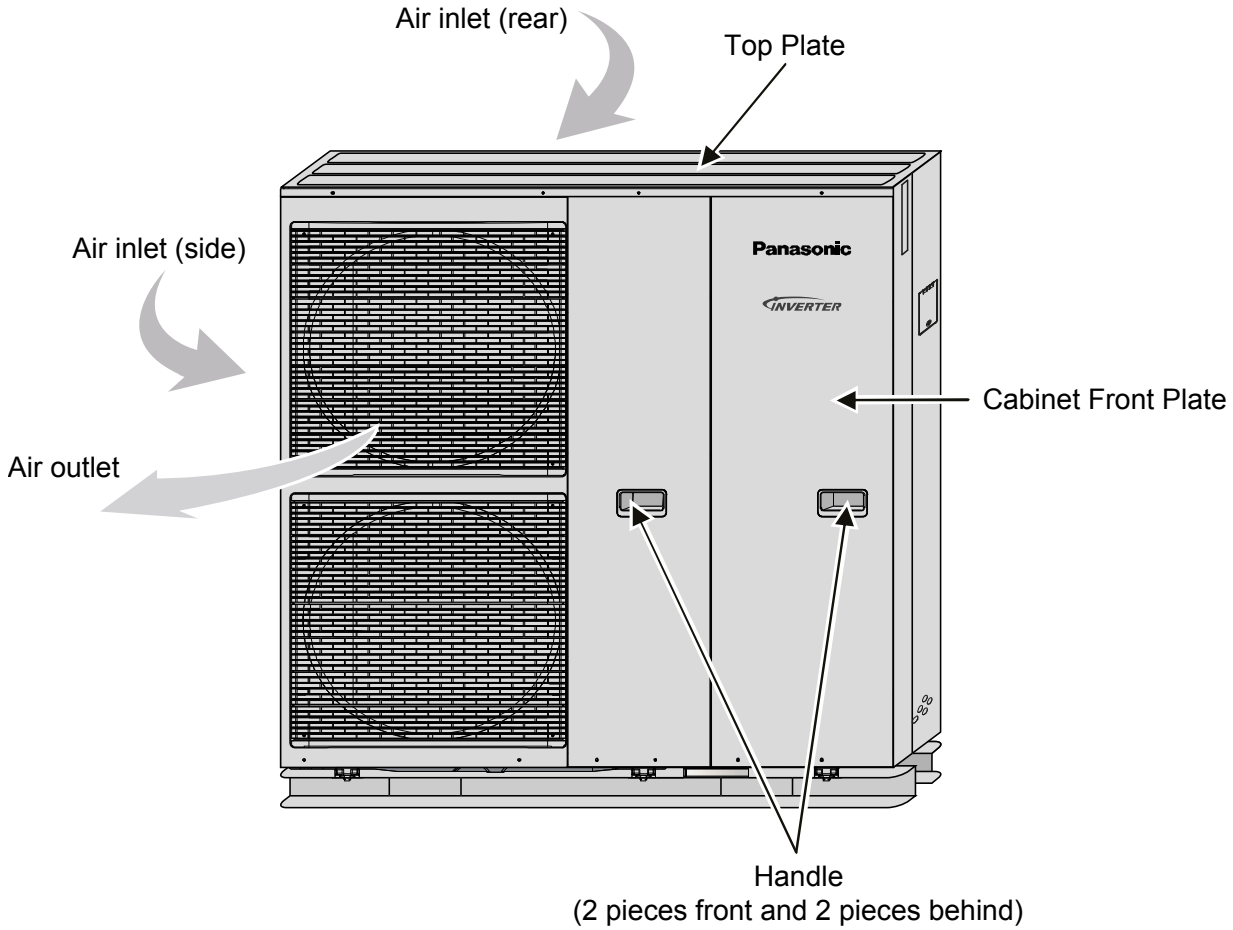
- **Inverter Technology**
  - Energy saving
- **High Efficiency**
- **Compact Design**
- **Environment Protection**
  - Non-ozone depletion substances refrigerant (R410A)
- **Easy to use remote control**
- **Weekly Timer setting**
- **Quality Improvement**
  - Random auto restart after power failure for safety restart operation
  - Gas leakage protection
  - Prevent compressor reverse cycle
  - Inner protector to protect compressor
- **Serviceability Improvement**
  - Breakdown Self Diagnosis function
  - System Status Check Buttons for servicing purpose
  - System Service Mode Button for servicing purpose
  - Front maintenance design for Mono bloc unit
- **Operation Condition**

		Water outlet temperature (°C)	Ambient temperature (°C)
COOLING	Maximum	20	43
	Minimum	5	16
HEATING	Maximum	55	35
	Minimum	25	-20

