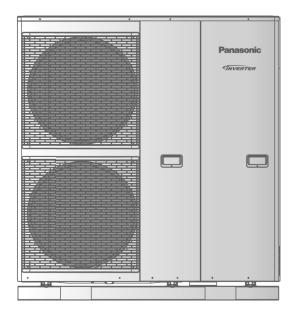
# Service Manual

(Mono Bloc) Air-to-Water Heatpump System



**Mono Bloc Unit** 

WH-MHF12G6E5

Destination Europe Turkey

## **MARNING**

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.

#### IMPORTANT SAFETY NOTICE •

There are special components used in this equipment which are important for safety. These parts are marked by  $\triangle$  in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

## PRECAUTION OF LOW TEMPERATURE

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



## 1. Safety Precautions

- Read the following "SAFETY PRECAUTIONS" carefully before installation of (Mono bloc) Air-to-Water Heatpump 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.

<b>⚠</b> WARNING	This indication shows the possibility of causing death or serious injury.
<b>⚠</b> CAUTION	This indication shows the possibility of causing injury or damage to properties only.

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

$\Diamond$	This symbol denotes item that is PROHIBITED from doing.
0 0	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.

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	<b>⚠</b> 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.	0
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.	0
20.	If there is any doubt about the installation procedure or operation, always contact the authorized dealer for advice and information.	0
21.	Select a location where in case of water leakage, the leakage will not cause damage to other properties.	0
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.	0
23.	This installation may be subjected to building regulation approval applicable to respective country that may require to notify the local authority before installation.	0
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.	0
25.	This unit must be properly earthed, the electrical earth must not be connected to a gas pipe, water pipe, the earth of a lightning 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.	•

	<b>⚠</b> 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.	$\Diamond$
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.	$\Diamond$
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.	$\Diamond$
4.	Do not touch the sharp aluminum fins or edges of metal parts.  If you are required to handle sharp parts during installation or servicing, please wear hand glove.  Sharp parts may cause injury.	$\Diamond$
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.	$\Diamond$
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.	0
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.	0
8.	Select an installation location where it is accessible for maintenance.	0
9.	Power supply connection to the 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 40A circuit breaker  Power supply 2: Use approved 40A circuit breaker	•
10.	Ensure the correct polarity is maintained throughout all wiring. Otherwise, it will cause electrical shock or fire.	0
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.	0
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.	0

## 2.2 WH-MHF12G6E5

	Item	Unit	Refrigeran	t System		
Performance Test Con	ndition		EN14	511		
		Condition (Ambient/Water)	A7W35	A2W35		
Heating Capacity		kW	12.00	12.00		
and the same of th		BTU/h	41000	41000		
		kcal/h	10320	10320		
COP		W/W	4.46	3.26		
COP		kcal/hW	3.84	2.80		
Air Flow		m³/min (ft³/min)	80.0 (2	830)		
Refrigeration Control D	Device		Expansion Valve			
Refrigeration Oil		cm <sup>3</sup>	FV50S (1600)			
Refrigerant (R407C)		g (oz)	1.92k (67.8)			
	Туре		Hermetic Motor / Rotary			
Compressor	Motor Type		Brushless (4-poles)			
	Rated Output	kW	3.40			
	Туре		Propeller Fan			
	Material		PP	)		
F	Motor Type		DC (8-p	poles)		
ran	Input Power	W	_			
	Output Power	W	60			
	Fan Speed	rpm	510 (Top Fan) 55	0 (Bottom Fan)		
	Fin material		Aluminium (Pre Coat)			
Fan Heat Exchanger	Fin Type		Corrugat	ed Fin		
neat Exchanger	Row × Stage × FPI		2 × 51	× 18		
	Size (W × H × L)	mm	903.7 × 129	5.4 × 38.1		

