Midea Building Technologies

Engineering Data

M thermal Arctic Split

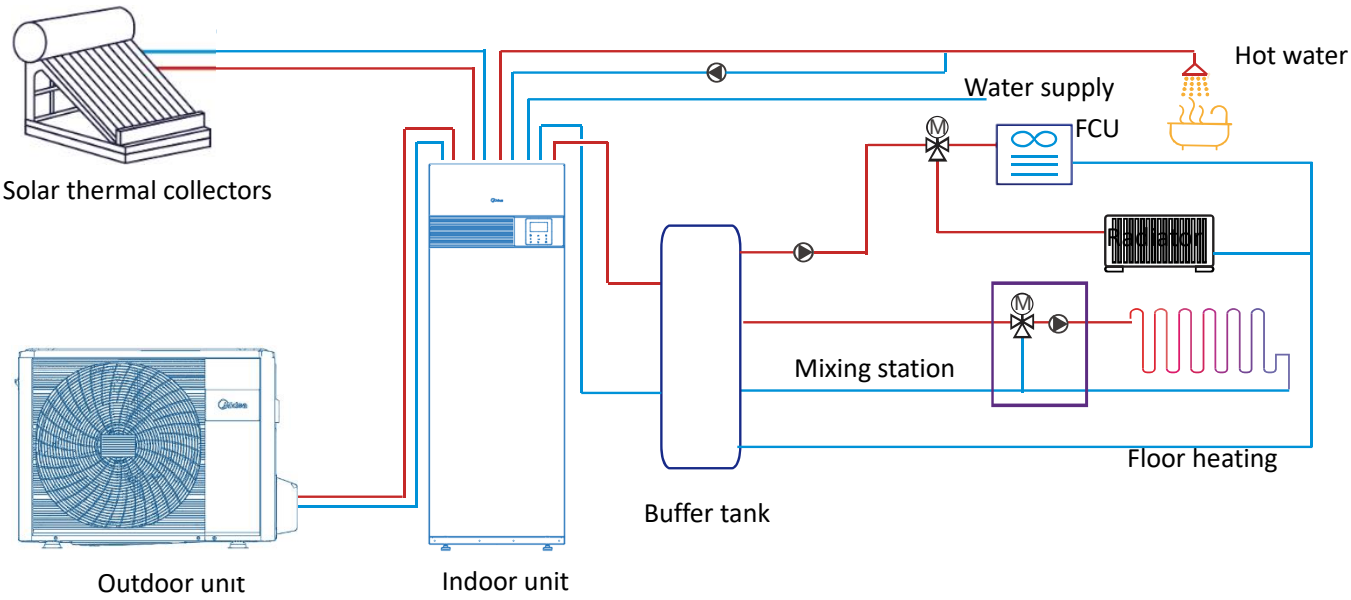
CONTENTS

Part 1

General Information

1 M thermal Split System

1.1 System Schematic



M thermal is an integrated air-to-water heat pump system which is one-stop solution for space heating, space cooling and domestic hot water. The outdoor heat pump system extracts heat from the outdoor air and transfers this heat through refrigerant piping to the plate heat exchanger in the hydro module with water tank. The heated water in the hydro module circulates to low temperature heat emitters (under-floor heating loops or low temperature radiators) to provide space heating. The 4-way valve in the outdoor unit can reverse the refrigerant cycle so that the hydro module can provide chilled water for cooling using fan coil units. Because the water tank is integrated design in the hydro module, so it can provide hot water directly to the users.

The heating capacity of heat pumps decreases with ambient temperature dropping. Backup electric heater is standard equipped to provide additional heating capacity for use during extremely cold weather when the heat pump capacity is insufficient.

1.2 System Configurations

M thermal Split is configured to run with the electric heater either and can also be used in conjunction with an auxiliary heat source such as a boiler.

The chosen configuration affects the size of heat pump that is required. Three typical configurations are described below.

Configuration 1: Heat pump only

- The heat pump covers the required capacity and no extra heating capacity is necessary.
- Requires selection of larger capacity heat pump and implies higher initial investment.
- Ideal for new construction in projects where energy efficiency is paramount.

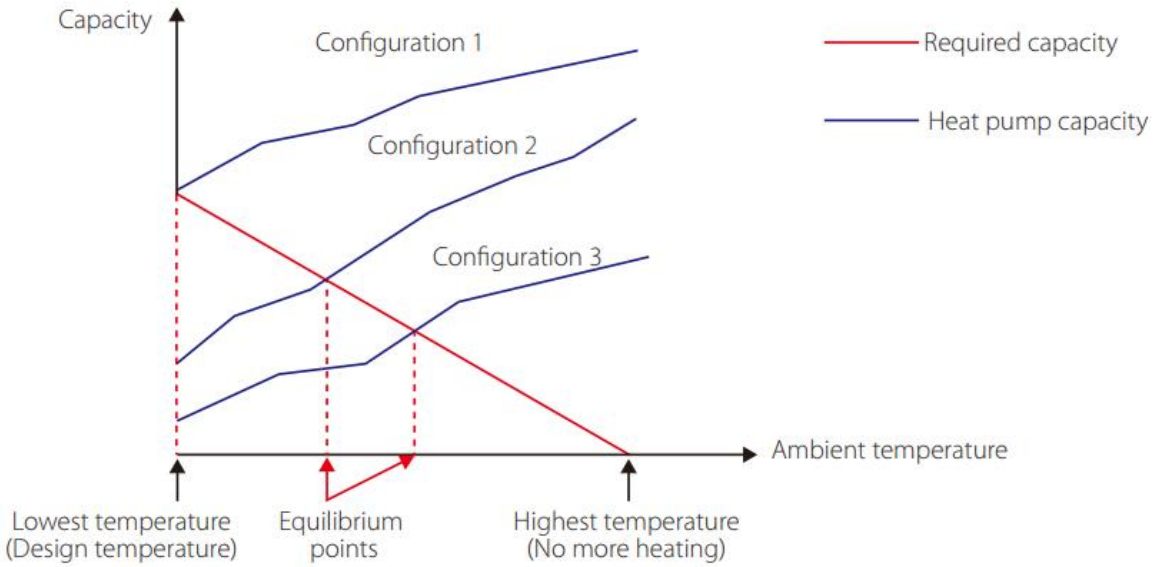
Configuration 2: Heat pump and backup electric heater (Hydro module with water tank is standard with 3kW backup electric heater)

- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, the backup electric heater supplies the required additional heating capacity.
- Best balance between initial investment and running costs, results in lowest lifecycle cost.
- Ideal for new construction.

Configuration 3: Heat pump conjunction with auxiliary heat source

- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, depending on the system settings, either the auxiliary heat source supplies the required additional heating capacity or the heat pump does not run and the auxiliary heat source covers the required capacity.
- Enables selection of lower capacity heat pump.
- Ideal for refurbishments and upgrades.

System configurations



2 Unit Capacities

2.1 Outdoor unit

Model	MHA-V4W/D2N8-B2	MHA-V6W/D2N8-B2
Appearance		

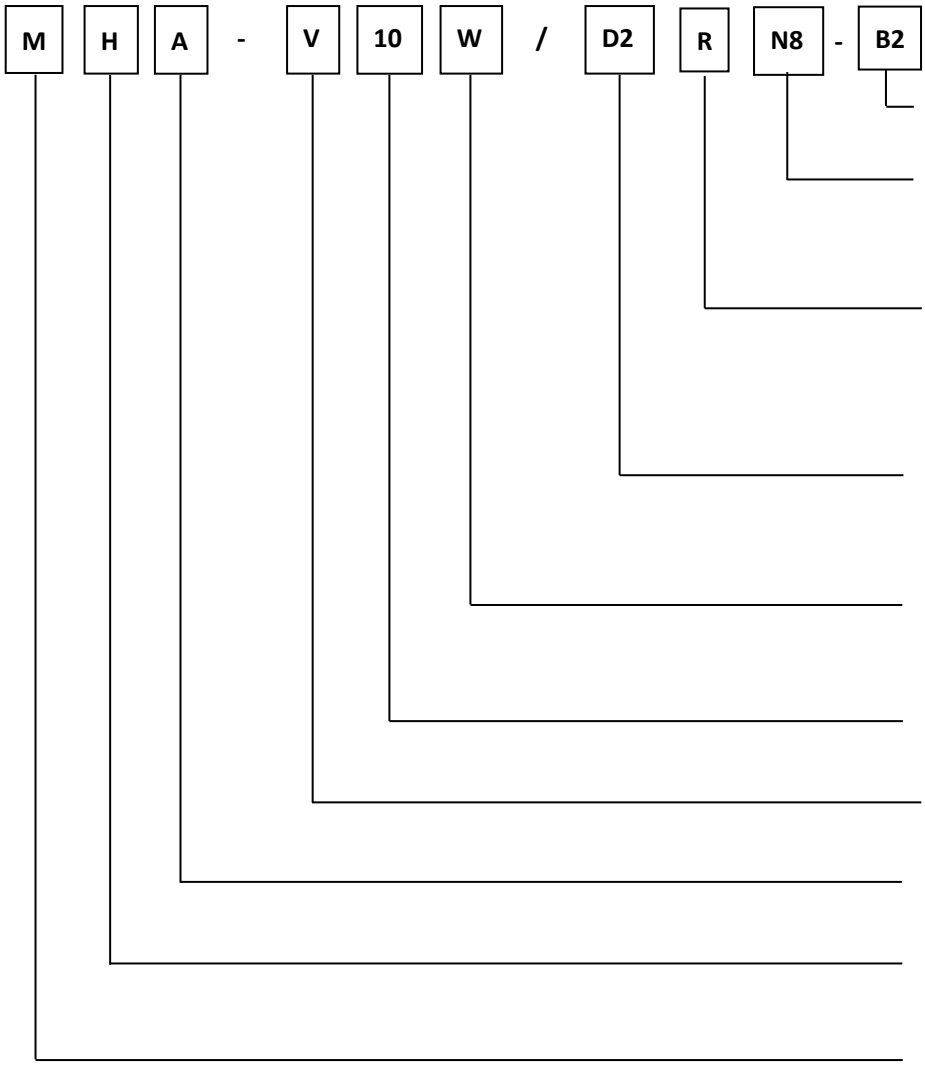
Model	MHA-V8W/D2N8-B2	MHA-V10W/D2N8-B2	MHA-V12W/D2N8-B2	MHA-V12W/D2RN8-B2	MHA-V14W/D2N8-B2	MHA-V14W/D2RN8-B2	MHA-V16W/D2N8-B2	MHA-V16W/D2RN8-B2
Appearance								

2.2 Hydro module with water tank

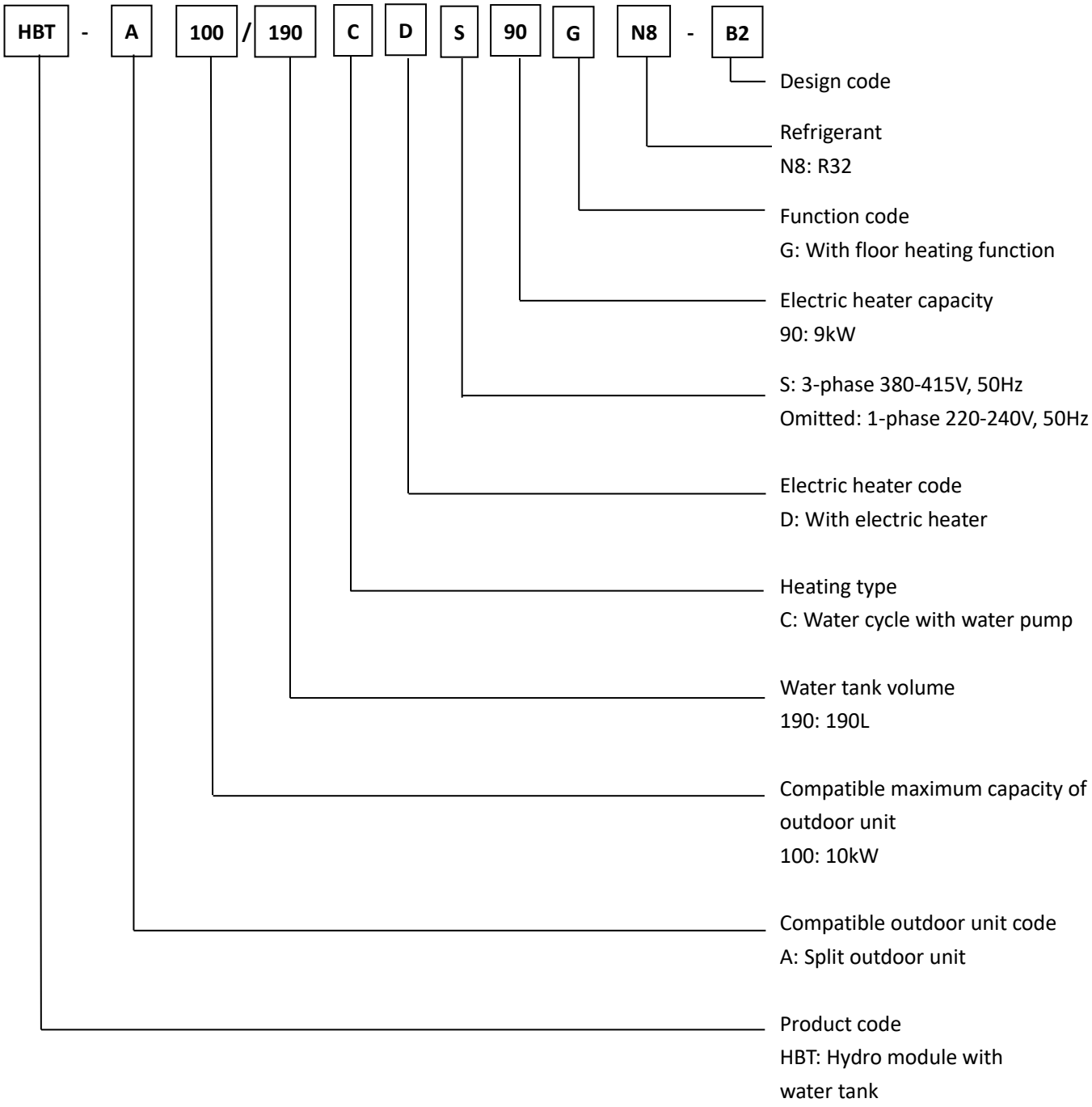
Model	HBT-A100/190CD30GN8-B	HBT-A100/240CD30GN8-B	HBT-A160/240CD30GN8-B
Compatible outdoor unit model	MHA-V4W/D2N8-B2 MHA-V6W/D2N8-B2 MHA-V8W/D2N8-B2 MHA-V10W/D2N8-B2	MHA-V4W/D2N8-B2 MHA-V6W/D2N8-B2 MHA-V8W/D2N8-B2 MHA-V10W/D2N8-B2	MHA-V12W/D2N8-B2 MHA-V14W/D2N8-B2 MHA-V16W/D2N8-B2 MHA-V12W/D2RN8-B2 MHA-V14W/D2RN8-B2 MHA-V16W/D2RN8-B2
Appearance			

3 Nomenclature

3.1 Outdoor unit



3.2 Hydro module with water tank



4 System Design and Unit Selection

4.1 Selection procedure

Step 1: Total heat load calculation

Calculate conditioned surface area
Select the heat emitters (type, quantity, water temperature and heat load)

Step 2: System configuration

Decide whether to include AHS and set AHS's switching temperature
Decide whether backup electric heater is enabled or disabled

Step 3: Selection of outdoor units

Determine required total heat load on outdoor units
Set capacity safety factor
Select power supply

Provisionally select M thermal Split unit capacity based on nominal capacity

Correct capacity of the outdoor units for the following items:
Outdoor air temperature / Outdoor humidity / Water outlet temperature[1] / Altitude / Anti-freeze fluid

Is corrected M thermal Split unit capacity ≥ Required total heat load on outdoor units[2]

Yes → M thermal Split system selection is complete

No → Select a larger model or enable backup electric heater operation → Correct capacity of the outdoor units for the following items: Outdoor air temperature / Outdoor humidity / Water outlet temperature[1] / Altitude / Anti-freeze fluid

Notes:

1. If the required water temperatures of the heat emitters are not all the same, the M thermal Split's outlet water temperature setting should be set at the highest of the heat emitter required water temperatures. If the water outlet design temperature falls between two temperatures listed in the outdoor unit's capacity table, calculate the corrected capacity by interpolation.
2. If the outdoor unit selection is to be based on total heating load and total cooling load, select Split units which satisfy both total heating and cooling load requirements.

4.2 M thermal Leaving Water Temperature (LWT) Selection

The recommended design LTW ranges for different types of heat emitter are:

- For floor heating: 30 to 35°C
- For fan coil units: 40 to 45°C
- For low temperature radiators: 40 to 50°C

4.3 Optimizing System Design

To get the most comfort with the lowest energy consumption with M thermal, it is important to take account of the following considerations:

- Choose heat emitters that allow the heat pump system to operate at as low a hot water temperature as possible whilst still providing sufficient heating.
- Make sure the correct weather dependency curve is selected to match the installation environment (building structure, climate) as well as ender user's demands.
- Connecting room thermostats (field supplied) to the hydro system helps prevent excessive space heating by stopping the outdoor unit and circulator pump when the room temperature is above the thermostat set point.

4.4 Tank back up heater notice

Heat pump will stop when T5(tank temperature) has reached the minimum of both T5S(tank setting temperature) and T5stop (highest tank temperature which can be reached under certain ambient temperature with heat pump only) and lasted for 5s. The value of T5stop is shown as below.

If T5S is higher than T5stop, then T5S can not be reached with heat pump only. In this case, tank back up heater is needed in order to reach T5S.

T5stop value:

Ambient temperature(℃)	< -20	-20~15	-15~-10	-10~-5	-5~0	0~5	5~10
T5stop(℃)	35	40	45	48	52	55	56

Ambient temperature(℃)	10~15	15~20	20~25	25~30	35~40	40~65	40~65
T5stop(℃)	57	56	55	52	50	48	45

4.5 Water Circuit Anti-freeze Protection

Ice formation can cause damage to the hydronic system. All internal hydronic parts are insulated to reduce heat loss. Insulation must also be added to the field piping.

- The software contains special functions using the heat pump to protect the entire system against freezing.
  When the temperature of the water flow in the system drops to a certain value, the unit will heat the water, either using the heat pump, or the backup heater. The freeze protection function will turn off only when the temperature increases to a certain value.
- In event of a power failure, the above features would not protect the unit from freezing.
  Since a power failure could happen when the unit is unattended, the supplier recommends use anti-freeze fluid to the water system.
- Depending on the expected lowest outdoor temperature, make sure the water system is filled with a concentration of glycol as mentioned in the table below. When glycol is added to the system, the freezing point of water will be lower and the performance of the unit will be affected. The correction factor of the unit capacity, flow rate and pressure drop of the system is listed below.

Concentration of ethylene glycol (%)	Modification coefficient				Minimum outdoor temperature (°C)
	Cooling capacity modification	Power input modification	Water resistance	Water flow modification	
0	1.000	1.000	1.000	1.000	0
10	0.984	0.998	1.118	1.019	-5
20	0.973	0.995	1.268	1.051	-15
30	0.965	0.992	1.482	1.092	-25

Concentration of propylene glycol (%)	Modification coefficient				Minimum outdoor temperature (°C)
	Cooling capacity modification	Power input modification	Water resistance	Water flow modification	
0	1.000	1.000	1.000	1.000	0
10	0.976	0.996	1.071	1.000	-4
20	0.961	0.992	1.189	1.016	-12
30	0.948	0.988	1.380	1.034	-20

Glycol absorbs water from its environment. Therefore do NOT add glycol that has been exposed to air. Leaving the cap off the glycol container causes the concentration of water to increase. The glycol concentration is then lower than assumed. As a result, the hydraulic components might freeze up after all. Take preventive actions to ensure a minimal exposure of the glycol to air.

Due to the presence of glycol, corrosion of the system is possible. Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by presence of copper and at higher temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system. It is of extreme importance:

- That the water treatment is correctly executed by a qualified water specialist.
- That a glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols.
- That in case of an installation with a domestic hot water tank, only the use of propylene glycol is allowed. If the system does NOT contain a domestic hot water tank, then you can use either propylene glycol or ethylene glycol;
- That no automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates that can foul or plug the system;
- That galvanized piping is not used in glycol systems since it may lead to the precipitation of certain elements in the glycol's corrosion inhibitor;
- To ensure that the glycol is compatible with the materials used in the system.
- Protection against bursting: the glycol will prevent the piping from bursting, but NOT the liquid inside the piping from freezing.
- Protection against freezing: the glycol will prevent the liquid inside the piping from freezing.
- The required concentration might differ depending on the type of glycol. ALWAYS compare the requirements from the table above with the specifications provided by the glycol manufacturer. If necessary, meet the requirements set by the glycol manufacturer.
- If the liquid in the system is frozen, the pump will NOT be able to start. Mind that if you only prevent the system from bursting, the liquid inside might still freeze.
- When water is at standstill inside the system, the system is very likely to freeze and get damaged.

Part 2

Engineering Data

1 Specifications

Outdoor Unit Model				MHA-V4W/D2N8-B2	MHA-V6W/D2N8-B2	MHA-V8W/D2N8-B2	MHA-V10W/D2N8-B2
Indoor Unit Model				HBT-A100/190CD30GN8-B2			
Heating	A7W35	Capacity	kW	4.25	6.20	8.30	10.00
		Rated input	kW	0.82	1.24	1.60	2.00
		COP		5.20	5.00	5.20	5.00
	A7W45	Capacity	kW	4.35	6.35	8.20	10.00
		Rated input	kW	1.14	1.69	2.08	2.63
		COP		3.80	3.75	3.95	3.80
	A-7W35	Capacity	kW	4.8	6.10	7.10	8.25
		Rated input	kW	1.52	2.00	2.18	2.62
		COP		3.15	3.05	3.25	3.15
	A-7W55	Capacity	kW	4.00	5.15	6.15	6.85
		Rated input	kW	2.05	2.58	3.00	3.43
		COP		1.95	2.00	2.05	2.00
Cooling	A35W18	Capacity	kW	4.50	6.55	8.40	10.00
		Rated input	kW	0.81	1.34	1.66	2.08
		EER		5.55	4.90	5.05	4.80
	A35W7	Capacity	kW	4.70	7.00	7.40	8.20
		Rated input	kW	1.36	2.33	2.19	2.48
		EER		3.45	3.00	3.38	3.30
DHW	Tapping profile according EN16147			L			
	Water heating energy efficiency class(1)	Warm climate	class	A+	A+	A+	A+
			COP	3.80	3.80	3.66	3.66
		Average climate	class	A+	A+	A+	A+
			COP	3.10	3.10	3.02	3.02
		Cold climate	class	A	A	A	A
			COP	2.50	2.50	2.61	2.61
Seasonal space heating energy efficiency		Warmer climate at 35°C	SCOP	5.71	6.57	6.99	7.09
		Warmer climate at 55°C	SCOP	4.15	4.21	4.50	4.58
		Average climate at 35°C	class	A+++	A+++	A+++	A+++
			SCOP	4.85	4.95	5.22	5.20
		Average climate at 55°C	class	A++	A++	A++	A++
			SCOP	3.31	3.52	3.36	3.49
		Colder climate at 35°C	SCOP	4.06	4.21	4.33	4.32
		Colder climate at 55°C	SCOP	2.63	2.85	2.88	2.99
Seasonal space cooling energy efficiency		Water outlet at 7°C	SEER	4.98	5.31	5.83	5.96
		Water outlet at 18°C	SEER	7.77	8.25	8.95	8.80
Rated water flow			m^3/h	0.73	1.07	1.43	1.72
Outdoor Unit	Power supply		V/Ph/Hz	220-240/1/50			
	Rated input		W	2200	2600	3300	3600
	Rated current		A	10.5	12.0	14.5	16.0
	Unit dimension (W×H×D)		mm	1008×712×426		1118×865×523	

	Packing dimension (W×H×D)		mm	1065×810×485		1190×970×560	
	Net/Gross weight		kg	58 / 63.5		75 / 89	
	Refrigerant	Type(GWP)		R32(675)			
		Charged volume	kg	1.50		1.65	
		Refrigerant to be added	g/m	20		38	
	Refrigerant piping connections	Liquid/Gas side	mm	ϕ6.35 / ϕ15.9		ϕ9.52 / ϕ15.9	
		Max. piping length	m	30			
		Max. difference in height	m	20			
	Drain connection			DN32			
	Outdoor unit sound Power Level(3)		dB	56	58	59	60
	Ambient temperature range	Heating	℃	-25～35			
		Cooling	℃	-5～43			
		Domestic hot water	℃	-25～43			
Indoor Unit	Power supply		V/Ph/Hz	220-240/1/50			
	Rated input		W	3095			
	Rated current		A	13.5			
	DHW Tank	Type		Stainless steel			
		Material	-	SUS 316L			
		Water Volume	l	190			
		Disinfection water temperature	℃	70			
		Maximum water pressure limit	bar	10			
		Insulation – Material	-	Polyurethane (Cyclopentane)			
		Insulation – Thickness	mm	45			
	Heat Exchanger			Plate heat exchanger			
	Backup E-heater	Standard mounted	kW	3			
		Capacity steps		1			
	Water Pump	Type		DC-Inverter			
		Max. head	m	9			
	Expansion vessel	Volume	L	8			
	Water Piping connection	Water circuit	Inlet	R1''			
			Outlet				
		DHW tank water circuit	Cold Inlet	R3/4''			
			Hot Outlet				
			Recirculation				
	Unit dimension (W×H×D)		mm	600*1683*600			
	Packing dimension (W×H×D)		mm	730*1920*730			
	Net/Gross weight		kg	140 / 161			
	Ambient temperature range		℃	5～35			
	LWT setting range	Heating	℃	25～65			
		Cooling	℃	5～25			
		Domestic hot water	℃	30～60			
	Indoor unit sound Power Level(2)		dB	38	38	40	40
	Sound pressure(1m)		dB	22	24	22	22

(1)According to EN16147/2017;EU No:811/2013

(2)Sound power in heating mode, measured according to the EN 12102 under conditions of the EN 1482

(3)Sound pressure(1m) is the calculated value for reference only

Outdoor Unit Model				MHA-V4W/D2N8-B2	MHA-V6W/D2N8-B2	MHA-V8W/D2N8-B2	MHA-V10W/D2N8-B2
Indoor Unit Model				HBT-A100/240CD30GN8-B2			
Heating	A7W35	Capacity	kW	4.25	6.20	8.30	10.00
		Rated input	kW	0.82	1.24	1.60	2.00
		COP		5.20	5.00	5.20	5.00
	A7W45	Capacity	kW	4.35	6.35	8.20	10.00
		Rated input	kW	1.14	1.69	2.08	2.63
		COP		3.80	3.75	3.95	3.80
	A-7W35	Capacity	kW	4.8	6.10	7.10	8.25
		Rated input	kW	1.52	2.00	2.18	2.62
		COP		3.15	3.05	3.25	3.15
	A-7W55	Capacity	kW	4.00	5.15	6.15	6.85
		Rated input	kW	2.05	2.58	3.00	3.43
		COP		1.95	2.00	2.05	2.00
Cooling	A35W18	Capacity	kW	4.50	6.55	8.40	10.00
		Rated input	kW	0.81	1.34	1.66	2.08
		EER		5.55	4.90	5.05	4.80
	A35W7	Capacity	kW	4.70	7.00	7.40	8.20
		Rated input	kW	1.36	2.33	2.19	2.48
		EER		3.45	3.00	3.38	3.30
DHW	Tapping profile according EN16147			XL			
	Water heating energy efficiency class(1)	Warm climate	class	A+	A+	A+	A+
			COP	4.24	4.24	4.18	4.18
		Average climate	class	A+	A+	A+	A+
			COP	3.34	3.34	3.36	3.36
		Cold climate	class	A	A	A	A
			COP	2.63	2.63	2.72	2.72
Seasonal space heating energy efficiency		Warmer climate at 35°C	SCOP	5.71	6.57	6.99	7.09
		Warmer climate at 55°C	SCOP	4.15	4.21	4.50	4.58
		Average climate at 35°C	class	A+++	A+++	A+++	A+++
			SCOP	4.85	4.95	5.22	5.20
		Average climate at 55°C	class	A++	A++	A++	A++
			SCOP	3.31	3.52	3.36	3.49
		Colder climate at 35°C	SCOP	4.06	4.21	4.33	4.32
		Colder climate at 55°C	SCOP	2.63	2.85	2.88	2.99
Seasonal space cooling energy efficiency		Water outlet at 7°C	SEER	4.98	5.31	5.83	5.96
		Water outlet at 18°C	SEER	7.77	8.25	8.95	8.80
Rated water flow			m^3/h	0.73	1.07	1.43	1.72
Outdoor Unit	Power supply		V/Ph/Hz	220-240/1/50			
	Rated input		W	2200	2600	3300	3600
	Rated current		A	10.5	12.0	14.5	16.0
	Unit dimension (W×H×D)		mm	1008×712×426		1118×865×523	
	Packing dimension (W×H×D)		mm	1065×810×485		1190×970×560	
	Net/Gross weight		kg	58 / 63.5		75 / 89	

	Refrigerant	Type(GWP)		R32(675)			
		Charged volume	kg	1.50		1.65	
		Refrigerant to be added	g/m	20.00		38.00	
	Refrigerant piping connections	Liquid/Gas side	mm	ϕ6.35 / ϕ15.9		ϕ9.52 / ϕ15.9	
		Max. piping length	m	30			
		Max. difference in height	m	20			
	Drain connection			DN32			
	Outdoor unit sound Power Level(3)		dB	56	58	59	60
	Ambient temperature range	Heating	℃	-25～35			
		Cooling	℃	-5～43			
		Domestic hot water	℃	-25～43			
Indoor Unit	Power supply		V/Ph/Hz	220-240/1/50			
	Rated input		W	3095			
	Rated current		A	13.5			
	DHW Tank	Type		Stainless steel			
		Material	-	SUS 316L			
		Water Volume	l	240			
		Disinfection water temperature	℃	70			
		Maximum water pressure limit	bar	10			
		Insulation – Material	-	Polyurethane (Cyclopentane)			
		Insulation – Thickness	mm	45			
	Heat Exchanger			Plate heat exchanger			
	Backup E-heater	Standard mounted	kW	3			
		Capacity steps		1			
	Water Pump	Type		DC Inverter			
		Max. head	m	9			
	Expansion vessel	Volume	L	8			
	Water Piping connection	Water circuit	Inlet	R1			
			Outlet				
		DHW tank water circuit	Cold Inlet	R3/4			
			Hot Outlet				
			Recirculation				
	Unit dimension (W×H×D)		mm	600*1943*600			
	Packing dimension (W×H×D)		mm	730*2180*730			
	Net/Gross weight		kg	157 / 178			
	Ambient temperature range		℃	5～35			
	LWT setting range	Heating	℃	25～65			
		Cooling	℃	5～25			
		Domestic hot water	℃	30～60			
	Indoor unit sound Power Level(2)		dB	38	38	40	40
	Sound pressure(1m)		dB	22	24	22	22

Notes:

(1)According to EN16147/2017;EU No:811/2013

(2)Sound power in heating mode, measured according to the EN 12102 under conditions of the EN 1482

(3)Sound pressure(1m) is the calculated value for reference only

Outdoor Unit Model				MHA-V12W/D 2N8-B2	MHA-V14W/D 2N8-B2	MHA-V16W/D 2N8-B2
Indoor Unit Model				HBT-A160/240CD30GN8-B2		
Heating	A7W35	Capacity	kW	12.10	14.50	16.00
		Rated input	kW	2.44	3.09	3.56
		COP		4.95	4.70	4.50
	A7W45	Capacity	kW	12.30	14.20	16.00
		Rated input	kW	3.24	3.89	4.44
		COP		3.80	3.65	3.60
	A-7W35	Capacity	kW	10.00	12.00	13.30
		Rated input	kW	3.33	4.29	4.93
		COP		3.00	2.80	2.70
	A-7W55	Capacity	kW	10.00	11.00	12.50
		Rated input	kW	4.88	5.37	6.19
		COP		2.05	2.05	2.02
Cooling	A35W18	Capacity	kW	12.00	13.50	14.2
		Rated input	kW	3.00	3.74	3.94
		EER		4.00	3.61	3.61
	A35W7	Capacity	kW	11.60	12.70	14.00
		Rated input	kW	4.22	4.98	5.71
		EER		2.75	2.55	2.45
DHW	Tapping profile according EN16147			XL		
	Water heating energy efficiency class(1)	Warm climate	class	A+	A+	A+
			COP	3.73	3.73	3.73
		Average climate	class	A+	A+	A+
			COP	3.00	3.00	3.00
		Cold climate	class	A	A	A
			COP	2.24	2.24	2.24
Seasonal space heating energy efficiency		Warmer climate at 35°C	SCOP	6.48	6.47	6.58
		Warmer climate at 55°C	SCOP	4.43	4.42	4.45
		Average climate at 35°C	class	A+++	A+++	A+++
			SCOP	4.81	4.81	4.72
		Average climate at 55°C	class	A++	A++	A++
			SCOP	3.45	33.45	3.47
		Colder climate at 35°C	SCOP	4.08	4.08	4.07
		Colder climate at 55°C	SCOP	3.02	3.02	3.05
Seasonal space cooling energy efficiency		Water outlet at 7°C	SEER	4.93	4.81	4.60
		Water outlet at 18°C	SEER	7.14	6.86	6.67
Rated water flow			m^3/h	2.08	2.49	2.75
Outdoor Unit	Power supply		V/Ph/Hz	220-240/1/50		
	Rated input		W	5400	5700	6100
	Rated current		A	24.5	25.0	26.0
	Unit dimension (W×H×D)		mm	1118×865×523		
	Packing dimension (W×H×D)		mm	1190×970×560		
	Net/Gross weight		kg	97 / 110.5		

	Refrigerant	Type(GWP)		R32(675)		
		Charged volume	kg	1.84		
		Refrigerant to be added	g/m	38		
	Refrigerant piping connections	Liquid/Gas side	mm	ϕ9.52 / ϕ15.9		
		Max. piping length	m	30		
		Max. difference in height	m	20		
	Drain connection			DN32		
	Outdoor unit sound Power Level(3)		dB	64	65	68
	Ambient temperature range	Heating	℃	-25～35		
		Cooling	℃	-5～43		
		Domestic hot water	℃	-25～43		
Indoor Unit	Power supply		V/Ph/Hz	220-240/1/50		
	Rated input		W	3095		
	Rated current		A	13.5		
	DHW Tank	Type		Stainless steel		
		Material	-	SUS 316L		
		Water Volume	l	240		
		Disinfection water temperature	℃	70		
		Maximum water pressure limit	bar	10		
		Insulation – Material	-	Polyurethane (Cyclopentane)		
		Insulation – Thickness	mm	45		
	Heat Exchanger			Plate heat exchanger		
	Backup E-heater	Standard mounted	kW	3		
		Capacity steps		1		
	Water Pump	Type		DC Inverter		
		Max. head	m	9		
	Expansion vessel	Volume	L	8		
	Water Piping connection	Water circuit	Inlet	R1''		
			Outlet			
		DHW tank water circuit	Cold Inlet	R3/4''		
			Hot Outlet			
			Recirculation			
	Unit dimension (W×H×D)		mm	600*1943*600		
	Packing dimension (W×H×D)		mm	730*2180*730		
	Net/Gross weight		kg	159 / 180		
	Ambient temperature range		℃	5～35		
	LWT setting range	Heating	℃	25～65		
		Cooling	℃	5～25		
		Domestic hot water	℃	30～60		
	Indoor unit sound Power Level(2)		dB	42	44	44
	Sound pressure(1m)		dB	24	25	24

Notes:

(1)According to EN16147/2017;EU No:811/2013

(2)Sound power in heating mode, measured according to the EN 12102 under conditions of the EN 1482

(3)Sound pressure(1m) is the calculated value for reference only

Outdoor Unit Model				MHA-V12W/D 2RN8-B2	MHA-V14W/D 2RN8-B2	MHA-V16W/D 2RN8-B2
Indoor Unit Model				HBT-A160/240CD30GN8-B2		
Heating	A7W35	Capacity	kW	12.10	14.50	16.00
		Rated input	kW	2.44	3.09	3.56
		COP		4.95	4.70	4.50
	A7W45	Capacity	kW	12.30	14.20	16.00
		Rated input	kW	3.24	3.89	4.44
		COP		3.80	3.65	3.60
	A-7W35	Capacity	kW	10.00	12.00	13.30
		Rated input	kW	3.33	4.29	4.93
		COP		3.00	2.80	2.70
	A-7W55	Capacity	kW	10.00	11.00	12.50
		Rated input	kW	4.88	5.37	6.19
		COP		2.05	2.05	2.02
Cooling	A35W18	Capacity	kW	12.00	13.50	14.2
		Rated input	kW	3.00	3.74	3.94
		EER		4.00	3.61	3.61
	A35W7	Capacity	kW	11.60	12.70	14.00
		Rated input	kW	4.22	4.98	5.71
		EER		2.75	2.55	2.45
DHW	Tapping profile according EN16147			XL		
	Water heating energy efficiency class(1)	Warm climate	class	A+	A+	A+
			COP	3.73	3.73	3.73
		Average climate	class	A+	A+	A+
			COP	3.00	3.00	3.00
		Cold climate	class	A	A	A
			COP	2.24	2.24	2.24
Seasonal space heating energy efficiency		Warmer climate at 35°C	SCOP	6.57	6.29	6.28
		Warmer climate at 55°C	SCOP	4.44	4.48	4.47
		Average climate at 35°C	class	A+++	A+++	A+++
			SCOP	4.72	4.62	4.62
		Average climate at 55°C	class	A++	A++	A++
			SCOP	3.47	3.41	3.41
		Colder climate at 35°C	SCOP	4.07	4.02	4.02
		Colder climate at 55°C	SCOP	3.05	3.12	3.12
Seasonal space cooling energy efficiency		Water outlet at 7°C	SEER	4.83	4.79	4.58
		Water outlet at 18°C	SEER	7.00	6.81	6.63
Rated water flow			m^3/h	2.08	2.49	2.75
Outdoor Unit	Power supply		V/Ph/Hz	380-415/3/50		
	Rated input		W	5400	5700	6100
	Rated current		A	9.0	10.0	11.0
	Unit dimension (W×H×D)		mm	1118×865×523		
	Packing dimension (W×H×D)		mm	1190×970×560		
	Net/Gross weight		kg	112 / 125.5		

	Refrigerant	Type(GWP)		R32(675)		
		Charged volume	kg	1.84		
		Refrigerant to be added	g/m	38		
	Refrigerant piping connections	Liquid/Gas side	mm	ϕ9.52 / ϕ15.9		
		Max. piping length	m	30		
		Max. difference in height	m	20		
	Drain connection			DN32		
	Outdoor unit sound Power Level(3)		dB	64	65	68
	Ambient temperature range	Heating	℃	-25～35		
		Cooling	℃	-5～43		
		Domestic hot water	℃	-25～43		
Indoor Unit	Power supply		V/Ph/Hz	220-240/1/50		
	Rated input		W	3095		
	Rated current		A	13.5		
	DHW Tank	Type		Stainless steel		
		Material	-	SUS 316L		
		Water Volume	l	240		
		Disinfection water temperature	℃	70		
		Maximum water pressure limit	bar	10		
		Insulation – Material	-	Polyurethane (Cyclopentane)		
		Insulation – Thickness	mm	45		
	Heat Exchanger			Plate heat exchanger		
	Backup E-heater	Standard mounted	kW	3		
		Capacity steps		1		
	Water Pump	Type		DC Inverter		
		Max. head	m	9		
	Expansion vessel	Volume	L	8		
	Water Piping connection	Water circuit	Inlet	R1’’		
			Outlet			
		DHW tank water circuit	Cold Inlet	R3/4’’		
			Hot Outlet			
			Recirculation			
	Unit dimension (W×H×D)		mm	600*1943*600		
	Packing dimension (W×H×D)		mm	730*2180*730		
	Net/Gross weight		kg	159 / 180		
	Ambient temperature range		℃	5～35		
	LWT setting range	Heating	℃	25～65		
		Cooling	℃	5～25		
		Domestic hot water	℃	30～60		
	Indoor unit sound Power Level(2)		dB	42	44	44
	Sound pressure(1m)		dB	24	25	24

Notes:

(1)According to EN16147/2017;EU No:811/2013

(2)Sound power in heating mode, measured according to the EN 12102 under conditions of the EN 1482

(3)Sound pressure(1m) is the calculated value for reference only

2 Electrical characteristics

System	Outdoor unit				Power current			Compressor		Fan	
	Voltage (V)	Hz	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	kW	FLA (A)
MHA-V4W/D2N8-B2	220~240	50	198	264	12	18	25	-	11.5	0.10	0.5
MHA-V6W/D2N8-B2	220~240	50	198	264	14	18	25	-	13.5	0.10	0.5
MHA-V8W/D2N8-B2	220~240	50	198	264	16	19	25	-	14.5	0.17	1.5
MHA-V10W/D2N8-B2	220~240	50	198	264	17	19	25	-	15.5	0.17	1.5
MHA-V12W/D2N8-B2	220~240	50	198	264	25	30	35	-	23.5	0.17	1.5
MHA-V14W/D2N8-B2	220~240	50	198	264	26	30	35	-	24.5	0.17	1.5
MHA-V16W/D2N8-B2	220~240	50	198	264	27	30	35	-	25.5	0.17	1.5
MHA-V12W/D2RN8-B2	380~415	50	342	456	10	14	16		9.15	0.17	1.5
MHA-V14W/D2RN8-B2	380~415	50	342	456	11	14	16	-	10.15	0.17	1.5
MHA-V16W/D2RN8-B2	380~415	50	342	456	12	14	16	-	11.15	0.17	1.5

Note：

MCA: Min. Circuit Amps. (A)

TOCA: Total Over-current Amps. (A)

MFA: Max. Fuse Amps. (A)

MSC: Max. Starting Amps. (A)

RLA: Rated Load Amps. (A)

The input Amps of compressor where MAX. Hz can operate for nominal cooling or heating test condition

kW: Rated Motor Output

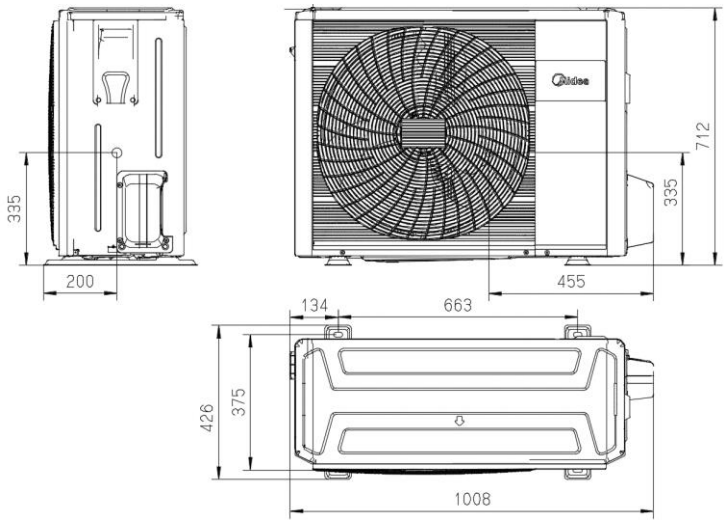
FLA: Full Load Amps. (A)