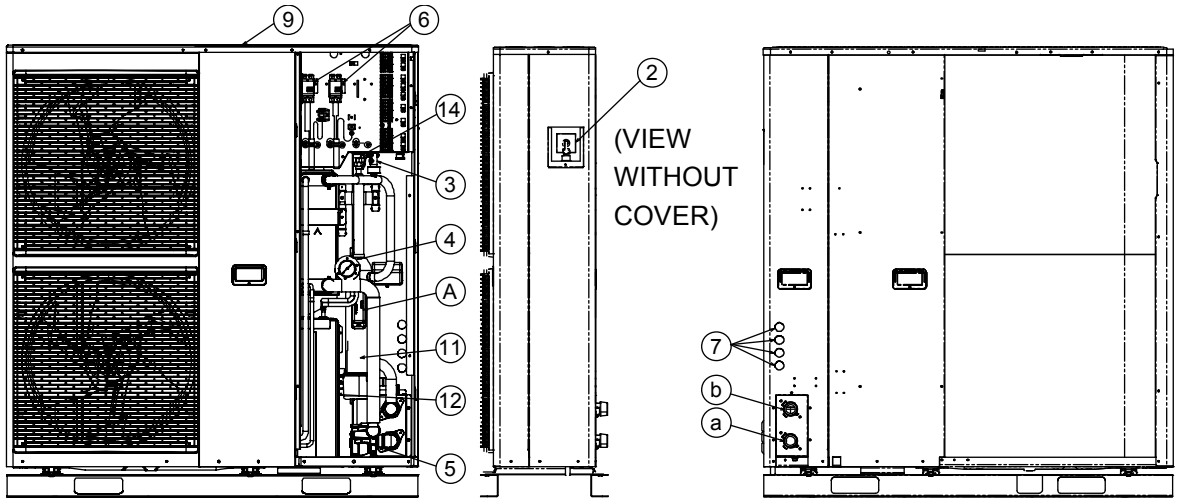
NOTICE : When the outdoor temperature is out of the above temperature range, the heating capacity will drop significantly and Mono bloc unit might stop for protection control.

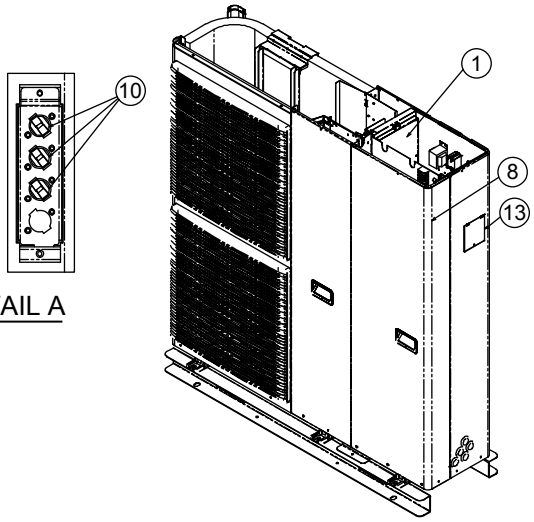
4. Location of Controls and Components

4.1 Mono Bloc Unit



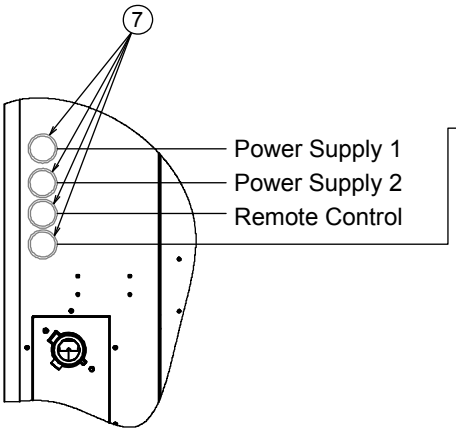
4.1.1 Main Components





DETAIL A

View without cabinet top plate



Optional cord / cable :-

- 2-way valve cable (3 × min 0.5mm²)
- 3-way Valve cable (3 × min 0.5mm²)
- Booster Heater cord (3 × min 1.5mm²)
- Room Themostat cable (4 or 3 × min 0.5mm²)
- Tank OLP cable (2 × min 0.5mm²)
- Tank Sensor cable (2 × min 0.3mm²)
- External Controller cable (2 × min 0.5mm²)
- Solar Three-way Valve cable (3 × min 0.5mm²)
- Solar Pump Station cable (2 × min 0.5mm²)

Type designation 60245 IEC 57 or heavier cord / cable

Component name

① PCB
② Pressure relief valve
③ Flow switch
④ Pressure gauge
⑤ Water pump
⑥ RCCB
⑦ Bushing
⑧ Cabinet front plate
⑨ Cabinet top plate
⑩ Overload protector
⑪ Heater assembly
⑫ Expansion vessel
⑬ Cover
⑭ Air purge valve