	Item	Unit	Mono B	loc Unit
	Height	mm (inch)	1410 (	55-1/2)
Dimension	Width	mm (inch)	1283 (	50-1/2)
	Depth	mm (inch)	320 (12	2-19/32)
Net Weight	<u>.</u>	kg (lbs)	151 (	(333)
Nieże a I essel		dB-A	5	0
Noise Level		Power Level dB	67 Single 230	
		Ø	Sin	igle
Power Source (Phas	se, Voltage, Cycle)	V	23	30
		Hz	5	0
Input Power		kW	2.69	3.68
Maximum Input Pow	er For Mono Bloc Unit	kW	6.3	20
Power Supply 1: Pha	ase (ø) / Max. Current (A) / Ma	x. Input Power (W)	Single / 29	9.0 / 6.20k
Power Supply 2: Pha	ase (ø) / Max. Current (A) / Ma	x. Input Power (W)	Single / 26	6.0 / 6.00k
Power Supply 3: Pha	ase (ø) / Max. Current (A) / Ma	x. Input Power (W)	-/-	- / -
Starting Current		A	12	2.8
Running Current		A	12.8	17.2
Maximum Current F	mum Current For Mono Bloc Unit A 29.0			
Power Factor		%	93	93

It	em	Unit	Mono Bloc Unit
Power factor means total f	igure of compressor and outo	door fan motor.	
Power Cord	Number of core		-
	Length	m (ft)	-
Thermostat			Electronic Control
Protection Device			Electronic Control

1	ltem		Unit	Water System
Performance Test Conditi	ion			EN14511
Operation Range	Outdoor A	mbient	°C	-20 ~ 35
Operation Range	Water Out	let	°C	25 ~ 65
Internal Pressure Differer	ernal Pressure Differential  ater Pipe Diameter  Inlet Outlet  ater Drain Hose Inner Diameter  Motor Type			44.7
Water Bine Diameter	Inlet		mm (inch)	30 (1-3/16)
Water Fipe Diameter	Outlet		mm (inch)	30 (1-3/16)
Water Drain Hose Inner Diameter			mm (inch)	15.00 (19/32)
	Motor Type	е		DC Motor
Pump	No. of Spe	ed		7 (Software Selection)
	Input Powe	er	W	72
	Туре			Brazed Plate
· Hot Water Coil	No. of Plat	es		80
Hot water Coil	Size (W x	H x L)	mm	130 × 93 × 325
	Water Flow	v Rate	l/min (m³/h)	34.4 (2.1)
Pressure Relief Valve Wa	iter Circuit		kPa	Open: 300, Close: 265 and below
Flow Switch				Magnetic Lead Switch
Protection Device		А	Residual Current Circuit Breaker (40)	
Evnancian Vaccal		Volume	I	10
Expansion Vessel	•	MWP	bar	3
Capacity of Integrated Ele	ectric Heater		kW	6.00

#### Note:

- 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 (R407C)

#### 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

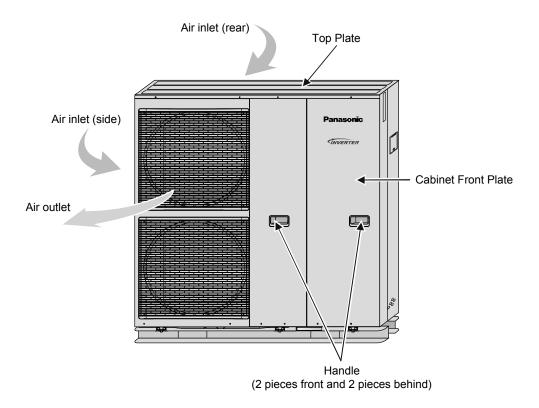
### Operation Condition

		Water outlet temperature (°C)	Ambient temperature (°C)		
HEATING	Maximum	65	35		
HEATING	Minimum	25	-20		

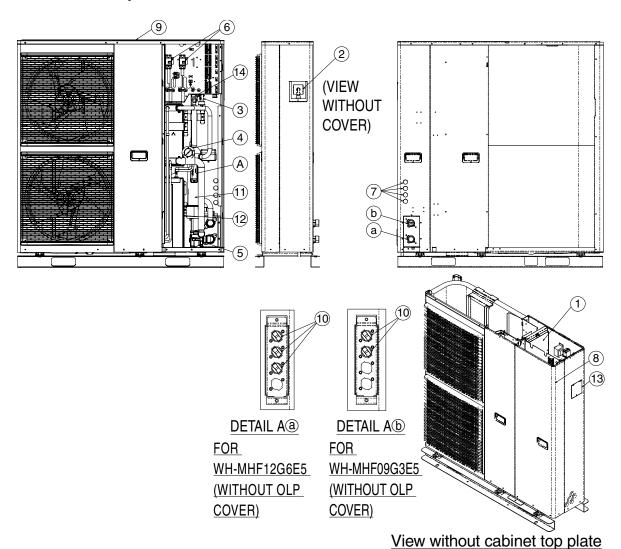
NOTICE: When the outdoor temperature is out of the above temperature range, the heating capacity will drop significantly and mono bloc unit might stop for protection control.