3 Dimensions and center of gravity

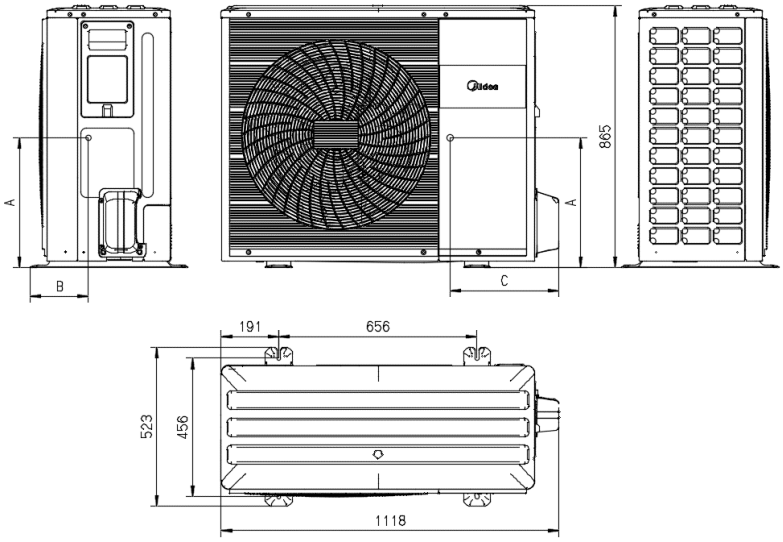
3.1 Outdoor Unit

MHA-V4(6)W/D2N8-B2

Unit: mm

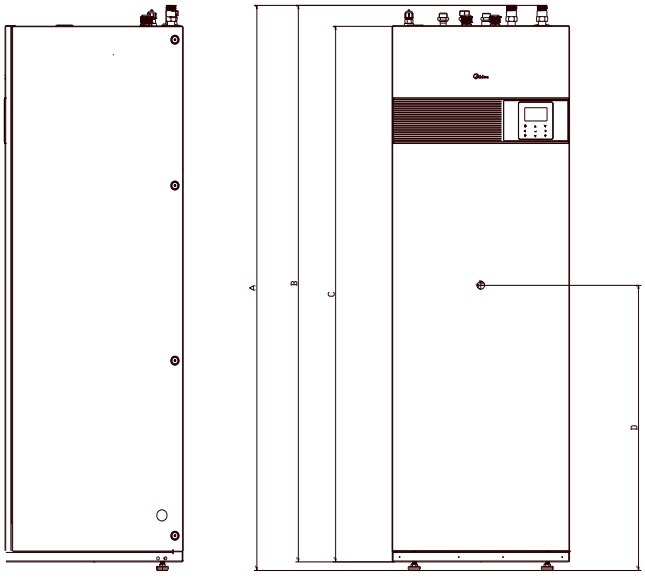


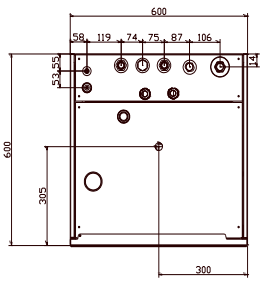
MHA-V8(10,12,14,16)W/D2N8-B2, MHA-V12(14,16)W/D2RN8-B2



Model	A(Unit: mm)	B(Unit: mm)	C(Unit: mm)
MHA-V8W/D2N8-B2 MHA-V10W/D2N8-B2	350	220	560
MHA-V12W/D2N8-B2 MHA-V14W/D2N8-B2 MHA-V16W/D2N8-B2	355	275	520
MHA-V12W/D2RN8-B2 MHA-V14W/D2RN8-B2 MHA-V16W/D2RN8-B2	465	250	445

3.2 Hydro module

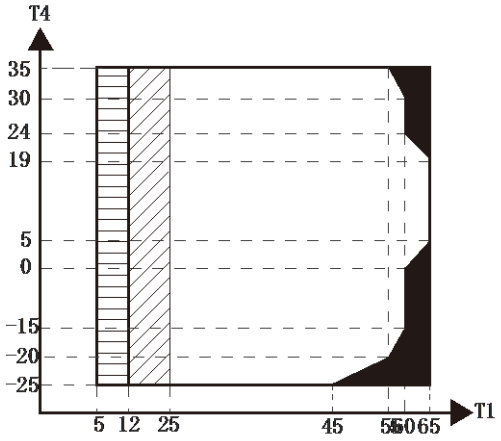




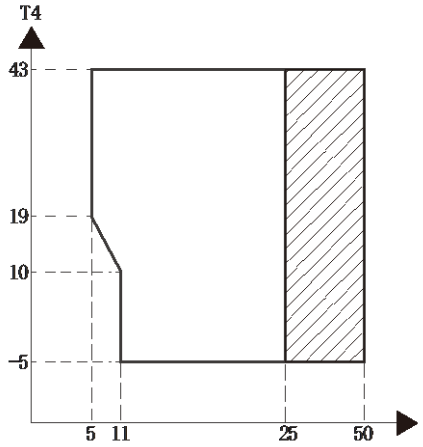
Model	A(mm)	B(mm)	C(mm)	D(mm)
HBT-A100/190CD30GN8-B2	1775	1748	1682	915
HBT-A100/240CD30GN8-B2	2034	2007	1942	1045
HBT-A160/240CD30GN8-B2	2034	2007	1942	1045

Operating Limits

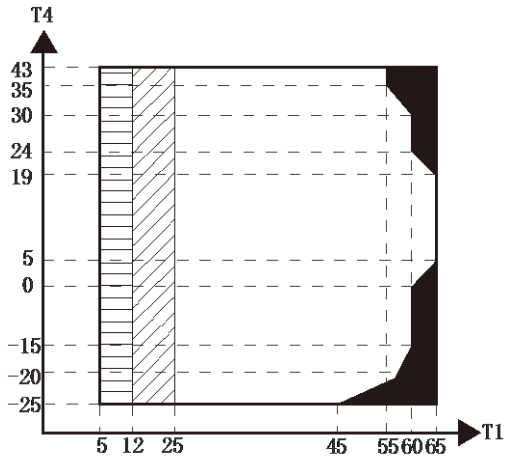
Heating operating limits



Cooling operating limits



Domestic hot water operating limits



Abbreviations:
T4: Outdoor temperature (°C)
T1: Leaving water temperature (°C)
Notes:

1. If IBH/AHS setting is valid, only IBH/AHS turns on; If IBH/AHS setting is invalid, only heat pump turns on
2. Water flow temperature drop or rise interval
3. IBH/AHS only

4 Capactiy Tables

4.1 Heating Capacity Tables (Test standard： EN14511)

Heating capacity for 4kW models

Maximum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	2.05	1.18	1.74	1.80	1.22	1.48	1.71	1.32	1.29	1.53	1.30	1.18	1.37	1.25	1.10
-20	3.09	1.31	2.36	2.83	1.56	1.82	2.44	1.70	1.43	2.17	1.74	1.24	1.98	1.75	1.13
-15	3.60	1.19	3.03	3.41	1.22	2.78	3.25	1.36	2.39	2.93	1.49	1.97	2.50	1.60	1.56
-10	4.47	1.33	3.36	4.29	1.33	3.23	4.14	1.45	2.85	4.02	1.65	2.43	3.59	1.77	2.02
-7	5.11	1.39	3.67	5.03	1.43	3.51	4.99	1.65	3.01	4.67	1.73	2.70	4.54	1.98	2.29
-5	5.18	1.29	4.03	5.08	1.36	3.72	5.02	1.53	3.27	4.74	1.68	2.82	4.63	1.89	2.45
-2	5.14	1.18	4.36	5.01	1.25	3.99	4.91	1.41	3.47	4.70	1.58	2.97	4.77	1.80	2.65
0	5.41	1.07	5.06	5.27	1.21	4.34	5.10	1.36	3.74	4.92	1.55	3.18	5.04	1.74	2.89
2	5.63	1.07	5.28	5.44	1.21	4.51	5.28	1.36	3.87	5.18	1.55	3.35	5.25	1.77	2.97
5	5.99	1.07	5.58	5.75	1.18	4.85	5.68	1.31	4.33	5.59	1.48	3.77	5.60	1.71	3.27
7	6.38	1.03	6.17	6.22	1.15	5.40	6.26	1.26	4.96	6.26	1.42	4.41	5.96	1.63	3.67
10	6.37	0.99	6.43	6.03	1.07	5.66	6.07	1.16	5.22	5.91	1.28	4.63	6.05	1.55	3.90
12	6.22	0.95	6.59	5.90	1.01	5.83	5.93	1.10	5.42	5.98	1.23	4.85	6.15	1.51	4.06
14	6.12	0.92	6.66	5.80	0.98	5.92	5.84	1.06	5.51	5.99	1.21	4.95	6.17	1.49	4.14
15	6.03	0.90	6.71	5.72	0.96	5.98	5.75	1.03	5.59	6.00	1.19	5.04	6.20	1.47	4.21
19	5.90	0.83	7.14	5.74	0.87	6.60	5.77	0.99	5.83	6.06	1.12	5.39	6.14	1.34	4.57
20	5.86	0.81	7.24	5.74	0.85	6.75	5.77	0.98	5.88	6.08	1.11	5.48	6.12	1.31	4.66
25	5.70	0.72	7.91	5.77	0.80	7.21	5.81	0.94	6.15	5.91	0.98	6.06	6.05	1.15	5.25
30	5.78	0.69	8.41	5.84	0.78	7.48	5.78	0.86	6.71	5.89	0.92	6.39	6.02	1.07	5.62
35	5.85	0.65	8.96	5.90	0.76	7.77	5.97	0.82	7.27	5.86	0.87	6.77	5.99	0.99	6.05
40	6.30	0.58	10.84	6.38	0.67	9.51	6.36	0.74	8.57	6.33	0.80	7.88	6.38	0.93	6.86
43	6.57	0.54	12.20	6.67	0.62	10.80	6.59	0.69	9.50	6.62	0.77	8.63	6.61	0.89	7.39
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	1.85	1.75	1.06	1.56	1.59	0.98	1.38	1.49	0.93	/	/	/	/	/	/
-15	2.20	1.68	1.31	1.84	1.56	1.18	1.77	1.62	1.09	1.73	1.68	1.03	/	/	/
-10	3.28	1.81	1.81	2.63	1.68	1.56	2.74	1.76	1.56	2.81	1.80	1.56	/	/	/
-7	4.41	2.12	2.08	4.28	2.34	1.83	3.85	2.10	1.83	3.56	1.94	1.84	/	/	/
-5	4.56	2.02	2.26	4.41	2.26	1.95	4.06	2.10	1.93	3.83	2.00	1.92	/	/	/
-2	4.74	2.01	2.36	4.72	2.20	2.15	4.35	2.11	2.06	4.10	2.06	1.99	/	/	/
0	5.02	2.03	2.48	5.13	2.16	2.37	4.69	2.13	2.20	4.40	2.10	2.09	/	/	/
2	5.19	2.06	2.52	5.26	2.17	2.42	4.86	2.16	2.25	4.59	2.16	2.13	/	/	/
5	5.50	1.98	2.78	5.54	2.07	2.68	5.16	2.08	2.48	4.90	2.09	2.35	4.04	2.16	1.87
7	5.69	1.83	3.11	5.74	2.03	2.83	5.54	2.06	2.70	5.41	2.08	2.61	4.27	2.09	2.04
10	5.80	1.71	3.40	5.70	1.80	3.16	5.44	1.89	2.88	5.27	1.96	2.69	4.49	2.02	2.22
12	5.76	1.63	3.53	5.69	1.73	3.29	5.38	1.80	2.99	5.17	1.86	2.79	4.70	1.96	2.40
14	5.71	1.59	3.60	5.65	1.69	3.35	5.32	1.75	3.04	5.10	1.80	2.83	4.79	1.93	2.48
15	5.67	1.55	3.65	5.63	1.65	3.41	5.27	1.71	3.08	5.04	1.76	2.87	4.87	1.90	2.56
19	5.71	1.46	3.92	5.54	1.53	3.63	5.11	1.57	3.26	4.82	1.60	3.02	5.22	1.82	2.87
20	5.72	1.43	3.99	5.52	1.50	3.68	5.07	1.53	3.31	4.77	1.56	3.06	/	/	/
25	5.68	1.29	4.39	5.42	1.35	4.02	4.86	1.35	3.59	4.50	1.36	3.30	/	/	/
30	5.67	1.22	4.63	5.51	1.28	4.31	4.97	1.30	3.83	4.61	1.32	3.51	/	/	/
35	5.59	1.14	4.90	5.61	1.22	4.62	/	/	/	/	/	/	/	/	/
40	6.00	1.15	5.20	/	/	/	/	/	/	/	/	/	/	/	/
43	6.25	1.16	5.38	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 4kW models

Normal															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	1.90	1.07	1.78	1.65	1.08	1.52	1.56	1.19	1.31	1.42	1.20	1.19	1.28	1.18	1.09
-20	2.82	1.15	2.45	2.57	1.38	1.86	2.20	1.49	1.48	1.98	1.57	1.26	1.83	1.61	1.14
-15	3.26	1.03	3.17	3.07	1.06	2.88	2.90	1.17	2.48	2.66	1.31	2.02	2.22	1.40	1.59
-10	4.00	1.11	3.60	3.92	1.15	3.40	3.82	1.30	2.95	3.60	1.45	2.49	3.25	1.59	2.05
-7	4.68	1.21	3.85	4.61	1.26	3.65	4.80	1.52	3.15	4.26	1.52	2.81	4.30	1.83	2.35
-5	4.69	1.11	4.22	4.62	1.19	3.86	4.37	1.28	3.41	4.21	1.42	2.96	4.20	1.65	2.54
-2	4.70	1.04	4.52	4.56	1.11	4.12	4.26	1.19	3.59	4.26	1.39	3.06	4.27	1.56	2.74
0	4.99	0.96	5.19	4.80	1.08	4.46	4.40	1.15	3.85	4.53	1.40	3.23	4.46	1.49	3.00
2	5.18	0.95	5.45	4.94	1.05	4.70	4.45	1.10	4.05	4.77	1.39	3.44	5.10	1.70	3.00
5	5.48	0.95	5.79	5.19	1.03	5.03	5.08	1.13	4.49	5.11	1.32	3.86	4.82	1.41	3.42
7	4.60	0.71	6.48	4.36	0.77	5.65	4.25	0.82	5.20	4.38	0.95	4.64	4.35	1.14	3.80
10	5.73	0.83	6.88	5.28	0.89	5.91	5.36	1.00	5.37	5.24	1.09	4.83	5.48	1.35	4.05
12	5.62	0.79	7.11	5.19	0.85	6.13	5.26	0.94	5.61	5.28	1.03	5.11	5.60	1.33	4.22
14	5.54	0.76	7.25	5.11	0.82	6.26	5.19	0.90	5.76	5.27	1.00	5.27	5.62	1.30	4.31
15	5.48	0.75	7.32	5.06	0.80	6.33	5.14	0.88	5.84	5.28	0.98	5.38	5.67	1.30	4.37
19	5.38	0.69	7.83	5.10	0.72	7.04	5.10	0.83	6.13	5.53	0.96	5.79	5.64	1.18	4.77
20	5.36	0.67	7.96	5.11	0.71	7.22	5.09	0.82	6.21	5.59	0.95	5.89	5.63	1.16	4.88
25	5.08	0.58	8.75	5.24	0.67	7.85	5.12	0.78	6.57	5.47	0.83	6.55	5.67	1.02	5.53
30	5.18	0.55	9.37	5.33	0.65	8.20	5.32	0.74	7.21	5.48	0.79	6.97	5.67	0.95	5.97
35	5.29	0.53	10.05	5.44	0.63	8.57	5.54	0.70	7.89	5.50	0.74	7.43	5.70	0.88	6.47
40	5.78	0.47	12.23	5.77	0.55	10.57	5.73	0.61	9.37	5.78	0.66	8.70	5.89	0.80	7.38
43	6.08	0.44	13.87	6.09	0.50	12.08	6.00	0.57	10.46	6.09	0.63	9.60	6.15	0.77	8.01
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	1.73	1.61	1.07	1.50	1.52	0.99	1.37	1.46	0.93	/	/	/	/	/	/
-15	1.96	1.46	1.34	1.69	1.41	1.20	1.64	1.49	1.10	1.61	1.56	1.03	/	/	/
-10	2.99	1.62	1.84	2.40	1.52	1.58	2.51	1.61	1.56	2.59	1.67	1.55	/	/	/
-7	4.12	1.93	2.14	4.00	2.05	1.95	3.49	1.84	1.89	3.15	1.68	1.87	/	/	/
-5	4.14	1.78	2.32	4.04	2.02	2.00	3.67	1.86	1.97	3.42	1.75	1.95	/	/	/
-2	4.22	1.75	2.41	4.19	1.87	2.23	3.84	1.83	2.10	3.63	1.81	2.01	/	/	/
0	4.41	1.75	2.52	4.43	1.78	2.49	4.09	1.82	2.25	3.87	1.86	2.09	/	/	/
2	5.03	1.96	2.56	5.10	2.08	2.45	4.46	1.96	2.28	4.04	1.87	2.16	/	/	/
5	4.53	1.59	2.86	4.56	1.66	2.75	4.39	1.74	2.52	4.28	1.81	2.37	3.30	1.68	1.96
7	4.54	1.37	3.32	4.40	1.49	2.95	4.32	1.56	2.77	4.27	1.61	2.65	3.54	1.64	2.16
10	5.20	1.51	3.45	4.96	1.54	3.23	4.89	1.66	2.94	4.84	1.76	2.74	3.67	1.56	2.35
12	5.17	1.42	3.65	4.98	1.47	3.38	4.86	1.58	3.07	4.78	1.67	2.86	3.86	1.50	2.57
14	5.13	1.36	3.76	4.96	1.43	3.47	4.81	1.53	3.15	4.72	1.61	2.93	3.93	1.46	2.69
15	5.11	1.33	3.83	4.96	1.40	3.53	4.79	1.50	3.19	4.68	1.58	2.97	4.03	1.45	2.77
19	5.24	1.26	4.15	4.90	1.30	3.78	4.66	1.39	3.34	4.50	1.48	3.05	4.39	1.40	3.13
20	5.27	1.25	4.23	4.89	1.27	3.84	4.63	1.37	3.38	4.45	1.45	3.07	/	/	/
25	5.30	1.13	4.68	4.89	1.16	4.23	4.52	1.22	3.70	4.28	1.28	3.34	/	/	/
30	5.45	1.10	4.97	5.01	1.10	4.56	4.65	1.17	3.97	4.41	1.23	3.57	/	/	/
35	5.42	1.02	5.30	5.14	1.04	4.92	/	/	/	/	/	/	/	/	/
40	5.66	1.00	5.67	/	/	/	/	/	/	/	/	/	/	/	/
43	5.94	1.01	5.90	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 4kW models

Minimum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	1.23	0.68	1.80	1.12	0.72	1.55	1.18	0.89	1.33	1.09	0.90	1.20	0.86	0.79	1.10
-20	1.73	0.69	2.50	1.53	0.80	1.90	1.42	0.94	1.51	1.39	1.08	1.29	1.23	1.07	1.15
-15	1.68	0.52	3.25	1.65	0.56	2.95	1.55	0.61	2.54	1.64	0.79	2.07	1.60	1.00	1.61
-10	1.65	0.45	3.70	1.75	0.50	3.50	1.71	0.56	3.04	2.09	0.82	2.56	2.17	1.04	2.09
-7	1.16	0.29	4.01	1.18	0.31	3.76	1.25	0.37	3.34	2.06	0.70	2.93	2.08	0.86	2.42
-5	1.36	0.31	4.38	1.36	0.34	3.98	1.42	0.40	3.51	2.06	0.67	3.07	2.16	0.83	2.60
-2	1.36	0.29	4.68	1.39	0.33	4.25	1.38	0.37	3.70	2.03	0.64	3.17	2.16	0.77	2.80
0	1.45	0.27	5.37	1.51	0.33	4.61	1.42	0.36	3.98	2.12	0.63	3.34	2.22	0.72	3.07
2	1.69	0.30	5.71	1.73	0.36	4.87	1.65	0.39	4.23	2.33	0.65	3.60	2.39	0.74	3.23
5	1.97	0.33	6.03	1.99	0.38	5.23	1.92	0.41	4.66	2.58	0.64	4.01	2.59	0.74	3.52
7	2.35	0.35	6.78	2.34	0.40	5.89	2.31	0.43	5.39	2.95	0.62	4.78	3.22	0.82	3.91
10	1.95	0.27	7.21	1.77	0.29	6.17	1.92	0.34	5.61	2.84	0.56	5.06	3.27	0.78	4.21
12	2.17	0.29	7.48	2.02	0.32	6.40	2.10	0.36	5.87	2.92	0.54	5.38	3.37	0.77	4.40
14	2.26	0.30	7.66	2.13	0.32	6.56	2.17	0.36	6.04	2.93	0.53	5.57	3.39	0.75	4.52
15	2.36	0.31	7.72	2.25	0.34	6.62	2.25	0.37	6.12	2.96	0.52	5.68	3.43	0.75	4.58
19	2.58	0.31	8.27	2.70	0.37	7.38	2.86	0.44	6.44	3.70	0.60	6.12	3.72	0.74	5.01
20	2.64	0.31	8.41	2.81	0.37	7.58	3.01	0.46	6.53	3.88	0.62	6.23	3.80	0.74	5.12
25	3.14	0.34	9.25	3.40	0.41	8.30	3.52	0.51	6.93	4.31	0.62	6.94	4.35	0.75	5.81
30	3.32	0.34	9.90	3.59	0.41	8.68	3.79	0.50	7.63	4.03	0.55	7.37	4.42	0.71	6.27
35	3.92	0.37	10.63	4.01	0.44	9.08	3.91	0.47	8.36	4.04	0.51	7.87	4.44	0.65	6.80
40	4.28	0.33	12.94	4.27	0.38	11.19	4.51	0.45	9.93	4.56	0.49	9.22	4.85	0.62	7.76
43	4.53	0.31	14.68	4.53	0.35	12.80	4.75	0.43	11.08	4.83	0.48	10.17	5.15	0.61	8.42
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	1.28	1.18	1.08	1.14	1.14	1.00	1.06	1.12	0.94	/	/	/	/	/	/
-15	1.52	1.12	1.36	1.25	1.00	1.25	1.24	1.10	1.13	1.23	1.17	1.05	/	/	/
-10	2.23	1.19	1.88	1.82	1.14	1.60	1.94	1.22	1.59	2.02	1.27	1.58	/	/	/
-7	2.05	0.94	2.18	1.88	0.93	2.02	2.09	1.09	1.91	2.22	1.16	1.91	/	/	/
-5	2.09	0.88	2.37	1.99	0.98	2.04	2.17	1.08	2.01	2.29	1.15	1.99	/	/	/
-2	2.14	0.85	2.51	2.08	0.92	2.26	2.30	1.07	2.14	2.44	1.19	2.05	/	/	/
0	2.24	0.84	2.68	2.21	0.88	2.51	2.45	1.07	2.29	2.61	1.22	2.14	/	/	/
2	2.39	0.87	2.75	2.48	0.95	2.61	2.68	1.12	2.39	2.81	1.25	2.24	/	/	/
5	2.58	0.88	2.94	2.79	0.99	2.81	2.95	1.14	2.59	3.05	1.25	2.44	2.33	1.14	2.04
7	3.22	0.95	3.40	3.65	1.16	3.15	3.59	1.24	2.91	3.56	1.30	2.75	2.71	1.19	2.26
10	3.19	0.90	3.54	3.60	1.07	3.35	3.56	1.16	3.05	3.53	1.24	2.85	2.87	1.17	2.44
12	3.30	0.87	3.78	3.85	1.09	3.53	3.71	1.17	3.17	3.62	1.24	2.93	2.99	1.12	2.68
14	3.33	0.85	3.93	3.94	1.08	3.64	3.76	1.16	3.25	3.64	1.22	2.99	3.02	1.07	2.81
15	3.37	0.84	4.01	4.05	1.10	3.70	3.83	1.17	3.28	3.68	1.23	3.00	3.07	1.06	2.90
19	3.59	0.83	4.35	3.77	0.95	3.97	3.48	1.00	3.50	3.29	1.03	3.18	3.27	1.00	3.27
20	3.65	0.82	4.44	3.70	0.92	4.04	3.40	0.96	3.55	3.19	0.99	3.23	/	/	/
25	4.31	0.88	4.92	3.89	0.87	4.44	3.52	0.91	3.89	3.28	0.93	3.52	/	/	/
30	4.39	0.84	5.22	4.10	0.85	4.79	3.73	0.89	4.17	3.48	0.93	3.76	/	/	/
35	4.47	0.80	5.57	4.38	0.85	5.18	/	/	/	/	/	/	/	/	/
40	4.86	0.82	5.96	/	/	/	/	/	/	/	/	/	/	/	/
43	5.19	0.84	6.20	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 6kW models

Maximum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	2.57	1.49	1.72	2.25	1.53	1.46	2.14	1.67	1.28	1.91	1.64	1.17	1.71	1.57	1.09
-20	3.64	1.56	2.34	3.34	1.86	1.80	2.88	2.03	1.42	2.56	2.08	1.23	2.33	2.08	1.12
-15	4.43	1.49	2.97	4.19	1.53	2.73	4.00	1.71	2.34	3.61	1.87	1.93	3.08	2.01	1.53
-10	5.75	1.69	3.41	5.50	1.84	2.99	5.11	1.99	2.57	4.83	2.18	2.22	4.64	2.24	2.07
-7	6.55	1.77	3.71	6.30	1.92	3.28	6.21	2.17	2.86	5.79	2.32	2.50	5.57	2.38	2.35
-5	6.54	1.64	3.98	6.32	1.79	3.52	6.25	2.02	3.09	5.97	2.18	2.74	5.84	2.30	2.54
-2	6.32	1.49	4.24	6.14	1.58	3.88	6.11	1.80	3.40	6.07	2.04	2.97	6.01	2.26	2.65
0	6.49	1.34	4.85	6.37	1.48	4.31	6.35	1.68	3.79	6.50	1.99	3.26	6.35	2.25	2.82
2	6.68	1.35	4.96	6.48	1.48	4.38	6.53	1.69	3.86	6.65	1.89	3.52	6.58	2.23	2.95
5	7.04	1.31	5.37	6.81	1.51	4.51	6.88	1.62	4.25	6.96	1.89	3.69	6.99	2.12	3.29
7	7.58	1.29	5.87	7.46	1.55	4.81	7.41	1.56	4.76	7.13	1.79	3.99	7.13	2.00	3.58
10	7.43	1.21	6.12	7.27	1.39	5.24	7.35	1.46	5.02	7.37	1.75	4.21	7.32	1.93	3.78
12	7.33	1.17	6.25	7.26	1.31	5.54	7.34	1.42	5.16	7.51	1.70	4.42	7.40	1.86	3.98
14	7.25	1.15	6.31	7.22	1.27	5.69	7.30	1.39	5.23	7.54	1.67	4.52	7.41	1.82	4.08
15	7.17	1.13	6.35	7.20	1.24	5.82	7.26	1.38	5.28	7.58	1.64	4.61	7.43	1.78	4.16
19	6.98	1.00	6.99	7.01	1.13	6.19	7.04	1.22	5.78	7.28	1.56	4.68	7.42	1.70	4.37
20	6.93	0.97	7.15	6.97	1.11	6.28	6.98	1.18	5.91	7.21	1.54	4.70	7.42	1.68	4.42
25	6.69	0.80	8.32	6.74	0.94	7.16	6.70	1.06	6.31	6.65	1.30	5.11	7.21	1.52	4.74
30	6.74	0.71	9.53	6.83	0.85	8.02	6.83	0.94	7.27	6.56	1.09	6.01	7.05	1.40	5.05
35	6.79	0.66	10.34	6.93	0.73	9.43	6.96	0.85	8.17	6.47	0.94	6.87	6.89	1.27	5.42
40	7.26	0.64	11.42	7.37	0.73	10.15	7.28	0.81	9.02	7.12	0.97	7.34	7.34	1.20	6.12
43	7.54	0.63	12.01	7.64	0.70	10.94	7.48	0.76	9.87	7.51	0.91	8.27	7.61	1.08	7.02
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	2.19	2.04	1.07	1.84	1.86	0.99	1.63	1.74	0.94	/	/	/	/	/	/
-15	2.70	2.02	1.34	2.26	1.88	1.20	2.18	1.96	1.11	2.13	2.02	1.05	/	/	/
-10	4.13	2.41	1.72	3.80	2.24	1.69	3.51	2.28	1.54	3.32	2.30	1.44	/	/	/
-7	5.29	2.63	2.01	5.22	2.66	1.96	4.83	2.63	1.84	4.57	2.61	1.75	/	/	/
-5	5.44	2.44	2.23	5.31	2.64	2.01	4.96	2.61	1.90	4.73	2.59	1.83	/	/	/
-2	5.59	2.38	2.35	5.31	2.60	2.04	5.05	2.58	1.96	4.88	2.57	1.90	/	/	/
0	5.88	2.37	2.48	5.42	2.59	2.09	5.21	2.56	2.03	5.06	2.54	1.99	/	/	/
2	6.05	2.38	2.54	5.69	2.36	2.41	5.48	2.50	2.19	5.33	2.61	2.05	/	/	/
5	6.37	2.27	2.81	6.11	2.46	2.48	5.89	2.50	2.36	5.74	2.53	2.27	4.92	2.68	1.84
7	6.87	2.16	3.17	6.90	2.37	2.91	6.61	2.46	2.69	6.42	2.52	2.55	5.25	2.60	2.02
10	7.01	2.09	3.35	6.93	2.28	3.04	6.53	2.35	2.78	6.27	2.41	2.60	5.57	2.52	2.21
12	7.15	2.03	3.52	6.99	2.20	3.18	6.50	2.27	2.86	6.17	2.32	2.65	5.86	2.45	2.39
14	7.19	1.99	3.60	6.98	2.15	3.24	6.44	2.22	2.91	6.09	2.27	2.68	5.98	2.41	2.48
15	7.24	1.97	3.67	6.98	2.12	3.30	6.40	2.18	2.94	6.01	2.23	2.70	6.10	2.39	2.56
19	7.27	1.84	3.95	6.84	1.93	3.54	6.33	1.97	3.21	5.98	2.00	2.99	6.60	2.30	2.88
20	7.28	1.81	4.02	6.81	1.89	3.60	6.31	1.92	3.28	5.98	1.95	3.06	/	/	/
25	7.33	1.66	4.43	6.63	1.66	4.00	6.22	1.67	3.73	5.94	1.67	3.55	/	/	/
30	6.91	1.40	4.92	6.60	1.57	4.21	6.25	1.57	3.98	6.01	1.57	3.83	/	/	/
35	6.49	1.24	5.21	6.57	1.48	4.45	/	/	/	/	/	/	/	/	/
40	6.93	1.22	5.68	/	/	/	/	/	/	/	/	/	/	/	/
43	7.19	1.21	5.96	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 6kW models

Normal															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	2.37	1.35	1.76	2.07	1.37	1.51	1.95	1.50	1.30	1.77	1.51	1.17	1.61	1.49	1.08
-20	3.33	1.37	2.43	3.04	1.65	1.85	2.60	1.78	1.46	2.34	1.87	1.25	2.16	1.92	1.13
-15	4.01	1.29	3.11	3.77	1.33	2.83	3.57	1.47	2.43	3.27	1.65	1.98	2.73	1.76	1.56
-10	5.15	1.43	3.61	4.89	1.57	3.12	4.51	1.69	2.66	4.33	1.91	2.27	4.21	2.01	2.10
-7	6.24	1.62	3.86	6.05	1.80	3.36	6.10	2.00	3.05	5.61	2.21	2.54	5.40	2.25	2.40
-5	5.94	1.42	4.17	5.89	1.62	3.63	5.72	1.79	3.19	5.65	1.97	2.87	5.50	2.11	2.61
-2	5.78	1.32	4.39	5.69	1.43	3.97	5.55	1.58	3.51	5.64	1.82	3.10	5.51	2.00	2.75
0	5.99	1.20	4.98	5.86	1.33	4.40	5.74	1.47	3.89	5.94	1.75	3.40	5.68	1.93	2.94
2	6.15	1.20	5.11	5.87	1.31	4.50	5.50	1.39	3.95	5.95	1.65	3.61	5.80	1.93	3.00
5	6.43	1.16	5.56	6.06	1.31	4.64	6.16	1.39	4.42	6.36	1.68	3.78	6.13	1.78	3.45
7	6.75	1.09	6.18	6.27	1.20	5.21	6.20	1.24	5.00	6.44	1.55	4.14	6.35	1.69	3.75
10	6.68	1.02	6.52	6.32	1.15	5.49	6.49	1.26	5.17	6.59	1.50	4.39	6.62	1.73	3.83
12	6.62	0.98	6.74	6.37	1.08	5.88	6.51	1.21	5.38	6.83	1.46	4.66	6.83	1.67	4.09
14	6.56	0.95	6.87	6.36	1.04	6.09	6.48	1.18	5.50	6.91	1.44	4.82	6.89	1.63	4.23
15	6.52	0.94	6.93	6.37	1.02	6.24	6.48	1.16	5.57	7.03	1.43	4.92	6.98	1.61	4.32
19	6.37	0.83	7.67	6.24	0.93	6.68	6.31	1.03	6.14	6.65	1.32	5.02	6.85	1.50	4.56
20	6.34	0.81	7.85	6.20	0.91	6.79	6.27	1.00	6.28	6.55	1.30	5.05	6.82	1.48	4.62
25	5.97	0.65	9.21	6.12	0.78	7.79	6.13	0.91	6.75	6.15	1.11	5.53	6.76	1.35	4.99
30	6.04	0.57	10.62	6.24	0.71	8.79	6.29	0.80	7.84	6.10	0.93	6.55	6.64	1.24	5.35
35	6.14	0.53	11.60	6.38	0.61	10.41	6.46	0.73	8.87	6.07	0.81	7.54	6.55	1.13	5.79
40	6.66	0.52	12.89	6.67	0.59	11.28	6.57	0.67	9.86	6.49	0.80	8.11	6.78	1.03	6.59
43	6.97	0.51	13.65	6.98	0.57	12.24	6.80	0.63	10.86	6.91	0.75	9.20	7.09	0.93	7.61
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	2.04	1.88	1.08	1.77	1.78	1.00	1.61	1.71	0.94	/	/	/	/	/	/
-15	2.41	1.76	1.37	2.08	1.70	1.22	2.02	1.80	1.12	1.98	1.88	1.05	/	/	/
-10	3.76	2.15	1.75	3.46	2.03	1.71	3.22	2.08	1.55	3.06	2.13	1.44	/	/	/
-7	5.07	2.45	2.07	5.15	2.58	2.00	4.63	2.47	1.87	4.28	2.39	1.79	/	/	/
-5	5.11	2.25	2.27	5.08	2.47	2.06	4.64	2.40	1.93	4.35	2.35	1.85	/	/	/
-2	5.17	2.17	2.39	5.06	2.44	2.07	4.69	2.37	1.98	4.44	2.32	1.91	/	/	/
0	5.36	2.12	2.53	5.15	2.44	2.11	4.80	2.35	2.04	4.56	2.29	1.99	/	/	/
2	5.73	2.18	2.63	5.65	2.31	2.45	5.25	2.36	2.23	4.99	2.40	2.08	/	/	/
5	5.91	2.04	2.89	5.80	2.28	2.54	5.45	2.28	2.39	5.22	2.28	2.29	4.23	2.21	1.91
7	6.13	1.86	3.29	6.00	2.00	3.00	5.79	2.10	2.76	5.64	2.17	2.60	4.40	2.06	2.14
10	6.47	1.88	3.44	6.04	1.94	3.11	5.87	2.07	2.83	5.76	2.17	2.65	4.54	1.94	2.34
12	6.64	1.82	3.66	6.12	1.87	3.27	5.86	1.99	2.94	5.70	2.09	2.73	4.81	1.88	2.56
14	6.69	1.77	3.78	6.12	1.82	3.36	5.83	1.94	3.01	5.63	2.03	2.77	4.91	1.83	2.68
15	6.76	1.75	3.86	6.15	1.80	3.42	5.81	1.91	3.04	5.59	2.00	2.79	5.04	1.82	2.77
19	6.82	1.63	4.18	6.06	1.64	3.69	5.77	1.76	3.29	5.58	1.85	3.02	5.55	1.77	3.14
20	6.84	1.61	4.25	6.03	1.60	3.76	5.76	1.72	3.35	5.58	1.82	3.07	/	/	/
25	7.01	1.49	4.72	5.99	1.43	4.20	5.79	1.51	3.83	5.65	1.57	3.59	/	/	/
30	6.64	1.26	5.28	6.00	1.35	4.46	5.85	1.42	4.13	5.75	1.47	3.91	/	/	/
35	6.29	1.12	5.63	6.02	1.27	4.75	/	/	/	/	/	/	/	/	/
40	6.53	1.06	6.19	/	/	/	/	/	/	/	/	/	/	/	/
43	6.84	1.05	6.54	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 6kW models

Minimum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	1.54	0.86	1.78	1.39	0.91	1.53	1.48	1.12	1.32	1.36	1.14	1.19	1.08	0.99	1.09
-20	2.04	0.82	2.47	1.80	0.96	1.88	1.67	1.12	1.49	1.64	1.28	1.28	1.45	1.27	1.14
-15	2.07	0.65	3.18	2.03	0.70	2.90	1.90	0.76	2.49	2.02	0.99	2.03	1.97	1.25	1.58
-10	2.28	0.62	3.71	2.14	0.67	3.21	2.02	0.74	2.74	2.51	1.07	2.34	2.81	1.32	2.14
-7	1.57	0.39	4.03	1.45	0.41	3.50	1.48	0.48	3.06	2.49	0.92	2.72	2.67	1.08	2.48
-5	1.78	0.41	4.32	1.66	0.44	3.76	1.70	0.52	3.30	2.59	0.87	2.98	2.82	1.08	2.61
-2	1.71	0.38	4.55	1.68	0.41	4.13	1.69	0.46	3.63	2.69	0.84	3.19	2.88	1.04	2.78
0	1.74	0.34	5.15	1.82	0.40	4.58	1.77	0.44	4.02	2.93	0.84	3.47	3.02	1.00	3.01
2	2.01	0.38	5.35	2.06	0.44	4.69	2.04	0.48	4.22	3.04	0.81	3.78	3.13	0.94	3.32
5	2.31	0.40	5.78	2.32	0.48	4.82	2.33	0.51	4.59	3.21	0.82	3.93	3.29	0.93	3.54
7	2.71	0.42	6.44	2.65	0.49	5.37	2.73	0.51	5.32	3.36	0.78	4.32	3.85	0.99	3.88
10	2.27	0.33	6.83	2.08	0.36	5.75	2.32	0.43	5.42	3.32	0.72	4.60	3.96	0.99	3.99
12	2.56	0.36	7.08	2.47	0.40	6.19	2.60	0.46	5.67	3.48	0.71	4.91	4.12	0.96	4.27
14	2.68	0.37	7.25	2.64	0.41	6.43	2.71	0.47	5.82	3.53	0.69	5.09	4.16	0.94	4.43
15	2.81	0.38	7.31	2.83	0.43	6.59	2.84	0.48	5.89	3.60	0.69	5.20	4.22	0.93	4.53
19	3.06	0.38	8.10	3.30	0.47	7.06	3.53	0.54	6.50	4.35	0.82	5.31	4.52	0.94	4.79
20	3.12	0.38	8.30	3.41	0.48	7.18	3.70	0.56	6.65	4.54	0.85	5.34	4.60	0.95	4.86
25	3.68	0.38	9.73	3.97	0.48	8.24	4.22	0.59	7.15	4.85	0.83	5.85	5.19	0.99	5.24
30	3.88	0.35	11.23	4.20	0.45	9.30	4.47	0.54	8.30	4.49	0.65	6.94	5.18	0.92	5.63
35	4.55	0.37	12.27	4.71	0.43	11.02	4.57	0.49	9.40	4.46	0.56	7.99	5.10	0.84	6.09
40	4.93	0.36	13.64	4.94	0.41	11.94	5.17	0.49	10.45	5.12	0.60	8.59	5.58	0.81	6.92
43	5.20	0.36	14.44	5.20	0.40	12.96	5.39	0.47	11.51	5.48	0.56	9.75	5.93	0.74	8.00
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	1.51	1.38	1.09	1.34	1.34	1.01	1.25	1.31	0.95	/	/	/	/	/	/
-15	1.86	1.35	1.39	1.53	1.24	1.24	1.52	1.34	1.14	1.51	1.41	1.07	/	/	/
-10	2.80	1.57	1.78	2.63	1.51	1.74	2.48	1.57	1.58	2.38	1.63	1.47	/	/	/
-7	2.57	1.22	2.11	2.64	1.27	2.08	2.66	1.40	1.90	2.68	1.47	1.82	/	/	/
-5	2.59	1.10	2.35	2.81	1.33	2.11	2.75	1.39	1.98	2.72	1.43	1.90	/	/	/
-2	2.75	1.12	2.46	2.80	1.31	2.13	2.83	1.40	2.03	2.85	1.45	1.96	/	/	/
0	2.99	1.15	2.59	2.85	1.31	2.17	2.94	1.41	2.09	3.00	1.47	2.04	/	/	/
2	3.18	1.17	2.73	3.13	1.24	2.52	3.21	1.39	2.30	3.26	1.51	2.16	/	/	/
5	3.43	1.15	2.98	3.46	1.32	2.62	3.53	1.43	2.46	3.58	1.52	2.36	2.85	1.42	2.01
7	4.26	1.25	3.41	4.38	1.41	3.10	4.29	1.50	2.85	4.23	1.57	2.69	3.33	1.49	2.24
10	4.22	1.18	3.57	4.37	1.35	3.23	4.27	1.45	2.94	4.20	1.53	2.75	3.55	1.46	2.43
12	4.37	1.15	3.82	4.73	1.39	3.41	4.48	1.47	3.04	4.32	1.55	2.79	3.72	1.39	2.67
14	4.40	1.11	3.96	4.86	1.38	3.52	4.55	1.47	3.10	4.34	1.54	2.82	3.77	1.34	2.80
15	4.46	1.10	4.05	5.03	1.40	3.58	4.65	1.49	3.13	4.39	1.56	2.82	3.84	1.33	2.90
19	4.68	1.07	4.38	4.65	1.20	3.88	4.31	1.25	3.44	4.08	1.30	3.15	4.14	1.26	3.28
20	4.73	1.06	4.46	4.56	1.15	3.95	4.23	1.20	3.52	4.00	1.24	3.23	/	/	/
25	5.50	1.11	4.96	4.76	1.08	4.41	4.51	1.12	4.03	4.34	1.15	3.78	/	/	/
30	5.35	0.96	5.55	4.91	1.05	4.69	4.69	1.08	4.34	4.54	1.10	4.11	/	/	/
35	5.19	0.88	5.92	5.13	1.03	4.99	/	/	/	/	/	/	/	/	/
40	5.61	0.86	6.50	/	/	/	/	/	/	/	/	/	/	/	/
43	5.97	0.87	6.87	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 8kW models