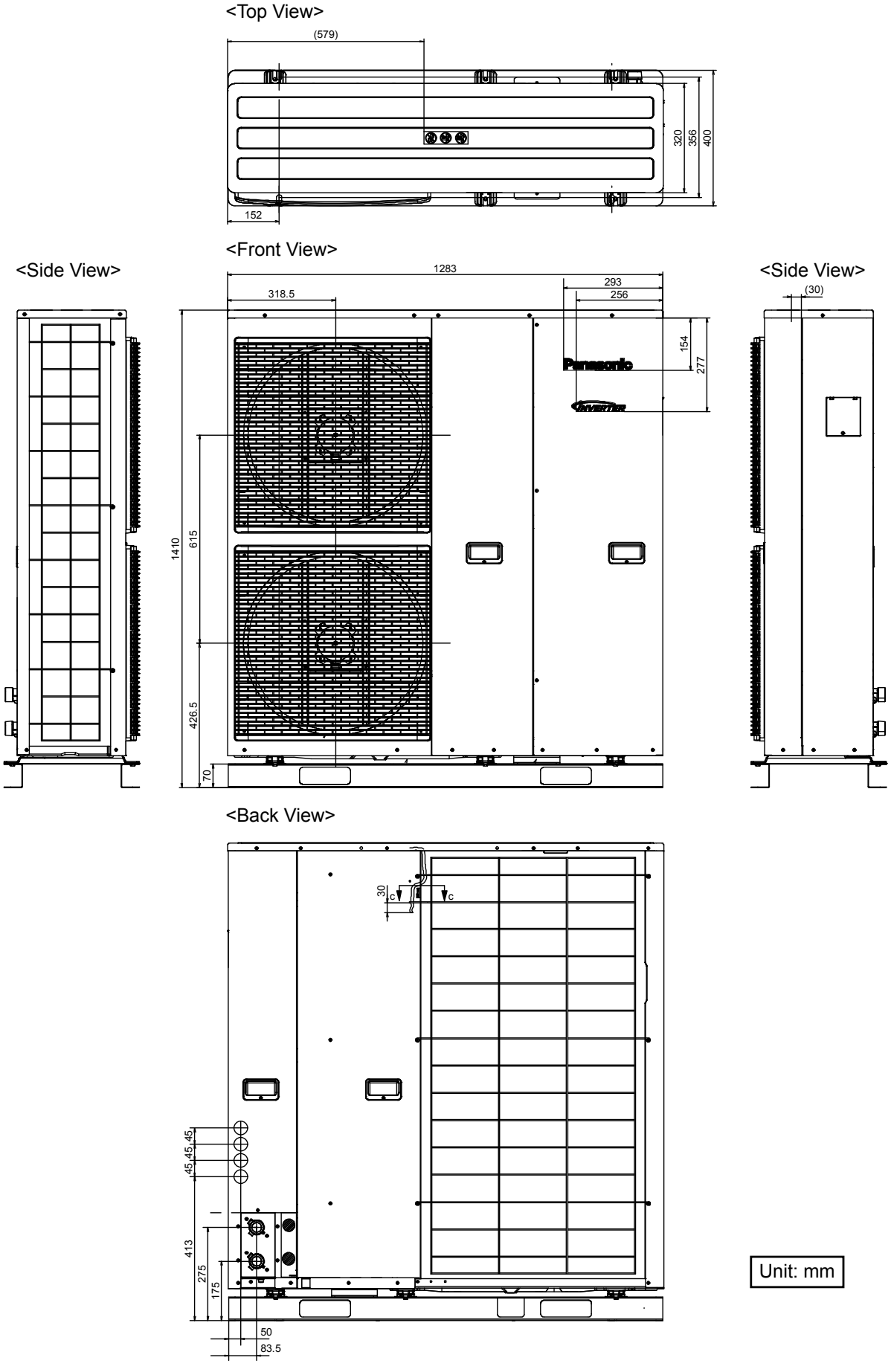
Connector name

ⓐ Water inlet
ⓑ Water outlet

It is advisable to avoid more than 2 blockage directions. For better ventilation & multiple-outdoor installation, please consult authorized dealer/specialist.