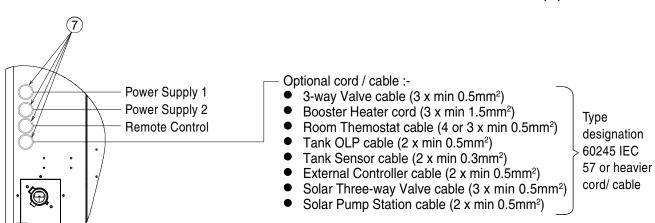
# 4. Location of Controls and Components

## 4.1 Mono Bloc Unit



## 4.1.1 Main Components





Component name

- 1 PCB
- 2 Pressure relief valve
- 3 Flow switch
- 4 Pressure gauge
- Water pump
- 6 RCCB
- 7 Bushing
- 8 Cabinet front plate

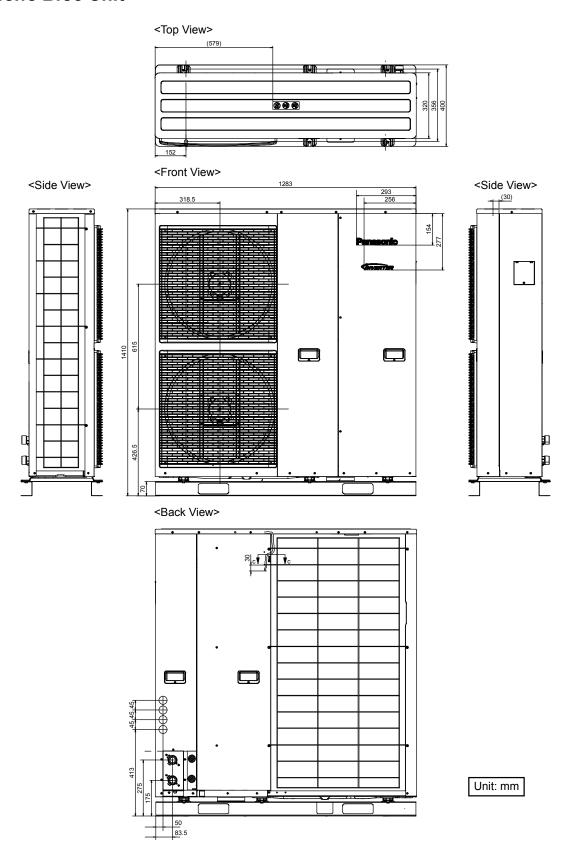
- 9 Cabinet top plate
- 10 Overload protector
- 11) Heater assembly
- in Heater assembly
- Expansion vessel
- (13) Cover
- 4 Air purge valve