Maximum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	4.45	1.98	2.25	4.00	2.04	1.96	3.59	2.19	1.64	3.34	2.15	1.55	2.81	2.17	1.30
-20	5.68	2.03	2.80	5.09	2.15	2.37	4.74	2.24	2.11	4.32	2.44	1.77	3.70	2.29	1.61
-15	6.90	2.07	3.34	6.44	2.24	2.87	6.11	2.51	2.43	5.57	2.47	2.26	5.29	2.65	2.00
-10	7.45	2.02	3.68	7.28	2.18	3.33	7.08	2.25	3.15	6.87	2.63	2.62	6.77	2.74	2.47
-7	7.64	2.03	3.76	7.47	2.20	3.40	7.27	2.29	3.17	7.05	2.64	2.67	6.94	2.76	2.52
-5	8.05	2.00	4.02	7.97	2.16	3.69	7.69	2.39	3.22	7.45	2.57	2.90	7.44	2.77	2.69
-2	8.26	1.94	4.25	8.19	2.11	3.89	8.15	2.28	3.57	7.95	2.58	3.08	7.77	2.80	2.78
0	8.55	1.79	4.77	8.49	2.01	4.23	8.42	2.23	3.77	8.40	2.53	3.32	8.09	2.75	2.94
2	8.66	1.67	5.20	8.65	1.92	4.50	8.48	2.14	3.95	8.50	2.50	3.40	8.31	2.74	3.04
5	9.03	1.52	5.95	8.95	1.81	4.94	8.86	1.94	4.56	8.78	2.29	3.84	8.69	2.57	3.38
7	9.51	1.45	6.54	9.20	1.73	5.32	9.11	1.80	5.07	8.85	2.12	4.18	8.98	2.35	3.82
10	10.06	1.35	7.44	9.28	1.59	5.84	8.94	1.65	5.42	8.70	2.02	4.30	8.74	2.24	3.90
12	10.00	1.23	8.13	9.37	1.45	6.48	9.05	1.58	5.74	8.92	1.89	4.72	8.86	2.14	4.15
14	9.92	1.16	8.53	9.38	1.37	6.83	9.06	1.53	5.93	8.99	1.81	4.96	8.88	2.07	4.30
15	9.86	1.12	8.79	9.39	1.33	7.09	9.09	1.51	6.04	9.07	1.77	5.12	8.91	2.03	4.38
19	9.69	0.98	9.87	9.48	1.17	8.08	9.28	1.35	6.88	9.69	1.67	5.81	9.05	1.85	4.89
20	9.65	0.95	10.14	9.51	1.14	8.33	9.33	1.32	7.09	9.45	1.59	5.93	9.08	1.81	5.02
25	9.42	0.90	10.44	9.00	1.03	8.75	8.75	1.15	7.64	9.15	1.44	6.34	9.01	1.55	5.80
30	9.18	0.83	11.03	8.49	0.93	9.16	8.17	1.05	7.78	8.85	1.29	6.84	8.93	1.43	6.23
35	9.55	0.84	11.31	8.83	0.93	9.45	8.50	1.06	8.05	9.20	1.31	7.05	9.29	1.46	6.34
40	10.03	0.87	11.57	9.27	0.93	10.02	8.92	1.05	8.49	9.66	1.32	7.31	9.75	1.51	6.46
43	10.33	0.84	12.25	9.55	0.85	11.27	9.19	1.01	9.11	9.95	1.27	7.86	10.04	1.47	6.83
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	3.17	2.26	1.41	2.62	2.10	1.25	2.28	1.98	1.15	/	/	/	/	/	/
-15	4.67	2.70	1.73	4.94	2.92	1.69	4.37	2.87	1.52	3.99	2.84	1.41	/	/	/
-10	6.32	2.88	2.20	6.07	3.05	1.99	5.54	2.94	1.88	5.19	2.86	1.81	/	/	/
-7	6.48	2.89	2.24	6.22	3.07	2.03	5.68	2.96	1.92	5.32	2.88	1.85	/	/	/
-5	7.35	2.99	2.46	6.45	2.94	2.19	6.20	2.97	2.09	6.04	3.00	2.02	/	/	/
-2	7.83	3.09	2.54	6.82	3.04	2.24	6.60	3.11	2.12	6.54	3.22	2.04	/	/	/
0	8.11	2.95	2.75	7.10	2.99	2.38	6.95	3.09	2.25	6.85	3.16	2.17	/	/	/
2	8.18	2.90	2.82	7.26	2.83	2.56	7.05	3.01	2.34	6.91	3.14	2.20	/	/	/
5	8.30	2.76	3.00	7.56	2.74	2.76	7.29	2.82	2.58	7.11	2.89	2.46	3.89	3.27	1.19
7	8.43	2.66	3.17	7.80	2.50	3.12	7.47	2.59	2.88	7.24	2.66	2.72	4.08	3.00	1.36
10	8.28	2.42	3.42	8.20	2.48	3.31	7.78	2.61	2.98	7.50	2.72	2.76	5.59	2.65	2.11
12	8.38	2.33	3.60	8.29	2.41	3.44	7.89	2.52	3.13	7.62	2.60	2.93	5.67	2.52	2.25
14	8.39	2.26	3.72	8.30	2.36	3.52	7.91	2.45	3.23	7.64	2.52	3.03	5.69	2.43	2.34
15	8.41	2.23	3.77	8.32	2.34	3.55	7.93	2.43	3.27	7.68	2.49	3.09	5.71	2.39	2.39
19	8.51	2.06	4.13	8.41	2.16	3.89	8.06	2.25	3.59	7.82	2.31	3.39	5.79	2.25	2.58
20	8.53	2.02	4.22	8.43	2.12	3.97	8.09	2.21	3.66	7.86	2.27	3.46	/	/	/
25	8.61	1.87	4.61	8.09	1.90	4.25	7.71	1.96	3.93	7.46	2.01	3.72	/	/	/
30	8.68	1.74	4.99	7.84	1.73	4.53	7.38	1.76	4.20	7.07	1.78	3.98	/	/	/
35	9.03	1.73	5.21	8.16	1.80	4.72	/	/	/	/	/	/	/	/	/
40	9.48	1.74	5.46	/	/	/	/	/	/	/	/	/	/	/	/
43	9.77	1.61	6.08	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 8kW models

Normal															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	4.11	1.79	2.29	3.68	1.82	2.03	3.27	1.96	1.67	3.10	1.99	1.56	2.64	2.05	1.29
-20	5.20	1.79	2.90	4.63	1.90	2.43	4.27	1.97	2.17	3.96	2.20	1.80	3.43	2.11	1.62
-15	6.24	1.79	3.49	5.80	1.95	2.98	5.45	2.15	2.53	5.04	2.18	2.32	4.69	2.31	2.03
-10	6.66	1.71	3.89	6.48	1.86	3.49	6.25	1.92	3.26	6.16	2.30	2.68	6.14	2.46	2.50
-7	7.27	1.83	3.97	7.11	2.01	3.53	7.10	2.18	3.25	6.71	2.40	2.79	6.60	2.59	2.55
-5	7.25	1.71	4.25	7.21	1.89	3.81	6.99	2.12	3.30	6.86	2.28	3.01	6.79	2.47	2.75
-2	7.59	1.77	4.28	7.62	1.92	3.97	7.45	2.12	3.51	7.40	2.39	3.10	7.20	2.54	2.84
0	7.60	1.55	4.89	7.78	1.79	4.34	7.67	1.98	3.88	7.74	2.30	3.37	7.16	2.35	3.05
2	7.77	1.45	5.36	7.85	1.69	4.64	7.10	1.73	4.10	7.80	2.21	3.54	7.40	2.28	3.25
5	8.09	1.31	6.17	8.08	1.58	5.13	8.08	1.71	4.73	8.03	2.04	3.93	7.62	2.15	3.54
7	8.60	1.26	6.84	8.21	1.47	5.57	8.30	1.60	5.20	8.00	1.84	4.34	8.20	2.08	3.95
10	9.05	1.14	7.93	8.12	1.33	6.12	7.89	1.41	5.58	7.77	1.74	4.48	7.91	2.00	3.95
12	9.03	1.03	8.78	8.25	1.20	6.87	8.03	1.34	5.99	8.02	1.61	4.98	8.06	1.89	4.26
14	8.98	0.97	9.26	8.26	1.13	7.30	8.05	1.29	6.23	8.09	1.54	5.26	8.09	1.82	4.44
15	8.96	0.93	9.59	8.32	1.09	7.60	8.11	1.27	6.37	8.20	1.50	5.46	8.15	1.79	4.55
19	8.85	0.82	10.83	8.43	0.97	8.72	8.32	1.14	7.30	8.85	1.48	5.98	8.32	1.63	5.11
20	8.82	0.79	11.14	8.46	0.94	9.00	8.37	1.11	7.53	8.58	1.35	6.37	8.36	1.59	5.25
25	8.39	0.73	11.55	8.17	0.86	9.52	8.01	0.98	8.18	8.47	1.23	6.86	8.44	1.38	6.11
30	8.23	0.67	12.29	7.75	0.77	10.04	7.52	0.90	8.39	8.24	1.11	7.46	8.42	1.27	6.61
35	8.63	0.68	12.68	8.13	0.78	10.43	7.89	0.90	8.74	8.64	1.12	7.74	8.83	1.30	6.77
40	9.20	0.70	13.06	8.39	0.75	11.13	8.04	0.87	9.28	8.81	1.09	8.08	9.01	1.30	6.95
43	9.56	0.69	13.92	8.72	0.69	12.61	8.36	0.83	10.03	9.16	1.05	8.74	9.36	1.26	7.40
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	2.96	2.08	1.42	2.52	2.00	1.25	2.25	1.95	1.15	/	/	/	/	/	/
-15	4.16	2.36	1.76	4.55	2.65	1.72	4.05	2.64	1.53	3.72	2.64	1.41	/	/	/
-10	5.75	2.58	2.23	5.53	2.75	2.01	5.08	2.69	1.89	4.78	2.65	1.81	/	/	/
-7	6.17	2.67	2.31	6.15	3.00	2.05	5.50	2.82	1.95	5.07	2.69	1.89	/	/	/
-5	6.59	2.61	2.52	6.06	2.72	2.23	5.71	2.70	2.12	5.48	2.69	2.04	/	/	/
-2	7.28	2.78	2.61	6.32	2.77	2.29	6.14	2.84	2.16	6.01	2.89	2.08	/	/	/
0	7.39	2.64	2.79	6.33	2.63	2.41	6.15	2.72	2.26	6.03	2.78	2.17	/	/	/
2	7.37	2.53	2.91	7.10	2.73	2.60	6.54	2.73	2.39	6.16	2.74	2.25	/	/	/
5	7.50	2.43	3.09	6.68	2.37	2.82	6.40	2.44	2.62	6.21	2.50	2.49	3.32	2.72	1.22
7	7.53	2.29	3.29	7.50	2.36	3.18	6.75	2.30	2.94	6.25	2.25	2.77	3.44	2.46	1.40
10	7.65	2.18	3.51	7.14	2.11	3.38	6.99	2.30	3.04	6.89	2.45	2.81	4.92	2.27	2.16
12	7.78	2.08	3.74	7.26	2.05	3.54	7.13	2.21	3.22	7.04	2.34	3.01	5.08	2.19	2.32
14	7.80	2.01	3.88	7.28	2.00	3.64	7.15	2.15	3.33	7.07	2.26	3.12	5.12	2.13	2.41
15	7.85	1.98	3.96	7.33	1.99	3.68	7.21	2.13	3.39	7.13	2.24	3.19	5.19	2.11	2.46
19	7.98	1.83	4.37	7.44	1.84	4.05	7.36	2.00	3.67	7.30	2.14	3.42	5.48	2.05	2.67
20	8.01	1.79	4.47	7.47	1.80	4.14	7.39	1.98	3.74	7.34	2.11	3.47	/	/	/
25	8.23	1.68	4.91	7.31	1.64	4.47	7.19	1.78	4.05	7.10	1.89	3.76	/	/	/
30	8.35	1.56	5.36	7.13	1.49	4.80	6.91	1.59	4.35	6.77	1.67	4.06	/	/	/
35	8.75	1.55	5.63	7.48	1.49	5.03	/	/	/	/	/	/	/	/	/
40	8.94	1.50	5.95	/	/	/	/	/	/	/	/	/	/	/	/
43	9.28	1.39	6.67	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 8kW models

Minimum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	2.67	1.15	2.33	2.48	1.21	2.06	2.48	1.46	1.69	2.37	1.50	1.58	1.77	1.37	1.29
-20	3.18	1.08	2.96	2.75	1.11	2.48	2.75	1.24	2.22	2.76	1.51	1.83	2.29	1.40	1.64
-15	3.22	0.90	3.58	3.12	1.03	3.05	2.91	1.12	2.59	3.12	1.31	2.37	3.38	1.64	2.06
-10	2.96	0.74	4.01	2.84	0.79	3.59	2.80	0.84	3.35	3.57	1.30	2.76	4.10	1.61	2.55
-7	1.83	0.45	4.09	1.72	0.47	3.63	1.82	0.53	3.44	3.12	1.07	2.90	3.41	1.28	2.67
-5	2.19	0.50	4.37	2.09	0.53	3.94	2.17	0.63	3.44	3.23	1.03	3.15	3.60	1.27	2.84
-2	2.22	0.48	4.59	2.26	0.54	4.18	2.28	0.62	3.66	3.46	1.07	3.24	3.59	1.23	2.91
0	2.21	0.44	5.06	2.44	0.54	4.49	2.37	0.59	4.01	3.62	1.04	3.48	3.57	1.14	3.12
2	2.54	0.45	5.62	2.75	0.57	4.86	2.69	0.62	4.37	3.80	1.05	3.63	3.80	1.15	3.31
5	2.90	0.45	6.41	3.10	0.58	5.32	3.06	0.62	4.91	4.05	0.99	4.08	4.09	1.12	3.64
7	3.40	0.48	7.14	3.46	0.60	5.81	3.36	0.61	5.54	4.17	0.92	4.53	4.85	1.17	4.15
10	3.08	0.37	8.30	2.72	0.42	6.41	2.83	0.48	5.85	3.92	0.83	4.70	4.73	1.15	4.11
12	3.49	0.38	9.23	3.22	0.45	7.23	3.21	0.51	6.30	4.08	0.78	5.24	4.86	1.09	4.44
14	3.67	0.38	9.75	3.45	0.45	7.69	3.37	0.51	6.57	4.13	0.74	5.55	4.88	1.05	4.64
15	3.86	0.38	10.12	3.69	0.46	8.03	3.55	0.53	6.73	4.20	0.73	5.76	4.94	1.04	4.77
19	4.25	0.37	11.44	4.46	0.48	9.22	4.67	0.60	7.73	4.25	0.66	6.44	5.49	1.02	5.36
20	4.34	0.37	11.77	4.66	0.49	9.52	4.94	0.62	7.98	5.95	0.88	6.74	5.63	1.02	5.51
25	5.18	0.42	12.21	5.31	0.53	10.07	5.51	0.64	8.66	6.68	0.92	7.26	6.48	1.01	6.42
30	5.28	0.41	12.99	5.22	0.49	10.63	5.35	0.60	8.88	6.06	0.77	7.89	6.56	0.94	6.95
35	6.40	0.48	13.42	6.00	0.54	11.04	5.58	0.60	9.26	6.35	0.77	8.20	6.87	0.96	7.12
40	6.82	0.49	13.82	6.21	0.53	11.79	6.34	0.64	9.84	6.96	0.81	8.56	7.41	1.01	7.31
43	7.13	0.48	14.73	6.49	0.49	13.35	6.62	0.62	10.63	7.27	0.78	9.26	7.83	1.01	7.78
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	2.19	1.52	1.44	1.91	1.51	1.27	1.74	1.49	1.17	/	/	/	/	/	/
-15	3.22	1.80	1.79	3.36	1.92	1.75	3.04	1.96	1.56	2.84	1.99	1.43	/	/	/
-10	4.29	1.88	2.28	4.20	2.05	2.05	3.91	2.03	1.93	3.72	2.02	1.84	/	/	/
-7	3.38	1.44	2.35	3.57	1.67	2.13	3.48	1.73	2.01	3.42	1.78	1.92	/	/	/
-5	3.78	1.46	2.59	3.65	1.59	2.30	3.68	1.69	2.18	3.71	1.77	2.09	/	/	/
-2	4.01	1.49	2.69	3.76	1.56	2.42	3.87	1.72	2.25	3.92	1.83	2.14	/	/	/
0	4.12	1.44	2.86	3.80	1.54	2.47	3.96	1.71	2.32	4.06	1.83	2.22	/	/	/
2	4.26	1.41	3.02	4.01	1.51	2.66	4.13	1.67	2.47	4.21	1.80	2.34	/	/	/
5	4.47	1.41	3.18	4.28	1.47	2.91	4.37	1.62	2.70	4.43	1.73	2.56	2.47	1.99	1.24
7	5.23	1.54	3.40	4.95	1.49	3.33	4.84	1.59	3.05	4.76	1.66	2.87	2.69	1.89	1.42
10	4.99	1.37	3.65	5.17	1.47	3.51	5.08	1.61	3.16	5.02	1.72	2.92	3.80	1.72	2.22
12	5.12	1.31	3.91	5.61	1.52	3.69	5.45	1.64	3.33	5.35	1.74	3.08	3.84	1.62	2.37
14	5.14	1.27	4.06	5.78	1.52	3.80	5.59	1.63	3.43	5.46	1.72	3.18	3.82	1.55	2.47
15	5.19	1.25	4.15	5.99	1.55	3.86	5.76	1.66	3.48	5.60	1.74	3.23	3.82	1.52	2.52
19	5.47	1.19	4.58	5.72	1.34	4.25	5.49	1.43	3.84	5.33	1.49	3.57	3.85	1.40	2.74
20	5.55	1.18	4.69	5.65	1.30	4.35	5.42	1.38	3.93	5.26	1.44	3.65	/	/	/
25	6.46	1.25	5.16	5.81	1.24	4.69	5.59	1.31	4.25	5.45	1.38	3.96	/	/	/
30	6.73	1.20	5.63	5.83	1.16	5.04	5.53	1.21	4.58	5.34	1.25	4.27	/	/	/
35	7.22	1.22	5.92	6.36	1.20	5.29	/	/	/	/	/	/	/	/	/
40	7.68	1.23	6.25	/	/	/	/	/	/	/	/	/	/	/	/
43	8.11	1.16	7.01	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 10kW models

Maximum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	4.68	2.06	2.27	4.21	2.12	1.98	3.78	2.28	1.66	3.52	2.24	1.57	2.96	2.26	1.31
-20	5.98	2.12	2.82	5.35	2.24	2.39	4.98	2.34	2.13	4.55	2.55	1.79	3.89	2.39	1.63
-15	7.26	2.15	3.37	6.78	2.34	2.90	6.43	2.62	2.46	5.86	2.57	2.28	5.57	2.76	2.02
-10	8.37	2.33	3.60	8.14	2.53	3.22	7.89	2.65	2.98	7.64	2.86	2.67	7.38	3.10	2.38
-7	8.72	2.29	3.81	8.48	2.49	3.41	8.31	2.77	3.00	7.96	2.81	2.83	7.68	3.05	2.52
-5	9.00	2.19	4.10	8.86	2.47	3.60	8.80	2.64	3.33	8.46	2.94	2.88	8.18	3.09	2.65
-2	9.25	2.13	4.34	9.19	2.42	3.81	9.10	2.58	3.53	8.81	2.85	3.09	8.60	3.14	2.74
0	9.43	1.93	4.90	9.36	2.31	4.05	9.46	2.52	3.76	9.25	2.93	3.16	8.89	3.10	2.87
2	9.72	1.88	5.18	9.57	2.21	4.34	9.72	2.48	3.93	9.58	2.86	3.35	9.24	3.07	3.01
5	10.24	1.79	5.72	10.07	2.10	4.80	10.13	2.25	4.51	10.10	2.64	3.83	9.79	2.88	3.40
7	10.49	1.77	5.94	10.28	1.97	5.21	10.32	2.09	4.93	10.45	2.50	4.18	10.28	2.76	3.72
10	11.20	1.59	7.04	10.41	1.85	5.64	10.03	1.96	5.13	9.94	2.38	4.17	9.87	2.69	3.67
12	11.36	1.50	7.58	10.56	1.74	6.08	10.17	1.84	5.53	10.08	2.24	4.49	10.01	2.53	3.95
14	11.38	1.44	7.90	10.59	1.67	6.33	10.20	1.77	5.76	10.10	2.16	4.68	10.04	2.44	4.12
15	11.42	1.41	8.10	10.62	1.64	6.49	10.23	1.73	5.90	10.13	2.11	4.80	10.07	2.39	4.22
19	10.93	1.23	8.86	10.73	1.40	7.67	10.58	1.61	6.56	10.57	1.93	5.49	10.24	2.16	4.73
20	10.81	1.19	9.05	10.76	1.35	7.96	10.67	1.59	6.72	10.68	1.89	5.66	10.28	2.12	4.86
25	9.94	1.04	9.59	9.90	1.17	8.44	9.82	1.38	7.12	9.82	1.64	6.00	9.46	1.84	5.15
30	9.77	0.96	10.15	9.07	1.03	8.79	8.90	1.12	7.95	8.85	1.32	6.72	9.92	1.61	6.15
35	10.16	0.95	10.73	9.44	1.03	9.15	9.25	1.11	8.30	9.21	1.32	6.97	10.32	1.61	6.40
40	10.67	0.93	11.52	9.91	1.01	9.81	9.71	1.15	8.47	9.67	1.32	7.34	10.84	1.60	6.79
43	10.99	0.91	12.03	10.20	0.96	10.61	10.00	1.08	9.25	9.96	1.23	8.07	11.16	1.47	7.58
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	3.34	2.35	1.42	2.75	2.18	1.26	2.40	2.06	1.16	/	/	/	/	/	/
-15	5.22	2.99	1.74	5.20	3.04	1.71	4.60	3.00	1.54	4.20	2.96	1.42	/	/	/
-10	7.03	3.31	2.13	6.67	3.58	1.86	5.90	3.33	1.77	5.38	3.15	1.71	/	/	/
-7	7.33	3.26	2.25	7.05	3.53	1.97	6.18	3.30	1.87	5.61	3.10	1.81	/	/	/
-5	8.04	3.27	2.46	7.53	3.32	2.27	6.69	3.19	2.09	6.13	3.10	1.98	/	/	/
-2	8.49	3.37	2.52	7.88	3.49	2.26	7.13	3.40	2.10	6.53	3.29	1.99	/	/	/
0	8.82	3.27	2.70	8.18	3.31	2.47	7.46	3.31	2.26	6.99	3.30	2.12	/	/	/
2	9.02	3.22	2.80	8.51	3.38	2.52	7.80	3.36	2.32	7.32	3.34	2.19	/	/	/
5	9.45	3.14	3.01	9.08	3.27	2.78	8.34	3.23	2.58	7.85	3.20	2.45	4.52	3.30	1.37
7	9.83	3.05	3.22	9.72	3.20	3.04	8.82	3.06	2.88	8.23	2.96	2.78	4.85	3.11	1.56
10	9.59	2.91	3.30	9.57	3.11	3.08	8.79	3.07	2.86	8.27	3.04	2.72	6.44	3.05	2.11
12	9.72	2.74	3.55	9.71	2.93	3.32	8.92	2.89	3.08	8.39	2.86	2.93	6.53	2.87	2.27
14	9.75	2.63	3.70	9.73	2.81	3.46	8.94	2.78	3.21	8.40	2.75	3.05	6.54	2.76	2.37
15	9.78	2.58	3.80	9.76	2.76	3.54	8.97	2.72	3.29	8.43	2.70	3.13	6.56	2.71	2.43
19	9.97	2.42	4.13	9.83	2.58	3.81	9.22	2.58	3.57	8.80	2.58	3.41	6.65	2.50	2.66
20	10.02	2.38	4.21	9.85	2.54	3.88	9.28	2.55	3.64	8.90	2.56	3.48	/	/	/
25	9.22	2.07	4.46	9.06	2.20	4.11	8.54	2.21	3.86	8.18	2.22	3.69	/	/	/
30	9.31	1.88	4.96	9.04	1.88	4.80	8.11	1.92	4.22	7.49	1.96	3.83	/	/	/
35	9.69	1.87	5.17	9.42	1.90	4.96	/	/	/	/	/	/	/	/	/
40	10.17	1.84	5.53	/	/	/	/	/	/	/	/	/	/	/	/
43	10.48	1.68	6.25	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 10kW models

Normal															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	4.33	1.87	2.32	3.87	1.89	2.05	3.45	2.05	1.68	3.26	2.07	1.57	2.78	2.14	1.30
-20	5.47	1.87	2.93	4.87	1.98	2.46	4.50	2.05	2.20	4.17	2.29	1.82	3.61	2.20	1.64
-15	6.57	1.86	3.53	6.10	2.03	3.01	5.73	2.24	2.56	5.31	2.27	2.34	4.94	2.41	2.05
-10	7.49	1.97	3.81	7.25	2.15	3.37	6.95	2.26	3.08	6.84	2.50	2.74	6.69	2.78	2.41
-7	8.28	2.11	3.92	8.18	2.33	3.51	8.25	2.62	3.15	7.43	2.54	2.93	7.35	2.88	2.55
-5	8.13	1.89	4.29	8.21	2.22	3.70	8.16	2.39	3.41	7.56	2.55	2.96	7.43	2.73	2.72
-2	8.40	1.91	4.40	8.28	2.16	3.84	8.31	2.33	3.56	8.13	2.70	3.01	7.91	2.85	2.78
0	8.33	1.64	5.06	8.25	1.99	4.15	8.33	2.16	3.86	8.23	2.57	3.20	7.87	2.65	2.97
2	8.62	1.61	5.34	8.68	1.92	4.52	8.20	2.03	4.05	8.79	2.54	3.46	7.85	2.45	3.20
5	9.09	1.53	5.95	9.00	1.81	4.99	9.07	1.94	4.68	9.23	2.35	3.92	8.58	2.41	3.55
7	10.22	1.69	6.05	9.98	1.85	5.40	10.00	2.00	5.00	10.14	2.36	4.29	10.00	2.63	3.80
10	10.06	1.34	7.50	9.12	1.54	5.91	8.85	1.68	5.28	8.88	2.04	4.35	8.94	2.40	3.72
12	10.26	1.25	8.19	9.29	1.44	6.45	9.03	1.57	5.77	9.05	1.91	4.74	9.11	2.25	4.06
14	10.30	1.20	8.58	9.33	1.38	6.76	9.06	1.50	6.04	9.08	1.83	4.97	9.14	2.15	4.25
15	10.38	1.18	8.83	9.40	1.35	6.96	9.13	1.47	6.22	9.16	1.79	5.12	9.22	2.10	4.38
19	9.98	1.03	9.72	9.54	1.15	8.27	9.49	1.36	6.96	9.59	1.63	5.89	9.41	1.90	4.94
20	9.88	0.99	9.94	9.58	1.11	8.60	9.58	1.34	7.14	9.70	1.60	6.08	9.46	1.86	5.08
25	8.86	0.83	10.61	8.98	0.98	9.18	8.99	1.18	7.63	9.10	1.40	6.49	8.87	1.63	5.43
30	8.76	0.77	11.31	8.28	0.86	9.63	8.19	0.96	8.57	8.24	1.13	7.32	9.35	1.43	6.53
35	9.19	0.76	12.03	8.69	0.86	10.10	8.59	0.95	9.01	8.65	1.13	7.65	9.81	1.43	6.84
40	9.79	0.75	13.01	8.97	0.82	10.90	8.75	0.95	9.26	8.82	1.09	8.11	10.01	1.37	7.31
43	10.17	0.74	13.67	9.32	0.79	11.87	9.10	0.89	10.18	9.16	1.02	8.98	10.40	1.27	8.21
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	3.11	2.17	1.44	2.65	2.09	1.27	2.37	2.03	1.17	/	/	/	/	/	/
-15	4.78	2.68	1.78	4.69	2.70	1.74	4.23	2.73	1.55	3.91	2.75	1.42	/	/	/
-10	6.41	2.96	2.16	6.08	3.23	1.88	5.41	3.05	1.78	4.96	2.91	1.70	/	/	/
-7	7.00	3.04	2.30	6.85	3.43	2.00	5.82	3.06	1.91	5.14	2.79	1.84	/	/	/
-5	7.08	2.81	2.52	6.89	2.98	2.31	6.03	2.83	2.13	5.46	2.71	2.02	/	/	/
-2	7.94	3.07	2.59	7.34	3.07	2.39	6.61	3.03	2.18	6.12	3.01	2.04	/	/	/
0	8.03	2.92	2.75	7.30	2.87	2.54	6.61	2.89	2.28	6.16	2.91	2.11	/	/	/
2	8.20	2.84	2.89	8.10	3.16	2.56	7.40	3.14	2.36	6.94	3.12	2.23	/	/	/
5	8.53	2.76	3.09	8.02	2.82	2.84	7.32	2.79	2.62	6.86	2.77	2.48	3.86	2.75	1.40
7	9.58	2.92	3.28	9.50	3.07	3.10	8.42	2.86	2.94	7.70	2.72	2.83	4.29	2.66	1.61
10	8.86	2.62	3.39	8.34	2.65	3.14	7.89	2.70	2.92	7.60	2.74	2.77	5.66	2.62	2.16
12	9.03	2.44	3.69	8.50	2.49	3.41	8.05	2.54	3.17	7.75	2.57	3.01	5.84	2.50	2.34
14	9.06	2.34	3.87	8.53	2.39	3.57	8.08	2.44	3.32	7.77	2.47	3.15	5.89	2.42	2.44
15	9.14	2.29	3.99	8.60	2.34	3.67	8.14	2.39	3.41	7.84	2.42	3.23	5.97	2.39	2.50
19	9.36	2.14	4.36	8.70	2.19	3.97	8.41	2.30	3.65	8.21	2.39	3.44	6.29	2.28	2.76
20	9.41	2.11	4.46	8.73	2.16	4.05	8.48	2.28	3.71	8.31	2.38	3.49	/	/	/
25	8.82	1.85	4.76	8.19	1.89	4.32	7.95	2.00	3.97	7.79	2.09	3.73	/	/	/
30	8.96	1.68	5.33	8.21	1.61	5.08	7.58	1.73	4.37	7.17	1.84	3.90	/	/	/
35	9.39	1.68	5.59	8.63	1.63	5.29	/	/	/	/	/	/	/	/	/
40	9.59	1.59	6.02	/	/	/	/	/	/	/	/	/	/	/	/
43	9.96	1.45	6.85	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 10kW models

Minimum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	2.81	1.19	2.35	2.61	1.26	2.08	2.61	1.53	1.71	2.50	1.56	1.60	1.87	1.43	1.31
-20	3.35	1.12	2.99	2.89	1.15	2.50	2.89	1.29	2.24	2.91	1.57	1.85	2.41	1.46	1.66
-15	3.39	0.94	3.61	3.29	1.07	3.08	3.06	1.17	2.62	3.28	1.37	2.40	3.56	1.71	2.08
-10	3.32	0.85	3.91	3.18	0.92	3.47	3.11	0.98	3.17	3.97	1.41	2.82	4.47	1.82	2.46
-7	2.09	0.51	4.14	1.95	0.54	3.64	2.05	0.61	3.37	3.52	1.14	3.08	3.77	1.41	2.67
-5	2.39	0.53	4.48	2.32	0.60	3.84	2.48	0.70	3.57	3.67	1.17	3.13	3.95	1.41	2.80
-2	2.46	0.53	4.64	2.52	0.62	4.05	2.55	0.68	3.73	3.90	1.21	3.21	3.99	1.39	2.87
0	2.42	0.46	5.24	2.68	0.62	4.30	2.67	0.67	3.99	3.99	1.20	3.31	3.92	1.29	3.04
2	2.82	0.50	5.60	3.04	0.65	4.69	3.03	0.70	4.34	4.29	1.18	3.62	4.23	1.29	3.28
5	3.26	0.53	6.18	3.45	0.67	5.18	3.43	0.71	4.86	4.65	1.14	4.07	4.61	1.26	3.66
7	3.76	0.58	6.48	3.86	0.68	5.69	3.81	0.71	5.39	4.92	1.09	4.53	5.55	1.36	4.09
10	3.43	0.44	7.86	3.05	0.49	6.19	3.17	0.57	5.54	4.47	0.98	4.55	5.34	1.38	3.86
12	3.98	0.46	8.60	3.63	0.54	6.78	3.61	0.59	6.07	4.61	0.92	4.99	5.49	1.30	4.24
14	4.21	0.47	9.03	3.89	0.55	7.12	3.79	0.59	6.38	4.64	0.89	5.24	5.52	1.24	4.45
15	4.48	0.48	9.32	4.17	0.57	7.35	4.00	0.61	6.58	4.69	0.87	5.40	5.58	1.21	4.59
19	4.79	0.47	10.27	5.05	0.58	8.75	5.33	0.72	7.36	6.32	1.01	6.23	6.22	1.20	5.19
20	4.86	0.46	10.51	5.27	0.58	9.10	5.66	0.75	7.56	6.73	1.05	6.44	6.38	1.19	5.34
25	5.47	0.49	11.22	5.84	0.60	9.72	6.19	0.77	8.07	7.17	1.04	6.87	6.81	1.19	5.70
30	5.62	0.47	11.96	5.58	0.55	10.20	5.83	0.64	9.08	6.06	0.78	7.75	7.29	1.06	6.86
35	6.81	0.53	12.73	6.42	0.60	10.69	6.07	0.64	9.55	6.35	0.78	8.10	7.64	1.06	7.19
40	7.26	0.53	13.76	6.64	0.58	11.54	6.90	0.70	9.81	6.96	0.81	8.59	8.24	1.07	7.68
43	7.59	0.52	14.47	6.94	0.55	12.57	7.20	0.67	10.79	7.27	0.76	9.51	8.71	1.01	8.64
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	2.31	1.59	1.45	2.01	1.57	1.28	1.83	1.56	1.18	/	/	/	/	/	/
-15	3.39	1.88	1.81	3.53	2.00	1.76	3.20	2.04	1.57	2.98	2.07	1.44	/	/	/
-10	4.78	2.17	2.20	4.62	2.40	1.92	4.17	2.30	1.81	3.87	2.22	1.74	/	/	/
-7	3.82	1.62	2.36	3.99	1.93	2.07	3.76	1.92	1.96	3.60	1.91	1.88	/	/	/
-5	4.13	1.60	2.58	4.26	1.79	2.38	3.96	1.81	2.19	3.76	1.83	2.06	/	/	/
-2	4.35	1.63	2.68	4.34	1.78	2.44	4.08	1.82	2.24	3.98	1.88	2.11	/	/	/
0	4.48	1.59	2.82	4.38	1.68	2.61	4.24	1.81	2.34	4.14	1.91	2.17	/	/	/
2	4.74	1.58	3.00	4.72	1.74	2.71	4.58	1.85	2.47	4.48	1.94	2.31	/	/	/
5	5.08	1.60	3.18	5.14	1.76	2.92	4.99	1.85	2.70	4.89	1.92	2.55	2.87	2.02	1.42
7	6.10	1.76	3.46	6.17	1.90	3.25	5.72	1.87	3.06	5.41	1.85	2.93	3.19	1.96	1.63
10	5.78	1.64	3.52	6.04	1.85	3.27	5.74	1.89	3.04	5.54	1.92	2.88	4.38	1.98	2.22
12	5.94	1.54	3.86	6.57	1.84	3.56	6.16	1.88	3.28	5.88	1.91	3.08	4.41	1.84	2.39
14	5.97	1.47	4.05	6.78	1.82	3.74	6.31	1.85	3.42	6.00	1.87	3.20	4.39	1.76	2.50
15	6.03	1.44	4.18	7.03	1.83	3.85	6.51	1.86	3.50	6.16	1.88	3.27	4.40	1.71	2.56
19	6.42	1.40	4.58	6.69	1.60	4.17	6.27	1.64	3.83	6.00	1.67	3.59	4.42	1.56	2.83
20	6.51	1.39	4.68	6.60	1.55	4.25	6.22	1.59	3.91	5.96	1.62	3.67	/	/	/
25	6.92	1.38	5.00	6.51	1.43	4.54	6.19	1.48	4.17	5.97	1.52	3.93	/	/	/
30	7.22	1.29	5.59	6.71	1.26	5.34	6.08	1.32	4.60	5.65	1.38	4.11	/	/	/
35	7.75	1.32	5.88	7.34	1.32	5.56	/	/	/	/	/	/	/	/	/
40	8.24	1.30	6.33	/	/	/	/	/	/	/	/	/	/	/	/
43	8.70	1.21	7.20	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 12kW models

Maximum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	6.33	2.92	2.17	5.96	2.77	2.15	5.03	2.96	1.70	4.53	3.12	1.45	4.23	3.29	1.28
-20	7.75	3.04	2.55	7.49	3.00	2.50	7.21	3.34	2.16	6.38	3.41	1.87	6.05	3.52	1.72
-15	8.95	3.13	2.85	8.66	3.27	2.65	8.36	3.41	2.45	7.93	3.62	2.19	7.39	3.95	1.87
-10	10.98	3.47	3.17	10.38	3.79	2.74	10.02	3.95	2.54	9.69	4.34	2.23	9.32	4.54	2.05
-7	12.30	3.52	3.49	10.94	3.62	3.02	11.02	3.89	2.83	10.42	4.27	2.44	10.40	4.50	2.31
-5	12.35	3.33	3.71	11.21	3.55	3.15	11.30	3.87	2.92	10.94	4.26	2.57	10.94	4.61	2.37
-2	12.04	3.11	3.87	11.28	3.28	3.44	11.30	3.56	3.17	11.29	4.07	2.77	11.46	4.46	2.57
0	12.48	2.87	4.35	12.09	3.18	3.80	11.99	3.44	3.48	12.25	4.04	3.04	12.29	4.37	2.81
2	13.36	2.80	4.78	12.73	3.11	4.09	12.64	3.45	3.66	12.87	3.93	3.28	12.83	4.40	2.92
5	14.60	2.66	5.49	13.71	3.02	4.55	13.62	3.28	4.15	13.78	3.70	3.73	13.62	4.18	3.26
7	15.45	2.57	6.00	14.67	2.93	5.01	14.57	3.11	4.69	14.80	3.57	4.14	14.51	4.00	3.63
10	14.95	2.40	6.22	14.36	2.62	5.49	14.30	2.83	5.06	14.61	3.34	4.37	14.32	3.89	3.69
12	15.10	2.17	6.96	14.59	2.40	6.08	14.39	2.74	5.25	14.84	3.26	4.55	14.52	3.71	3.92
14	15.06	2.07	7.27	14.60	2.31	6.33	14.34	2.70	5.31	14.85	3.22	4.61	14.52	3.63	4.00
15	15.12	1.97	7.67	14.70	2.21	6.65	14.36	2.65	5.43	14.96	3.17	4.72	14.61	3.53	4.14
19	14.67	1.72	8.54	14.39	1.94	7.41	14.25	2.28	6.26	14.86	2.83	5.25	14.72	3.22	4.58
20	14.56	1.66	8.76	14.32	1.88	7.60	14.22	2.20	6.47	14.84	2.75	5.39	14.75	3.15	4.69
25	14.41	1.55	9.31	14.28	1.73	8.23	14.18	1.93	7.35	14.72	2.35	6.26	14.70	2.73	5.39
30	14.64	1.45	10.12	14.20	1.62	8.75	14.35	1.85	7.76	14.69	2.22	6.63	14.73	2.63	5.59
35	15.17	1.39	10.87	14.86	1.60	9.29	14.71	1.80	8.16	15.09	2.17	6.95	14.57	2.50	5.83
40	15.69	1.41	11.10	15.59	1.59	9.82	15.48	1.79	8.65	15.96	2.17	7.36	15.34	2.44	6.29
43	16.15	1.35	11.96	15.95	1.50	10.61	15.89	1.73	9.18	16.28	2.08	7.82	15.99	2.35	6.81
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	5.36	3.55	1.51	5.08	3.76	1.35	4.90	3.68	1.33	/	/	/	/	/	/
-15	6.71	3.97	1.69	6.33	4.31	1.47	6.05	4.52	1.34	5.87	4.69	1.25	/	/	/
-10	8.96	4.62	1.94	8.60	4.79	1.79	7.46	4.97	1.50	6.70	5.13	1.30	/	/	/
-7	10.61	4.74	2.24	10.59	5.25	2.02	9.06	5.15	1.76	8.05	5.06	1.59	/	/	/
-5	10.77	4.75	2.27	10.55	4.96	2.13	9.15	5.14	1.78	8.21	5.14	1.60	/	/	/
-2	10.82	4.65	2.33	10.56	4.82	2.19	9.22	5.00	1.84	8.33	5.09	1.64	/	/	/
0	11.12	4.61	2.41	10.77	4.70	2.29	9.42	4.89	1.93	8.52	5.03	1.69	/	/	/
2	11.85	4.52	2.62	11.64	4.62	2.52	10.61	4.92	2.15	9.92	5.19	1.91	/	/	/
5	12.81	4.46	2.88	12.82	4.62	2.77	12.07	4.90	2.46	11.57	5.06	2.29	9.92	5.16	1.92
7	13.91	4.43	3.14	13.85	4.66	2.97	13.31	4.89	2.72	12.95	5.07	2.56	11.54	5.17	2.23
10	13.54	4.11	3.30	13.12	4.22	3.11	12.87	4.61	2.79	12.70	4.79	2.65	11.69	4.89	2.39
12	13.54	3.92	3.45	12.64	3.86	3.27	12.58	4.40	2.86	12.55	4.56	2.75	11.76	4.65	2.53
14	13.44	3.84	3.50	12.31	3.70	3.33	12.35	4.30	2.87	12.38	4.45	2.78	11.71	4.55	2.58
15	13.42	3.73	3.60	12.05	3.52	3.42	12.19	4.18	2.92	12.29	4.32	2.85	11.73	4.42	2.65
19	13.61	3.43	3.97	12.03	3.48	3.46	11.45	3.74	3.06	11.07	3.83	2.89	11.82	3.98	2.97
20	13.66	3.37	4.06	12.02	3.42	3.52	11.27	3.64	3.10	10.76	3.71	2.90	/	/	/
25	13.90	3.00	4.63	12.00	3.12	3.84	10.82	3.25	3.33	10.03	3.36	2.99	/	/	/
30	13.95	2.82	4.95	12.64	2.89	4.37	11.26	3.18	3.55	10.34	3.40	3.04	/	/	/
35	14.23	2.72	5.24	12.89	2.75	4.69	/	/	/	/	/	/	/	/	/
40	14.51	2.69	5.40	/	/	/	/	/	/	/	/	/	/	/	/
43	14.78	2.57	5.75	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 12kW models