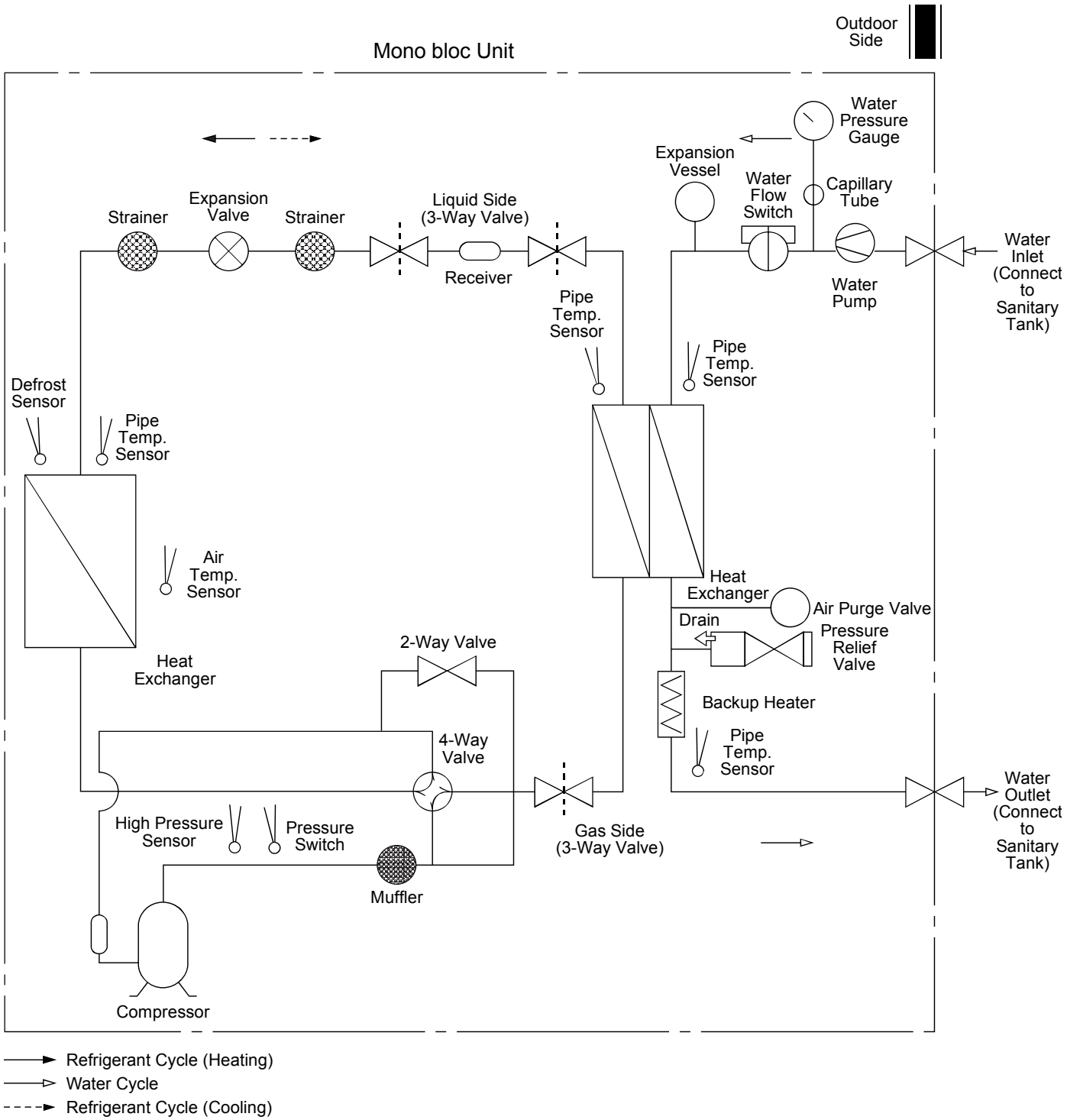
5. Dimensions

5.1 Mono Bloc Unit

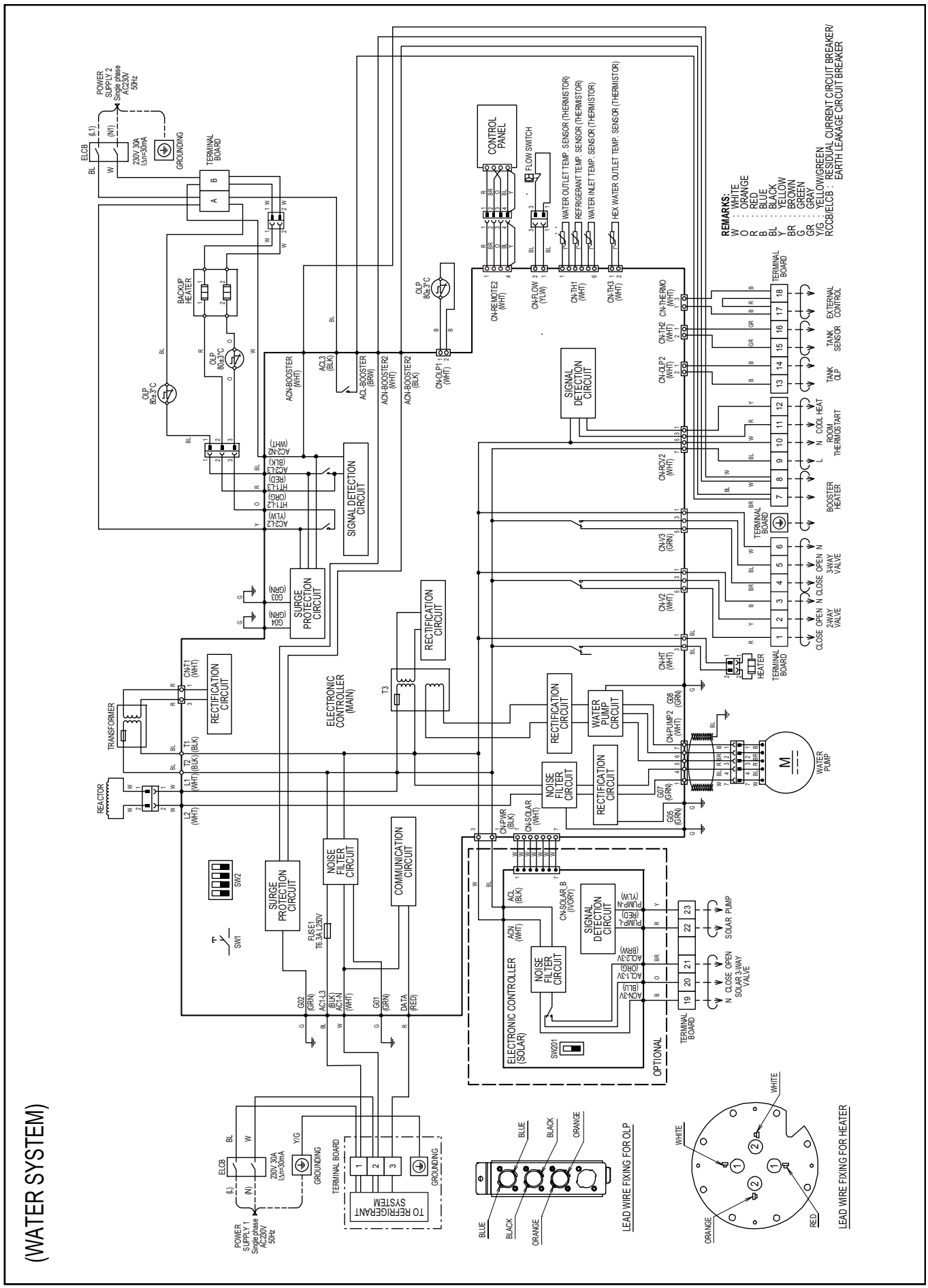