#### Connector name

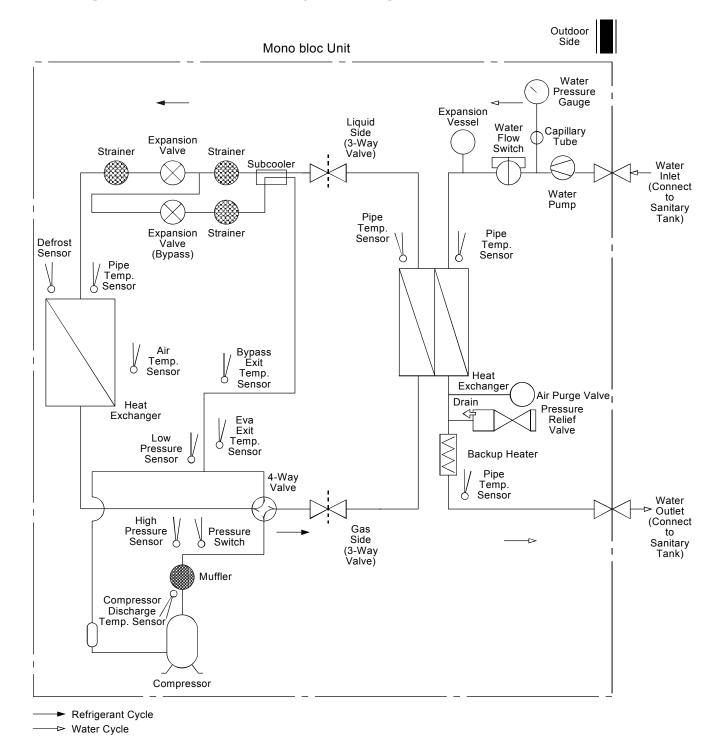
- Water inlet
- **b** Water outlet

# 5. Dimensions

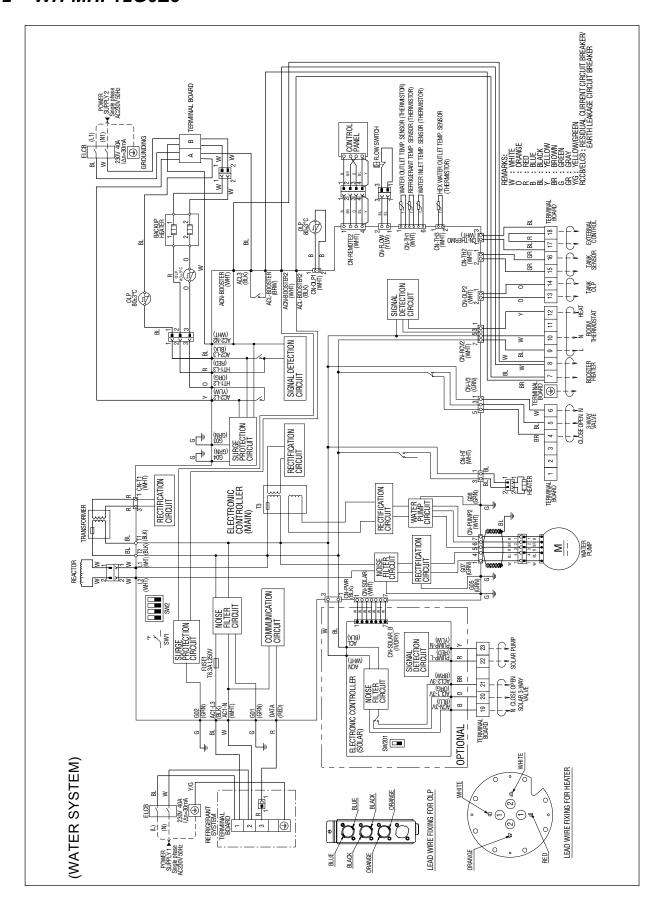
## 5.1 Mono Bloc Unit

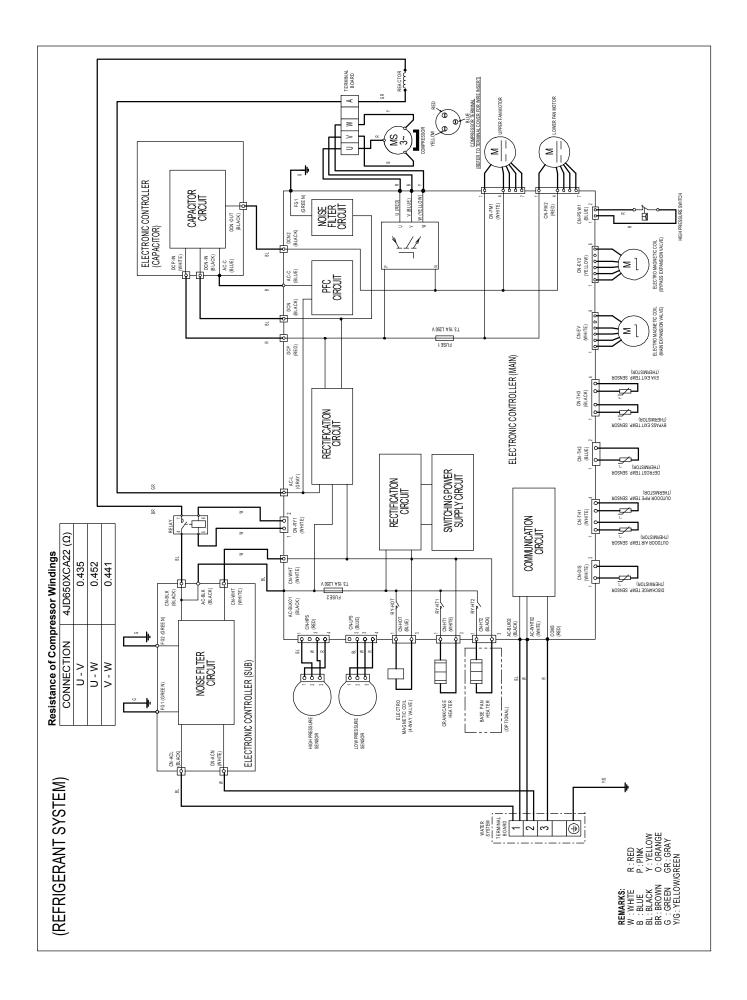


# 6. Refrigeration and Water Cycle Diagram



## 8.2 WH-MHF12G6E5





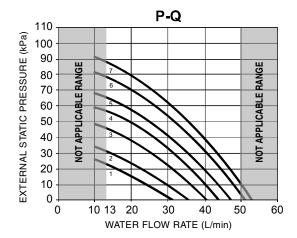
## How To Adjust Water Flow Rate

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 4 (Only for WH-MHF09G3E5) and SPEED 5 for WH-MHF12G6E5. 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.



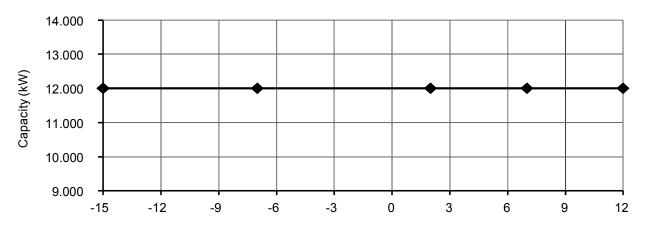
## 18.1.2 WH-MHF12G6E5

#### **Heating Characteristics at Different Outdoor Air Temperature**

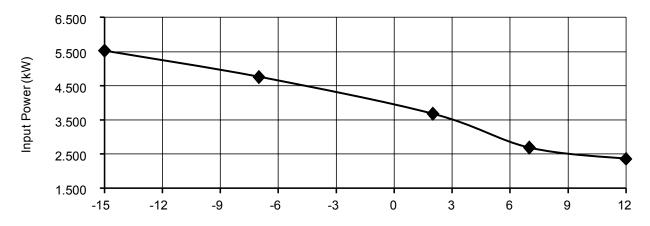
Condition

o Outdoor air temperature: 7°C (DBT), 6°C (WBT)

Indoor water inlet temperature : 30°C
 Indoor water outlet temperature : 35°C



Outdoor Temperature (°C)



Outdoor Temperature (°C)

# 18.2 Heating Capacity Table

## 18.2.1 WH-MHF09G3E5

Water Out (°C)	30		30 35 40		0	45		55*		65**		