Normal															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	5.36	2.32	2.30	5.12	2.23	2.29	4.24	2.37	1.79	3.88	2.57	1.51	3.66	2.82	1.30
-20	6.73	2.45	2.75	6.60	2.44	2.70	6.25	2.72	2.30	5.62	2.85	1.97	5.31	3.01	1.77
-15	7.43	2.41	3.09	7.35	2.55	2.88	7.28	2.78	2.62	6.63	2.86	2.32	6.04	3.13	1.93
-10	9.06	2.69	3.37	8.26	2.83	2.92	8.14	3.06	2.66	8.00	3.45	2.32	7.80	3.70	2.11
-7	11.09	3.11	3.57	10.29	3.26	3.15	10.00	3.33	3.00	10.14	4.06	2.50	10.20	4.25	2.40
-5	10.26	2.55	4.03	10.22	3.19	3.20	9.95	3.28	3.03	10.07	3.76	2.68	10.18	4.15	2.45
-2	9.94	2.39	4.16	9.81	2.75	3.57	9.57	2.86	3.35	9.83	3.35	2.94	10.06	3.76	2.68
0	10.23	2.21	4.63	10.05	2.51	4.01	9.79	2.62	3.74	10.11	3.11	3.25	10.23	3.46	2.96
2	10.74	2.05	5.23	9.96	2.23	4.47	9.30	2.35	3.95	10.07	2.81	3.58	10.70	3.57	3.00
5	11.77	1.95	6.05	10.77	2.18	4.94	10.57	2.35	4.50	10.83	2.65	4.08	11.08	3.16	3.51
7	12.90	1.96	6.57	12.11	2.23	5.42	12.10	2.44	4.95	12.35	2.75	4.50	12.30	3.24	3.80
10	11.82	1.72	6.88	11.23	1.87	5.99	10.88	1.97	5.51	11.26	2.34	4.81	10.91	2.74	3.99
12	11.97	1.55	7.73	11.44	1.71	6.67	10.98	1.91	5.75	11.47	2.28	5.04	11.10	2.61	4.26
14	11.97	1.48	8.10	11.47	1.65	6.96	10.96	1.88	5.83	11.51	2.25	5.11	11.12	2.55	4.36
15	12.03	1.41	8.56	11.57	1.58	7.32	11.00	1.84	5.97	11.61	2.21	5.24	11.20	2.48	4.52
19	11.58	1.21	9.60	11.23	1.37	8.22	10.82	1.56	6.93	11.43	1.94	5.88	11.19	2.22	5.03
20	11.47	1.16	9.86	11.15	1.32	8.45	10.77	1.50	7.18	11.39	1.89	6.04	11.19	2.17	5.16
25	11.42	1.09	10.47	11.19	1.22	9.15	10.81	1.33	8.15	11.37	1.46	7.79	11.22	1.89	5.93
30	11.71	1.04	11.31	11.23	1.16	9.66	11.05	1.29	8.55	11.46	1.41	8.15	11.36	1.93	5.88
35	12.36	1.02	12.09	11.97	1.17	10.21	11.55	1.32	8.78	11.99	1.60	7.49	11.45	1.86	6.17
40	13.10	1.06	12.42	12.88	1.19	10.86	12.46	1.33	9.37	13.00	1.63	7.99	12.36	1.84	6.71
43	13.73	1.02	13.47	13.41	1.14	11.81	13.03	1.30	10.01	13.51	1.58	8.54	13.12	1.80	7.31
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	4.72	3.03	1.56	4.63	3.38	1.37	4.57	3.50	1.31	/	/	/	/	/	/
-15	5.51	3.14	1.75	5.30	3.58	1.48	5.10	3.82	1.33	4.96	4.01	1.24	/	/	/
-10	7.54	3.77	2.00	7.24	3.91	1.85	6.32	4.11	1.54	5.70	4.30	1.33	/	/	/
-7	10.28	4.48	2.29	10.00	4.88	2.05	8.34	4.63	1.80	7.23	4.42	1.64	/	/	/
-5	10.15	4.37	2.32	9.96	4.58	2.17	8.33	4.57	1.82	7.24	4.44	1.63	/	/	/
-2	10.02	4.21	2.38	9.85	4.30	2.29	8.29	4.39	1.89	7.26	4.34	1.67	/	/	/
0	10.13	4.12	2.46	9.94	4.16	2.39	8.37	4.24	1.98	7.33	4.23	1.73	/	/	/
2	10.13	3.82	2.65	11.40	4.47	2.55	9.46	4.26	2.22	8.17	4.08	2.01	/	/	/
5	11.75	4.01	2.93	11.60	4.07	2.85	10.17	3.98	2.55	9.21	3.86	2.38	8.19	4.05	2.02
7	12.17	3.75	3.25	12.00	3.87	3.10	11.29	3.98	2.84	10.81	4.06	2.66	9.64	4.10	2.35
10	10.10	2.93	3.44	9.86	3.03	3.25	9.90	3.42	2.89	9.92	3.62	2.74	9.48	3.80	2.49
12	10.13	2.79	3.62	9.53	2.77	3.44	9.71	3.25	2.98	9.83	3.44	2.86	9.56	3.59	2.66
14	10.07	2.73	3.69	9.30	2.66	3.50	9.55	3.18	3.00	9.71	3.36	2.89	9.54	3.50	2.72
15	10.08	2.66	3.79	9.12	2.53	3.61	9.44	3.09	3.06	9.66	3.26	2.97	9.57	3.39	2.82
19	10.13	2.40	4.21	9.02	2.45	3.68	8.79	2.72	3.23	8.63	2.84	3.04	9.72	3.03	3.20
20	10.14	2.35	4.32	9.00	2.40	3.74	8.62	2.63	3.28	8.37	2.74	3.06	/	/	/
25	10.39	2.11	4.93	9.04	2.21	4.09	8.33	2.36	3.52	7.85	2.50	3.14	/	/	/
30	10.53	2.01	5.24	9.62	2.11	4.56	8.75	2.37	3.70	8.17	2.58	3.17	/	/	/
35	10.95	1.96	5.58	10.00	2.03	4.93	/	/	/	/	/	/	/	/	/
40	11.46	1.98	5.80	/	/	/	/	/	/	/	/	/	/	/	/
43	11.90	1.91	6.22	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 12kW models

Minimum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	3.64	1.54	2.36	3.52	1.50	2.35	3.27	1.81	1.81	3.08	2.01	1.53	2.83	2.17	1.30
-20	4.44	1.60	2.78	4.22	1.54	2.74	4.08	1.75	2.33	3.72	1.86	2.00	3.93	2.25	1.75
-15	4.85	1.54	3.16	5.00	1.70	2.94	4.92	1.83	2.68	4.55	1.92	2.37	4.73	2.45	1.93
-10	4.67	1.34	3.49	4.48	1.48	3.03	4.36	1.59	2.74	4.39	1.84	2.38	4.85	2.25	2.15
-7	4.61	1.17	3.94	3.85	1.15	3.36	3.97	1.26	3.14	4.20	1.53	2.74	5.41	2.14	2.52
-5	4.75	1.13	4.19	4.06	1.15	3.53	4.18	1.28	3.26	4.52	1.56	2.90	5.80	2.23	2.61
-2	4.73	1.08	4.40	4.21	1.09	3.86	4.27	1.20	3.55	4.75	1.51	3.14	6.16	2.18	2.83
0	4.99	1.01	4.96	4.64	1.08	4.28	4.62	1.18	3.92	5.24	1.52	3.45	6.70	2.15	3.11
2	5.41	0.98	5.54	4.95	1.06	4.69	4.92	1.16	4.23	5.56	1.45	3.83	7.04	2.12	3.32
5	5.91	0.93	6.35	5.34	1.03	5.19	5.31	1.12	4.73	5.97	1.39	4.29	7.49	2.05	3.66
7	6.15	0.88	6.98	5.53	0.96	5.79	5.58	1.04	5.38	6.30	1.31	4.80	7.88	1.92	4.10
10	6.10	0.84	7.24	5.72	0.91	6.31	5.62	0.97	5.81	6.37	1.26	5.07	7.92	1.90	4.16
12	6.05	0.75	8.12	5.78	0.82	7.01	5.65	0.94	6.04	6.69	1.26	5.29	8.05	1.81	4.44
14	5.97	0.70	8.49	5.76	0.79	7.30	5.62	0.92	6.11	6.78	1.27	5.36	8.05	1.77	4.54
15	5.93	0.66	8.96	5.78	0.75	7.68	5.62	0.90	6.26	6.92	1.26	5.49	8.09	1.72	4.69
19	5.83	0.58	10.05	5.74	0.67	8.61	5.65	0.78	7.27	6.96	1.13	6.16	8.24	1.58	5.23
20	5.81	0.56	10.32	5.73	0.65	8.85	5.66	0.75	7.52	6.97	1.10	6.32	8.27	1.54	5.36
25	5.89	0.54	10.97	5.85	0.61	9.58	5.79	0.68	8.54	7.06	0.96	7.36	8.39	1.36	6.16
30	6.83	0.58	11.82	6.96	0.69	10.11	7.82	0.89	8.78	8.23	1.09	7.52	8.52	1.38	6.18
35	7.23	0.56	12.79	7.43	0.69	10.81	8.17	0.88	9.31	8.60	1.08	7.94	8.58	1.32	6.49
40	7.63	0.58	13.14	7.95	0.69	11.50	8.75	0.88	9.93	9.09	1.07	8.47	9.05	1.28	7.05
43	8.10	0.57	14.26	8.37	0.67	12.51	9.22	0.87	10.62	9.52	1.05	9.06	9.75	1.27	7.69
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	3.75	2.43	1.54	3.60	2.54	1.42	3.51	2.69	1.30	/	/	/	/	/	/
-15	4.63	2.64	1.75	4.43	2.98	1.49	4.31	3.21	1.34	4.22	3.39	1.25	/	/	/
-10	5.11	2.50	2.04	5.33	2.83	1.89	4.82	3.08	1.57	4.49	3.32	1.35	/	/	/
-7	5.73	2.41	2.37	6.03	2.77	2.18	5.55	2.96	1.87	5.23	3.11	1.68	/	/	/
-5	5.93	2.44	2.43	6.12	2.68	2.28	5.70	3.01	1.89	5.42	3.20	1.69	/	/	/
-2	5.95	2.35	2.53	6.12	2.59	2.36	5.78	2.95	1.96	5.56	3.20	1.74	/	/	/
0	6.12	2.31	2.65	6.23	2.53	2.46	5.94	2.90	2.05	5.75	3.18	1.81	/	/	/
2	6.66	2.32	2.87	7.10	2.66	2.67	6.89	2.97	2.32	6.76	3.22	2.10	/	/	/
5	7.30	2.32	3.15	8.08	2.66	3.04	7.95	2.97	2.68	7.87	3.18	2.48	6.99	3.33	2.10
7	7.83	2.26	3.46	8.63	2.64	3.27	8.68	2.91	2.98	8.71	3.13	2.79	8.06	3.28	2.46
10	7.76	2.13	3.63	8.30	2.44	3.40	8.53	2.82	3.03	8.68	3.03	2.87	8.28	3.17	2.61
12	8.07	2.11	3.82	8.12	2.26	3.58	8.50	2.73	3.11	8.75	2.93	2.98	8.50	3.07	2.77
14	8.15	2.10	3.88	7.95	2.18	3.65	8.41	2.69	3.13	8.71	2.89	3.02	8.54	3.02	2.83
15	8.28	2.08	3.98	7.83	2.09	3.75	8.37	2.63	3.18	8.73	2.83	3.09	8.62	2.95	2.92
19	8.48	1.92	4.42	7.89	2.06	3.83	7.91	2.35	3.36	7.92	2.50	3.16	8.97	2.73	3.29
20	8.52	1.88	4.53	7.90	2.03	3.89	7.79	2.28	3.41	7.72	2.43	3.18	/	/	/
25	8.81	1.70	5.18	8.00	1.88	4.25	7.58	2.07	3.66	7.29	2.23	3.27	/	/	/
30	8.95	1.62	5.51	8.60	1.79	4.80	7.84	2.02	3.89	7.34	2.20	3.33	/	/	/
35	9.27	1.58	5.87	8.90	1.71	5.19	/	/	/	/	/	/	/	/	/
40	9.60	1.57	6.10	/	/	/	/	/	/	/	/	/	/	/	/
43	10.00	1.53	6.54	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 14kW models

Maximum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	7.00	3.27	2.14	6.76	3.20	2.11	5.43	3.18	1.71	4.89	3.35	1.46	4.47	3.47	1.29
-20	8.36	3.25	2.57	8.01	3.18	2.52	7.79	3.58	2.18	6.89	3.65	1.89	6.25	3.61	1.73
-15	9.61	3.40	2.82	9.47	3.61	2.62	9.22	3.80	2.43	8.57	3.95	2.17	7.63	4.12	1.85
-10	11.88	3.81	3.12	11.42	4.18	2.73	10.95	4.44	2.47	10.60	4.70	2.26	9.64	4.73	2.04
-7	13.71	4.02	3.41	12.91	4.28	3.02	12.70	4.55	2.79	12.32	4.94	2.49	11.94	5.17	2.31
-5	13.90	3.78	3.68	13.19	3.87	3.41	12.76	4.27	2.99	12.56	4.61	2.73	12.07	4.99	2.42
-2	13.69	3.61	3.79	13.01	3.61	3.60	12.51	4.04	3.09	12.45	4.38	2.84	12.21	4.90	2.49
0	14.32	3.40	4.21	13.68	3.54	3.87	13.03	4.00	3.26	13.01	4.32	3.01	12.69	4.85	2.62
2	14.69	3.20	4.59	14.14	3.44	4.11	13.61	3.94	3.46	13.46	4.23	3.18	13.32	4.84	2.75
5	15.38	2.93	5.25	14.91	3.30	4.51	14.32	3.63	3.94	14.28	3.95	3.61	14.29	4.59	3.11
7	16.27	2.81	5.80	15.55	3.15	4.94	15.46	3.44	4.49	15.60	3.86	4.04	15.65	4.52	3.46
10	15.54	2.28	6.81	15.52	2.89	5.36	14.86	3.10	4.79	15.27	3.60	4.24	14.97	4.08	3.67
12	15.49	2.14	7.23	15.41	2.76	5.58	15.08	3.02	4.99	15.61	3.59	4.35	15.30	4.04	3.79
14	15.36	2.08	7.38	15.25	2.70	5.65	15.08	2.99	5.04	15.68	3.58	4.37	15.36	4.02	3.82
15	15.32	2.01	7.62	15.18	2.62	5.79	15.17	2.94	5.16	15.83	3.56	4.45	15.50	3.98	3.89
19	14.99	1.83	8.21	14.89	2.27	6.55	14.75	2.66	5.55	15.35	3.14	4.90	15.20	3.52	4.32
20	14.90	1.78	8.35	14.81	2.20	6.74	14.64	2.59	5.65	15.23	3.04	5.01	15.12	3.42	4.42
25	14.89	1.64	9.08	14.75	1.92	7.69	14.62	2.38	6.15	14.93	2.68	5.57	14.74	2.98	4.95
30	15.25	1.55	9.82	14.81	1.80	8.21	14.86	2.10	7.09	15.06	2.42	6.22	15.00	2.80	5.36
35	16.01	1.45	11.05	15.37	1.70	9.04	14.99	1.87	8.02	15.49	2.26	6.86	15.25	2.65	5.77
40	16.22	1.40	11.62	16.41	1.59	10.29	16.21	1.89	8.57	15.96	2.20	7.26	15.75	2.59	6.08
43	16.55	1.36	12.20	16.73	1.54	10.83	16.54	1.88	8.81	16.28	2.12	7.69	16.07	2.56	6.27
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	5.42	3.61	1.50	5.14	3.99	1.29	4.97	4.06	1.23	/	/	/	/	/	/
-15	7.01	4.32	1.62	6.46	4.58	1.41	6.19	4.84	1.28	6.01	5.05	1.19	/	/	/
-10	9.07	5.01	1.81	8.72	5.21	1.67	7.53	5.26	1.43	6.73	5.30	1.27	/	/	/
-7	11.04	5.33	2.07	11.27	5.61	2.01	9.32	5.45	1.71	8.09	5.36	1.51	/	/	/
-5	11.17	5.24	2.13	11.14	5.32	2.09	9.41	5.18	1.82	8.25	5.06	1.63	/	/	/
-2	11.39	5.07	2.25	11.36	5.23	2.17	9.80	5.26	1.86	8.76	5.28	1.66	/	/	/
0	11.89	4.99	2.38	11.80	5.19	2.27	10.32	5.34	1.93	9.34	5.48	1.70	/	/	/
2	12.68	5.13	2.47	12.62	5.27	2.39	11.28	5.44	2.07	10.38	5.58	1.86	/	/	/
5	13.80	4.98	2.77	13.78	5.05	2.73	12.53	5.29	2.37	11.70	5.38	2.17	10.31	5.43	1.90
7	14.97	4.81	3.11	14.53	5.04	2.88	13.73	5.08	2.70	13.20	5.20	2.54	10.39	4.95	2.10
10	15.31	4.62	3.31	14.15	4.60	3.08	13.58	4.77	2.84	13.20	4.91	2.69	11.24	4.98	2.26
12	15.39	4.50	3.42	13.63	4.31	3.16	13.27	4.53	2.93	13.02	4.70	2.77	12.01	4.79	2.51
14	15.32	4.45	3.44	13.27	4.17	3.18	13.01	4.42	2.95	12.84	4.60	2.79	11.69	4.96	2.36
15	15.34	4.37	3.51	12.99	4.02	3.24	12.84	4.28	3.00	12.74	4.48	2.84	11.86	4.97	2.41
19	15.06	3.94	3.83	12.78	3.71	3.45	11.91	3.81	3.12	11.34	3.91	2.90	12.53	4.80	2.61
20	14.99	3.84	3.90	12.73	3.68	3.46	11.68	3.70	3.16	10.99	3.77	2.92	/	/	/
25	14.72	3.43	4.30	12.47	3.26	3.82	11.08	3.35	3.31	10.16	3.40	2.99	/	/	/
30	14.61	3.14	4.65	12.80	2.97	4.30	11.32	3.17	3.57	10.34	3.40	3.04	/	/	/
35	14.78	2.95	5.00	13.01	2.82	4.62	/	/	/	/	/	/	/	/	/
40	14.95	2.78	5.38	/	/	/	/	/	/	/	/	/	/	/	/
43	15.15	2.73	5.54	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 14kW models

Normal															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	5.85	2.57	2.27	5.71	2.54	2.25	4.57	2.55	1.79	4.19	2.76	1.51	3.88	2.97	1.30
-20	7.27	2.63	2.77	7.27	2.67	2.72	6.75	2.92	2.32	6.07	3.06	1.99	5.48	3.08	1.78
-15	8.03	2.63	3.06	7.94	2.79	2.85	7.86	3.03	2.60	7.16	3.12	2.29	6.24	3.26	1.91
-10	9.80	2.96	3.31	9.36	3.22	2.91	8.89	3.43	2.59	8.76	3.74	2.34	8.07	3.85	2.09
-7	12.45	3.50	3.56	12.19	3.94	3.09	12.00	4.29	2.80	11.87	4.46	2.66	11.80	5.02	2.35
-5	12.05	3.05	3.95	11.84	3.29	3.60	11.87	3.88	3.06	11.70	4.08	2.87	11.68	4.73	2.47
-2	11.76	2.89	4.07	11.44	3.01	3.80	11.44	3.55	3.22	11.44	3.79	3.02	11.54	4.52	2.55
0	12.20	2.70	4.52	11.79	2.89	4.08	11.72	3.40	3.45	11.79	3.65	3.23	11.74	4.36	2.69
2	11.98	2.41	4.97	11.80	2.65	4.46	11.40	3.12	3.65	11.55	3.40	3.40	11.70	4.09	2.86
5	13.40	2.39	5.61	13.08	2.71	4.82	13.01	3.17	4.10	12.62	3.26	3.87	12.70	3.85	3.30
7	15.21	2.43	6.26	14.54	2.77	5.24	14.50	3.09	4.70	14.58	3.52	4.15	14.20	3.89	3.65
10	12.29	1.63	7.53	12.14	2.07	5.85	11.31	2.17	5.22	11.77	2.52	4.67	11.41	2.87	3.97
12	12.29	1.53	8.03	12.08	1.97	6.12	11.50	2.11	5.46	12.07	2.51	4.82	11.69	2.84	4.12
14	12.20	1.49	8.22	11.98	1.93	6.21	11.53	2.08	5.53	12.14	2.50	4.85	11.76	2.83	4.16
15	12.19	1.43	8.50	11.95	1.87	6.37	11.62	2.05	5.67	12.29	2.49	4.94	11.89	2.80	4.25
19	11.83	1.28	9.22	11.62	1.60	7.27	11.20	1.82	6.15	11.81	2.15	5.48	11.55	2.43	4.75
20	11.74	1.25	9.40	11.53	1.54	7.49	11.09	1.77	6.27	11.69	2.08	5.62	11.47	2.35	4.87
25	11.80	1.15	10.22	11.56	1.35	8.55	11.15	1.63	6.82	11.53	1.66	6.93	11.25	2.06	5.46
30	12.20	1.11	10.98	11.71	1.29	9.07	11.44	1.46	7.81	11.75	1.54	7.64	11.56	2.05	5.63
35	13.05	1.06	12.28	12.39	1.25	9.93	11.77	1.36	8.63	12.31	1.67	7.39	11.99	1.96	6.10
40	13.55	1.04	13.01	13.55	1.19	11.38	13.05	1.41	9.28	13.01	1.65	7.88	12.70	1.96	6.48
43	14.06	1.02	13.75	14.07	1.17	12.06	13.56	1.41	9.61	13.51	1.61	8.40	13.19	1.96	6.73
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	4.77	3.08	1.55	4.69	3.60	1.30	4.64	3.87	1.20	/	/	/	/	/	/
-15	5.76	3.42	1.68	5.41	3.81	1.42	5.22	4.09	1.28	5.09	4.31	1.18	/	/	/
-10	7.63	4.08	1.87	7.34	4.26	1.72	6.37	4.35	1.46	5.73	4.44	1.29	/	/	/
-7	10.86	5.15	2.11	11.00	5.37	2.05	8.84	5.05	1.75	7.41	4.77	1.55	/	/	/
-5	10.78	4.99	2.16	10.83	5.13	2.11	8.87	4.82	1.84	7.57	4.56	1.66	/	/	/
-2	10.80	4.73	2.28	10.87	4.90	2.22	9.05	4.78	1.89	7.85	4.64	1.69	/	/	/
0	11.08	4.57	2.42	11.13	4.75	2.34	9.36	4.77	1.96	8.18	4.70	1.74	/	/	/
2	12.14	4.86	2.50	12.40	5.06	2.45	10.10	4.77	2.12	8.56	4.46	1.92	/	/	/
5	12.50	4.40	2.84	12.57	4.47	2.81	10.61	4.31	2.46	9.31	4.11	2.27	8.52	4.28	1.99
7	14.00	4.40	3.18	13.80	4.60	3.00	12.93	4.67	2.77	12.34	4.73	2.61	9.71	4.50	2.16
10	11.42	3.30	3.46	10.64	3.31	3.21	10.44	3.54	2.95	10.31	3.71	2.78	9.11	3.88	2.35
12	11.51	3.21	3.59	10.28	3.10	3.32	10.23	3.35	3.05	10.20	3.54	2.88	9.76	3.69	2.65
14	11.48	3.17	3.62	10.03	3.00	3.35	10.05	3.26	3.08	10.07	3.47	2.90	9.53	3.82	2.50
15	11.52	3.11	3.70	9.84	2.88	3.41	9.94	3.16	3.14	10.01	3.38	2.96	9.68	3.78	2.56
19	11.21	2.76	4.07	9.59	2.62	3.67	9.14	2.77	3.30	8.83	2.90	3.05	10.29	3.65	2.82
20	11.13	2.68	4.16	9.53	2.59	3.68	8.94	2.68	3.34	8.54	2.78	3.07	/	/	/
25	11.00	2.41	4.58	9.40	2.31	4.07	8.53	2.43	3.50	7.95	2.53	3.14	/	/	/
30	11.03	2.24	4.92	9.74	2.17	4.49	8.80	2.36	3.73	8.17	2.58	3.17	/	/	/
35	11.38	2.13	5.33	10.09	2.08	4.86	/	/	/	/	/	/	/	/	/
40	11.81	2.04	5.78	/	/	/	/	/	/	/	/	/	/	/	/
43	12.20	2.04	5.99	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 14kW models

Minimum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	3.76	1.62	2.33	4.02	1.74	2.30	3.54	1.94	1.82	3.33	2.17	1.54	3.00	2.29	1.31
-20	4.58	1.63	2.80	4.77	1.73	2.76	4.40	1.87	2.35	4.02	1.99	2.02	4.06	2.31	1.76
-15	5.24	1.68	3.13	5.40	1.85	2.91	5.31	2.00	2.66	4.91	2.09	2.35	4.88	2.56	1.91
-10	5.05	1.47	3.44	5.08	1.68	3.02	4.76	1.79	2.66	4.80	1.99	2.41	5.01	2.35	2.13
-7	5.14	1.34	3.84	4.55	1.35	3.36	4.57	1.48	3.10	4.96	1.77	2.80	6.21	2.46	2.52
-5	5.35	1.28	4.17	4.78	1.25	3.81	4.61	1.38	3.34	5.19	1.69	3.07	6.40	2.41	2.65
-2	5.37	1.25	4.30	4.89	1.21	4.04	4.56	1.32	3.47	5.24	1.63	3.22	6.56	2.39	2.75
0	5.73	1.19	4.80	5.34	1.22	4.36	4.79	1.31	3.66	5.57	1.63	3.42	6.92	2.39	2.90
2	5.93	1.11	5.33	5.57	1.18	4.71	5.14	1.29	4.00	5.83	1.60	3.64	7.33	2.34	3.13
5	6.23	1.03	6.07	5.89	1.14	5.15	5.58	1.24	4.49	6.18	1.49	4.16	7.86	2.25	3.49
7	6.48	0.96	6.75	6.03	1.06	5.68	5.92	1.12	5.27	6.64	1.42	4.68	8.50	2.09	4.07
10	6.34	0.80	7.93	6.18	1.00	6.16	5.84	1.06	5.50	6.66	1.35	4.92	8.28	2.00	4.15
12	6.21	0.74	8.43	6.11	0.95	6.43	5.92	1.03	5.73	7.04	1.39	5.06	8.49	1.98	4.29
14	6.09	0.71	8.62	6.02	0.92	6.52	5.91	1.02	5.80	7.16	1.41	5.09	8.51	1.97	4.33
15	6.01	0.67	8.90	5.97	0.89	6.68	5.93	1.00	5.94	7.33	1.42	5.18	8.59	1.94	4.42
19	5.96	0.62	9.65	5.93	0.78	7.61	5.85	0.91	6.45	7.19	1.25	5.74	8.50	1.72	4.93
20	5.95	0.60	9.84	5.93	0.76	7.85	5.83	0.89	6.57	7.16	1.22	5.88	8.48	1.68	5.06
25	6.09	0.57	10.70	6.05	0.68	8.95	5.96	0.83	7.15	7.17	1.10	6.54	8.42	1.48	5.67
30	7.11	0.62	11.47	7.26	0.76	9.49	8.10	1.01	8.02	8.43	1.20	7.05	8.68	1.46	5.92
35	7.63	0.59	13.00	7.69	0.73	10.52	8.32	0.91	9.15	8.83	1.13	7.84	8.98	1.40	6.42
40	7.89	0.57	13.77	8.37	0.69	12.06	9.16	0.93	9.84	9.10	1.09	8.35	9.29	1.36	6.82
43	8.30	0.57	14.55	8.79	0.69	12.78	9.59	0.94	10.19	9.53	1.07	8.90	9.80	1.39	7.08
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	3.79	2.47	1.54	3.65	2.68	1.36	3.56	2.98	1.20	/	/	/	/	/	/
-15	4.84	2.87	1.68	4.52	3.17	1.43	4.41	3.44	1.28	4.33	3.65	1.19	/	/	/
-10	5.17	2.71	1.90	5.40	3.08	1.76	4.87	3.26	1.49	4.51	3.43	1.32	/	/	/
-7	5.96	2.71	2.20	6.25	2.89	2.16	5.63	3.09	1.82	5.26	3.29	1.60	/	/	/
-5	6.15	2.69	2.28	6.46	2.88	2.24	5.85	3.03	1.93	5.44	3.15	1.73	/	/	/
-2	6.30	2.61	2.41	6.62	2.83	2.34	6.12	3.07	1.99	5.78	3.28	1.76	/	/	/
0	6.61	2.58	2.57	6.90	2.83	2.44	6.46	3.12	2.07	6.17	3.39	1.82	/	/	/
2	7.18	2.62	2.74	7.73	2.92	2.65	7.29	3.20	2.28	7.00	3.43	2.04	/	/	/
5	7.86	2.59	3.03	8.68	2.91	2.98	8.24	3.20	2.58	7.95	3.38	2.35	7.27	3.48	2.09
7	8.43	2.46	3.43	9.05	2.78	3.25	8.95	3.02	2.96	8.88	3.21	2.77	7.25	3.14	2.31
10	8.77	2.40	3.65	8.96	2.67	3.36	8.99	2.91	3.09	9.02	3.10	2.91	7.95	3.23	2.46
12	9.17	2.43	3.78	8.75	2.53	3.46	8.95	2.81	3.19	9.08	3.03	3.00	8.69	3.16	2.75
14	9.29	2.44	3.81	8.57	2.46	3.49	8.85	2.76	3.21	9.04	2.99	3.03	8.60	3.05	2.82
15	9.47	2.43	3.89	8.45	2.38	3.55	8.80	2.69	3.27	9.04	2.93	3.09	8.72	3.29	2.65
19	9.38	2.20	4.27	8.38	2.20	3.81	8.22	2.39	3.43	8.11	2.56	3.17	9.49	3.27	2.90
20	9.35	2.14	4.36	8.36	2.18	3.83	8.07	2.32	3.47	7.88	2.47	3.19	/	/	/
25	9.33	1.94	4.80	8.32	1.97	4.23	7.76	2.13	3.65	7.38	2.26	3.27	/	/	/
30	9.37	1.81	5.17	8.70	1.84	4.73	7.89	2.01	3.92	7.34	2.20	3.33	/	/	/
35	9.63	1.72	5.61	8.97	1.76	5.11	/	/	/	/	/	/	/	/	/
40	9.89	1.63	6.08	/	/	/	/	/	/	/	/	/	/	/	/
43	10.25	1.63	6.30	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 16kW models

Maximum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	7.69	4.03	1.91	7986.00	4132.04	1.93	6.61	4.01	1.65	5.89	4.43	1.33	4.96	4.21	1.18
-20	9.57	4.02	2.38	9.71	4.43	2.19	8.16	4.77	1.71	7.48	4.76	1.57	6.55	4.85	1.35
-15	11.84	4.37	2.71	11.27	4.60	2.45	10.71	4.93	2.17	10.07	5.24	1.92	9.03	5.38	1.68
-10	13.40	4.51	2.97	13.03	4.79	2.72	12.68	5.10	2.49	12.42	5.45	2.28	11.05	5.64	1.96
-7	14.34	4.59	3.13	14.09	4.89	2.88	13.87	5.19	2.67	13.84	5.55	2.50	13.13	6.02	2.18
-5	14.55	4.19	3.47	14.25	4.55	3.13	13.98	4.88	2.86	13.84	5.31	2.61	13.38	5.88	2.28
-2	14.38	3.84	3.74	13.90	4.08	3.41	13.70	4.46	3.07	13.48	4.96	2.72	13.53	5.56	2.43
0	15.09	3.49	4.33	14.46	3.85	3.75	14.27	4.27	3.34	13.85	4.80	2.88	14.06	5.33	2.64
2	15.73	3.36	4.68	15.10	3.86	3.91	14.72	4.38	3.36	14.48	4.75	3.05	14.73	5.42	2.72
5	16.79	3.24	5.19	16.53	4.07	4.06	16.07	3.98	4.04	15.64	4.56	3.43	15.88	4.96	3.20
7	17.48	3.16	5.53	16.91	3.68	4.60	16.79	3.79	4.43	16.35	4.25	3.85	16.62	4.80	3.46
10	18.01	2.99	6.02	17.76	3.58	4.96	17.58	3.71	4.74	17.07	4.31	3.96	17.33	4.72	3.67
12	18.52	2.88	6.44	18.22	3.30	5.52	18.07	3.55	5.08	17.74	4.19	4.23	18.00	4.63	3.89
14	18.65	2.83	6.60	18.31	3.19	5.75	18.18	3.49	5.22	17.94	4.14	4.33	18.21	4.60	3.96
15	18.89	2.76	6.84	18.52	3.06	6.05	18.41	3.40	5.41	18.26	4.08	4.48	18.53	4.53	4.09
19	17.55	2.25	7.79	17.15	2.49	6.89	17.04	2.82	6.05	16.77	3.36	4.99	16.59	3.92	4.24
20	17.22	2.14	8.03	16.81	2.37	7.10	16.70	2.69	6.21	16.39	3.20	5.12	16.11	3.77	4.28
25	16.48	1.86	8.86	16.19	2.23	7.26	16.24	2.34	6.94	16.15	2.78	5.81	15.73	3.23	4.87
30	15.63	1.55	10.09	15.46	1.88	8.21	15.37	2.00	7.68	15.41	2.37	6.49	15.05	2.76	5.46
35	16.57	1.53	10.82	16.35	1.81	9.01	16.31	1.94	8.42	16.23	2.36	6.87	15.88	2.79	5.68
40	16.90	1.47	11.46	17.64	1.75	10.06	17.25	1.88	9.15	17.35	2.40	7.24	16.41	2.78	5.91
43	17.24	1.46	11.84	17.99	1.71	10.51	17.59	1.88	9.37	17.70	2.39	7.41	16.74	2.70	6.20
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	5.85	4.54	1.29	5.37	4.63	1.16	5.07	4.90	1.04	/	/	/	/	/	/
-15	7.53	5.32	1.42	6.82	5.29	1.29	6.58	5.46	1.21	6.42	5.59	1.15	/	/	/
-10	9.49	5.58	1.70	8.92	5.92	1.51	7.79	5.74	1.36	7.04	5.59	1.26	/	/	/
-7	12.86	6.22	2.07	12.54	6.27	2.00	9.94	6.17	1.61	8.25	6.18	1.33	/	/	/
-5	12.95	5.82	2.22	12.60	6.14	2.05	10.21	5.94	1.72	8.62	5.97	1.45	/	/	/
-2	13.02	5.53	2.35	12.59	5.85	2.15	10.47	5.75	1.82	9.06	5.74	1.58	/	/	/
0	13.42	5.35	2.51	12.84	5.68	2.26	10.87	5.60	1.94	9.56	5.54	1.72	/	/	/
2	14.08	5.40	2.61	13.65	5.74	2.38	12.08	5.78	2.09	11.03	5.82	1.89	/	/	/
5	15.26	5.05	3.02	14.47	5.44	2.66	13.42	5.29	2.53	12.71	5.36	2.37	10.71	5.70	1.88
7	16.20	5.11	3.17	16.20	5.73	2.83	14.91	5.45	2.74	14.06	5.34	2.63	11.28	5.13	2.20
10	16.69	5.12	3.26	16.05	5.36	2.99	15.01	5.14	2.92	14.32	5.13	2.79	12.23	4.97	2.46
12	17.33	4.96	3.50	16.82	5.57	3.02	15.48	5.05	3.07	14.59	4.98	2.93	12.40	4.98	2.49
14	17.52	4.89	3.59	17.09	5.68	3.01	15.61	5.01	3.12	14.62	4.92	2.97	12.40	4.86	2.55
15	17.83	4.79	3.72	17.46	5.76	3.03	15.83	4.95	3.20	14.75	4.83	3.06	12.47	4.80	2.60
19	15.26	4.21	3.63	15.45	4.66	3.32	14.26	4.48	3.19	13.46	4.47	3.01	12.76	4.58	2.79
20	15.30	4.25	3.60	14.95	4.41	3.39	13.86	4.36	3.18	13.14	4.39	3.00	/	/	/
25	15.60	3.72	4.20	14.06	3.70	3.80	13.26	3.93	3.37	12.73	4.15	3.07	/	/	/
30	15.71	3.28	4.79	13.56	3.18	4.26	12.83	3.63	3.53	12.34	3.98	3.10	/	/	/
35	15.00	3.00	5.01	13.37	2.93	4.56	/	/	/	/	/	/	/	/	/
40	15.58	2.98	5.22	/	/	/	/	/	/	/	/	/	/	/	/
43	15.89	2.94	5.41	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 16kW models

Normal															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	6.57	3.24	2.03	6.79	3.29	2.06	5.57	3.21	1.73	5.04	3.65	1.38	4.30	3.60	1.19
-20	8.42	3.29	2.56	8.50	3.59	2.37	7.07	3.88	1.82	6.59	3.99	1.65	5.74	4.14	1.39
-15	9.89	3.37	2.93	9.35	3.52	2.66	8.80	3.79	2.32	8.41	4.14	2.03	7.38	4.26	1.73
-10	11.06	3.51	3.15	10.69	3.68	2.90	10.30	3.95	2.61	10.26	4.34	2.37	9.25	4.59	2.01
-7	13.87	4.27	3.25	13.54	4.44	3.05	13.30	4.93	2.70	13.09	4.98	2.63	12.90	5.79	2.23
-5	13.71	3.85	3.56	13.62	4.13	3.30	13.20	4.47	2.95	13.12	4.86	2.70	12.73	5.49	2.32
-2	13.00	3.35	3.88	12.90	3.57	3.62	12.67	4.03	3.14	12.60	4.44	2.84	12.58	5.05	2.49
0	13.10	2.90	4.52	13.04	3.25	4.01	12.93	3.80	3.40	12.74	4.21	3.03	12.78	4.72	2.71
2	13.25	2.61	5.07	13.10	3.18	4.12	13.00	3.71	3.50	12.72	3.97	3.20	12.80	4.49	2.85
5	14.14	2.52	5.61	13.66	3.19	4.28	13.46	3.09	4.35	13.09	3.58	3.66	13.14	3.88	3.39
7	16.96	2.87	5.91	16.14	3.16	5.11	16.00	3.56	4.50	15.74	3.99	3.94	16.00	4.44	3.60
10	14.24	2.14	6.66	13.89	2.57	5.42	13.48	2.61	5.16	13.16	3.01	4.36	13.21	3.33	3.97
12	14.54	2.03	7.16	14.28	2.32	6.17	14.03	2.52	5.58	13.72	2.93	4.68	13.76	3.26	4.22
14	14.59	1.99	7.35	14.38	2.22	6.49	14.21	2.48	5.74	13.90	2.90	4.80	13.94	3.23	4.32
15	14.73	1.93	7.63	14.57	2.11	6.89	14.48	2.43	5.97	14.18	2.85	4.98	14.21	3.19	4.46
19	13.56	1.55	8.76	13.44	1.75	7.69	13.26	1.98	6.70	12.95	2.32	5.59	12.62	2.71	4.66
20	13.27	1.47	9.04	13.16	1.67	7.89	12.95	1.88	6.88	12.65	2.20	5.75	12.22	2.59	4.71
25	12.82	1.29	9.97	12.68	1.57	8.06	12.73	1.65	7.71	12.67	1.75	7.22	12.01	2.24	5.36
30	12.51	1.11	11.29	12.23	1.35	9.06	11.83	1.40	8.47	12.41	1.55	7.98	11.83	2.06	5.74
35	13.36	1.11	12.03	13.24	1.34	9.90	12.80	1.41	9.06	13.22	1.79	7.40	12.48	2.07	6.02
40	14.11	1.10	12.83	14.57	1.31	11.13	13.88	1.40	9.91	14.14	1.80	7.86	13.22	2.10	6.30
43	14.65	1.10	13.33	15.13	1.29	11.71	14.43	1.41	10.21	14.69	1.81	8.10	13.74	2.06	6.66
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	5.15	3.88	1.33	4.89	4.18	1.17	4.74	4.68	1.01	/	/	/	/	/	/
-15	6.18	4.21	1.47	5.71	4.40	1.30	5.54	4.61	1.20	5.43	4.77	1.14	/	/	/
-10	7.98	4.55	1.75	7.51	4.83	1.55	6.60	4.75	1.39	5.99	4.69	1.28	/	/	/
-7	12.38	5.83	2.12	12.50	6.19	2.02	9.61	5.89	1.63	7.69	5.60	1.37	/	/	/
-5	12.41	5.51	2.25	11.67	5.63	2.07	9.30	5.24	1.77	7.88	5.32	1.48	/	/	/
-2	12.49	5.19	2.41	11.96	5.45	2.19	9.68	5.14	1.88	8.04	4.99	1.61	/	/	/
0	12.88	4.97	2.59	12.48	5.43	2.30	9.86	4.90	2.01	8.26	4.69	1.76	/	/	/
2	13.02	4.88	2.67	13.40	5.58	2.40	10.71	4.95	2.17	8.92	4.44	2.01	/	/	/
5	13.22	4.25	3.11	13.50	4.91	2.75	11.47	4.37	2.62	10.12	4.09	2.47	8.84	4.54	1.95
7	15.97	4.92	3.24	16.00	5.52	2.90	14.31	5.13	2.79	13.19	4.86	2.72	10.24	4.60	2.23
10	12.45	3.66	3.41	12.07	3.86	3.13	11.53	3.81	3.03	11.18	3.88	2.88	9.92	3.93	2.52
12	12.96	3.53	3.67	12.69	4.01	3.17	11.93	3.73	3.20	11.43	3.76	3.04	10.08	3.83	2.63
14	13.14	3.48	3.77	12.91	4.08	3.16	12.05	3.70	3.26	11.47	3.71	3.09	10.10	3.85	2.62
15	13.39	3.41	3.92	13.22	4.13	3.20	12.24	3.65	3.35	11.59	3.64	3.19	10.18	3.81	2.67
19	11.36	2.95	3.85	11.60	3.29	3.52	10.93	3.25	3.36	10.49	3.32	3.16	10.49	3.65	2.87
20	11.36	2.96	3.84	11.19	3.10	3.61	10.61	3.15	3.36	10.22	3.24	3.15	/	/	/
25	11.66	2.61	4.47	10.59	2.62	4.04	10.07	2.83	3.57	9.73	3.01	3.23	/	/	/
30	11.86	2.34	5.07	10.02	2.33	4.31	10.05	2.73	3.68	10.06	3.12	3.23	/	/	/
35	11.55	2.16	5.34	10.38	2.19	4.74	/	/	/	/	/	/	/	/	/
40	12.31	2.19	5.61	/	/	/	/	/	/	/	/	/	/	/	/
43	12.79	2.19	5.85	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

Heating capacity for 16kW models

Minimum															
DB	LWT														
	25			30			35			40			45		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	4.38	2.11	2.08	4.74	2.25	2.11	4.30	2.45	1.76	4.01	2.86	1.40	3.33	2.77	1.20
-20	5.31	2.04	2.60	5.58	2.33	2.40	4.61	2.50	1.85	4.36	2.60	1.68	4.25	3.10	1.37
-15	6.45	2.15	3.00	6.37	2.34	2.72	5.94	2.50	2.38	5.77	2.77	2.08	5.78	3.33	1.73
-10	5.70	1.74	3.27	5.80	1.93	3.01	5.52	2.06	2.68	5.63	2.31	2.43	5.75	2.80	2.05
-7	5.38	1.53	3.52	4.96	1.55	3.21	4.99	1.68	2.97	5.58	1.99	2.80	6.83	2.86	2.38
-5	5.60	1.43	3.93	5.16	1.47	3.50	5.17	1.62	3.20	5.72	1.94	2.94	7.09	2.84	2.50
-2	5.64	1.33	4.26	5.22	1.36	3.83	5.17	1.50	3.44	5.67	1.84	3.08	7.27	2.71	2.68
0	6.04	1.22	4.94	5.62	1.33	4.23	5.49	1.46	3.76	5.93	1.81	3.28	7.66	2.62	2.92
2	6.35	1.18	5.39	5.69	1.31	4.34	5.82	1.42	4.10	6.28	1.77	3.56	8.12	2.55	3.19
5	6.80	1.13	5.99	6.53	1.41	4.64	6.27	1.36	4.60	6.77	1.71	3.95	8.74	2.43	3.59
7	6.96	1.08	6.43	6.56	1.22	5.38	6.43	1.27	5.08	6.97	1.56	4.46	9.02	2.26	3.99
10	6.51	0.93	7.01	6.78	1.19	5.70	6.93	1.27	5.44	7.44	1.62	4.59	9.58	2.31	4.15
12	6.65	0.89	7.51	6.84	1.06	6.48	7.15	1.22	5.86	7.99	1.63	4.92	9.98	2.27	4.40
14	6.66	0.86	7.71	6.81	1.00	6.81	7.20	1.20	6.02	8.20	1.63	5.04	10.09	2.25	4.49
15	6.71	0.84	7.99	6.82	0.94	7.22	7.29	1.17	6.26	8.45	1.62	5.22	10.26	2.21	4.64
19	6.76	0.74	9.17	6.86	0.85	8.06	7.10	1.01	7.02	8.23	1.41	5.86	9.28	1.92	4.84
20	6.77	0.72	9.46	6.86	0.83	8.27	7.05	0.98	7.21	8.17	1.36	6.02	9.04	1.85	4.89
25	6.92	0.66	10.44	7.00	0.83	8.45	7.34	0.91	8.07	7.99	1.17	6.82	8.98	1.61	5.57
30	7.29	0.62	11.79	7.58	0.80	9.48	8.38	0.96	8.70	8.91	1.21	7.36	8.88	1.47	6.03
35	7.75	0.61	12.73	8.28	0.79	10.48	9.05	0.94	9.60	9.48	1.21	7.85	9.34	1.48	6.33
40	8.22	0.61	13.58	9.00	0.76	11.79	9.75	0.93	10.51	9.89	1.19	8.34	9.68	1.46	6.62
43	8.64	0.61	14.11	9.45	0.76	12.40	10.20	0.94	10.83	10.35	1.21	8.59	10.21	1.46	7.00
DB	LWT														
	50			55			58			60			65		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
-25	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
-20	4.10	3.11	1.32	3.81	3.14	1.21	3.64	3.60	1.01	/	/	/	/	/	/
-15	5.20	3.54	1.47	4.78	3.66	1.30	4.69	3.88	1.21	4.62	4.04	1.15	/	/	/
-10	5.41	3.03	1.79	5.53	3.49	1.58	5.04	3.56	1.42	4.71	3.62	1.30	/	/	/
-7	6.94	3.17	2.19	7.11	3.30	2.15	6.06	3.53	1.72	5.36	3.80	1.41	/	/	/
-5	7.12	3.00	2.37	7.31	3.32	2.20	6.34	3.46	1.83	5.69	3.72	1.53	/	/	/
-2	7.26	2.85	2.55	7.34	3.20	2.30	6.52	3.35	1.95	5.98	3.57	1.68	/	/	/
0	7.58	2.76	2.75	7.52	3.11	2.42	6.80	3.26	2.09	6.32	3.43	1.84	/	/	/
2	8.06	2.79	2.89	8.23	3.13	2.63	7.74	3.27	2.36	7.41	3.43	2.16	/	/	/
5	8.70	2.69	3.24	9.11	3.13	2.91	8.83	3.20	2.76	8.65	3.36	2.57	7.55	3.63	2.08
7	9.01	2.58	3.49	9.96	3.13	3.19	9.66	3.22	3.00	9.46	3.29	2.87	7.87	3.41	2.31
10	9.56	2.66	3.59	10.16	3.11	3.27	9.93	3.13	3.17	9.78	3.24	3.02	8.66	3.38	2.56
12	10.34	2.68	3.86	10.82	3.27	3.30	10.44	3.13	3.34	10.18	3.21	3.17	8.97	3.29	2.73
14	10.64	2.68	3.97	11.05	3.35	3.30	10.60	3.12	3.39	10.30	3.19	3.23	9.04	3.39	2.67
15	11.00	2.67	4.12	11.35	3.41	3.33	10.82	3.10	3.49	10.47	3.16	3.32	9.17	3.37	2.72
19	9.50	2.35	4.05	10.13	2.76	3.67	9.83	2.81	3.50	9.63	2.93	3.29	9.68	3.30	2.93
20	9.55	2.37	4.03	9.82	2.62	3.75	9.58	2.74	3.50	9.42	2.87	3.28	/	/	/
25	9.89	2.11	4.69	9.38	2.23	4.21	9.17	2.47	3.71	9.04	2.69	3.36	/	/	/
30	10.08	1.89	5.33	8.95	1.95	4.60	9.01	2.32	3.88	9.05	2.66	3.40	/	/	/
35	9.77	1.74	5.61	9.23	1.85	4.98	/	/	/	/	/	/	/	/	/
40	10.30	1.75	5.90	/	/	/	/	/	/	/	/	/	/	/	/
43	10.75	1.75	6.15	/	/	/	/	/	/	/	/	/	/	/	/