Unit: mm

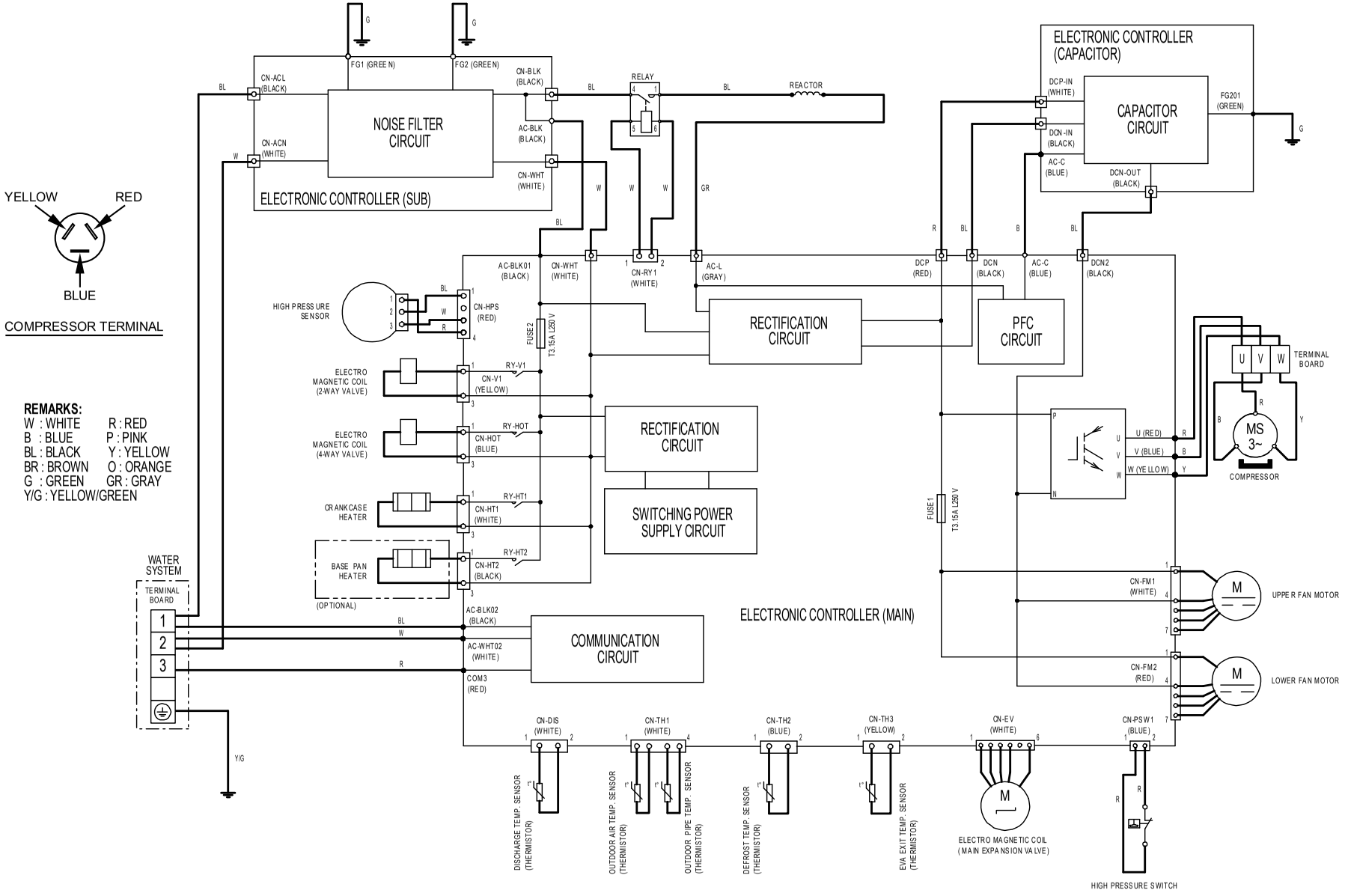
6. Refrigeration and Water Cycle Diagram