Outdoor Air (°C)	Capacity (W)	Input Power (W)										
-15	9000	3460	9000	3710	9000	4010	8800	4260	8500	4710	7800	5380
-7	9000	3060	9000	3290	9000	3560	8900	3830	8900	4280	9000	5020
2	9000	2430	9000	2610	9000	2910	9000	3210	9000	3720	9000	4370
7	9000	1820	9000	1940	9000	2210	9000	2460	9000	2990	9000	3640
12	9000	1520	9000	1700	9000	1880	9000	2160	9000	2630	9000	3200

<sup>\*</sup> is tested with dT = 8°C, \*\* is tested with dT = 10°C

## 18.2.2 WH-MHF12G6E5

Water Out (°C)	30		30 35		4	40		45		55*		65**	
Outdoor Air (°C)	Capacity (W)	Input Power (W)											
-15	12000	5160	12000	5530	11000	5510	10800	5490	9700	5520	8000	5610	
-7	12000	4430	12000	4760	11500	4910	11200	5060	10100	5060	9600	5430	
2	12000	3420	12000	3680	11500	3860	11300	4140	10800	4660	10300	5130	
7	12000	2520	12000	2690	12000	3060	12000	3440	12000	4100	12000	4970	
12	12000	2030	12000	2360	12000	2690	12000	3020	12000	3610	12000	4370	

<sup>\*</sup> is tested with dT = 8°C,

<sup>\*\*</sup> is tested with dT = 10°C