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
HC: Total heating capacity (kW)
PI: Power input (kW)

4.2 Cooling Capacity Tables (Test standard：EN14511)

Cooling capacity for 4kW models

Maximum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	4.76	0.46	10.30	5.19	0.50	10.32	5.47	0.55	10.01	6.09	0.48	12.66
0	/	/	/	/	/	/	/	/	/	/	/	/	4.54	0.57	8.03	4.96	0.61	8.19	5.25	0.65	8.08	5.87	0.55	10.70
5	/	/	/	/	/	/	/	/	/	/	/	/	4.04	0.67	6.07	4.45	0.71	6.30	4.75	0.75	6.34	5.37	0.65	8.28
10	/	/	/	/	/	/	/	/	/	4.88	0.84	5.78	6.06	1.06	5.71	6.34	1.03	6.15	6.44	1.01	6.40	7.11	0.85	8.37
15	/	/	/	/	/	/	5.05	0.93	5.42	5.66	1.04	5.45	8.09	1.46	5.55	8.13	1.33	6.10	8.14	1.26	6.44	8.85	1.05	8.43
19	4.48	0.99	4.53	5.06	1.07	4.75	5.82	1.14	5.11	6.28	1.21	5.18	8.14	1.49	5.48	8.25	1.36	6.06	8.29	1.29	6.42	8.96	1.09	8.21
20	4.72	1.04	4.53	5.27	1.11	4.73	6.01	1.20	5.03	6.44	1.26	5.12	8.16	1.49	5.47	8.28	1.37	6.05	8.33	1.30	6.42	8.98	1.10	8.15
25	5.87	1.30	4.51	6.30	1.36	4.65	6.97	1.43	4.88	7.22	1.45	4.98	8.23	1.53	5.39	8.41	1.40	6.00	8.52	1.33	6.40	9.12	1.15	7.90
30	5.84	1.55	3.78	6.21	1.56	3.99	6.80	1.59	4.28	7.00	1.60	4.36	7.77	1.65	4.72	8.09	1.54	5.27	8.19	1.46	5.63	8.77	1.30	6.75
35	5.80	1.79	3.24	6.11	1.84	3.32	6.64	1.79	3.70	6.77	1.78	3.82	7.31	1.71	4.28	7.65	1.62	4.73	7.87	1.55	5.06	8.43	1.44	5.84
40	3.80	1.51	2.52	4.36	1.65	2.64	5.08	1.81	2.81	5.25	1.79	2.93	5.91	1.73	3.41	6.36	1.70	3.75	6.63	1.68	3.95	7.88	1.64	4.80
43	2.58	1.15	2.24	3.13	1.33	2.35	3.80	1.52	2.51	4.06	1.53	2.66	5.08	1.56	3.26	5.56	1.56	3.56	5.88	1.57	3.74	7.55	1.59	4.73

Normal

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	3.83	0.33	11.74	4.18	0.35	11.97	4.45	0.37	11.92	4.95	0.35	14.10
0	/	/	/	/	/	/	/	/	/	/	/	/	3.66	0.39	9.35	4.01	0.41	9.70	4.28	0.44	9.81	4.78	0.36	13.31
5	/	/	/	/	/	/	/	/	/	/	/	/	3.23	0.48	6.68	3.56	0.50	7.07	3.81	0.52	7.29	4.36	0.45	9.77
10	/	/	/	/	/	/	/	/	/	3.53	0.58	6.04	4.87	0.77	6.29	5.08	0.73	6.91	5.19	0.70	7.37	5.79	0.59	9.89
15	/	/	/	/	/	/	3.79	0.66	5.71	4.39	0.76	5.75	6.79	1.15	5.89	6.91	1.05	6.56	7.00	0.99	7.06	7.44	0.80	9.29
19	3.48	0.73	4.76	3.92	0.79	4.97	4.64	0.86	5.42	5.08	0.92	5.51	6.80	1.16	5.88	6.99	1.07	6.51	7.14	1.03	6.96	7.74	0.86	9.04
20	3.68	0.77	4.76	4.10	0.83	4.95	4.86	0.91	5.34	5.25	0.96	5.45	6.80	1.16	5.88	7.01	1.08	6.50	7.17	1.03	6.94	7.82	0.87	8.98
25	4.65	0.97	4.78	4.98	1.02	4.88	5.72	1.10	5.18	5.97	1.13	5.29	6.96	1.21	5.74	7.27	1.13	6.45	7.44	1.07	6.98	8.05	0.91	8.85
30	4.69	1.17	4.02	4.97	1.18	4.20	5.67	1.24	4.56	5.87	1.26	4.66	6.67	1.32	5.06	7.03	1.25	5.63	7.25	1.20	6.05	7.85	1.06	7.44
35	4.51	1.36	3.32	4.70	1.36	3.45	4.81	1.20	4.01	4.80	1.16	4.15	4.77	1.01	4.70	4.50	0.81	5.55	4.87	0.85	5.71	5.69	0.89	6.42
40	3.10	1.15	2.70	3.55	1.26	2.81	4.30	1.42	3.03	4.47	1.41	3.16	5.15	1.40	3.68	5.60	1.38	4.07	5.95	1.37	4.34	7.15	1.32	5.41
43	2.12	0.91	2.33	2.45	1.02	2.41	2.99	1.15	2.59	3.20	1.16	2.76	4.04	1.18	3.43	4.58	1.21	3.79	5.04	1.25	4.04	5.97	1.15	5.18

Minimum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	2.48	0.20	12.60	2.69	0.21	12.59	2.87	0.23	12.38	3.21	0.20	15.83
0	/	/	/	/	/	/	/	/	/	/	/	/	2.37	0.24	9.92	2.59	0.26	10.09	2.77	0.27	10.09	3.11	0.23	13.40
5	/	/	/	/	/	/	/	/	/	/	/	/	1.74	0.24	7.35	1.91	0.25	7.62	2.06	0.27	7.76	2.35	0.23	10.17
10	/	/	/	/	/	/	/	/	/	2.79	0.43	6.44	2.70	0.39	6.99	2.82	0.37	7.51	2.90	0.37	7.91	3.21	0.31	10.39
15	/	/	/	/	/	/	2.32	0.38	6.04	2.59	0.42	6.09	3.64	0.58	6.29	3.58	0.50	7.10	3.50	0.45	7.80	4.25	0.41	10.32
19	1.78	0.36	4.96	1.87	0.36	5.24	2.17	0.38	5.71	2.42	0.42	5.81	3.43	0.55	6.24	3.66	0.53	6.88	3.86	0.52	7.41	4.40	0.46	9.66
20	1.86	0.38	4.95	1.93	0.37	5.20	2.13	0.38	5.62	2.38	0.41	5.74	3.38	0.54	6.23	3.68	0.54	6.83	3.95	0.54	7.32	4.44	0.47	9.50
25	2.23	0.46	4.89	2.23	0.44	5.02	2.37	0.45	5.31	2.55	0.47	5.46	3.29	0.54	6.04	3.63	0.54	6.74	3.92	0.53	7.33	4.38	0.47	9.28
30	2.23	0.54	4.10	2.21	0.51	4.35	2.33	0.49	4.73	2.49	0.51	4.85	3.12	0.59	5.30	3.48	0.59	5.89	3.79	0.59	6.38	4.23	0.55	7.72
35	2.05	0.59	3.50	2.22	0.58	3.80	2.53	0.60	4.23	2.63	0.60	4.36	3.01	0.61	4.91	3.35	0.60	5.62	3.66	0.62	5.92	4.23	0.62	6.84
40	1.40	0.52	2.69	1.66	0.58	2.86	2.01	0.64	3.12	2.11	0.65	3.26	2.52	0.66	3.82	2.87	0.68	4.19	3.18	0.71	4.50	4.07	0.74	5.51
43	0.73	0.31	2.38	1.04	0.42	2.49	1.43	0.53	2.68	1.57	0.55	2.86	2.11	0.59	3.57	2.35	0.60	3.90	2.57	0.62	4.17	3.80	0.71	5.38

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
CC: Total cooling capacity (kW)
PI: Power input (kW)

Cooling capacity for 6kW models

Maximum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	5.27	0.59	8.93	5.91	0.57	10.42	6.38	0.55	11.53	6.77	0.64	10.62
0	/	/	/	/	/	/	/	/	/	/	/	/	5.05	0.69	7.28	5.68	0.67	8.49	6.16	0.66	9.39	6.55	0.74	8.85
5	/	/	/	/	/	/	/	/	/	/	/	/	4.55	0.79	5.74	5.17	0.77	6.73	5.66	0.76	7.48	6.05	0.84	7.20
10	/	/	/	/	/	/	/	/	/	5.81	1.25	4.65	6.32	1.13	5.61	6.70	1.06	6.33	6.90	1.01	6.83	7.45	0.95	7.88
15	/	/	/	/	/	/	5.89	1.10	5.33	6.33	1.18	5.38	8.09	1.46	5.55	8.13	1.33	6.10	8.14	1.26	6.44	8.85	1.05	8.43
19	5.06	1.29	3.93	5.87	1.36	4.31	6.48	1.36	4.76	6.81	1.39	4.91	8.14	1.49	5.48	8.25	1.36	6.06	8.29	1.29	6.42	8.96	1.09	8.21
20	5.41	1.38	3.93	6.10	1.43	4.27	6.63	1.43	4.62	6.93	1.45	4.79	8.16	1.49	5.47	8.28	1.37	6.05	8.33	1.30	6.42	8.98	1.10	8.15
25	7.16	1.80	3.98	7.26	1.79	4.07	7.37	1.77	4.17	7.54	1.71	4.42	8.23	1.53	5.39	8.41	1.40	6.00	8.52	1.33	6.40	9.12	1.15	7.90
30	6.50	1.85	3.51	7.15	1.95	3.67	7.29	1.90	3.84	7.39	1.84	4.02	7.77	1.65	4.72	8.09	1.54	5.27	8.19	1.46	5.63	8.77	1.30	6.75
35	6.04	2.09	2.89	7.11	2.39	2.97	7.22	2.03	3.55	7.24	1.95	3.71	7.31	1.68	4.35	7.65	1.64	4.67	7.87	1.58	4.98	8.43	1.44	5.84
40	3.80	1.51	2.52	4.50	1.69	2.66	5.08	1.81	2.81	5.25	1.79	2.93	5.91	1.73	3.41	6.36	1.70	3.75	6.63	1.68	3.95	7.88	1.64	4.80
43	2.58	1.15	2.24	3.24	1.37	2.37	3.80	1.52	2.51	4.06	1.53	2.66	5.08	1.56	3.26	5.56	1.56	3.56	5.88	1.57	3.74	7.55	1.59	4.73

Normal

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	4.24	0.42	10.18	4.76	0.39	12.12	5.19	0.38	13.72	5.50	0.42	12.96
0	/	/	/	/	/	/	/	/	/	/	/	/	4.07	0.48	8.48	4.59	0.46	10.08	5.02	0.44	11.39	5.33	0.48	11.01
5	/	/	/	/	/	/	/	/	/	/	/	/	3.64	0.58	6.31	4.13	0.55	7.56	4.54	0.53	8.61	4.91	0.58	8.49
10	/	/	/	/	/	/	/	/	/	4.69	0.95	4.93	5.08	0.82	6.18	5.37	0.75	7.12	5.55	0.71	7.86	6.06	0.65	9.31
15	/	/	/	/	/	/	4.42	0.78	5.65	4.89	0.86	5.69	6.79	1.15	5.89	6.91	1.05	6.56	7.00	0.99	7.06	7.44	0.80	9.29
19	3.93	0.95	4.12	4.62	1.01	4.58	5.17	1.01	5.10	5.50	1.05	5.25	6.80	1.16	5.88	6.99	1.07	6.51	7.14	1.03	6.96	7.74	0.86	9.04
20	4.22	1.02	4.14	4.84	1.07	4.54	5.36	1.08	4.96	5.65	1.10	5.14	6.80	1.16	5.88	7.01	1.08	6.50	7.17	1.03	6.94	7.82	0.87	8.98
25	5.67	1.35	4.21	5.92	1.36	4.34	6.05	1.35	4.49	6.23	1.31	4.74	6.96	1.21	5.74	7.27	1.13	6.45	7.44	1.07	6.98	8.05	0.91	8.85
30	5.23	1.40	3.74	5.82	1.49	3.91	6.08	1.48	4.10	6.20	1.44	4.29	6.67	1.32	5.06	7.03	1.25	5.63	7.25	1.20	6.05	7.85	1.06	7.44
35	4.74	1.61	2.94	7.00	2.33	3.00	6.85	1.87	3.67	6.86	1.78	3.85	6.87	1.50	4.58	6.55	1.34	4.90	6.87	1.28	5.36	7.69	1.20	6.39
40	3.10	1.15	2.70	3.74	1.31	2.86	4.30	1.42	3.03	4.47	1.41	3.16	5.15	1.40	3.68	5.60	1.38	4.07	5.95	1.37	4.34	7.15	1.32	5.41
43	2.12	0.91	2.33	2.58	1.05	2.46	2.99	1.15	2.59	3.20	1.16	2.76	4.04	1.18	3.43	4.58	1.21	3.79	5.04	1.25	4.04	5.97	1.15	5.18

Minimum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	2.75	0.25	10.92	3.07	0.24	12.69	3.35	0.23	14.26	3.57	0.27	13.17
0	/	/	/	/	/	/	/	/	/	/	/	/	2.64	0.29	9.00	2.96	0.28	10.44	3.25	0.28	11.72	3.47	0.31	11.08
5	/	/	/	/	/	/	/	/	/	/	/	/	1.96	0.28	6.95	2.22	0.27	8.12	2.46	0.27	9.16	2.64	0.30	8.84
10	/	/	/	/	/	/	/	/	/	2.60	0.45	5.73	2.81	0.41	6.87	2.98	0.39	7.72	3.10	0.37	8.44	3.36	0.34	9.78
15	/	/	/	/	/	/	2.71	0.45	5.99	2.89	0.48	6.05	3.64	0.58	6.29	3.58	0.50	7.10	3.50	0.45	7.80	4.25	0.41	10.32
19	2.07	0.48	4.29	2.20	0.46	4.77	2.42	0.45	5.34	2.62	0.47	5.52	3.43	0.55	6.24	3.66	0.53	6.88	3.86	0.52	7.41	4.40	0.46	9.66
20	2.13	0.50	4.30	2.25	0.48	4.72	2.35	0.45	5.17	2.55	0.47	5.39	3.38	0.54	6.23	3.68	0.54	6.83	3.95	0.54	7.32	4.44	0.47	9.50
25	2.42	0.56	4.31	2.49	0.55	4.50	2.50	0.53	4.72	2.66	0.53	4.98	3.29	0.54	6.04	3.63	0.54	6.74	3.92	0.53	7.33	4.38	0.47	9.28
30	2.48	0.65	3.81	2.49	0.61	4.05	2.49	0.58	4.30	2.62	0.58	4.50	3.12	0.59	5.30	3.48	0.59	5.89	3.79	0.59	6.38	4.23	0.55	7.72
35	2.07	0.62	3.31	2.44	0.67	3.65	2.75	0.69	4.00	2.80	0.67	4.20	3.01	0.60	4.99	3.35	0.60	5.62	3.66	0.63	5.81	4.23	0.62	6.84
40	1.40	0.52	2.69	1.73	0.60	2.90	2.01	0.64	3.12	2.11	0.65	3.26	2.52	0.66	3.82	2.87	0.68	4.19	3.18	0.71	4.50	4.07	0.74	5.51
43	0.73	0.31	2.38	1.09	0.43	2.52	1.43	0.53	2.68	1.57	0.55	2.86	2.11	0.59	3.57	2.35	0.60	3.90	2.57	0.62	4.17	3.80	0.71	5.38

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
CC: Total cooling capacity (kW)
PI: Power input (kW)

Cooling capacity for 8kW models

Maximum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	6.39	0.63	10.07	7.40	0.70	10.51	8.21	0.76	10.82	8.74	0.71	12.31
0	/	/	/	/	/	/	/	/	/	/	/	/	6.17	0.71	8.69	6.81	0.73	9.28	7.26	0.74	9.76	7.76	0.70	11.05
5	/	/	/	/	/	/	/	/	/	/	/	/	5.96	0.82	7.30	6.21	0.77	8.04	6.30	0.72	8.69	6.78	0.69	9.78
10	/	/	/	/	/	/	/	/	/	5.07	0.65	7.86	6.29	0.74	8.54	7.20	0.80	9.05	7.91	0.84	9.45	8.30	0.79	10.53
15	/	/	/	/	/	/	5.97	0.87	6.84	6.24	0.90	6.95	7.33	0.99	7.38	8.34	1.08	7.71	9.11	1.15	7.94	9.73	1.12	8.67
19	5.52	1.09	5.08	6.31	1.19	5.30	6.84	1.19	5.74	7.11	1.21	5.88	8.17	1.27	6.45	9.25	1.39	6.63	10.1	1.50	6.73	10.9	1.51	7.18
20	5.68	1.15	4.96	6.46	1.25	5.18	7.06	1.29	5.46	7.33	1.31	5.61	8.38	1.35	6.22	9.47	1.49	6.36	10.3	1.60	6.43	11.6	1.64	6.81
25	6.47	1.48	4.36	7.25	1.59	4.56	7.82	1.63	4.81	8.11	1.64	4.95	9.26	1.68	5.52	10.4	1.81	5.75	11.3	1.90	5.92	12.8	2.02	6.33
30	7.27	1.89	3.85	8.03	1.99	4.03	8.57	2.01	4.25	8.89	2.02	4.39	10.2	2.06	4.93	11.3	2.15	5.26	12.2	2.20	5.54	14.4	2.40	6.00
35	7.39	2.37	3.12	8.20	2.55	3.21	8.77	2.31	3.80	9.06	2.31	3.93	10.2	2.31	4.43	11.1	2.37	4.69	11.7	2.40	4.89	13.6	2.50	5.42
40	6.61	2.52	2.62	7.11	2.49	2.86	7.42	2.37	3.14	7.71	2.40	3.21	8.88	2.53	3.51	9.69	2.54	3.81	10.2	2.51	4.07	12.3	2.83	4.34
43	5.09	2.28	2.23	5.44	2.28	2.39	5.64	2.19	2.58	5.86	2.17	2.70	6.73	2.13	3.16	7.55	2.17	3.48	8.15	2.17	3.75	10.04	2.49	4.03

Normal

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	5.14	0.45	11.38	5.97	0.50	12.01	6.68	0.53	12.50	7.10	0.51	14.03
0	/	/	/	/	/	/	/	/	/	/	/	/	4.98	0.50	9.94	5.50	0.51	10.69	5.91	0.52	11.31	6.31	0.49	12.86
5	/	/	/	/	/	/	/	/	/	/	/	/	4.77	0.60	7.96	4.96	0.56	8.88	5.05	0.52	9.69	5.50	0.51	10.76
10	/	/	/	/	/	/	/	/	/	4.10	0.49	8.42	5.05	0.54	9.32	5.77	0.58	10.00	6.37	0.60	10.55	6.75	0.58	11.60
15	/	/	/	/	/	/	4.48	0.62	7.24	4.82	0.65	7.36	6.16	0.79	7.83	7.07	0.85	8.32	7.83	0.90	8.70	8.17	0.86	9.55
19	4.29	0.80	5.34	4.98	0.88	5.64	5.46	0.89	6.14	5.74	0.91	6.29	6.82	0.99	6.92	7.82	1.09	7.15	8.66	1.19	7.30	9.40	1.19	7.91
20	4.43	0.85	5.21	5.12	0.93	5.52	5.71	0.97	5.86	5.97	0.99	6.03	6.99	1.04	6.69	8.01	1.17	6.86	8.87	1.28	6.95	9.71	1.29	7.50
25	5.13	1.11	4.61	5.83	1.20	4.87	6.42	1.24	5.17	6.70	1.26	5.31	7.84	1.33	5.87	8.92	1.44	6.20	9.82	1.52	6.46	11.3	1.59	7.09
30	5.84	1.42	4.10	6.56	1.52	4.31	7.14	1.57	4.54	7.45	1.59	4.69	8.71	1.65	5.28	9.85	1.74	5.65	10.80	1.82	5.94	12.9	1.95	6.61
35	5.75	1.79	3.20	7.40	2.19	3.38	7.70	1.89	4.07	7.82	1.86	4.21	8.32	1.74	4.77	8.40	1.66	5.05	10.25	1.95	5.26	12.4	2.09	5.94
40	5.40	1.92	2.81	5.89	1.91	3.08	6.27	1.86	3.38	6.56	1.90	3.46	7.73	2.04	3.79	8.54	2.06	4.15	9.18	2.06	4.47	11.1	2.28	4.89
43	4.18	1.80	2.32	4.35	1.75	2.49	4.44	1.66	2.67	4.62	1.65	2.80	5.36	1.61	3.32	6.23	1.68	3.71	6.98	1.72	4.06	7.94	1.80	4.41

Minimum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	3.33	0.28	11.86	3.84	0.31	12.42	4.31	0.33	12.89	4.60	0.31	14.71
0	/	/	/	/	/	/	/	/	/	/	/	/	3.23	0.31	10.38	3.55	0.32	11.13	3.83	0.32	11.79	4.11	0.31	13.34
5	/	/	/	/	/	/	/	/	/	/	/	/	2.57	0.30	8.55	2.67	0.28	9.46	2.74	0.27	10.29	2.96	0.26	11.57
10	/	/	/	/	/	/	/	/	/	2.27	0.25	9.25	2.80	0.28	10.11	3.20	0.30	10.75	3.56	0.31	11.31	3.75	0.30	12.59
15	/	/	/	/	/	/	2.75	0.36	7.69	2.86	0.37	7.82	3.30	0.39	8.37	3.63	0.40	9.03	3.92	0.41	9.62	4.67	0.44	10.61
19	2.19	0.40	5.55	2.34	0.40	5.87	2.55	0.40	6.43	2.73	0.41	6.61	3.44	0.47	7.35	4.09	0.54	7.60	4.69	0.60	7.79	5.34	0.63	8.47
20	2.24	0.41	5.42	2.38	0.42	5.73	2.50	0.41	6.12	2.69	0.43	6.31	3.47	0.49	7.09	4.20	0.58	7.24	4.88	0.67	7.33	5.51	0.69	7.93
25	2.46	0.52	4.73	2.57	0.51	5.05	2.66	0.49	5.43	2.87	0.51	5.58	3.71	0.60	6.18	4.47	0.69	6.51	5.18	0.76	6.78	6.12	0.82	7.44
30	2.78	0.66	4.19	2.86	0.64	4.45	2.93	0.62	4.76	3.16	0.64	4.91	4.08	0.74	5.53	4.89	0.82	5.93	5.64	0.90	6.28	6.92	1.01	6.86
35	2.62	0.74	3.54	2.99	0.77	3.89	3.34	0.78	4.28	3.51	0.79	4.45	4.21	0.82	5.12	4.86	0.90	5.43	5.46	0.96	5.70	6.82	1.07	6.36
40	2.44	0.87	2.80	2.70	0.86	3.12	2.94	0.84	3.48	3.11	0.87	3.57	3.79	0.97	3.93	4.38	1.02	4.30	4.91	1.06	4.64	6.34	1.28	4.97
43	1.43	0.60	2.37	1.78	0.70	2.55	2.12	0.77	2.76	2.26	0.78	2.90	2.80	0.81	3.46	3.20	0.83	3.84	3.55	0.85	4.18	5.06	1.11	4.58

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
CC: Total cooling capacity (kW)
PI: Power input (kW)

Cooling capacity for 10kW models

Maximum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	6.83	0.69	9.92	7.94	0.77	10.35	8.79	0.82	10.66	9.35	0.77	12.13
0	/	/	/	/	/	/	/	/	/	/	/	/	6.61	0.77	8.56	7.30	0.80	9.14	7.76	0.81	9.61	8.30	0.76	10.88
5	/	/	/	/	/	/	/	/	/	/	/	/	6.38	0.89	7.19	6.66	0.84	7.92	6.74	0.79	8.56	7.25	0.75	9.63
10	/	/	/	/	/	/	/	/	/	5.30	0.69	7.69	6.55	0.75	8.73	7.48	0.79	9.51	8.17	0.80	10.18	8.80	0.86	10.22
15	/	/	/	/	/	/	6.30	1.07	5.89	6.56	1.06	6.18	7.61	1.03	7.35	8.68	1.10	7.91	9.48	1.13	8.38	10.64	1.20	8.84
19	6.01	1.21	4.98	6.52	1.28	5.11	7.01	1.32	5.31	7.30	1.33	5.50	8.46	1.35	6.25	9.64	1.45	6.63	10.53	1.52	6.93	12.12	1.57	7.73
20	6.20	1.28	4.86	6.72	1.35	4.98	7.19	1.39	5.17	7.49	1.40	5.33	8.67	1.45	5.97	9.88	1.57	6.31	10.79	1.64	6.57	12.49	1.68	7.45
25	7.13	1.68	4.24	7.73	1.77	4.37	8.26	1.81	4.56	8.59	1.83	4.70	9.87	1.88	5.24	11.11	2.00	5.55	12.00	2.07	5.79	13.93	2.17	6.42
30	8.06	2.17	3.71	8.63	2.24	3.86	9.34	2.31	4.05	9.68	2.33	4.16	11.08	2.40	4.62	12.34	2.51	4.91	13.21	2.57	5.14	15.37	2.79	5.51
35	8.13	2.70	3.01	8.53	2.72	3.13	9.48	2.43	3.72	9.79	2.57	3.82	11.03	2.62	4.21	12.05	2.68	4.49	12.70	2.68	4.73	14.51	2.87	5.06
40	6.61	2.52	2.62	7.04	2.46	2.86	7.42	2.37	3.14	7.71	2.40	3.21	8.88	2.53	3.51	9.71	2.55	3.81	10.23	2.51	4.07	12.27	2.83	4.34
43	5.09	2.28	2.23	5.39	2.25	2.39	5.64	2.19	2.58	5.86	2.17	2.70	6.73	2.13	3.16	7.56	2.17	3.48	8.15	2.17	3.75	10.04	2.49	4.03

Normal

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	5.50	0.49	11.21	6.40	0.54	11.83	7.15	0.58	12.31	7.59	0.55	13.82
0	/	/	/	/	/	/	/	/	/	/	/	/	5.33	0.54	9.79	5.90	0.56	10.53	6.33	0.57	11.14	6.75	0.53	12.66
5	/	/	/	/	/	/	/	/	/	/	/	/	5.11	0.65	7.84	5.32	0.61	8.74	5.41	0.57	9.54	5.88	0.56	10.60
10	/	/	/	/	/	/	/	/	/	4.29	0.52	8.22	5.26	0.55	9.53	5.99	0.57	10.51	6.58	0.58	11.37	7.16	0.64	11.26
15	/	/	/	/	/	/	4.73	0.76	6.24	5.06	0.77	6.55	6.39	0.82	7.80	7.36	0.86	8.54	8.15	0.89	9.18	8.94	0.92	9.74
19	4.67	0.89	5.23	5.18	0.95	5.43	5.60	0.98	5.69	5.89	1.00	5.89	7.06	1.05	6.70	8.16	1.14	7.15	9.06	1.21	7.51	10.48	1.23	8.51
20	4.83	0.95	5.11	5.36	1.01	5.31	5.82	1.05	5.55	6.10	1.07	5.72	7.23	1.13	6.42	8.35	1.23	6.80	9.29	1.31	7.10	10.87	1.32	8.21
25	5.65	1.26	4.49	6.25	1.34	4.68	6.78	1.38	4.91	7.10	1.41	5.04	8.35	1.50	5.58	9.53	1.59	5.99	10.47	1.66	6.32	12.30	1.71	7.18
30	6.48	1.64	3.95	7.17	1.74	4.12	7.78	1.80	4.32	8.12	1.83	4.45	9.51	1.92	4.95	10.73	2.04	5.26	11.69	2.12	5.51	13.76	2.26	6.08
35	6.31	2.01	3.15	8.20	2.48	3.30	8.57	2.16	3.96	8.68	2.13	4.07	9.09	2.05	4.43	10.00	2.08	4.80	11.08	2.18	5.09	13.23	2.39	5.54
40	5.40	1.92	2.81	5.87	1.90	3.08	6.27	1.86	3.38	6.56	1.90	3.46	7.73	2.04	3.79	8.56	2.06	4.15	9.18	2.06	4.47	11.14	2.28	4.89
43	4.18	1.80	2.32	4.33	1.74	2.49	4.44	1.66	2.67	4.62	1.65	2.80	5.36	1.61	3.32	6.24	1.68	3.71	6.98	1.72	4.06	7.94	1.80	4.41

Minimum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	3.56	0.30	11.68	4.11	0.34	12.24	4.61	0.36	12.69	4.93	0.34	14.49
0	/	/	/	/	/	/	/	/	/	/	/	/	3.46	0.34	10.23	3.80	0.35	10.96	4.09	0.35	11.61	4.39	0.33	13.14
5	/	/	/	/	/	/	/	/	/	/	/	/	2.75	0.33	8.42	2.86	0.31	9.32	2.93	0.29	10.13	3.17	0.28	11.40
10	/	/	/	/	/	/	/	/	/	2.38	0.26	9.04	2.92	0.28	10.33	3.31	0.29	11.30	3.67	0.30	12.18	3.97	0.33	12.22
15	/	/	/	/	/	/	2.90	0.44	6.62	3.00	0.43	6.96	3.42	0.41	8.33	3.77	0.41	9.28	4.08	0.40	10.14	5.11	0.47	10.81
19	2.39	0.44	5.45	2.45	0.43	5.65	2.62	0.44	5.96	2.80	0.45	6.19	3.56	0.50	7.11	4.26	0.56	7.60	4.91	0.61	8.02	5.96	0.65	9.11
20	2.44	0.46	5.31	2.50	0.45	5.52	2.55	0.44	5.79	2.75	0.46	5.99	3.59	0.53	6.81	4.38	0.61	7.18	5.11	0.68	7.49	6.17	0.71	8.68
25	2.71	0.59	4.60	2.77	0.57	4.85	2.81	0.55	5.15	3.04	0.57	5.30	3.95	0.67	5.88	4.76	0.76	6.28	5.52	0.83	6.64	6.69	0.89	7.54
30	3.08	0.76	4.03	3.15	0.74	4.26	3.19	0.70	4.53	3.44	0.74	4.66	4.45	0.86	5.19	5.31	0.96	5.53	6.10	1.05	5.82	7.41	1.18	6.30
35	2.88	0.85	3.37	3.26	0.87	3.76	3.61	0.86	4.19	3.80	0.88	4.32	4.55	0.94	4.86	5.26	1.01	5.21	5.90	1.07	5.52	7.28	1.23	5.93
40	2.44	0.87	2.80	2.70	0.86	3.12	2.94	0.84	3.48	3.11	0.87	3.57	3.79	0.97	3.93	4.38	1.02	4.30	4.91	1.06	4.64	6.34	1.28	4.97
43	1.43	0.60	2.37	1.78	0.70	2.55	2.12	0.77	2.76	2.26	0.78	2.90	2.80	0.81	3.46	3.20	0.83	3.84	3.55	0.85	4.18	5.06	1.11	4.58

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
CC: Total cooling capacity (kW)
PI: Power input (kW)

Cooling capacity for 12kW models

Maximum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	9.55	1.27	7.50	10.05	1.34	7.48	10.39	1.41	7.37	11.39	1.36	8.35
0	/	/	/	/	/	/	/	/	/	/	/	/	9.33	1.57	5.93	10.20	1.53	6.66	10.90	1.49	7.32	11.89	1.50	7.92
5	/	/	/	/	/	/	/	/	/	/	/	/	9.12	1.71	5.32	10.35	1.63	6.33	11.41	1.57	7.27	12.38	1.64	7.57
10	/	/	/	/	/	/	/	/	/	9.13	2.19	4.17	10.81	2.05	5.27	12.07	1.98	6.10	13.14	1.92	6.85	14.18	1.94	7.32
15	/	/	/	/	/	/	10.51	2.32	4.53	10.91	2.32	4.69	12.50	2.33	5.36	13.79	2.30	6.00	14.87	2.27	6.56	15.98	2.24	7.14
19	7.32	1.87	3.92	9.69	2.41	4.01	11.82	2.83	4.19	12.23	2.85	4.29	13.83	2.94	4.70	14.89	2.94	5.07	15.72	2.92	5.37	16.42	2.70	6.09
20	7.78	2.03	3.83	10.09	2.56	3.94	12.15	2.96	4.10	12.55	3.00	4.19	14.16	3.12	4.54	15.17	3.14	4.84	15.93	3.14	5.08	16.53	2.84	5.82
25	10.10	3.00	3.37	12.09	3.38	3.57	13.80	3.61	3.82	14.20	3.67	3.87	15.82	3.91	4.04	16.54	3.97	4.17	17.00	4.01	4.24	17.07	3.44	4.96
30	9.99	3.58	2.79	11.88	3.96	3.00	13.43	4.13	3.25	13.78	4.14	3.33	15.18	4.17	3.64	15.80	4.17	3.79	16.17	4.15	3.90	16.11	3.74	4.31
35	9.89	4.33	2.29	11.81	4.38	2.70	13.07	4.72	2.77	13.36	4.62	2.89	14.53	4.29	3.39	15.05	4.22	3.57	15.34	4.14	3.71	15.26	3.86	3.95
40	8.11	4.53	1.79	9.10	4.50	2.02	9.87	4.33	2.28	10.03	4.24	2.37	10.67	3.92	2.72	11.52	4.00	2.88	12.19	4.05	3.01	13.23	3.77	3.51
43	5.20	3.72	1.40	5.72	3.52	1.63	6.11	3.26	1.87	6.35	3.20	1.98	7.33	3.02	2.43	7.99	3.11	2.57	8.53	3.19	2.67	10.68	3.26	3.27

Normal

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	7.69	0.91	8.47	8.11	0.95	8.54	8.46	0.99	8.51	9.25	0.97	9.52
0	/	/	/	/	/	/	/	/	/	/	/	/	7.53	1.11	6.78	8.25	1.07	7.68	8.89	1.05	8.48	9.67	1.05	9.22
5	/	/	/	/	/	/	/	/	/	/	/	/	7.30	1.26	5.80	8.27	1.18	6.99	9.16	1.13	8.10	10.05	1.21	8.32
10	/	/	/	/	/	/	/	/	/	7.36	1.66	4.43	8.68	1.51	5.75	9.68	1.44	6.74	10.57	1.38	7.65	11.54	1.43	8.07
15	/	/	/	/	/	/	7.88	1.62	4.86	8.41	1.66	5.06	10.50	1.80	5.82	11.70	1.76	6.63	12.78	1.74	7.36	13.43	1.67	8.05
19	5.68	1.38	4.12	7.67	1.78	4.30	9.44	2.08	4.54	9.86	2.11	4.67	11.54	2.24	5.16	12.60	2.25	5.59	13.53	2.27	5.96	14.20	2.07	6.86
20	6.07	1.51	4.02	8.01	1.90	4.23	9.83	2.20	4.46	10.22	2.24	4.57	11.81	2.36	4.99	12.82	2.40	5.33	13.71	2.44	5.61	14.39	2.19	6.56
25	8.00	2.24	3.56	9.74	2.53	3.85	11.33	2.71	4.17	11.74	2.78	4.22	13.39	3.04	4.41	14.19	3.09	4.60	14.84	3.14	4.73	15.07	2.65	5.68
30	8.04	2.71	2.97	9.69	3.00	3.23	11.19	3.18	3.52	11.56	3.20	3.61	13.03	3.27	3.99	13.74	3.30	4.16	14.31	3.34	4.28	14.43	2.97	4.86
35	8.98	3.75	2.40	11.60	4.22	2.75	12.13	4.25	2.85	12.10	4.02	3.01	11.97	3.28	3.65	12.00	3.00	4.00	13.39	3.38	3.96	13.91	3.18	4.37
40	6.62	3.45	1.92	7.54	3.43	2.20	8.35	3.35	2.49	8.53	3.29	2.59	9.28	3.09	3.00	10.16	3.17	3.21	10.94	3.24	3.38	12.00	2.97	4.05
43	4.27	2.93	1.45	4.57	2.68	1.70	4.80	2.44	1.97	5.01	2.39	2.10	5.83	2.23	2.61	6.60	2.36	2.80	7.30	2.47	2.96	8.44	2.30	3.66

Minimum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	4.98	0.56	8.83	5.23	0.59	8.84	5.46	0.62	8.78	6.00	0.60	9.98
0	/	/	/	/	/	/	/	/	/	/	/	/	4.88	0.69	7.09	5.33	0.67	8.00	5.75	0.65	8.84	6.29	0.66	9.56
5	/	/	/	/	/	/	/	/	/	/	/	/	3.93	0.63	6.23	4.46	0.60	7.45	4.96	0.58	8.61	5.41	0.60	8.95
10	/	/	/	/	/	/	/	/	/	4.07	0.83	4.89	4.81	0.77	6.24	5.37	0.74	7.25	5.91	0.72	8.20	6.40	0.73	8.75
15	/	/	/	/	/	/	4.83	0.94	5.16	4.99	0.93	5.37	5.63	0.91	6.22	6.02	0.84	7.19	6.39	0.79	8.11	7.67	0.86	8.92
19	2.91	0.68	4.29	3.58	0.80	4.47	4.41	0.93	4.75	4.69	0.96	4.90	5.82	1.06	5.47	6.58	1.11	5.94	7.32	1.15	6.35	8.07	1.10	7.33
20	3.07	0.73	4.18	3.70	0.84	4.39	4.30	0.92	4.65	4.61	0.97	4.78	5.86	1.11	5.29	6.72	1.20	5.62	7.55	1.28	5.92	8.16	1.18	6.93
25	3.84	1.05	3.65	4.28	1.07	3.99	4.69	1.07	4.38	5.02	1.13	4.43	6.33	1.36	4.64	7.09	1.47	4.82	7.82	1.58	4.96	8.19	1.38	5.95
30	3.82	1.26	3.03	4.22	1.27	3.34	4.59	1.25	3.68	4.89	1.29	3.78	6.10	1.46	4.17	6.80	1.56	4.36	7.47	1.65	4.51	7.77	1.54	5.04
35	3.50	1.42	2.46	4.26	1.50	2.83	4.98	1.64	3.04	5.18	1.61	3.21	5.99	1.53	3.90	6.57	1.56	4.21	7.13	1.64	4.36	7.66	1.65	4.65
40	2.99	1.56	1.91	3.46	1.56	2.22	3.91	1.53	2.56	4.04	1.51	2.67	4.55	1.46	3.11	5.21	1.57	3.32	5.85	1.67	3.50	6.83	1.66	4.12
43	1.46	0.98	1.48	1.89	1.08	1.75	2.30	1.13	2.03	2.45	1.13	2.17	3.05	1.12	2.72	3.39	1.17	2.89	3.72	1.22	3.04	5.38	1.42	3.80

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
CC: Total cooling capacity (kW)
PI: Power input (kW)

Cooling capacity for 14kW models

Maximum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	10.03	1.32	7.57	10.55	1.40	7.55	10.91	1.47	7.44	11.96	1.42	8.43
0	/	/	/	/	/	/	/	/	/	/	/	/	9.80	1.67	5.87	10.71	1.62	6.59	11.45	1.58	7.24	12.48	1.59	7.84
5	/	/	/	/	/	/	/	/	/	/	/	/	9.57	1.76	5.44	10.86	1.68	6.47	11.98	1.61	7.43	13.00	1.68	7.73
10	/	/	/	/	/	/	/	/	/	10.02	2.46	4.07	11.35	2.18	5.21	12.34	2.03	6.07	13.14	1.92	6.85	14.18	1.94	7.32
15	/	/	/	/	/	/	10.98	2.32	4.60	11.40	2.39	4.77	13.06	2.32	5.45	14.41	2.36	6.10	15.53	2.32	6.67	16.38	2.32	7.26
19	7.69	1.99	3.86	10.37	2.63	3.95	12.40	2.99	4.15	12.83	3.02	4.25	14.51	3.11	4.67	15.30	3.02	5.06	15.85	2.94	5.40	16.50	2.70	6.11
20	8.17	2.17	3.77	10.80	2.78	3.88	12.76	3.16	4.04	13.18	3.20	4.12	14.87	3.33	4.47	15.52	3.23	4.80	15.93	3.14	5.08	16.53	2.84	5.82
25	10.61	3.19	3.32	12.95	3.67	3.53	14.49	3.84	3.77	14.91	3.91	3.82	16.62	4.16	3.99	16.94	4.09	4.14	17.00	4.01	4.24	17.07	3.44	4.96
30	10.49	3.96	2.65	12.79	4.47	2.86	14.10	4.53	3.11	14.47	4.54	3.19	15.94	4.56	3.49	16.18	4.37	3.70	16.17	4.18	3.87	16.11	3.74	4.31
35	10.38	4.81	2.16	12.84	5.45	2.35	13.72	5.32	2.58	14.03	5.22	2.69	15.26	4.88	3.13	15.42	4.66	3.31	15.34	4.44	3.45	15.26	4.12	3.71
40	8.11	4.53	1.79	9.28	4.59	2.02	9.87	4.33	2.28	10.03	4.24	2.37	10.67	3.92	2.72	11.52	4.00	2.88	12.19	4.05	3.01	13.23	3.77	3.51
43	5.20	3.72	1.40	5.83	3.59	1.63	6.11	3.26	1.87	6.35	3.20	1.98	7.33	3.02	2.43	7.99	3.11	2.57	8.53	3.19	2.67	10.68	3.26	3.27