8. Wiring Connection Diagram



(REFRIGERANT SYSTEM)

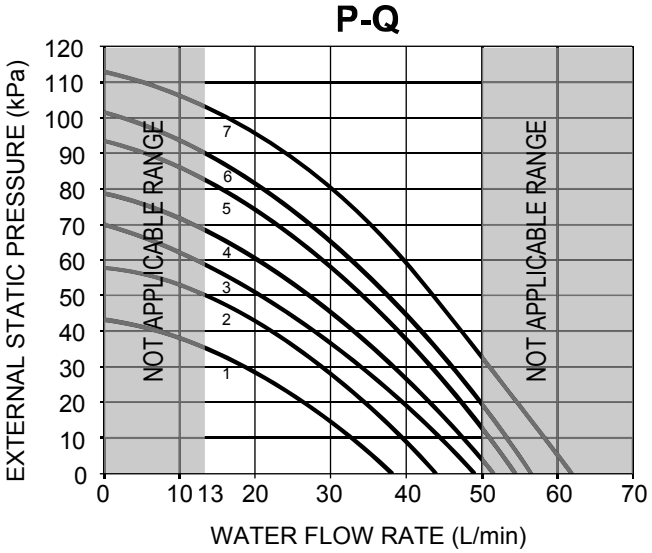


14.4 How To Adjust Water Flow Rate

Before adjust the water flow rate, make sure that the total water volume in the installation is 50 litres minimum for heating side. The default setting is SPEED 3 (Only for WH-MDC12G6E5) and SPEED 5 for WH-MDC16G6E5.
Please ensure the minimum flow rate is not less than 13 l/min and not more than 50 l/min.
The available external static pressure (kPa) in function of the water flow rate (l/min) is shown in the P-Q graph.
Depend on the hydraulic system pressure loss and type, the water flow rate can be adjusted by remote control.

1 When the Air-to-Water Heatpump is in stop operation, press SERVICE button for 5 seconds.
2 Press ▲/▼ button to select menu S02 (PUMP SPEED ADJUST MODE) and press SET button to confirm the menu.
3 Press SELECT button then press ▲/▼ button to change pump speed and press SET button to confirm the pump speed.
4 Press OFF/ON button to exit PUMP SPEED ADJUST MODE.