Normal

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	8.07	0.94	8.56	8.52	0.99	8.63	8.88	1.03	8.60	9.72	1.01	9.61
0	/	/	/	/	/	/	/	/	/	/	/	/	7.90	1.18	6.71	8.66	1.14	7.60	9.33	1.11	8.39	10.16	1.11	9.13
5	/	/	/	/	/	/	/	/	/	/	/	/	7.67	1.29	5.93	8.68	1.21	7.15	9.61	1.16	8.28	10.55	1.24	8.50
10	/	/	/	/	/	/	/	/	/	8.08	1.87	4.32	9.12	1.60	5.69	9.90	1.48	6.71	10.57	1.38	7.65	11.54	1.43	8.07
15	/	/	/	/	/	/	8.24	1.67	4.94	8.78	1.71	5.14	10.97	1.85	5.92	12.23	1.81	6.74	13.36	1.79	7.48	13.76	1.68	8.19
19	5.97	1.47	4.05	8.21	1.94	4.24	9.90	2.20	4.50	10.34	2.24	4.63	12.11	2.37	5.12	12.94	2.32	5.59	13.64	2.28	5.99	14.26	2.07	6.88
20	6.37	1.61	3.96	8.58	2.06	4.16	10.32	2.35	4.40	10.73	2.39	4.50	12.40	2.52	4.92	13.12	2.48	5.30	13.71	2.44	5.61	14.39	2.19	6.56
25	8.40	2.39	3.52	10.43	2.74	3.80	11.89	2.89	4.12	12.33	2.96	4.17	14.06	3.23	4.35	14.52	3.18	4.57	14.84	3.14	4.73	15.07	2.65	5.68
30	8.44	2.99	2.82	10.38	3.37	3.08	11.75	3.49	3.37	12.14	3.51	3.46	13.68	3.57	3.83	14.07	3.46	4.06	14.31	3.37	4.25	14.43	2.97	4.86
35	9.34	4.12	2.27	12.70	4.98	2.55	12.86	4.75	2.71	12.92	4.54	2.85	13.17	3.87	3.40	13.50	3.74	3.61	13.59	3.58	3.80	13.91	3.35	4.15
40	6.62	3.45	1.92	7.69	3.50	2.20	8.35	3.35	2.49	8.53	3.29	2.59	9.28	3.09	3.00	10.16	3.17	3.21	10.94	3.24	3.38	12.00	2.97	4.05
43	4.27	2.93	1.45	4.66	2.73	1.70	4.80	2.44	1.97	5.01	2.39	2.10	5.83	2.23	2.61	6.60	2.36	2.80	7.30	2.47	2.96	8.44	2.30	3.66

Minimum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	5.22	0.59	8.92	5.49	0.61	8.93	5.73	0.65	8.86	6.30	0.63	10.08
0	/	/	/	/	/	/	/	/	/	/	/	/	5.13	0.73	7.01	5.59	0.71	7.92	6.04	0.69	8.75	6.61	0.70	9.47
5	/	/	/	/	/	/	/	/	/	/	/	/	4.12	0.65	6.37	4.68	0.61	7.61	5.21	0.59	8.80	5.68	0.62	9.15
10	/	/	/	/	/	/	/	/	/	4.47	0.94	4.77	5.06	0.82	6.16	5.49	0.76	7.21	5.91	0.72	8.20	6.40	0.73	8.75
15	/	/	/	/	/	/	5.05	0.96	5.24	5.22	0.96	5.46	5.88	0.93	6.32	6.29	0.86	7.31	6.68	0.81	8.25	7.86	0.87	9.07
19	3.06	0.72	4.22	3.79	0.86	4.40	4.62	0.98	4.71	4.92	1.01	4.86	6.10	1.12	5.43	6.75	1.14	5.93	7.38	1.16	6.38	8.10	1.10	7.36
20	3.22	0.78	4.12	3.92	0.91	4.32	4.52	0.99	4.58	4.85	1.03	4.71	6.16	1.18	5.21	6.87	1.23	5.58	7.55	1.28	5.92	8.16	1.18	6.93
25	4.03	1.12	3.60	4.53	1.15	3.94	4.93	1.14	4.32	5.27	1.21	4.37	6.65	1.45	4.58	7.25	1.51	4.79	7.82	1.58	4.96	8.19	1.38	5.95
30	4.01	1.39	2.88	4.47	1.40	3.18	4.82	1.37	3.53	5.14	1.42	3.62	6.41	1.60	4.01	6.95	1.63	4.26	7.47	1.67	4.48	7.77	1.54	5.04
35	3.67	1.58	2.33	4.50	1.68	2.68	5.23	1.78	2.94	5.44	1.76	3.09	6.29	1.70	3.69	6.72	1.60	4.21	7.13	1.73	4.11	7.66	1.73	4.44
40	2.99	1.56	1.91	3.49	1.57	2.22	3.91	1.53	2.56	4.04	1.51	2.67	4.55	1.46	3.11	5.21	1.57	3.32	5.85	1.67	3.50	6.83	1.66	4.12
43	1.46	0.98	1.48	1.90	1.09	1.75	2.30	1.13	2.03	2.45	1.13	2.17	3.05	1.12	2.72	3.39	1.17	2.89	3.72	1.22	3.04	5.38	1.42	3.80

Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
CC: Total cooling capacity (kW)
PI: Power input (kW)

Cooling capacity for 16kW models

Maximum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	10.03	1.32	7.57	10.55	1.40	7.55	10.91	1.47	7.44	11.96	1.42	8.43
0	/	/	/	/	/	/	/	/	/	/	/	/	9.80	1.67	5.87	10.71	1.62	6.59	11.45	1.58	7.24	12.48	1.59	7.84
5	/	/	/	/	/	/	/	/	/	/	/	/	9.57	1.76	5.44	10.86	1.68	6.47	11.98	1.61	7.43	13.00	1.68	7.73
10	/	/	/	/	/	/	/	/	/	10.02	2.46	4.07	11.35	2.18	5.21	12.34	2.03	6.07	13.14	1.92	6.85	14.18	1.94	7.32
15	/	/	/	/	/	/	11.37	2.43	4.67	11.80	2.44	4.84	13.52	2.44	5.53	14.92	2.41	6.19	16.08	2.37	6.77	16.96	2.30	7.37
19	8.46	2.23	3.78	11.41	2.94	3.87	13.50	3.29	4.10	13.86	3.29	4.21	15.31	3.30	4.65	16.15	3.20	5.04	16.73	3.11	5.38	17.41	2.86	6.08
20	8.99	2.43	3.70	11.88	3.12	3.80	14.04	3.55	3.96	14.38	3.55	4.05	15.76	3.56	4.42	16.46	3.46	4.75	16.89	3.36	5.03	17.52	3.04	5.76
25	11.67	3.59	3.25	14.24	4.13	3.45	15.94	4.32	3.69	16.24	4.36	3.73	17.45	4.47	3.90	17.72	4.38	4.04	17.85	4.31	4.14	17.92	3.70	4.84
30	11.54	4.46	2.59	14.26	5.10	2.79	15.51	5.11	3.04	15.85	5.09	3.11	17.21	5.05	3.41	17.24	4.84	3.57	17.14	4.66	3.68	16.92	4.02	4.21
35	11.42	5.42	2.11	14.18	6.17	2.30	15.09	6.00	2.52	15.37	5.91	2.60	16.48	5.60	2.94	16.50	5.28	3.13	16.26	4.96	3.27	16.17	4.47	3.62
40	8.92	5.11	1.75	10.21	5.18	1.97	10.86	4.89	2.22	11.03	4.78	2.31	11.73	4.42	2.65	12.67	4.57	2.77	13.41	4.69	2.86	14.55	4.36	3.34
43	5.98	4.50	1.33	6.87	4.44	1.54	7.33	4.12	1.78	7.67	4.07	1.89	9.01	3.91	2.31	9.83	4.03	2.44	10.49	4.13	2.54	11.96	3.85	3.11

Normal

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	8.07	0.94	8.56	8.52	0.99	8.63	8.88	1.03	8.60	9.72	1.01	9.61
0	/	/	/	/	/	/	/	/	/	/	/	/	7.90	1.18	6.71	8.66	1.14	7.60	9.33	1.11	8.39	10.16	1.11	9.13
5	/	/	/	/	/	/	/	/	/	/	/	/	7.67	1.29	5.93	8.68	1.21	7.15	9.61	1.16	8.28	10.55	1.24	8.50
10	/	/	/	/	/	/	/	/	/	8.08	1.87	4.32	9.12	1.60	5.69	9.90	1.48	6.71	10.57	1.38	7.65	11.54	1.43	8.07
15	/	/	/	/	/	/	8.52	1.70	5.02	9.09	1.74	5.22	11.36	1.89	6.01	12.65	1.85	6.84	13.83	1.82	7.59	14.24	1.71	8.31
19	6.56	1.65	3.98	9.03	2.17	4.15	10.79	2.42	4.45	11.18	2.44	4.58	12.78	2.51	5.10	13.66	2.45	5.56	14.39	2.41	5.96	15.05	2.20	6.85
20	7.01	1.80	3.88	9.44	2.31	4.08	11.35	2.63	4.31	11.71	2.65	4.42	13.14	2.70	4.87	13.91	2.65	5.24	14.53	2.62	5.56	15.25	2.35	6.49
25	9.24	2.69	3.43	11.47	3.09	3.71	13.08	3.25	4.02	13.42	3.30	4.07	14.76	3.47	4.25	15.25	3.42	4.46	15.58	3.37	4.62	15.83	2.85	5.55
30	9.28	3.37	2.75	11.42	3.79	3.01	12.93	3.93	3.29	13.30	3.94	3.38	14.77	3.95	3.74	15.05	3.85	3.91	15.17	3.75	4.04	15.15	3.19	4.75
35	9.87	4.46	2.21	14.00	5.71	2.45	14.19	5.23	2.71	14.27	5.10	2.79	14.57	4.65	3.13	14.20	3.94	3.61	15.19	4.33	3.51	15.15	3.93	3.85
40	7.28	3.89	1.87	8.46	3.95	2.14	9.18	3.78	2.43	9.39	3.71	2.53	10.21	3.49	2.93	11.18	3.62	3.09	12.03	3.75	3.21	13.20	3.43	3.84
43	4.91	3.55	1.38	5.48	3.39	1.62	5.76	3.08	1.87	6.04	3.03	1.99	7.17	2.89	2.48	8.12	3.05	2.66	8.98	3.20	2.81	9.46	2.72	3.48

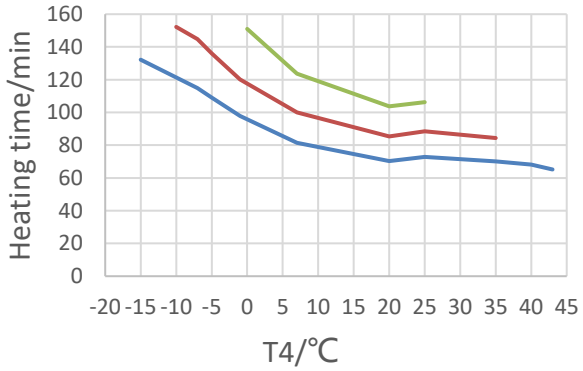
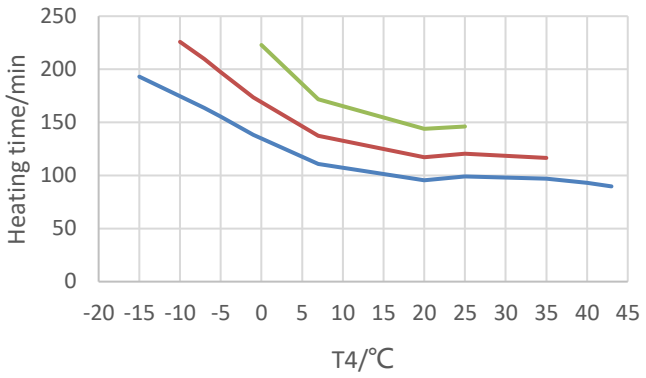
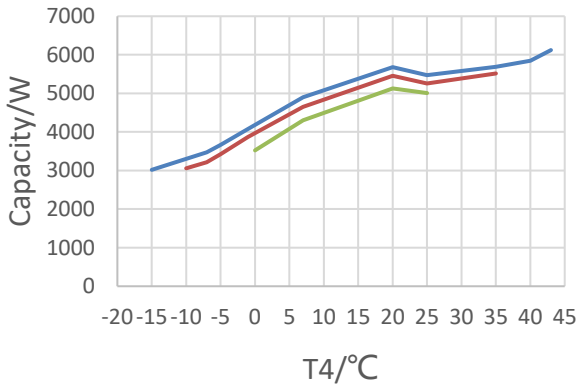
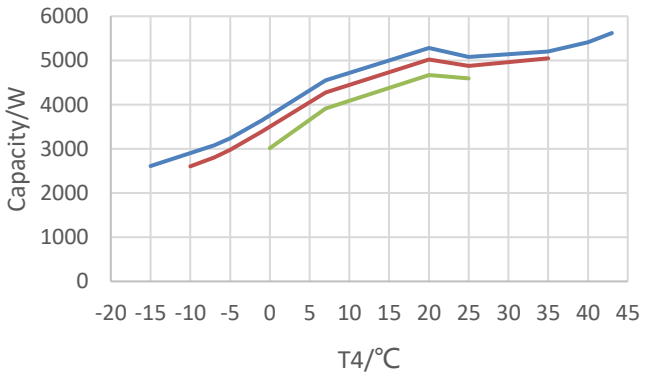
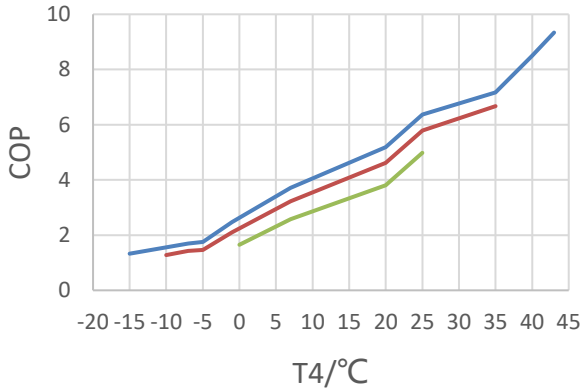
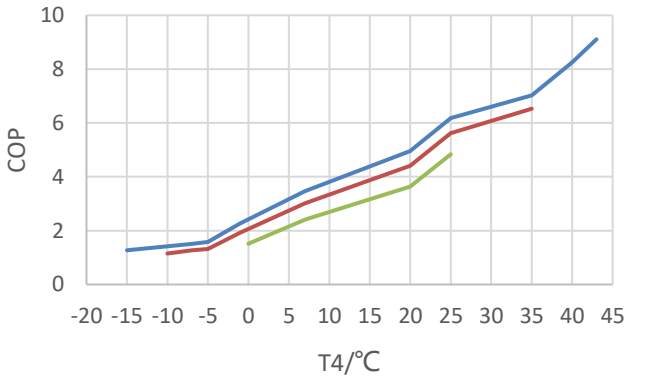
Minimum

DB	LWT																							
	5			7			10			11			15			18			20			25		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
-5	/	/	/	/	/	/	/	/	/	/	/	/	5.22	0.59	8.92	5.49	0.61	8.93	5.73	0.65	8.86	6.30	0.63	10.08
0	/	/	/	/	/	/	/	/	/	/	/	/	5.13	0.73	7.01	5.59	0.71	7.92	6.04	0.69	8.75	6.61	0.70	9.47
5	/	/	/	/	/	/	/	/	/	/	/	/	4.12	0.65	6.37	4.68	0.61	7.61	5.21	0.59	8.80	5.68	0.62	9.15
10	/	/	/	/	/	/	/	/	/	4.47	0.94	4.77	5.06	0.82	6.16	5.49	0.76	7.21	5.91	0.72	8.20	6.40	0.73	8.75
15	/	/	/	/	/	/	5.23	0.98	5.32	5.40	0.97	5.54	6.08	0.95	6.41	6.51	0.88	7.42	6.91	0.83	8.37	8.14	0.88	9.21
19	3.36	0.81	4.14	4.17	0.97	4.32	5.02	1.08	4.66	5.30	1.10	4.81	6.44	1.19	5.41	7.13	1.21	5.91	7.79	1.22	6.36	8.55	1.17	7.33
20	3.54	0.88	4.04	4.31	1.02	4.24	4.97	1.11	4.49	5.28	1.14	4.62	6.53	1.27	5.15	7.28	1.32	5.53	8.01	1.37	5.86	8.65	1.26	6.86
25	4.43	1.26	3.52	4.98	1.30	3.85	5.42	1.28	4.22	5.73	1.34	4.27	6.98	1.56	4.47	7.61	1.63	4.68	8.21	1.69	4.85	8.60	1.48	5.81
30	4.41	1.57	2.81	4.92	1.58	3.11	5.31	1.54	3.44	5.63	1.59	3.54	6.92	1.77	3.91	7.43	1.81	4.10	7.92	1.86	4.26	8.15	1.66	4.92
35	4.04	1.78	2.27	4.95	1.94	2.56	5.75	2.00	2.87	5.96	1.99	2.99	6.79	1.96	3.47	7.19	1.80	4.00	7.56	1.83	4.12	8.12	1.87	4.33
40	3.29	1.76	1.86	3.84	1.77	2.17	4.30	1.72	2.50	4.44	1.70	2.60	5.01	1.65	3.03	5.73	1.80	3.19	6.43	1.93	3.33	7.52	1.92	3.91
43	1.68	1.19	1.41	2.24	1.35	1.66	2.76	1.43	1.93	2.95	1.44	2.06	3.75	1.45	2.58	4.17	1.52	2.75	4.57	1.58	2.89	6.03	1.67	3.61

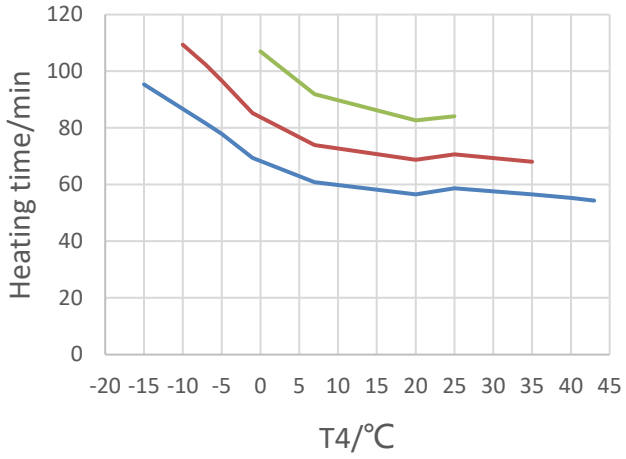
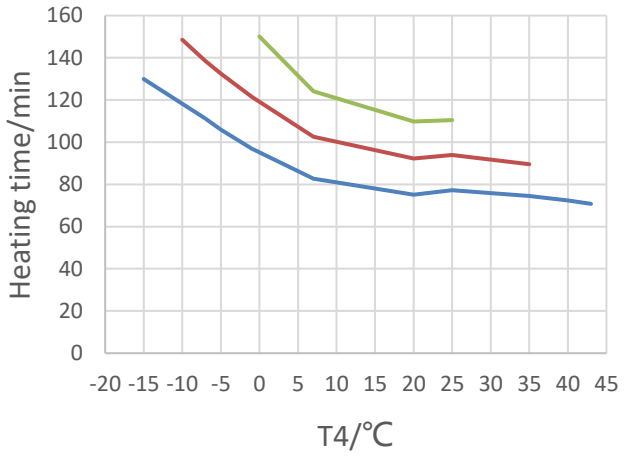
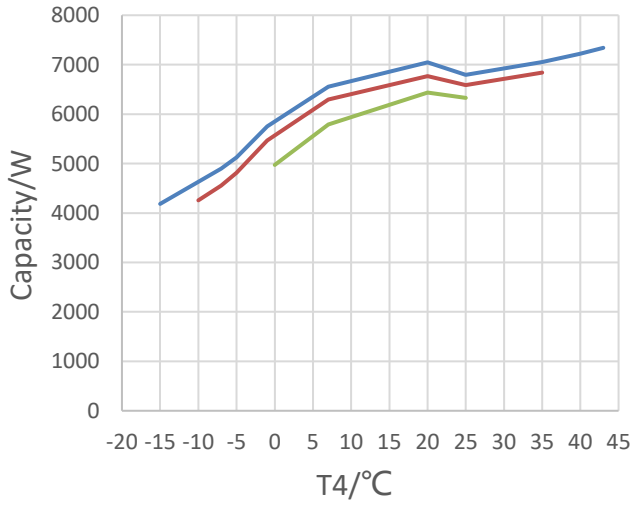
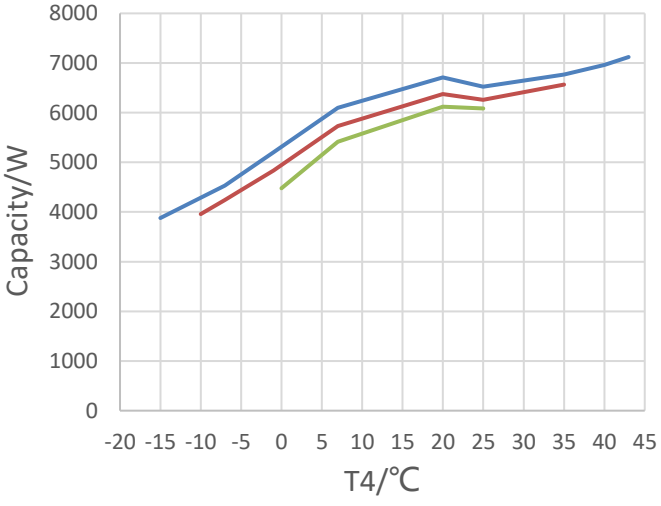
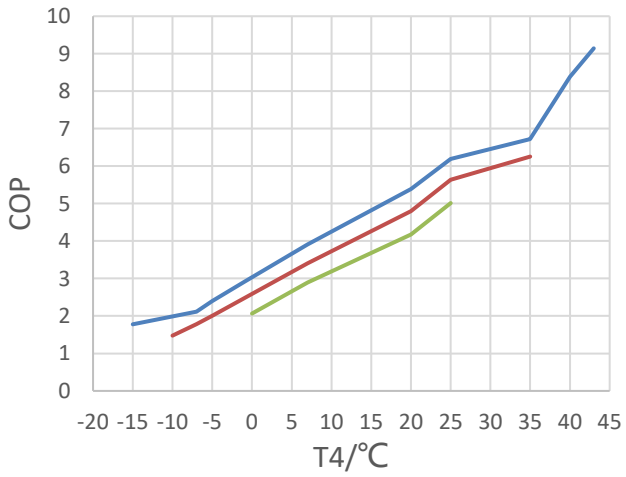
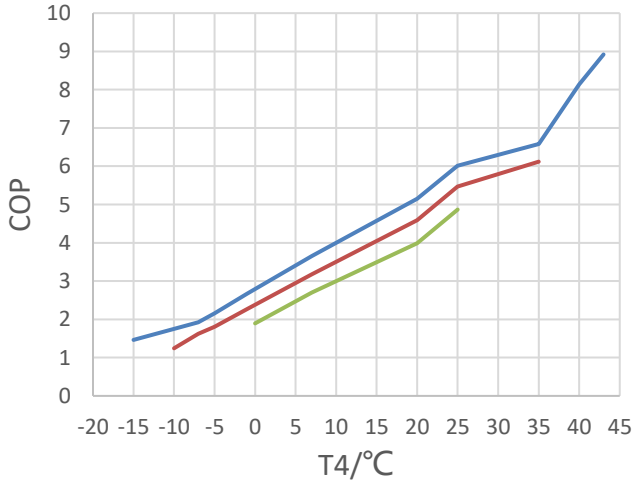
Abbreviations:
LWT: Leaving water temperature (°C)
DB: Dry-bulb temperature for Outdoor air temperature (°C)
CC: Total cooling capacity (kW)
PI: Power input (kW)

Performance curves in domestic hot water production

15℃~45℃
15℃~50℃
15℃~55℃

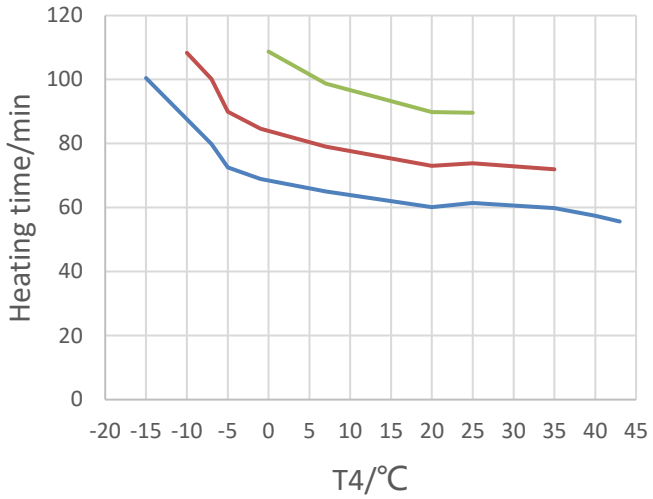
MHA-V4(6)W/D2N8-B2 + HBT-A100/190CD30(S90)GN8-B	MHA-V4(6)W/D2N8-B2 + HBT-A100/240CD30(S90)GN8-B
Heat up	Heat up
	
Heating Capacity	Heating Capacity
	
COP	COP
	

15~45
15~50
15~55

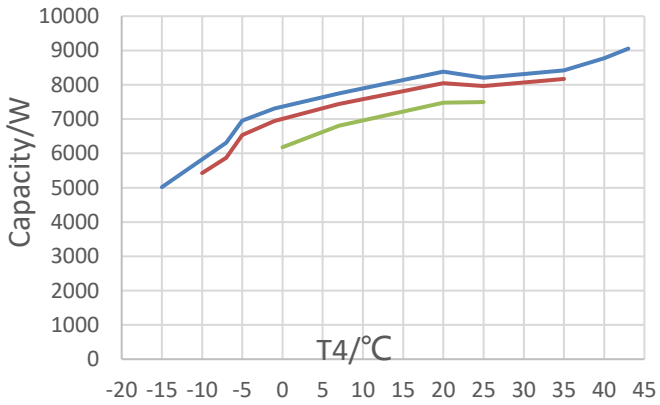
MHA-V8(10)W/D2N8-B2 + HBT-A100/190CD30(S90)GN8-B	MHA-V8(10)W/D2N8-B2 + HBT-A100/240CD30(S90)GN8-B
Heat up	Heat up
	
Heating Capacity	Heating Capacity
	
COP	COP
	

15~45
15~50
15~55

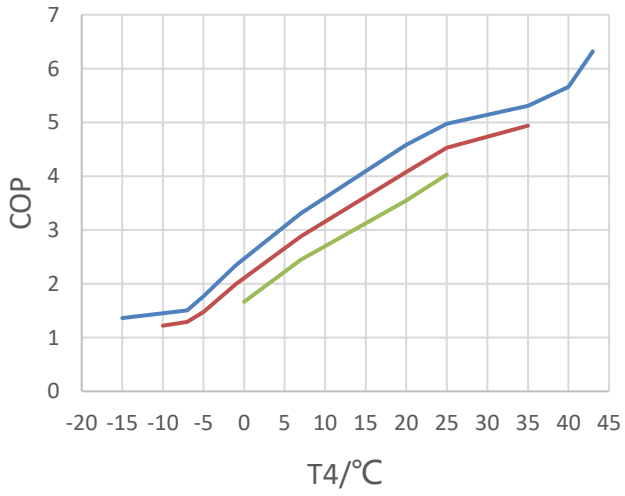
MHA-V12(14,16)W/D2(R)N8-B + HBT-A160/240CD30(S90)GN8-B
Heat up



Capacity

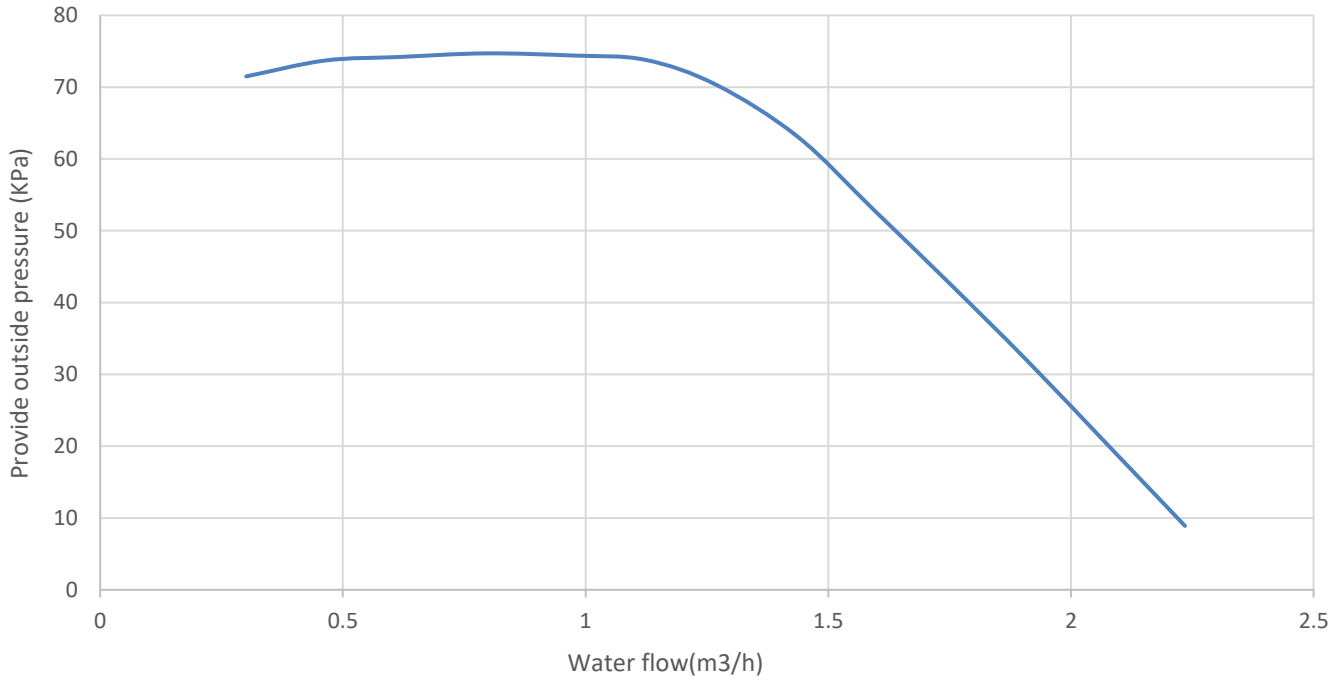


COP

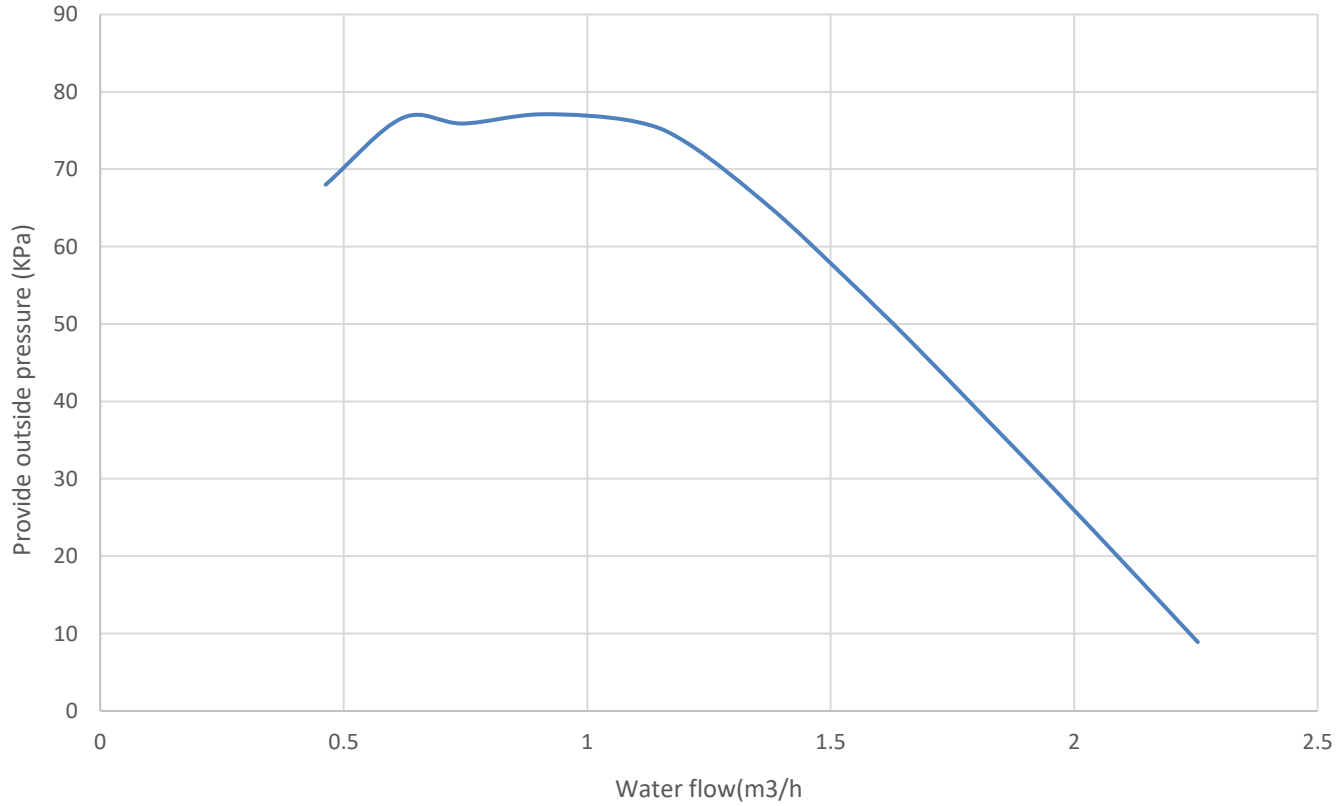


5 Hydronic Performance

Hydro module with 190L water tank



Hydro module with 240L water tank



6 Sound Levels

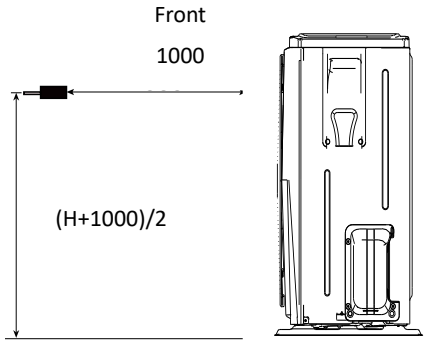
6.1 Overall

Model name	dB
MHA-V4W/D2N8-B2	44
MHA-V6W/D2N8-B2	45
MHA-V8W/D2N8-B2	46
MHA-V10W/D2N8-B2	49
MHA-V12W/D2RN8-B2	50
MHA-V14W/D2RN8-B2	51
MHA-V16W/D2RN8-B2	54
MHA-V12W/D2RN8-B2	50
MHA-V14W/D2RN8-B2	51
MHA-V16W/D2RN8-B2	55

Notes:

1. Sound pressure level is measured at a position 1m in front of the unit and (1+H)/2m (where H is the height of the unit) above the floor in a semi-anechoic chamber. During in-situ operation, sound pressure levels may be higher as a result of ambient noise. Sound pressure level is the maximum value tested under the two conditions of Notes2 and Notes3.

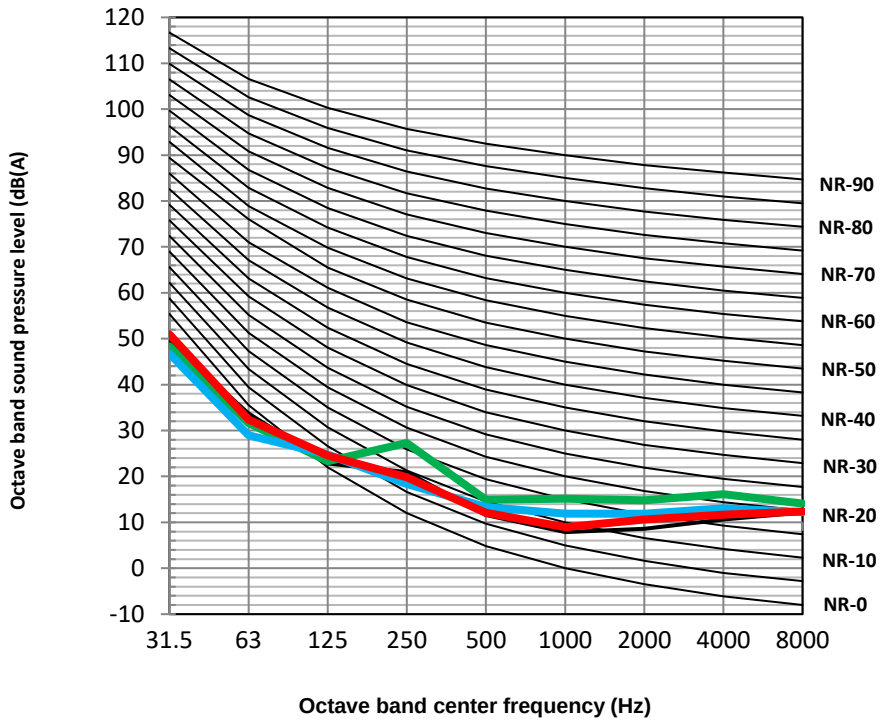
Sound pressure level measurement (unit: mm)



2. Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
3. Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C..

6.2 Octave Band Levels

MHA-V4W/D2N8-B2 + HBT-A100/190CD30GN8-B octave band levels



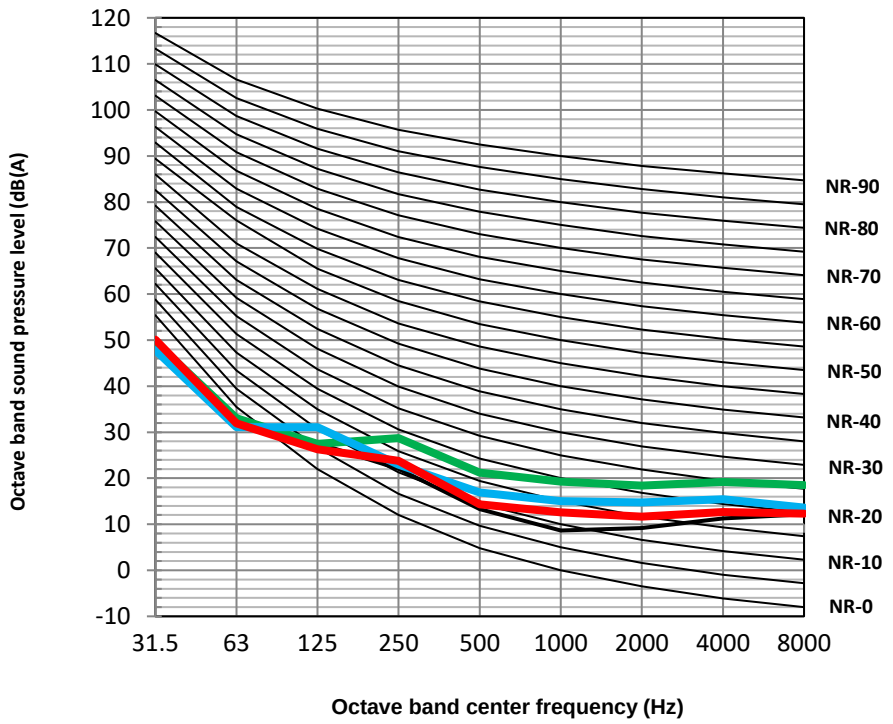
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C

Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°

Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C

Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C

MHA-V6W/D2N8-B2 + HBT-A100/190CD30GN8-B octave band levels



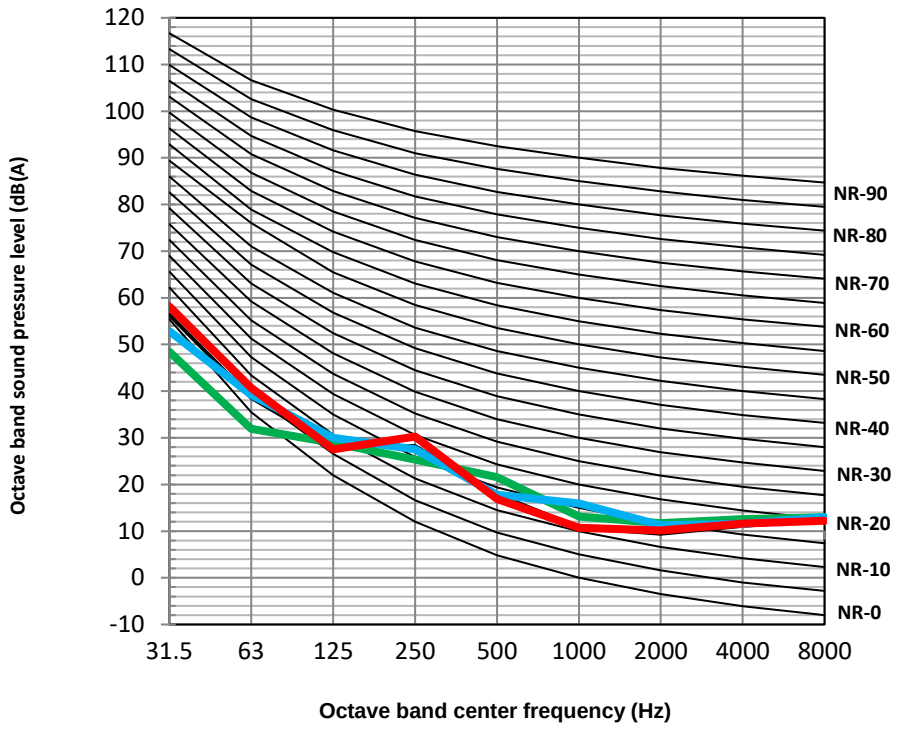
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C

Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°

Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C

Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C

MHA-V8W/D2N8-B2 + HBT-A100/190CD30GN8-B octave band levels



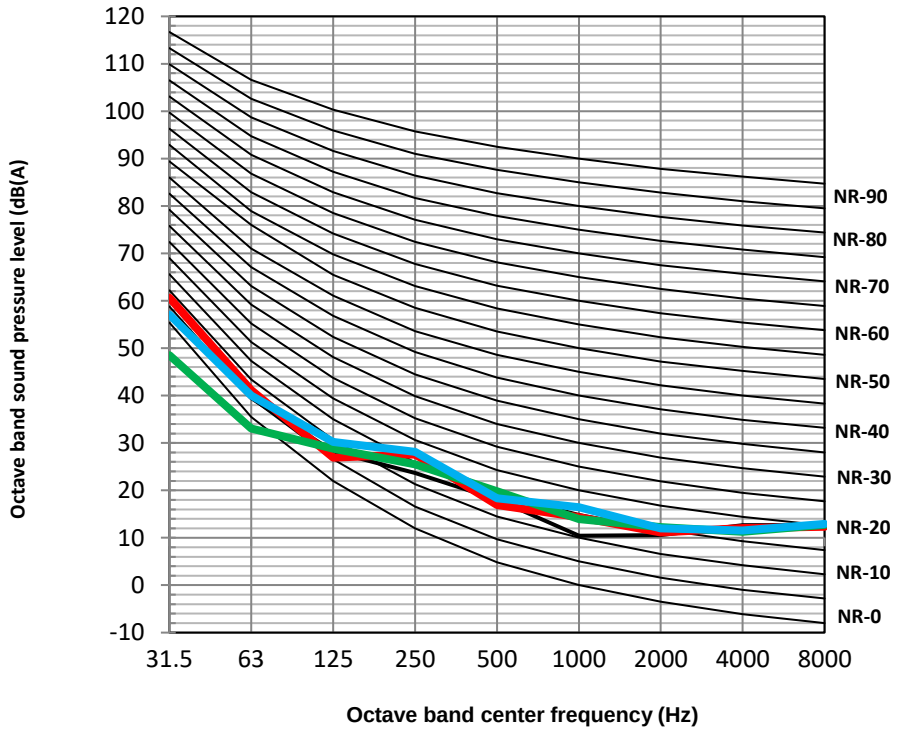
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C

Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°

Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C

Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C

MHA-V10W/D2N8-B2 + HBT-A100/190CD30GN8-B octave band levels



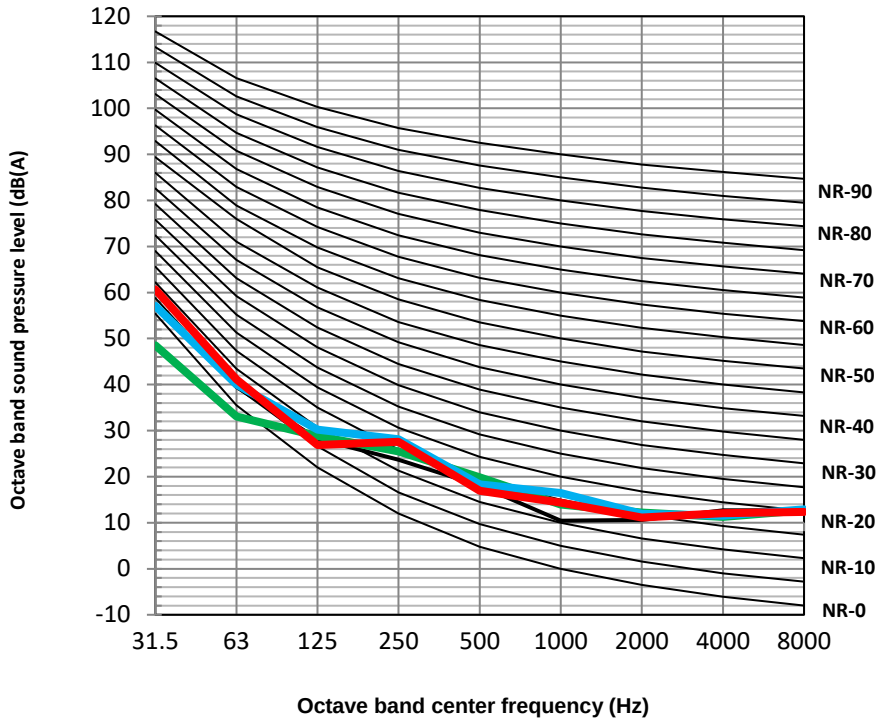
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C

Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°

Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C

Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C

MHA-V12W/D2(R)N8-B + HBT-A160/240CD30GN8-B octave band levels



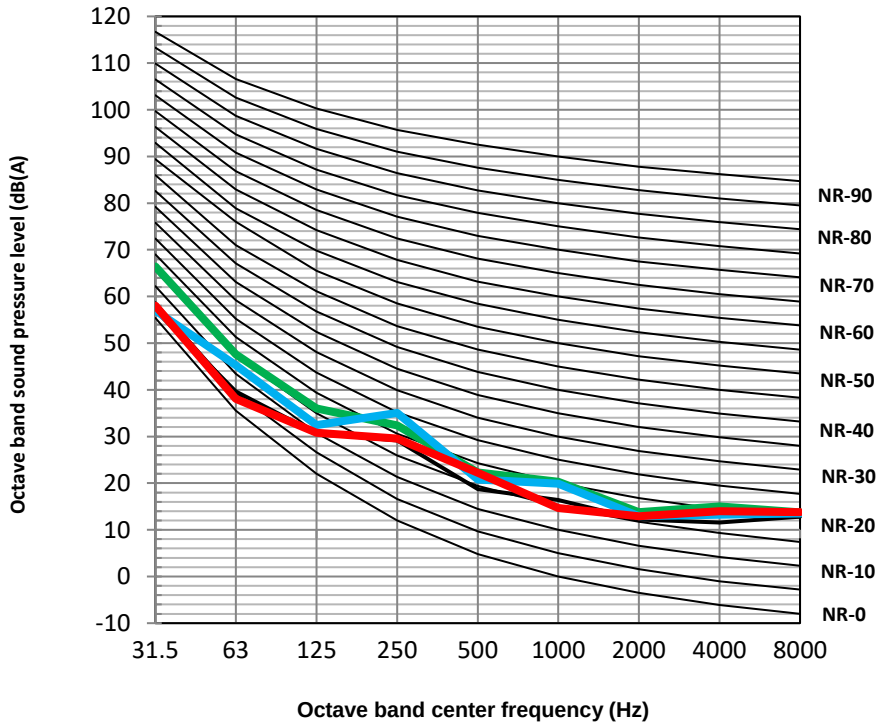
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C

Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°

Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C

Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C

MHA-V14W/D2(R)N8-B + HBT-A160/240CD30GN8-B octave band levels



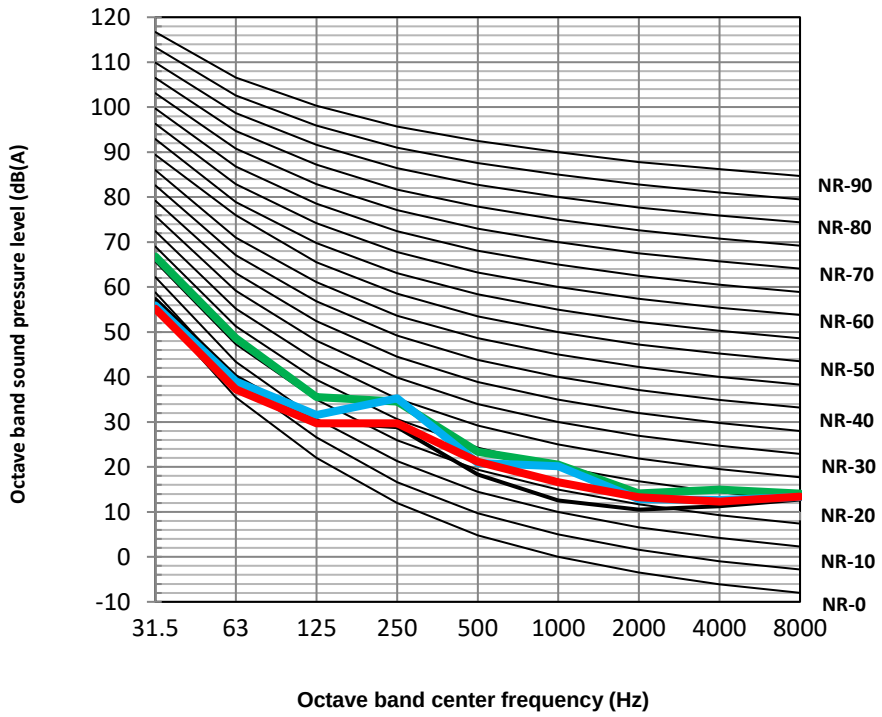
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C

Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°

Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C

Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C

MHA-V16W/D2(R)N8-B + HBT-A160/240CD30GN8-B octave band levels



Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C

Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°

Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C

Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C

Part 3

Field Settings

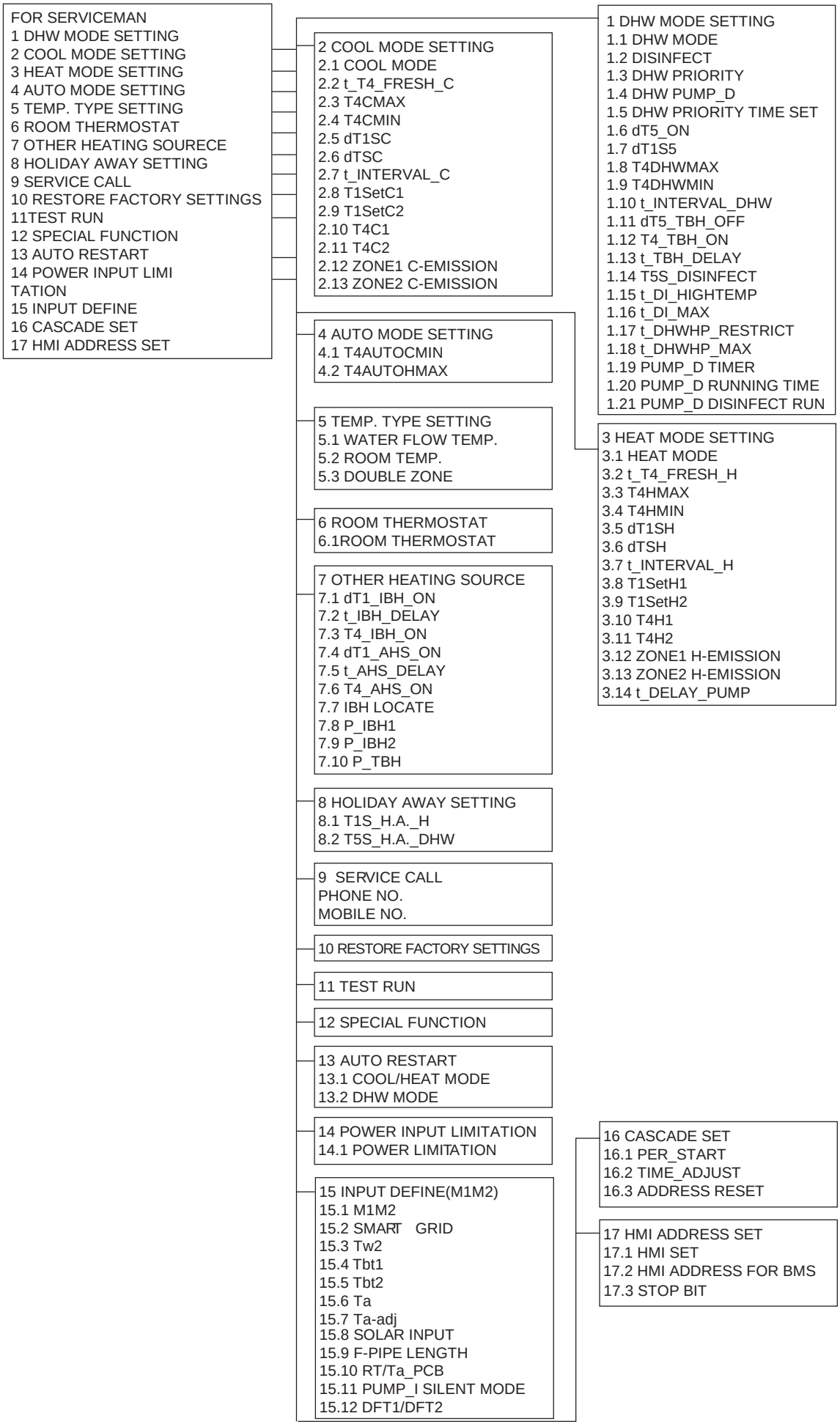
1 User Interface Field Settings

1.1 Introduction

During installation, the M thermal settings and parameters should be configured by the installer to suit the installation configuration, climate conditions and end-user preferences. The relevant settings are accessible and programmable through the **FOR SERVICEMAN** menu on the M thermal user interface. The user interface is integrated design in the hydro module.

Keys	Function
	Menu: Go to the menu structure
◄►▼▲	Adjust: Navigate the cursor on the display Navigate in the menu structure Adjust settings
	On/Off Turn on/off the space heating/cooling operation or DHW mode Turn on/off functions in the menu structure
	Back: Come back to the up level
	Unlock: Long press for unlock/lock the controller Unlock /lock some functions such as “DHW temperature adjusting”
	Enter: Go to the next step when programming a schedule in the menu structure and confirm a selection to enter in the submenu of the menu structure.

1.2 Menu Structure



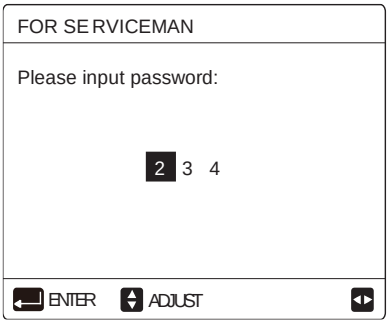
1.3 FOR SERVICEMAN Menu

FOR SERVICEMAN allows installers to input the system configuration and set the system parameters. To enter **FOR SERVICEMAN**, go to **MENU** > **FOR SERVICEMAN**.

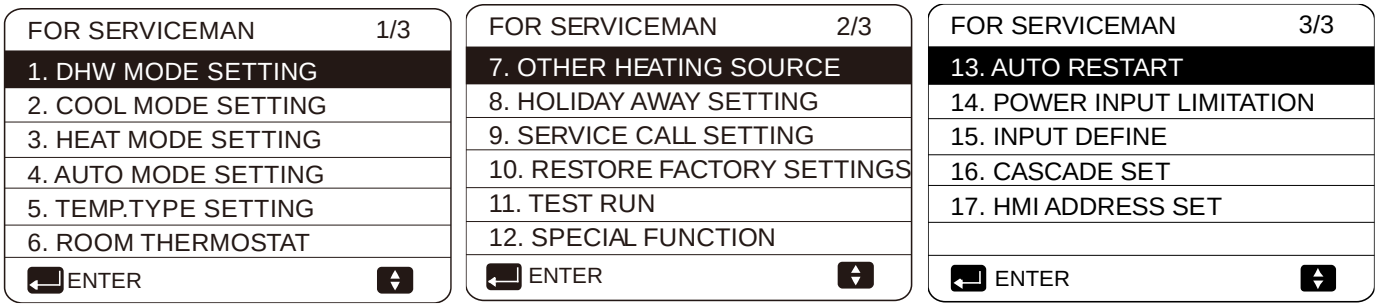
Enter the password, using ◄ ► to navigate between digits and using ▼ ▲ to adjust the numerical values. The password is 234.

Then the following pages will be displayed after putting the password.

FOR SERVICEMAN password screen



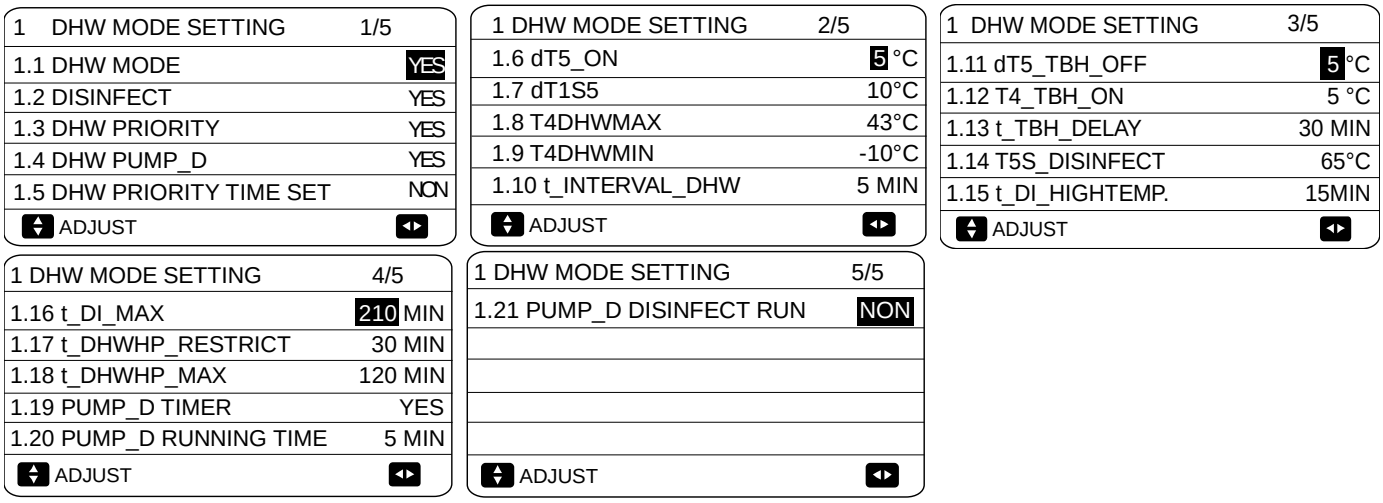
FOR SERVICEMAN menu



1.4 DHW MODE SETTING Menu

1.4.1 DHW MODE SETTING menu overview

MENU > **FOR SERVICEMAN** > **DHW MODE SETTING**



In **DHW MODE SETTING** the following parameters should be set.

DHW MODE enables or disables DHW mode. For installations with DHW tanks, select **YES** to enable DHW mode. For installations without DHW tanks, select **NON** to disable DHW mode.

DISINFECT sets whether or not the disinfection operation is performed.

DHW PRIORITY sets whether domestic hot water heating or space heating/cooling takes priority. If **NON** is selected in the **DHW PRIORITY** mode, when it is available and the space heating/cooling is **OFF**, the heat pump will heat the water as required. If space heating/cooling is **ON**, the water will be heated as required when the immersion heater is unavailable. Only when the space heating/cooling is **OFF** will the heat pump operate to heat domestic water.

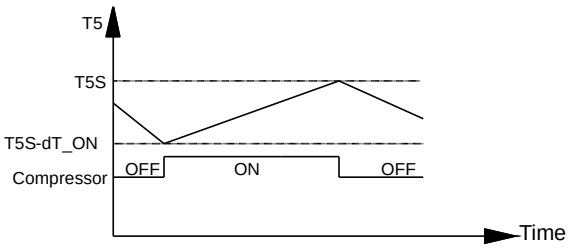
DHW PUMP sets whether or not the DHW pump is controlled by the M thermal Split unit. If the DHW pump is to be controlled by the M thermal Split, select **YES**. If the DHW pump is not to be controlled by the M thermal Split unit, select **NON**.

DHW PUMP PRIORITY TIME SET set the operation time of DHW during **DHW PRIORITY** mode.

dT5_ON sets the temperature difference between the DHW set temperature (T5S) and the DHW tank water temperature (T5) above which the heat pump providing heated water to the DHW tank. When T5S - T5 ≥ dT5_ON the heat pump providing heated water to the DHW tank.

Note: When the heat pump's leaving water temperature is above the DHW mode leaving water temperature operating limit (T5stop), the heat pump does not provide heated water to the DHW tank.

dT5_ON

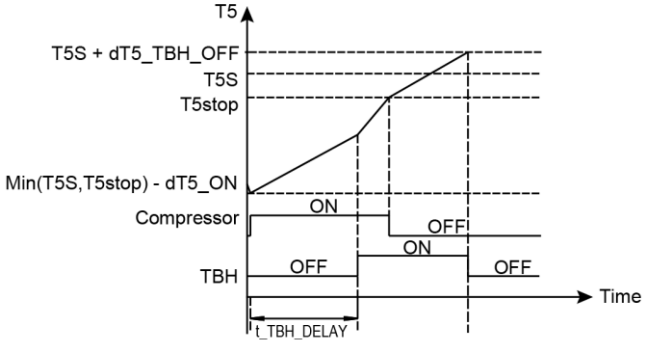


Abbreviations:
T5: DHW tank water temperature
T5S: DHW set temperature

dT1S5 sets the heat pump's leaving water set temperature (T1S) relative to DHW tank water temperature (T5). For DHW mode, the user sets the DHW set temperature (T5S) on the main screen and cannot manually set T1S. T1S is set as T1S = T5 + dT1S5.

Figure on right illustrates the operation of the heat pump and immersion heater(optional) in DHW mode. If the DHW tank water temperature (T5) is less than the minimum of the DHW set temperature (T5S) and the heat pump leaving water temperature operating limit (T5stop) less **dT5_ON**, the heat pump starts providing heated water to the DHW tank. After **t_TBH_delay** minutes have elapsed, the immersion heater is turned on. If T5 reaches T5stop, the heat pump stops but the immersion heater continues running until T5 has reached T5S + **dT5_TBH_OFF**

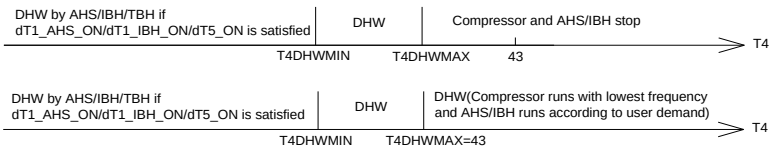
DHW mode operation



Abbreviations:
T5: DHW tank water temperature
T5S: DHW set temperature
T5stop: DHW mode leaving water temperature operating limit
TBH: Immersion heater in DHW tank

T4DHWMAX sets the ambient temperature above which heat pump and AHS/IBH may have different actions.
When T4DHWMAX≤T4 and T4DHWMAX<43, both compressor and AHS/IBH stop running.
When T4HMAX≤T4 and T4DHWMAX=43, compressor runs with lowest frequency and AHS/IBH runs according to user demand.

T4DHWMAX and T4DHWMIN



Abreviations:
HP: Heat pump
TBH: DWH tank immersion heater
AHS: Additional heating source
IBH: Internal backup heater

T4DHWMIN sets the ambient temperature below which heat pump stops, while AHS/IBH/TBH can run if dT1_AHS_ON/dT1_IBH_ON/dT5_ON is satisfied.

t_INTERVAL_DHW sets the DHW mode compressor re-start delay. When the compressor stops running, it will not re-start until at least **t_INTERVAL_DHW** minutes have elapsed.

dT5_TBH_OFF sets the temperature difference between the DHW set temperature (T5S) and the DHW tank water

temperature (T5) below which the immersion is not used. When T5 > Min(T5Stop+dT5_TBH_OFF, 65°C), the immersion heater is off.

T4_TBH_ON sets the ambient temperature above which the immersion heater will not be used.

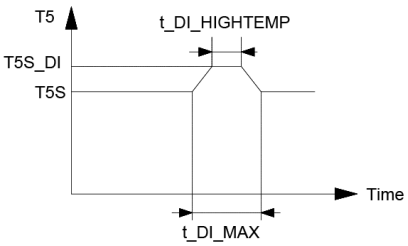
t_TBH_DELAY sets the delay between the compressor starting and the immersion heater being turned on.

T5S_DI sets the DHW tank disinfection operation target temperature. Caution: during the disinfection operation (duration: **t_DI_MAX**) the domestic hot water temperature at the hot water taps will at times be equal to the value set for **T5S_DI**.

t_DI_HIGHTEMP sets that length of time that the DHW tank disinfection operation target temperature is maintained.

t_DI_MAX sets the total duration of the DHW tank disinfect operation.

DHW tank disinfection



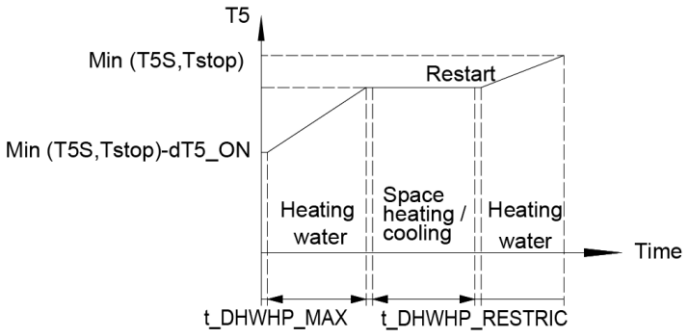
Abbreviations:
T5: DHW tank water temperature
T5S: DHW set temperature

t_DHWHP_RESTRICT sets the maximum length of time that the heat pump will run in space heating or space cooling modes before switching to DHW mode, if a requirement for DHW mode exists. When running in space heating mode or space cooling mode, the heat pump becomes available for DHW mode either as soon as the space heating/cooling set temperatures have been reached or after **t_DHWHP_MAX** minutes have elapsed.

t_DHWHP_MAX sets the maximum length of time that the heat pump will run in DWH mode before switching to space heating mode or space cooling mode if a requirement for space heating/cooling modes exists. When running in DHW mode, the heat pump becomes available for space heating/cooling either as soon as the DHW tank water temperature (T5) reaches the DHW set temperature (T5S) or after **t_DHWHP_MAX** minutes have elapsed.

Figure below illustrates the effects of **t_DHWHP_MAX** and **t_DHWHP_RESTRICT** when **DHW PRIORITY** is enabled. The heat pump initially runs in DWH mode. After **t_DHWHP_MAX** minutes, T5 has not reached

Operation in DHW PRIORITY



Abbreviations:
T5: DHW tank water temperature
T5S: DHW set temperature
T5stop: DHW mode leaving water temperature operating limit

DHWPUMP TIME RUN sets whether or not the user is able to set the DHW pump (field supply) in DHW mode. For installations with a DHW pump, select ON so that the user is able to set pump start times.

PUMP RUNNING TIME sets the length of time the pump runs for at each of the user-specified start times on the **DHW PUMP** tab on the **DOMESTIC HOT WATER (DHW)** menu, if **TIMER RUNNING** is enabled.

DHW PUMP DI RUN sets whether or not the DHW pump (field supply) operates during the disinfection mode.

1.5 COOL MODE SETTING Menu

MENU > **FOR SERVICEMAN** > **COOL MODE SETTING**

2 COOL MODE SETTING	1/3
2.1 COOL MODE	YES
2.2 t_T4_FRESH_C	2.0HRS
2.3 T4CMAX	43°C
2.4 T4CMIN	20°C
2.5 dT1SC	5°C
ADJUST	

2 COOL MODE SETTING	2/3
2.6 dTSC	2°C
2.7 t_INTERVAL_C	5MIN
2.8 T1SetC1	10°C
2.9 T1SetC2	16°C
2.10 T4C1	35°C
ADJUST	

2 COOL MODE SETTING	3/3
2.11 T4C2	25°C
2.12 ZONE1 C-EMISSION	FCU
2.13 ZONE2 C-EMISSION	FLH
ADJUST	

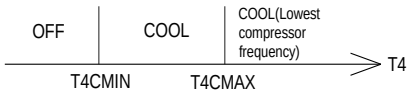
In **COOL MODE SETTING** the following parameters should be set.

COOL MODE enables or disables cooling mode. For installations with space cooling terminals, select **YES** to enable cooling mode. For installations without space cooling terminals, select **NON** to disable cooling mode.

t_T4_FRESH_C sets the refresh time of cooling mode climate temperature curve.

T4CMAX sets the ambient temperature above which the heat pump will operate in cooling mode with lowest compressor frequency. The highest value that **T4CMAX** can take is 46°C, which is the cooling mode upper ambient temperature operating limit of the heat pump.

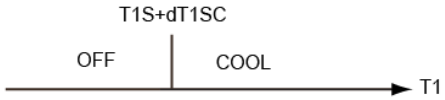
T4CMAX, T4CMIN



Abreviations:
T4: Outdoor ambient temperature

T4CMIN sets the ambient temperature below which the heat pump will not operate in cooling mode. The lowest value that **T4CMIN** can take is -5°C, which is the cooling mode lower ambient temperature operating limit of the heat pump.

dT1SC

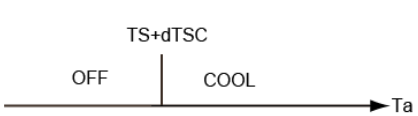


Abreviations:
T1: Heat pump leaving water temperature
T1S: Heat pump leaving water set temperature

dT1SC sets the minimum temperature difference between the heat pump leaving water temperature (T1) and the heat pump leaving water set temperature (T1S) at which the heat pump provides chilled water to the space cooling terminals. When T1 – T1S ≥ dT1SC the heat pump provides chilled water to the space cooling terminals and when T1 ≤ T1S the heat pump does not provide chilled water to the space cooling terminals.

dTSC sets the temperature difference between the actual room temperature (Ta) and set room temperature (TS) above which the heat pump provides chilled water to the space cooling terminals. When Ta – TS ≥ dTSC the heat pump provides chilled water to the space cooling terminals and when Ta ≤ TS the heat pump does not provide chilled water to the space cooling terminals. **dTSC** is only applicable if **YES** is selected for **ROOM TEMP** in the **TEMP. TYPE SETTING** menu. Refer to Part 3, 8.8 “TEMP. TYPE SETTING Menu”.

dTSC



t_INTERVAL_C sets the cooling mode compressor re-start delay. When the compressor stops running, it will not re-start until at least **t_INTERVAL_C** minutes have elapsed.

T1SetC1 sets the temperature 1 of automatic setting curve for cooling mode.

T1SetC2 sets the temperature 2 of automatic setting curve for cooling mode.

T4C1 sets the ambient temperature 1 of automatic setting curve for cooling mode.

T4C2 sets the ambient temperature 2 of automatic setting curve for cooling mode.

ZONE1 C-EMISSION sets the emission type of zone1 for cooling mode.

ZONE2 C-EMISSION sets the emission type of zone2 for cooling mode.

1.6 HEAT MODE SETTING Menu

MENU > **FOR SERVICEMAN** > **HEAT MODE SETTING**

3 HEAT MODE SETTING	1/3
3.1 HEAT MODE	YES
3.2 t_T4_FRESH_H	2.0HRS
3.3 T4HMAX	16°C
3.4 T4HMIN	-15°C
3.5 dT1SH	5°C
ADJUST	

3 HEAT MODE SETTING	2/3
3.6 dTSH	2°C
3.7 t_INTERVAL_H	5MIN
3.8 T1SetH1	35°C
3.9 T1SetH2	28°C
3.10 T4H1	-5°C
ADJUST	

3 HEAT MODE SETTING	3/3
3.11 T4H2	7°C
3.12 ZONE1 H-EMISSION	RAD.
3.13 ZONE2 H-EMISSION	FLH
3.14 t_DELAY_PUMP	2MIN
ADJUST	

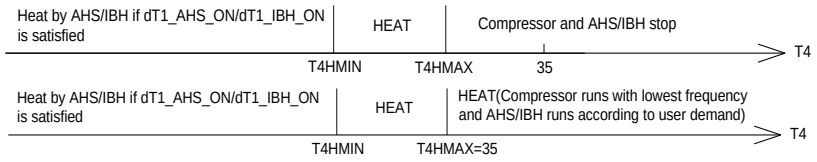
In **HEAT MODE SETTING** the following parameters should be set.

HEAT MODE enables or disables heating mode.

t_T4_FRESH_H sets the refresh time of heating model climate temperature curve.

T4HMAX sets the ambient temperature above which heat pump and AHS/IBH may have different actions.
When T4HMAX≤T4 and T4HMAX<35, both compressor and AHS/IBH stop running.
When T4HMAX≤T4 and T4HMAX=35, compressor runs at lowest frequency and AHS/IBH runs according to user demand.

T4HMAX, T4HMIN



Abreviations:
T4: Outdoor ambient temperature
AHS: Additional heating source
IBH: Internal backup heater

T4HMIN sets the ambient temperature below which heat pump stops, while AHS/IBH can run if dT1_AHS_ON/dT1_IBH_ON is satisfied.

dT1SH sets the temperature difference between the heat pump leaving water temperature (T1) and the heat pump leaving water set temperature (T1S) above which the heat pump provides heated water to the space heating terminals.

dTSH sets the temperature difference between the actual room temperature (Ta) and set room temperature (TS) above which the heat pump provides heated water to the space heating terminals. When TS – Ta ≥ dTSH the heat pump provides heated water to the space heating terminals and when Ta ≥ TS the heat pump does not provide heated water to the space heating terminals.

dTSH

Note:
Only when ROOM TEMP is enabled will this function be available

dTSH is only relevant if **YES** is selected for **ROOM TEMP** in the **TEMP. TYPE SETTING** menu. Refer to Part 3, 8.8 "TEMP. TYPE SETTING Menu".

t_INTERVAL_H sets the heating mode compressor re-start delay. When the compressor stops running, it will not re-start until at least **t_INTERVAL_H** minutes have elapsed.

T1SetH1 sets the temperature 1 of automatic setting curve for heating mode.

T1SetH2 sets the temperature 2 of automatic setting curve for heating mode.

T4H1 sets the ambient temperature 1 of automatic setting curve for heating mode.

T4H2 sets the ambient temperature 2 of automatic setting curve for heating mode.

ZONE1 H-EMISSION sets the emission type for heating mode.

ZONE2 H-EMISSION sets the emission type for heating mode.

1.7 AUTO MODE SETTING Menu

MENU > **FOR SERVICEMAN** > **AUTO MODE SETTING**

In **AUTO MODE SETTING** the following parameters should be set.

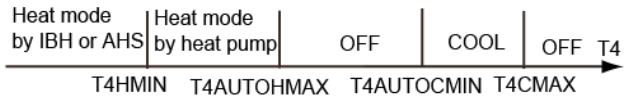
AUTO MODE SETTING menu

4 AUTO. MODE SETTING	
4.1 T4AUTOCMIN	25°C
4.2 T4AUTOHMAX	17°C
ADJUST	

T4AUTOCMIN sets the ambient temperature below which the heat pump will not provide chilled water for space cooling in auto mode.

T4AUTOHMAX sets the ambient temperature above which the heat pump will not provide heated water for space heating in auto mode.

T4AUTOCMAX, T4AUTOCMIN

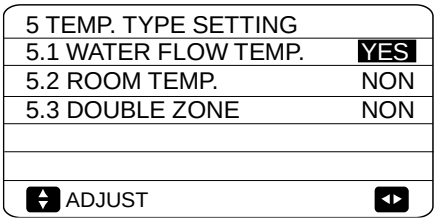


Abreviations:
HP: Heat pump
AHS: Additional heating source
IBH: Backup electric heater
T4CMAX: The ambient temperature above which the heat pump will not operate in cooling mode.
T4HMIN: The ambient temperature below which the heat pump will not operate in heating mode.

1.8 TEMP. TYPE SETTING Menu

MENU > **FOR SERVICEMAN** > **TEMP. TYPE SETTING**

TEMP. TYPE SETTING menu



The TEMP. TYPE SETTING is used for selecting whether the water flow temperature or room temperature is used to control the ON/OFF of the heat pump.

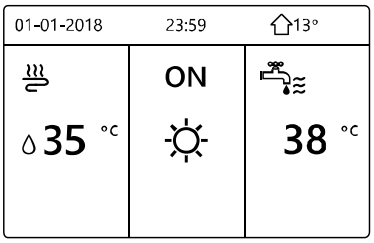
When ROOM TEMP. is enabled, the target water flow temperature will be calculated from climate-related curves.

For installations without room thermostats, space heating and cooling modes can be controlled in one of two different ways:

- according to the M thermal leaving water temperature alone
- according to the room temperature detected by the M thermal Split user interface's built-in temperature sensor alone

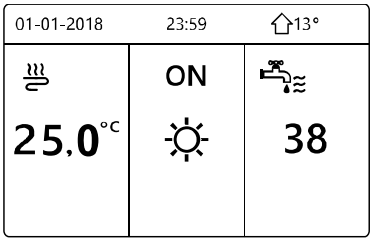
WATER FLOW TEMP. sets whether space heating/cooling modes are controlled according to the M thermal leaving water temperature. If **YES** is selected, the user is able to set the M thermal Split unit's leaving water temperature set temperature on the user interface's main screen.

Only set WATER FLOW TEMP to YES



ROOM TEMP. sets whether space heating/cooling modes are controlled according to the room temperature detected by the temperature sensor in the M thermal Split user interface. If **YES** is selected, the user is able to set the room temperature set temperature on the user interface's main screen, no matter what is the setting of **WATER FLOW TEMP.**

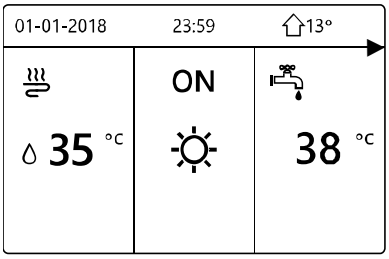
Only set ROOM TEMP to YES



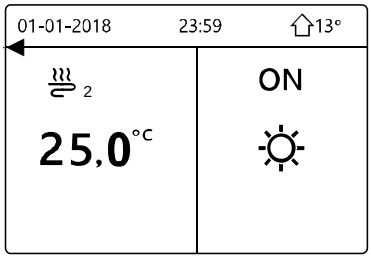
DOUBLE ZONE sets whether there are two zones.

If set WATER FLOW TEMP. and ROOM TEMP. to YES, meanwhile set DOUBLE ZONE to NON or YES, the following pages will be displayed. In this case, the setting value of zone 1 is T1S, the setting value of zone 2 is T1S2 (The corresponding TIS2 is calculated according to the climate related curves.)

Set WATER FLOW TEMP. and ROOM TEMP. to YES; Set DOUBLE ZONE to NON or YES



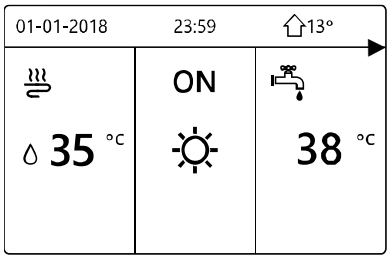
Homepage (zone 1)



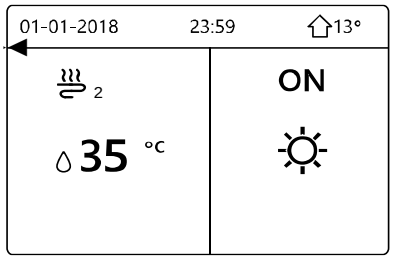
Addition page (zone 2)
(Double zone is effective)

If set DOUBLE ZONE to YES and set ROOM TEMP. to NON, meanwhile set WATER FLOW TEMP. to YES or NON, the following pages will be displayed. In this case, the setting value of zone 1 is T1S, the setting value of zone 2 is T1S2.

Set DOUBLE ZONE to YES and set ROOM TEMP. to NON; Set WATER FLOW TEMP. to YES or NON



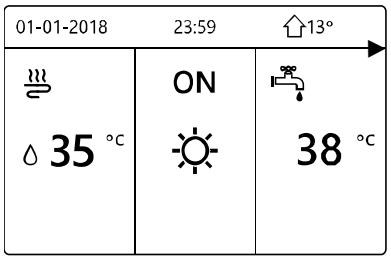
Homepage (zone 1)



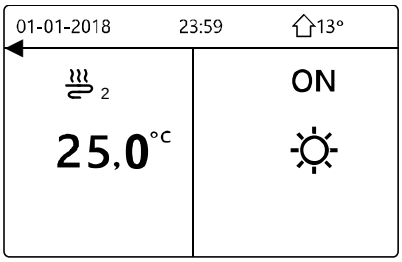
Addition page (zone 2)

If set DOUBLE ZONE and ROOM TEMP. to YES, meanwhile set WATER FLOW TEMP. to YES or NON, the following page will be displayed. In this case, the setting value of zone 1 is T1S, the setting value of zone 2 is T1S2. (The corresponding TIS2 is calculated according to the climate related curves.)

Set DOUBLE ZONE and ROOM TEMP. to YES; Set WATER FLOW TEMP. to YES or NON



Homepage (zone 1)

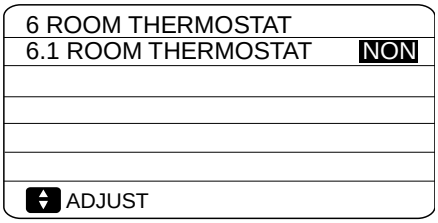


Addition page (zone 2)
(Double zone is effective)

1.9 ROOM THERMOSTAT Menu

MENU > **FOR SERVICEMAN** > **ROOM THERMOSTAT**

ROOM THERMOSTAT menu



As an alternative to controlling space heating/cooling modes according the M thermal Split unit's leaving water temperature and/or the room temperature detected by the temperature sensor in the M thermal Split user interface, separate room thermostat can be installed and used to control space heating/cooling modes.

In **ROOM THERMOSTAT** the following parameters should be set.

ROOM THERMOSTAT sets whether or not room thermostats are installed. For installations with room thermostats, select **YES**. For installations without room thermostats, select **NON**.

ROOM THERMOSTAT = NON: No room thermostat.

ROOM THERMOSTAT = MODE SET: Room thermostat can control heating and cooling individually.

ROOM THERMOSTAT=ONE ZONE: Room thermostat provides the switch signal to unit.

ROOM THERMOSTAT=DOUBLE ZONE: Indoor unit is connected with two room thermostat.

1.10 OTHER HEATING SOURCE Menu

1.10.1 OTHER HEATING SOURCE menu overview

MENU > **FOR SERVICEMAN** > **OTHER HEATING SOURCE**

OTHER HEATING SOURCE menu

7 OTHER HEATING SOURCE 1/2	
7.1 dT1_IBH_ON	5°C
7.2 t_IBH_DELAY	30MIN
7.3 T4_IBH_ON	-5°C
7.4 dT1_AHS_ON	5°C
7.5 t_AHS_DELAY	30MIN
ADJUST	

7 OTHER HEATING SOURCE 2/2	
7.6 T4_AHS_ON	-5°C
7.7 IBH LOCATE	PIPE LOOP
7.8 P_IBH1	0.0kW
7.9 P_IBH2	0.0kW
7.10 P_TBH	2.0kW
ADJUST	

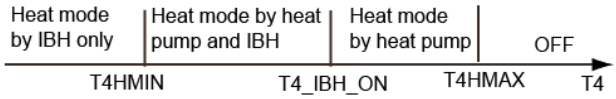
In **OTHER HEATING SOURCE** the following parameters should be set. Backup electric heater is optional.

dT1_IBH_ON sets the temperature difference between the heat pump's leaving water set temperature (T1S) and the heat pump's leaving water temperature (T1) above which the backup electric heater heating element(s) are on. When T1S - T1 ≥ dT1_IBH_ON the backup electric heater is on (on models where the backup electric heater has a simple on/off control function).

t_IBH_DELAY sets the delay between the compressor starting and the backup electric heater being turned on.

T4_IBH_ON sets the ambient temperature below which the backup electric heater is used. If the ambient temperature is above **T4_IBH_ON**, the backup electric heater is not used. The relationship between operation of the backup heater and the ambient is shown on right.

T4_IBH_ON



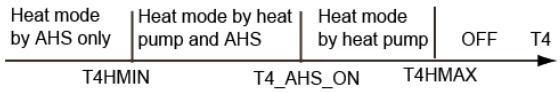
Abreviations:
T4: Outdoor ambient temperature
IBH: Backup electric heater

dT1_ASH_ON sets the temperature difference between the heat pump's leaving water set temperature (T1S) and the heat pump's leaving water temperature (T1) above which the additional heating source is on. When T1S - T1 ≥ dT1_AHS_ON the additional heating source is on.

t_ASH_DELAY sets the delay between the compressor starting and the additional heating source being turned on.

T4_AHS_ON sets the ambient temperature below which the additional heating source is used. If the ambient temperature is above **T4_ASH_ON**, the additional heating source is not used. The relationship between operation of the additional heating source and the ambient is shown in the picture below.

T4_AHS_ON



Abreviations:
AHS: *Additional heating source*
T4: Outdoor ambient temperature

IBH LOCATE means IBH is installed for pipe heating.

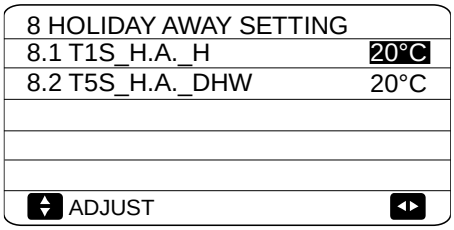
P_IBH1, P_IBH2 set heating capacity of IBH and **P_TBH** sets heating capacity of TBH, which are used for energy consumption statistics.

1.11 HOLIDAY AWAY SETTING Menu

MENU > FOR SERVICEMAN > HOLIDAY AWAY SETTING

The **HOLIDAY AWAY SETTING** menu settings are used to set the outlet water temperature to prevent water pipes freezing when away from home in cold weather seasons. In **HOLIDAY AWAY SETTING** the following parameters should be set.

HOLIDAY AWAY SETTING menu



T1S_H.A._H sets the heat pump's leaving water set temperature for space heating mode when in holiday away mode.