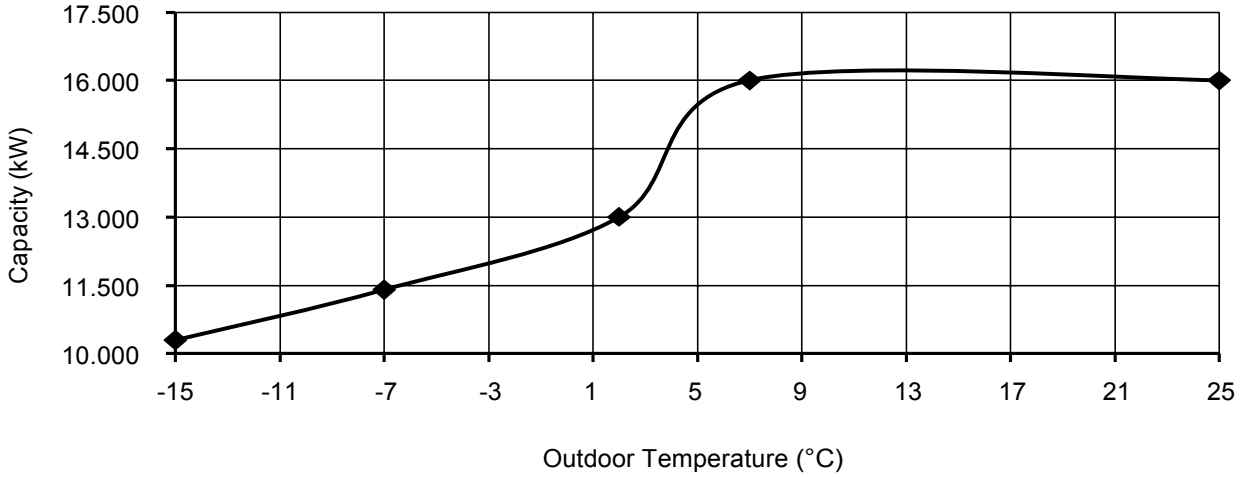
During PUMP SPEED ADJUST MODE, we can select AIR PURGE function by pressing FORCE button.
In AIR PURGE function, the pump will operate ON and OFF for 10 minutes to purge the air in the hydraulic system.
Press again the FORCE button to exit AIR PURGE function. PUMP SPEED ADJUST
MODE will stop operation.

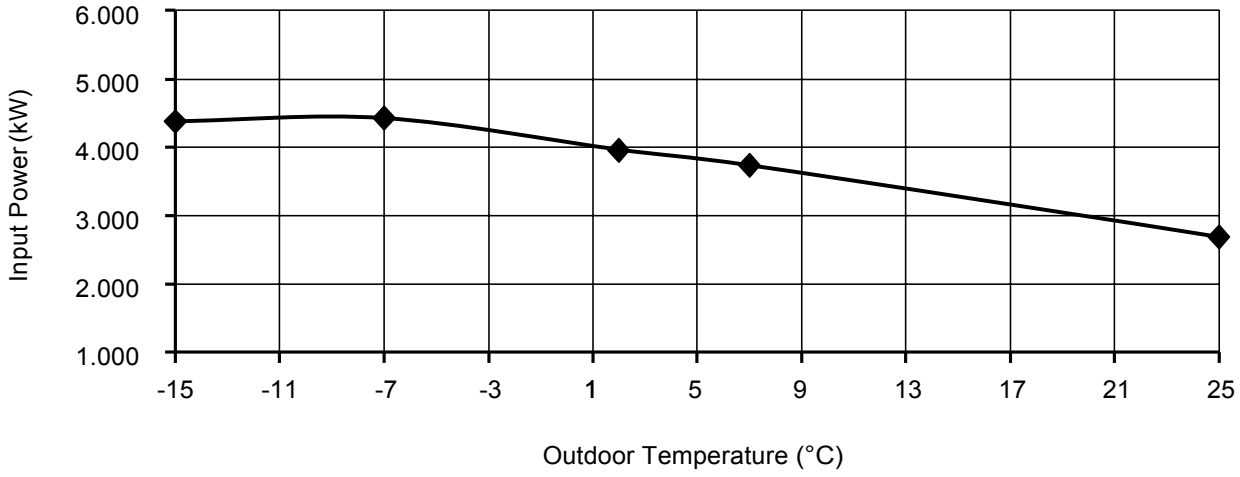


18.1.2 WH-MDC16G6E5

Heating Characteristics at Different Outdoor Air Temperature

Condition
Outdoor air temperature : 7°C (DBT), 6°C (WBT)
Indoor water inlet temperature : 30°C
Indoor water outlet temperature : 35°C





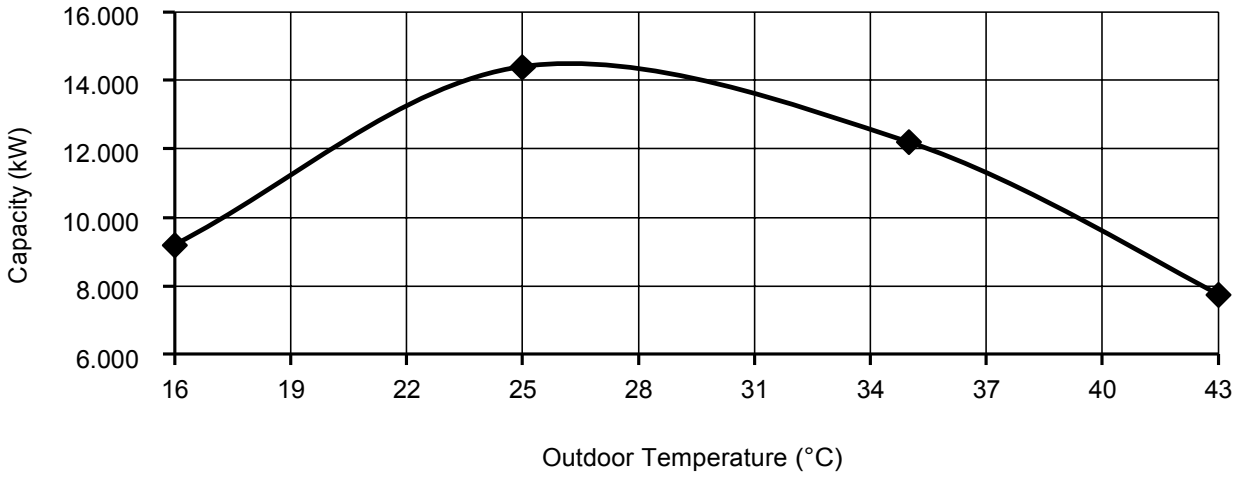
Cooling Characteristics at Different Outdoor Air Temperature

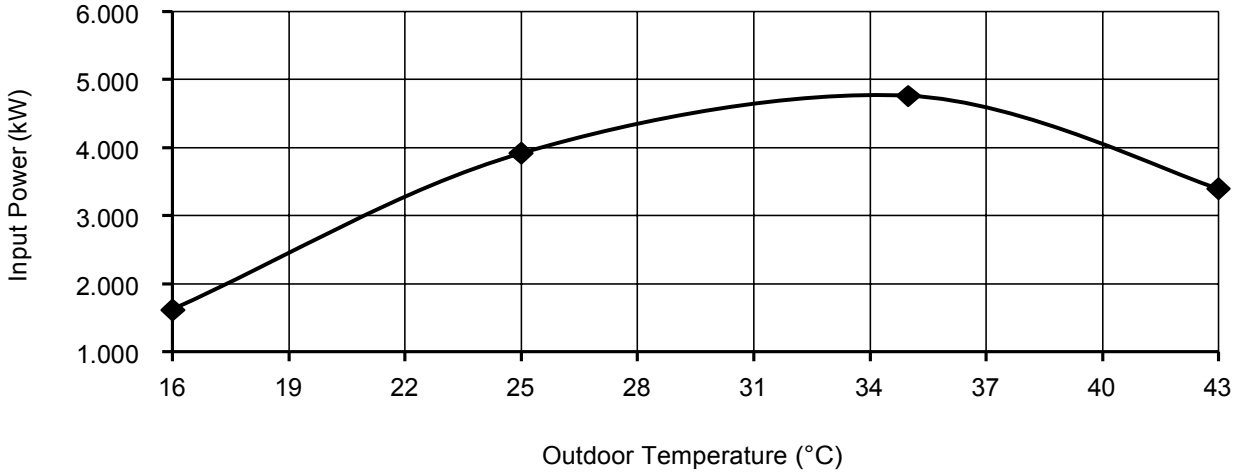
Condition

Outdoor air temperature : 35°C (DBT), -°C (WBT)

Indoor water inlet temperature : 12°C

Indoor water outlet temperature : 7°C





18.2 Heating Capacity Table

18.2.1 WH-MDC12G6E5

Water Out (°C)	30		35		40		45		55*	
Outdoor Air (°C)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)
-15	9300	3460	8900	3620	8500	3790	8100	3950	7000	4100
-7	10400	3370	10000	3660	9600	3950	9200	4240	8200	4210
2	11800	3100	11400	3310	11000	3530	10600	3740	9100	4080
7	12000	2100	12000	2530	12000	2960	12000	3390	12000	4100
25	12000	1380	12000	1660	11800	1940	11700	2230	11400	2740

* is rating based on ∆T = 8

18.2.2 WH-MDC16G6E5

Water Out (°C)	30		35		40		45		55*	
Outdoor Air (°C)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)
-15	10600	4090	10300	4380	10000	4670	9700	4960	7900	4840
-7	11900	4030	11400	4430	10800	4830	10300	5220	9000	4880
2	13500	3740	13000	3960	12400	4180	11900	4400	9800	4440
7	16000	3210	16000	3740	16000	4270	16000	4800	14500	5330
25	16000	2310	16000	2690	16000	3070	16000	3450	15900	3890

* is rating based on ∆T = 8

18.3 Cooling Capacity Table

18.3.1 WH-MDC12G6E5

Water Out (°C)		7		14		18	
OD Ambient	°C	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)
	16	7860	1180	13150	2050	10000	1730
	25	12080	2900	15700	3050	10000	1970
	35	10000	3560	12000	3670	10000	2150
	43	7800	3800	11100	3190	8000	2850

18.3.2 WH-MDC16G6E5

Water Out (°C)		7		14		18	
OD Ambient	°C	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)
	16	9200	1620	16400	2580	12200	2450
	25	14400	3920	19200	3830	12200	2790
	35	12200	4760	15000	4980	12200	2960
	43	7750	3400	13800	5950	9700	4000