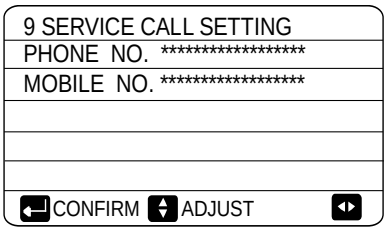
T5S_H.A._DHW sets the heat pump's leaving water set temperature for DHW mode when in holiday away mode.

1.12 SERVICE CALL Menu

MENU > FOR SERVICEMAN > SERVICE CALL

In **SERVICE CALL** the following parameters can be set.

SERVICE CALL menu



PHONE NO. and **MOBILE NO.** can be used to set after-sales service contact numbers. If set, these numbers are displayed to users in **MENU** > **FOR SERVICEMAN > SERVICE CALL**

Use ▼ ▲ to adjust the numerical values. The maximum length of the phone numbers is 14 digits.

The black rectangle found between 0 and 9 when scrolling up and down using ▼ ▲ is converted to a blank space when the phone numbers are displayed to users in **MENU** > **FOR SERVICEMAN > SERVICE CALL** and can be used for phone numbers less than 14 digits in length.

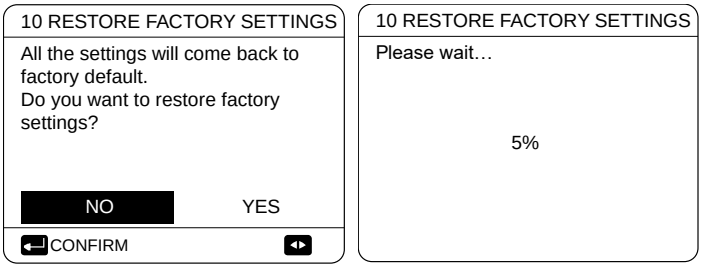
1.13 RESTORE FACTORY SETTINGS

MENU > FOR SERVICEMAN > RESTORE FACTORY SETTINGS

RESTORE FACTORY SETTINGS is used to restore all the parameters set in the user interface to their factory defaults.

On selecting **YES**, the process of restoring all settings to their factory defaults begins and progress is displayed as a percentage.

RESTORE FACTORY SETTINGS screens



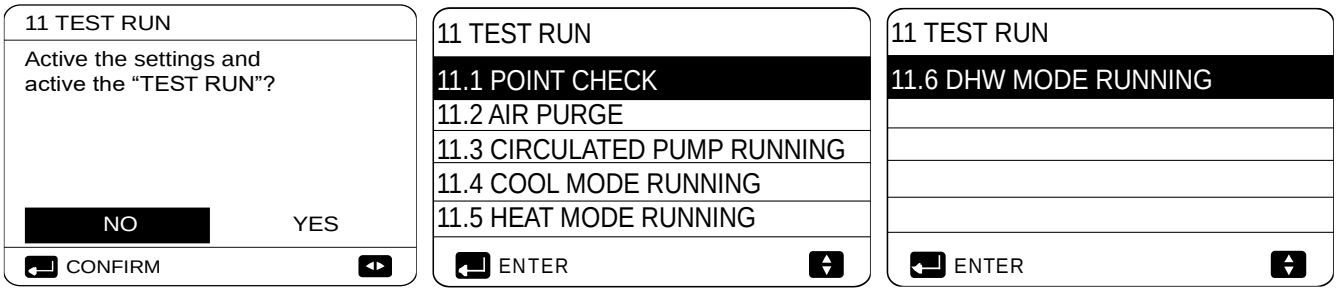
1.14 TEST RUN

1.14.1 TEST RUN Menu overview

MENU > FOR SERVICEMAN > TEST RUN

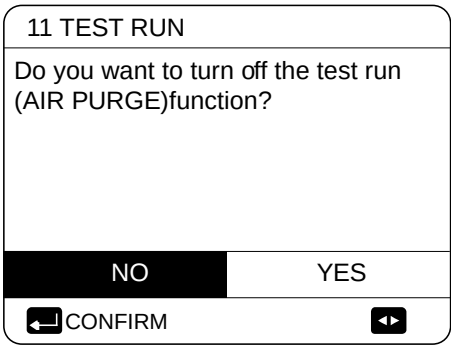
TEST RUN is used to check that the valves, air purge function, circulation pump, space cooling mode, space heating mode and DHW mode are all operating correctly.

TEST RUN start screen and TEST RUN menu



During test run, all buttons except OK are invalid. If you want to turn off the test run, please press OK. For example ,when the unit is in air purge mode, after you press OK, the following page will be displayed:

Exit air purge screen

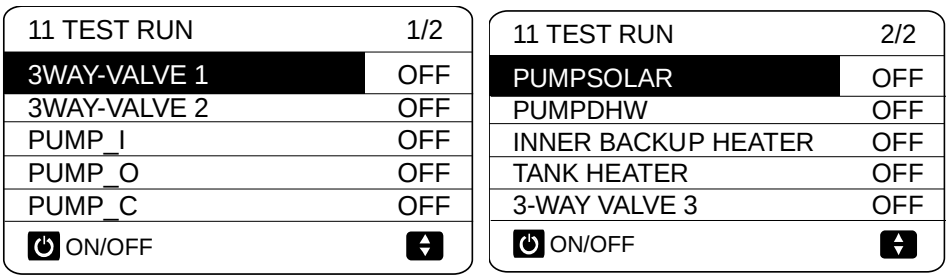


1.14.2 POINT CHECK menu

MENU > FOR SERVICEMAN > TEST RUN > POINT CHECK

The **POINT CHECK** menu is used to check the operation of individual components. Use ▼▲ to scroll to the components you want to check and press ON/OFF to toggle the on/off state of the component. If a valve does not turn on/off when its on/off state is toggled or if a pump/heater does not operate when turned on, check the component's connection to the hydro system main PCB.

POINT CHECK menu



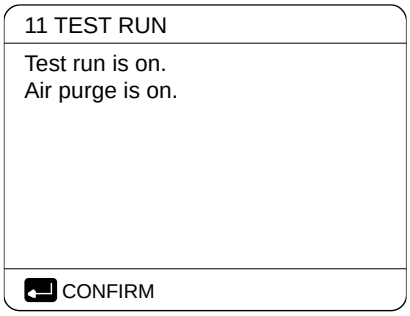
1.14.3 AIR PURGE operation

MENU > FOR SERVICEMAN > TEST RUN > AIR PURGE

Once installation is complete it is important to run the air purge function to remove any air which may be present in the water piping and which could cause malfunctions during operation.

The **AIR PURGE** operation is used to remove air from the water piping. Before running AIR PURGE mode, make sure that the air purge valve is open. When the air purge operation starts, the 3-way valve opens and the 2-way valve closes. 60 secs later the pump in the unit (PUMPI) operates for 10min during which the flow switch does not work. After the pump stops, the 3-way valve closes and the 2-way valve opens. 60 secs later both PUMPI and PUMPO operate until the next command is received. If any error code is displayed during the air purge operation, the cause should be investigated.

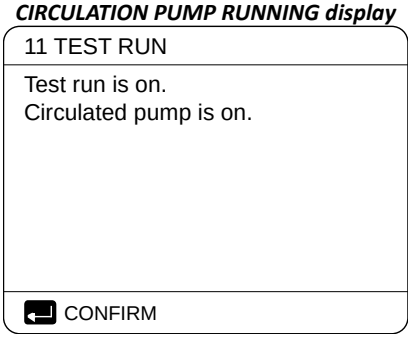
AIR PURGE operation



1.14.4 CIRCULATION PUMP RUNNING operation

MENU > FOR SERVICEMAN > TEST RUN > CIRCULATION PUMP RUNNING

CIRCULATION PUMP RUNNING display

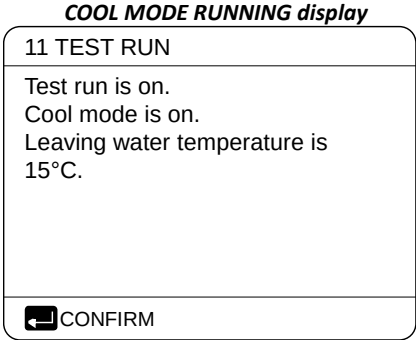


The **CIRCULATION PUMP RUNNING** operation is used to check the operation of the circulation pump. When the circulation pump running operation starts, all running components stop. 60 secs later, the 3-way valve opens and the 2-way valve closes. After a further 60 secs PUMPI starts. 30 seconds later, if the flow switch detects that the water flow is normal, PUMPI operates for 3 min. After the pump stops 60s, the 3-way valve closes and the 2-way valve opens. 60s later both PUMI and PUMPO will operate. After a further 2 min the flow switch start to check the water flow. If the water flow rate is sufficient, both PUMPI and PUMPO operate until the next command is received. If the water flow rate is insufficient over any 15-second period, PUMPI and PUMPO stop and error code E8 is displayed. Refer to Part 3, 8.2 “Error Code table”.

1.14.5 COOL MODE RUNNING operation

MENU > FOR SERVICEMAN > TEST RUN > COOL MODE RUNNING

COOL MODE RUNNING display



The **COOL MODE RUNNING** operation is used to check the operation of the system in space cooling mode.

During the **COOL MODE RUNNING** operation, the M thermal Split unit leaving water set temperature is 7°C. The current actual leaving water temperature is displayed on the user interface. The unit operates until the leaving water temperature drops to the set temperature or the next command is received.

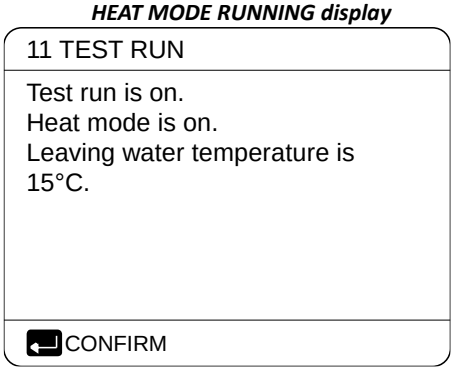
If any error code is displayed during the cool mode running operation, the cause should be investigated. Refer to Part 3, 8.2 “Error Code table”.

1.14.6 HEAT MODE RUNNING operation

The **HEAT MODE RUNNING** operation is used to check the operation of the system in space heating mode.

During the **HEAT MODE RUNNING** operation the M thermal Split unit leaving water set temperature is 35°C. The current actual leaving water temperature is displayed on the user interface. When the **HEAT MODE RUNNING** operation starts, the heat pump first runs for 10 mins.

HEAT MODE RUNNING display



After 10 mins:

- On systems where an auxiliary heat source (AHS) is installed, the AHS starts and runs for 10 mins (whilst the heat pump continues running), after which the AHS stops and the heat pump continues to operate until the water temperature rises to the set temperature or the heat mode running operation is exited by pressing **OK**.
- On systems where a backup electric heater is being used, the backup heater turn on (on models where the backup heater has a simple on/off control function). 3 mins later the backup electric heater will turn off. The heat pump will then operate until the water temperature rises to the set temperature or the **next command is received.**
- On systems with no auxiliary heat source (AHS), the heat pump will then operate until the water temperature rises to the set temperature or the **next command is received.**

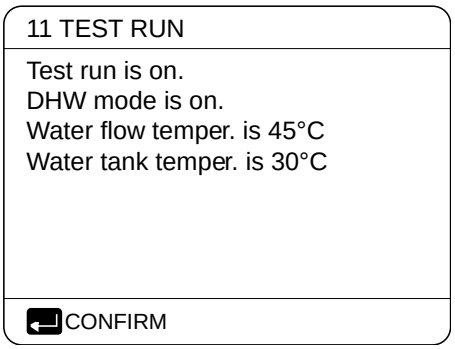
If any error code is displayed during the cool mode running operation, the cause should be investigated. Refer to Part 3, 8.2 “Error Code table”.

1.14.7 DHW MODE RUNNING operation

The **DHW MODE RUNNING** operation is used to check the operation of the system in DHW mode.

During the **DHW MODE RUNNING** operation, the DHW set temperature is 55°C. On systems where a tank boost heater is installed, the tank boost heater will turn on once the heat pump has run for 10 mins. The tank boost heater will turn off 3 min later and the heat pump will operate until the water temperature rises to the set temperature or the **next command is received.**

DHW MODE RUNNING display

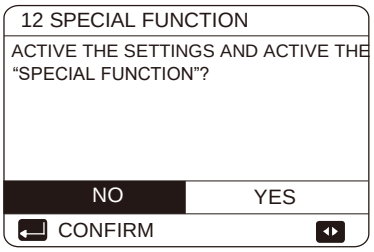


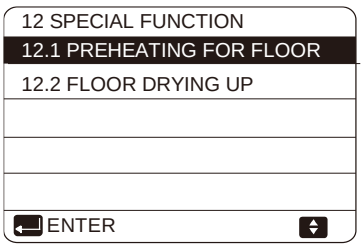
1.15 SPECIAL FUNCTION

1.15.1 SPECIAL FUNCTION menu overview

MENU > FOR SERVICEMAN > SPECIAL FUNCTION

Special functions menu





SPECIAL FUNCTION is used to pre-heating floor and drying up floor once installation is complete or the first time start up the unit or restart the unit after a long time stop.

1.15.2 PREHEATING FOR FLOOR

MENU > **FOR SERVICEMAN** > **SPECIAL FUNCTION** > **PREHEATING FOR FLOOR**

Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even rupture during floor heating operation, in order to protect the floor, floor drying is necessary, during which the temperature of the floor should be increased gradually.

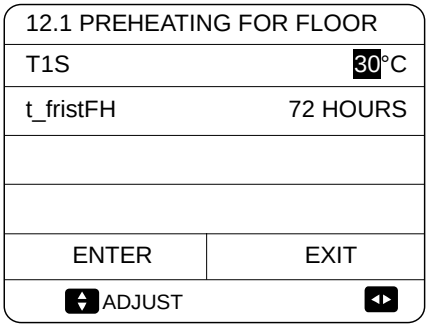
During first operation of the unit, air may remain in the water system which can cause malfunctions during operation. It is necessary to run the air purge function to release the air (make sure the air purge valve is open).

T1S sets the heat pump's leaving water set temperature in preheating for floor mode.

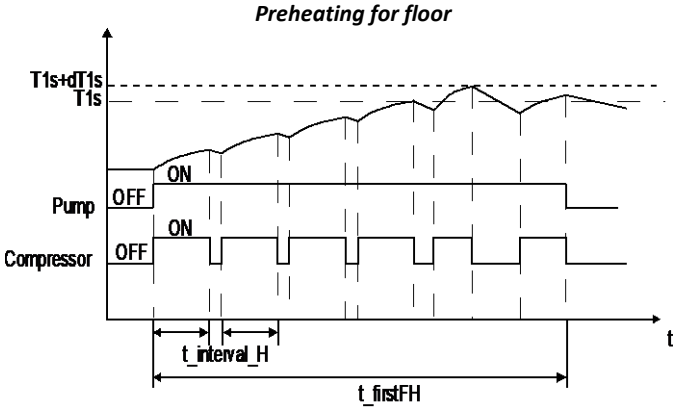
t_fristFH sets the duration of preheating for floor mode.

The operation of the unit during preheating for floor mode is illustrated below:.

Preheating for floor menu



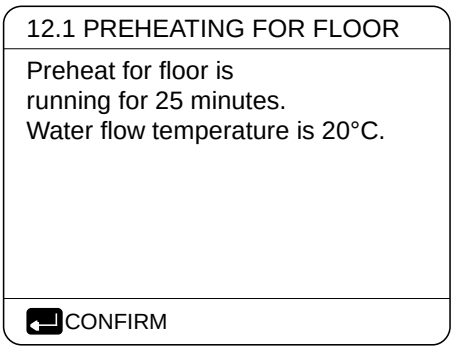
Preheating for floor

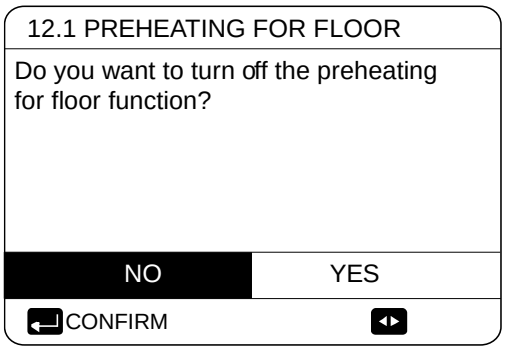


Abreviations:
t_interval_H: Compressor re-start delay in space heating mode. (Refer to Part 3, 8.6 "HEAT MODE SETTING Menu").

Whilst the preheating for floor operation is running, the number of minutes that it has been running for and the heat pump's leaving water temperature are displayed on the user interface. During the preheating for floor operation all buttons except **OK** are inactivated. To exit the preheating for floor operation, press **OK** and then select **YES** when prompted. Refer to below:

Preheating for floor screens

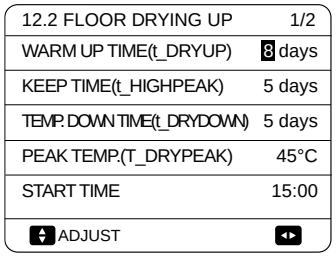


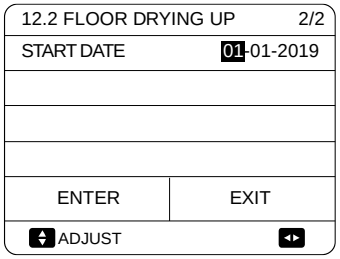


1.15.3 FLOOR DRYING UP

MENU > **FOR SERVICEMAN** > **SPECIAL FUNCTION** > **FLOOR DRYING UP**

FLOOR DRYING UP menu

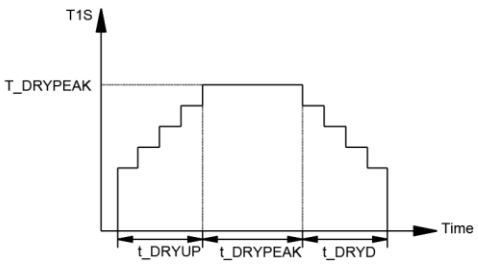




For newly-installed under-floor heating systems, floor drying up mode can be used to remove moisture from the floor slab and subfloor to prevent warping or rupture of the floor during floor heating operation. There are three phases to the floor drying up operation:

- Phase 1: gradual temperature increase from a starting point of 25°C to the peak temperature
- Phase 2: maintain peak temperature
- Phase 3: gradual temperature decrease from the peak temperature to 45°C

FLOOR DRYING UP settings



WARM UP TIME(t_DRYUP) sets the duration of Phase 1.

KEEP TIME(t_HIGHPEAK) sets the duration of Phase 2.

TEMP. DOWN TIME(t_DRYDOWN) is the duration of Phase 3.

PEAK TEMP(T_DRYPEAK) sets the heat pump's leaving water set temperature for Phase 2.

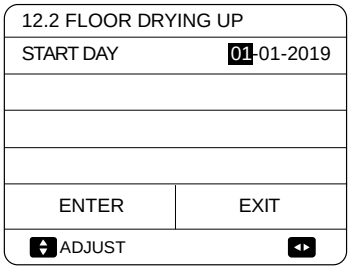
START TIME sets the floor drying up operation start time.

START DATE sets the floor drying up operation start date.

During the floor drying up operation all buttons except **OK** are inactivated. To exit the floor drying up operation, press **OK** and then select **YES** when prompted.

Note: In the event of a heat pump malfunction, floor drying up mode will continue if a backup electric heater and/or additional heating source is available and configured to support space heating mode.

FLOOR DRYING UP screen



1.16 AUTO RESTART

MENU > FOR SERVICEMAN > AUTO RESTART

AUTO RESTART menu

13 AUTO RESTART	
13.1 COOL/HEAT MODE	YES
13.2 DHW MODE	NON
ADJUST	

AUTO RESTART sets whether or not the unit re-applies the user interface settings when the power returns following a power failure. Select **YES** to enable auto restart or **NON** to disable auto restart.

If the auto restart function is enabled, when the power returns following a power failure, the unit re-applies the user interface settings from before the power failure. If the auto restart function is disabled, when the power returns after a power failure, the unit won't auto restart.

1.17 POWER INPUT LIMITATION

MENU > FOR SERVICEMAN > POWER INPUT LIMITATION

POWER INPUT LIMITATION menu

14 POWER INPUT LIMITATION	
14.1 POWER INPUT LIMITATION	0
ADJUST	

POWER INPUT LIMITATION sets the type of power input limitation and the setting range is 0-8. If the unit will operate at larger power input, 0 should be selected. If the unit will operate at a lower power input, 1-8 should be selected and the power input and capacity will decrease.

Limitation value (unit:A)

Model \ No.	0	1	2	3	4	5	6	7	8
4/6kW	18	18	16	15	14	13	12	12	12
8/10kW	19	19	18	16	14	12	12	12	12
12/14kW(1N)	30	30	28	26	24	22	20	18	16
16kW(1N)	30	30	29	27	25	23	21	19	17
12/14kW(3N)	14	14	13	12	11	10	9	9	9
16kW(3N)	14	14	13	12	11	10	9	9	9

1.18 INPUT DEFINE

MENU > FOR SERVICEMAN > INPUT DEFINE

15 INPUT DEFINE	
15.1 M1M2	REMOTE
15.2 SMART GRID	NON
15.3 Tw2	NON
15.4 Tbt1	NON
15.5 Tbt2	NON
ADJUST	

15 INPUT DEFINE	
15.6 Ta	HMI
15.7 Ta-adj	-2°C
15.8 SOLAR INPUT	NON
15.9 F-PIPE LENGTH	<10m
15.10 RT/Ta_PCB	NON
ADJUST	

15 INPUT DEFINE	
15.11 PUMP_I SILENT MODE	NON
15.12 DFT1/DFT2	DEFROST
ADJUST	

INPUT DEFINE sets sensors and functions to fulfill with installation.

(M1M2) sets the control function of M1M2 for remote ON/OFF of unit or AHS or TBH

SMART GRID sets whether SMART GRID control signal is connected to hydronic PCB.

Tw2 sets whether T1b sensor exist in the installation.

Tbt1 set whether balance tank temperature sensors are installed in the balance tank. (Tbt1 sensor, individually purchase; Tbt2, reserved)

Ta sets the Ta sensor connection type (HMI: Ta on wired controller; IDU: Ta connected on hydronic PCB)

Ta-adj is an correction value for Ta.

SOLAR INPUT sets whether solar control signal is connected to hydronic PCB. (0=NON; 1=CN18; Tsolar 2=CN11SL1SL2)

F-PIPE LENGTH sets the length of refrigerant pipes between outdoor unit and indoor unit.

RT/Ta_PCB sets whether M-kit is valid.

Pump silent mode can decrease water pump maximum output by 5% in order to decrease the noise of heat pump.

DFT1/DFT2 sets DFT1 and DFT2 port of the hydro module as DEFROST or Alarm(ALARM function can be valid only with IDU software version higher than V99)

1.19 HMI ADDRESS SET

MENU > FOR SERVICEMAN > HMI ADDRESS SET

HMI ADDRESS SET

17 HMI ADDRESS SET	
17.1 HMI SET	MASTER
17.2 HMI ADDRESS FOR BMS	1
17.3 STOP BIT	1

HMI SET sets the wired controller is master or slave. (0=MASTER, 1=SLAVE)

When HMI SET is set to SLAVE, the controller can only switch the operation mode, turn on or off, set the temperature, and cannot set other parameters and functions.

HMI ADDRESS FOR BMS sets the HMI address code for BMS.(only valid for master controller)

The **STOP BIT** of wired controller and upper computer software should be the same to ensure the reliability of data transformation.

2 Operation Parameter Checking

MENU > **OPERATION PARAMETER**

This menu is for installer or service engineer reviewing the operation parameters. There are nine pages for the operating parameter as following

OPERATION PARAMETER	#01
ONLINE UNITS NUMBER	1
OPERATE MODE	COOL
SV1 STATE	ON
SV2 STATE	OFF
SV3 STATE	OFF
PUMP_I	ON
ADDRESS	1/9

OPERATION PARAMETER	#01
PUMP-O	OFF
PUMP-C	OFF
PUMP-S	OFF
PUMP-D	OFF
PIPE BACKUP HEATER	OFF
TANK BACKUP HEATER	ON
ADDRESS	2/9

OPERATION PARAMETER	#01
GAS BOILER	OFF
T1 LEAVING WATER TEMP.	35°C
WATER FLOW	1.72m 3/h
HEAT PUMP CAPACTIY	11.52kW
POWER CONSUM.	1000kWh
Ta ROOM TEMP	25°C
ADDRESS	3/9

OPERATION PARAMETER	#01
T5 WATER TANK TEMP.	53°C
Tw2 CIRCUIT2 WATER TEMP.	35°C
TIS' C1 CLIMATE CURVE TEMP.	35°C
TIS2' C2 CLIMATE CURVE TEMP.	35°C
TW_O PLATE W-OUTLET TEMP.	35°C
TW_I PLATE W-OUTLET TEMP.	30°C
ADDRESS	4/9

OPERATION PARAMETER	#01
Tbt1 BUFFERTANK_UP TEMP.	35°C
Tbt2 BUFFERTANK_LOW TEMP.	35°C
Tsolar	25°C
IDU SOFTWARE	01-09-2019V01
ADDRESS	5/9

OPERATION PARAMETER	#01
ODU MODEL	6kW
COMP.CURRENT	12A
COMP.FREQENCY	24Hz
COMP.RUN TIME	54 MIN
COMP.TOTAL RUN TIME	1000Hrs
EXPANSION VALVE	200P
ADDRESS	6/9

OPERATION PARAMETER	#01
FAN SPEED	600R/MIN
IDU TARGET FREQUENCY	46Hz
FREQUENCY LIMITED TYPE	5
SUPPLY VOLTAGE	230V
DC GENERATRIX VOLTAGE	420V
DC GENERATRIX CURRENT	18A
ADDRESS	7/9

OPERATION PARAMETER	#01
TW_O PLATE W-OUTLET TEMP.	35°C
TW_I PLATE W-INLET TEMP.	30°C
T2 PLATE F-OUT TEMP.	35°C
T2B PLATE F-IN TEMP.	35°C
Th COMP. SUCTION TEMP.	5°C
Tp COMP. DISCHARGE TEMP.	75°C
ADDRESS	8/9

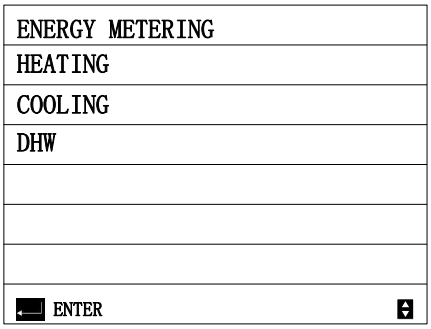
OPERATION PARAMETER	#01
T3 OUTDOOR EXCHARGE TEMP.	5°C
T4 OUTDOOR AIR TEMP.	5°C
TF MODULE TEMP.	55°C
P1 COMP. PRESSURE	2300kPa
ODU SOFTWARE	01-09-2018V01
HMI SOFTWARE	01-09-2018V01
ADDRESS	9/9

3 Energy metering

MENU > **ENERGY METERING**

3.1 Energy metering function

After the energy metering function is enabled, select ENERGY METERING in the main menu to view the heating, cooling and hot water energy data of the unit; in each mode, the real-time, cumulative, daily, weekly, monthly, annually and calendar year energy data can be viewed respectively.



Select the mode to view the energy metering data through the ▲ ▼ key, and press the OK key to enter the viewing interface of this mode;

Viewing the energy metering data for each mode is done in the same way.

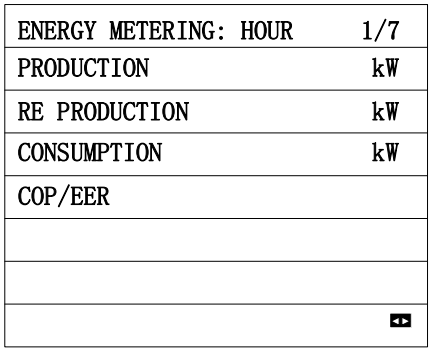
The following table is the energy data parameter table:

Item	Mode	Explanation
PRODUCED	Heating/DHW	Heating capacity (include electric heater capacity)
	Cooling	Cooling capacity
RE PRODUCED	Heating/DHW	The raised heating capacity by heat pump compared to electric heater with the same amount of electricity consumed, which is for reference only.
	Cooling	The raised cooling capacity by heat pump compared to semiconductor refrigeration with the same amount of electricity consumed, which is for reference only.
CONSUMED	Heating/DHW/Cooling	Total power consumption(include electric heater)
COP/EER	Heating/DHW	COP = Heating capacity / Total power consumption
	Cooling	EER = Cooling capacity / Total power consumption

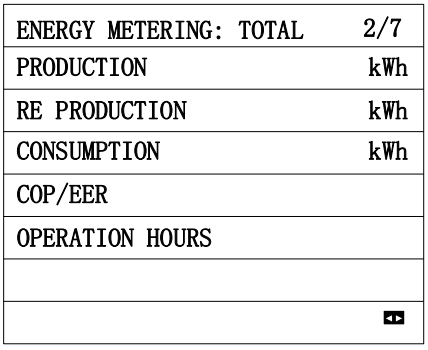
3.1.1 Data display interface of real-time, cumulative, current day, current week, current month and current year

Select the mode to view the energy metering data through the ▲ ▼ key, and press the OK key to enter the viewing interface of this mode.

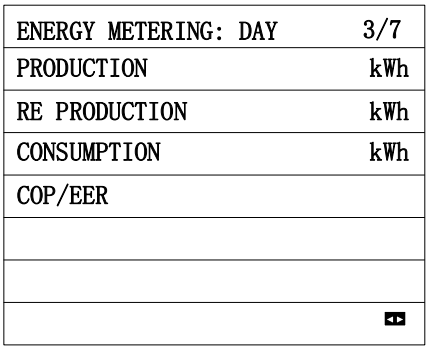
1/7: Real-Time Energy Data



2/7: Cumulative Energy Data



3/7: Energy Data of the Day



4/7: Energy Data of the Week

ENERGY METERING: WEEK	4/7
PRODUCTION	kWh
RE PRODUCTION	kWh
CONSUMPTION	kWh
COP/EER	

5/7: Energy Data of the Month

ENERGY METERING: MONTH	5/7
PRODUCTION	kWh
RE PRODUCTION	kWh
CONSUMPTION	kWh
COP/EER	

6/7: Energy Data of the Year

ENERGY METERING: YEAR	6/7
PRODUCTION	kWh
RE PRODUCTION	kWh
CONSUMPTION	kWh
COP/EER	

Press ◀▶ to turn pages to view the parameters (turn a page each time); press "BACK" to return to the previous page, and the invalid data will be displayed as "----".

3.1.2 Display interface of energy data HISTORICAL DATA over the years

On the ENERGY METERING: YEAR page, press ▸ to scroll to the right to view the HISTORICAL DATA energy data page over the years.

7/7: Calendar Year Energy Data

ENERGY METERING	7/7
HISTORICAL DATA	
CONFIRM	

Full Year 2022 Energy Data

ENERGY METERING	2022 TOTAL
PRODUCTION	kWh
RE PRODUCTION	kWh
CONSUMPTION	kWh
COP/EER	
MONTH	YEAR

January 2022 Energy Data

ENERGY METERING	2022 JAN
PRODUCTION	kWh
RE PRODUCTION	kWh
CONSUMPTION	kWh
COP/EER	
MONTH	YEAR

Energy data over the years shall be stored monthly and annually for at least 10 years (including the current year).

Press ▸ and ▼ ▲ to turn pages to view parameters (turn a page each time), press "BACK" to return to the previous page, and invalid data will be displayed as "----".

Explain

1) The data can be refreshed and displayed after the wired controller is powered on for more than 10 minutes, and all the above data are displayed as 0 within 10 minutes;
2) OPERATION HOURS is the operating time of the host compressor.
3) Installation setting option 5.4 ENERGY METERING determines whether to display or not according to whether the indoor and outdoor units support energy consumption calculation. Both the indoor and outdoor units support energy consumption calculation, and the installation setting option is displayed. If either of the indoor or outdoor units supports energy consumption calculation, the installation setting option is hidden. If the indoor or outdoor unit is not connected, the installation setting options are hidden.
4) Data calculation and display of MENU menu-> ENERGY METERING of wired controller (including synchronous uploading of data to cloud and plug-in display) shall meet the requirement of supporting energy consumption calculation for internal and external units at the same time. 5.4 ENERGY METERING on wired controller is set to YES.

4 Climate Related Curves

The climate related curves can be selected in the user interface, **MENU** > **PRESET TEMPERATURE** > **WEATHER TEMP. SET.**

WEATHER TEMP.SET menu

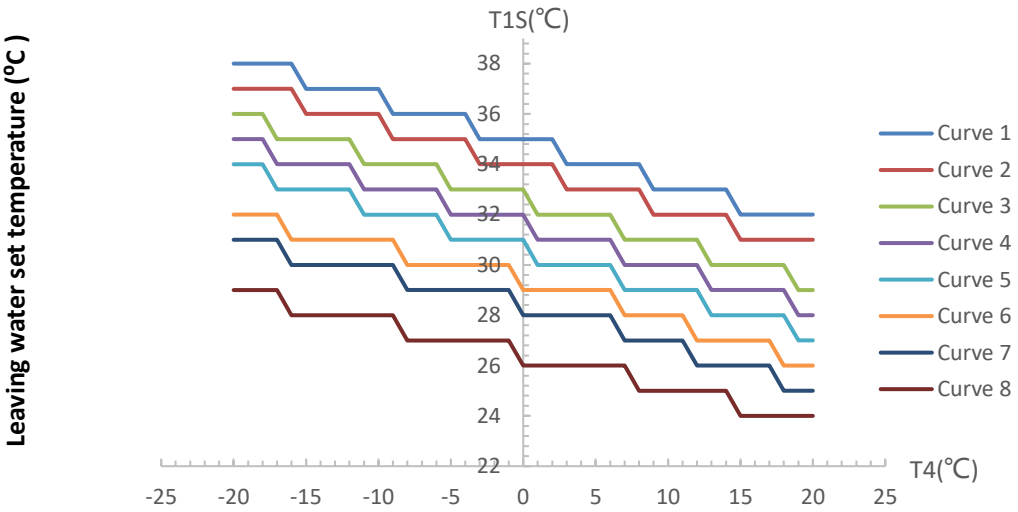
PRE SET TEMPERATURE		
PRESET TEMP	WEATHER TEMPSET	ECO MODE
ZONE1 C-MODE LOW TEMP		OFF
ZONE1 H-MODE LOW TEMP		OFF
ZONE2 C-MODE LOW TEMP		OFF
ZONE2 H-MODE LOW TEMP		OFF
ON/OFF		

In cooling/heating mode, eight curves which are already set in the user interface can be selected. Once the curve is selected, the leaving water set temperature (T1s) is determined by the outdoor temperature(T4).

ECO mode is only suitable for heating mode. It has lower water temperature setting inside the program, which is more energy saving.

The relationship between outdoor ambient temperature (T4) and leaving water set temperature (T1s) is described as below.

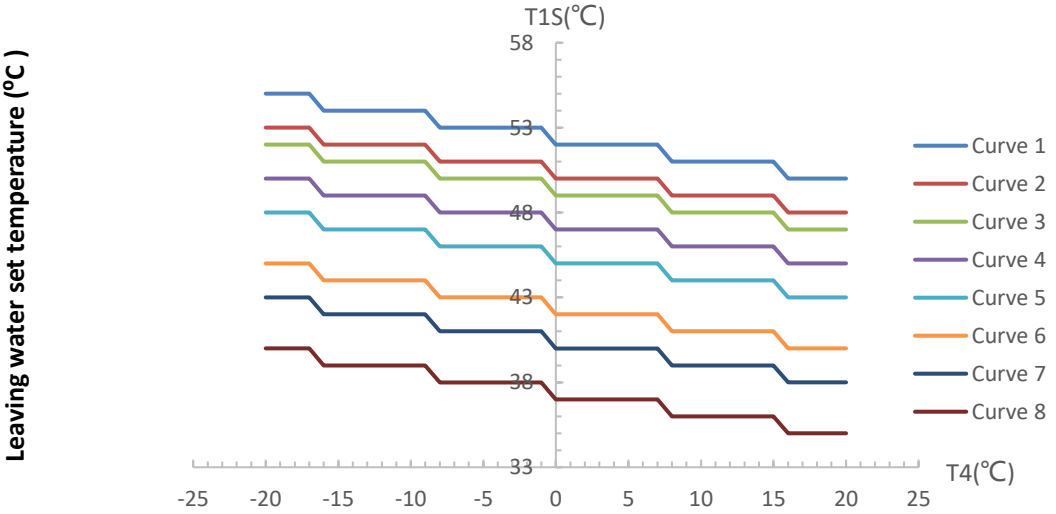
Low temperature curves for heating mode[1]



Notes:

1. It only has the curves of the low temperature setting for heating, if the low temperature is set for heating.
2. Curve 4 is default in low temperature heating mode and curve 6 is default in ECO mode.

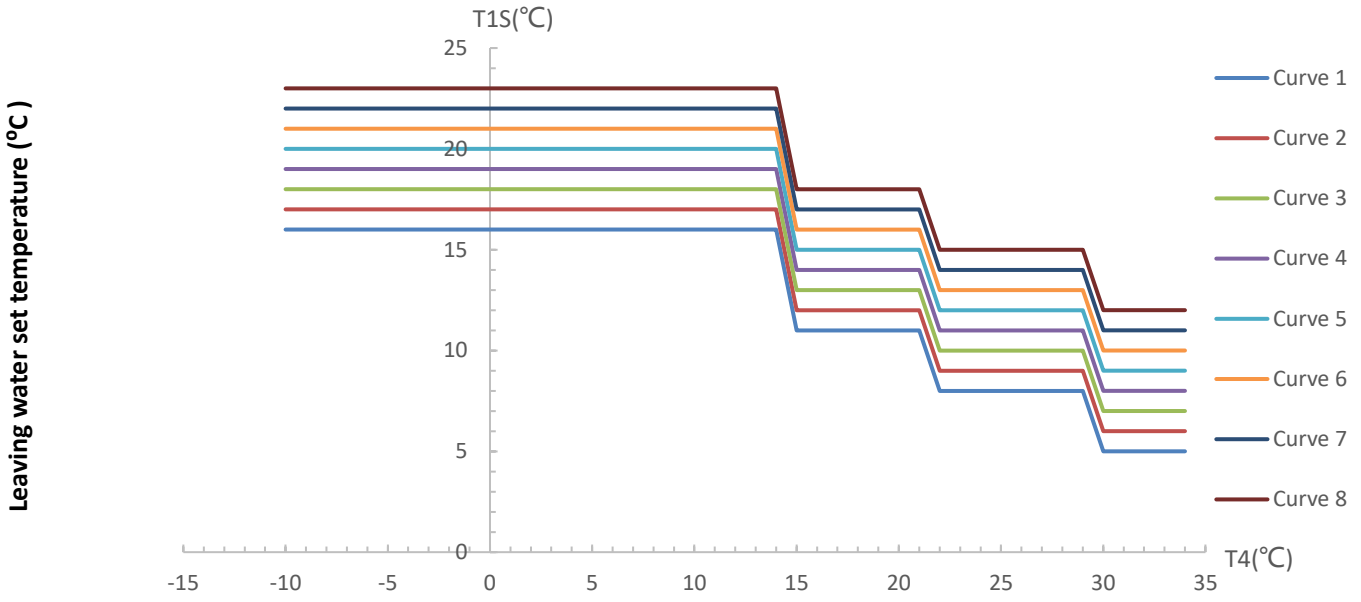
High temperature curves for heating mode[1]



Notes:

1. It only has the curves of the high temperature setting for heating, if the high temperature is set for heating.
2. Curve 4 is default in high temperature heating mode and curve 6 is default in ECO mode.

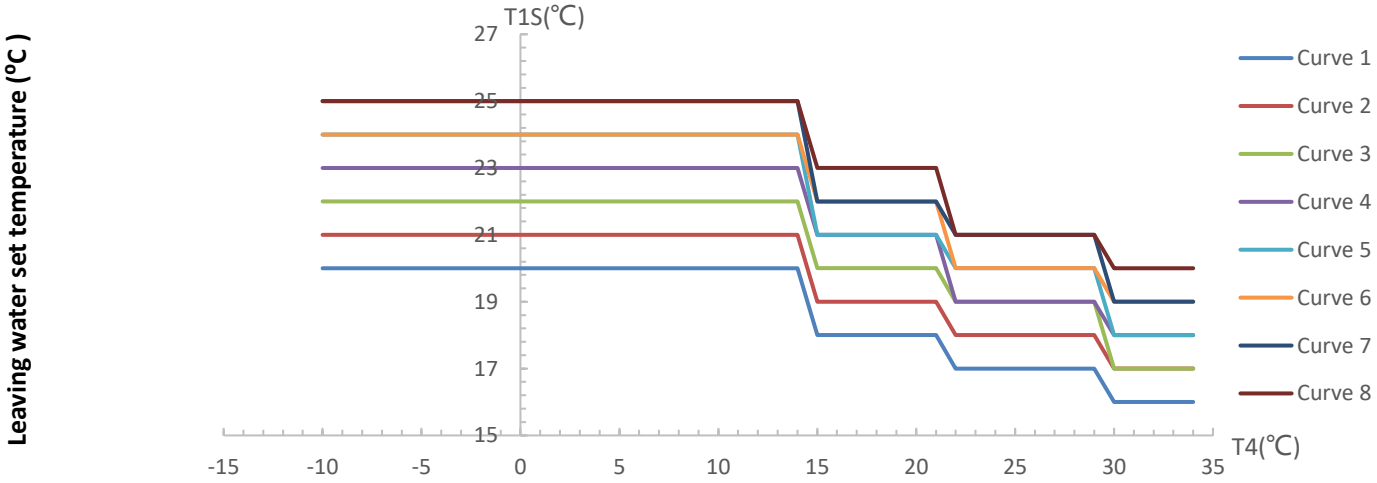
Low temperature curves for cooling mode[1]



Notes:

1. It only has the curves of the low temperature setting for cooling, if the low temperature is set for cooling.
2. Curve 4 is default in low temperature cooling mode.

High temperature curves for cooling mode[1]

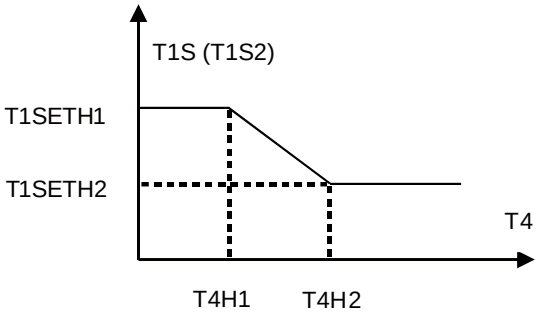


Notes:

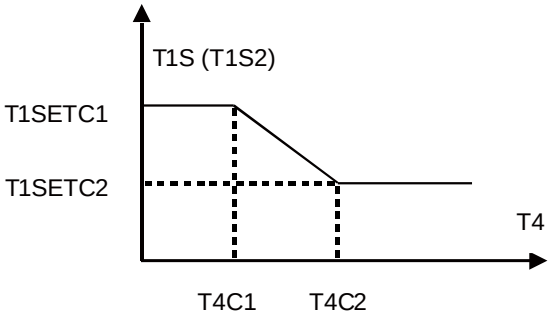
1. It only has the curves of the high temperature setting for cooling, if the high temperature is set for cooling.
2. Curve 4 is default in high temperature cooling mode.

There is one customized curve which can set by user according to using habits. Users just need to input the ambient temperature and desire water temperature for two working condition to build the customized curve. The setting of T1SETH1, T1SETH2, T4H1, T4H2 refer to Part 3, 1.6" HEATING MODE SETTING Menu" and T1SETC1, T1SETC2, T4C1, T4C2 refer to Part 3, 1.5" COOLING MODE SETTING Menu".

Automatic setting curve for heating mode



Automatic setting curve for cooling mode



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