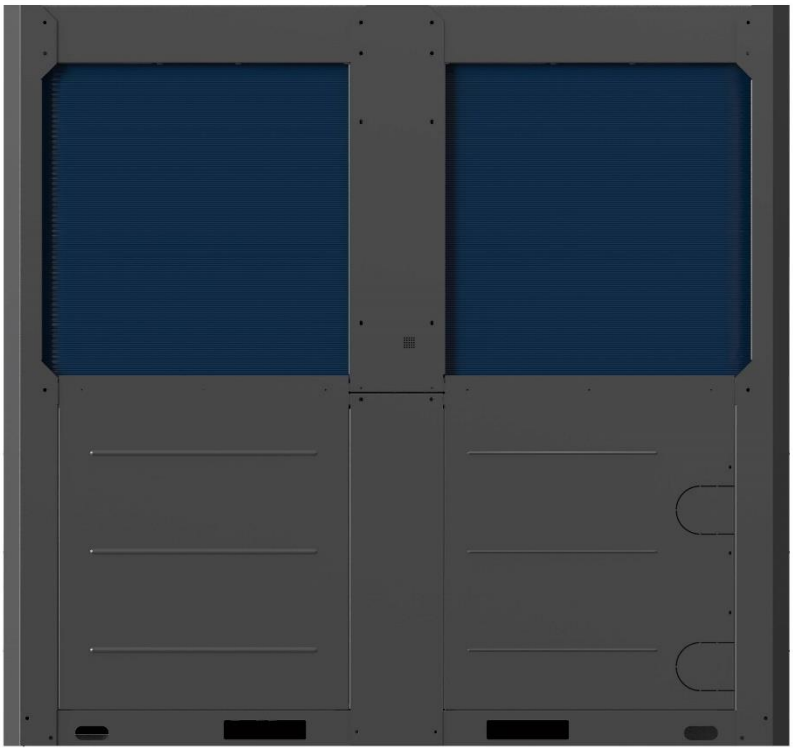
R290

Midea Building Technologies Division

Engineering Data

Mars Large



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Part 1

General Information

1 System introduction

1.1 System Schematic

Mars Large is an integrated air-to-water space heating and space cooling heat pump system. 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 hydronic system. The heated water in the hydronic system circulates to low temperature heat emitters (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 hydronic system can provide chilled water for cooling using fan coil units.

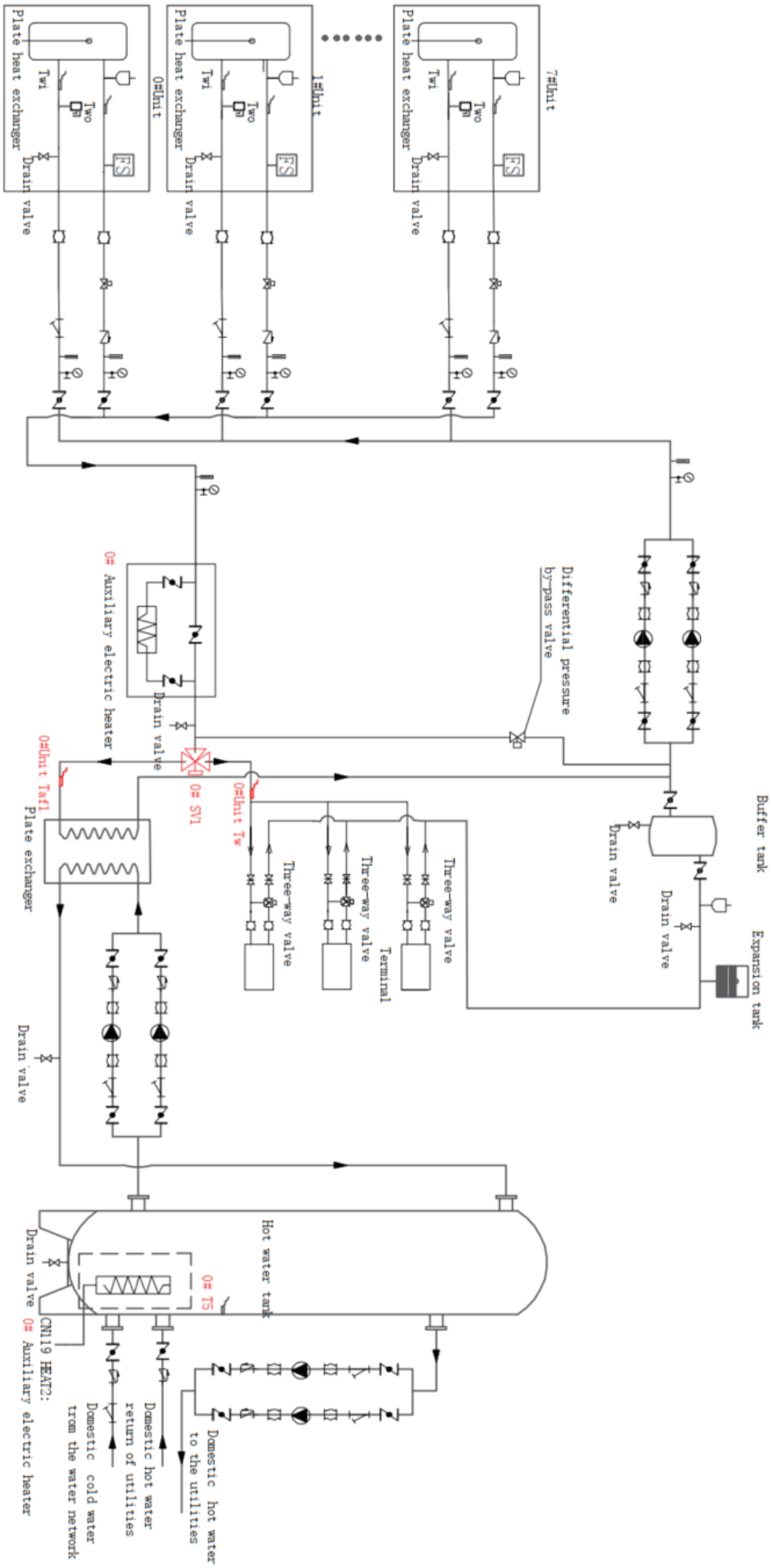
The heating capacity of heat pumps decreases with the decrease of ambient temperature. Mars Large is reserved an auxiliary electric heater control port to provide additional heating capacity for use during extremely cold weather when the heat pump capacity is insufficient. The auxiliary electric heater also serves as a backup in case of heat pump malfunction and for anti-freeze protection of the outside water piping in winter.

1.2 Typical Applications

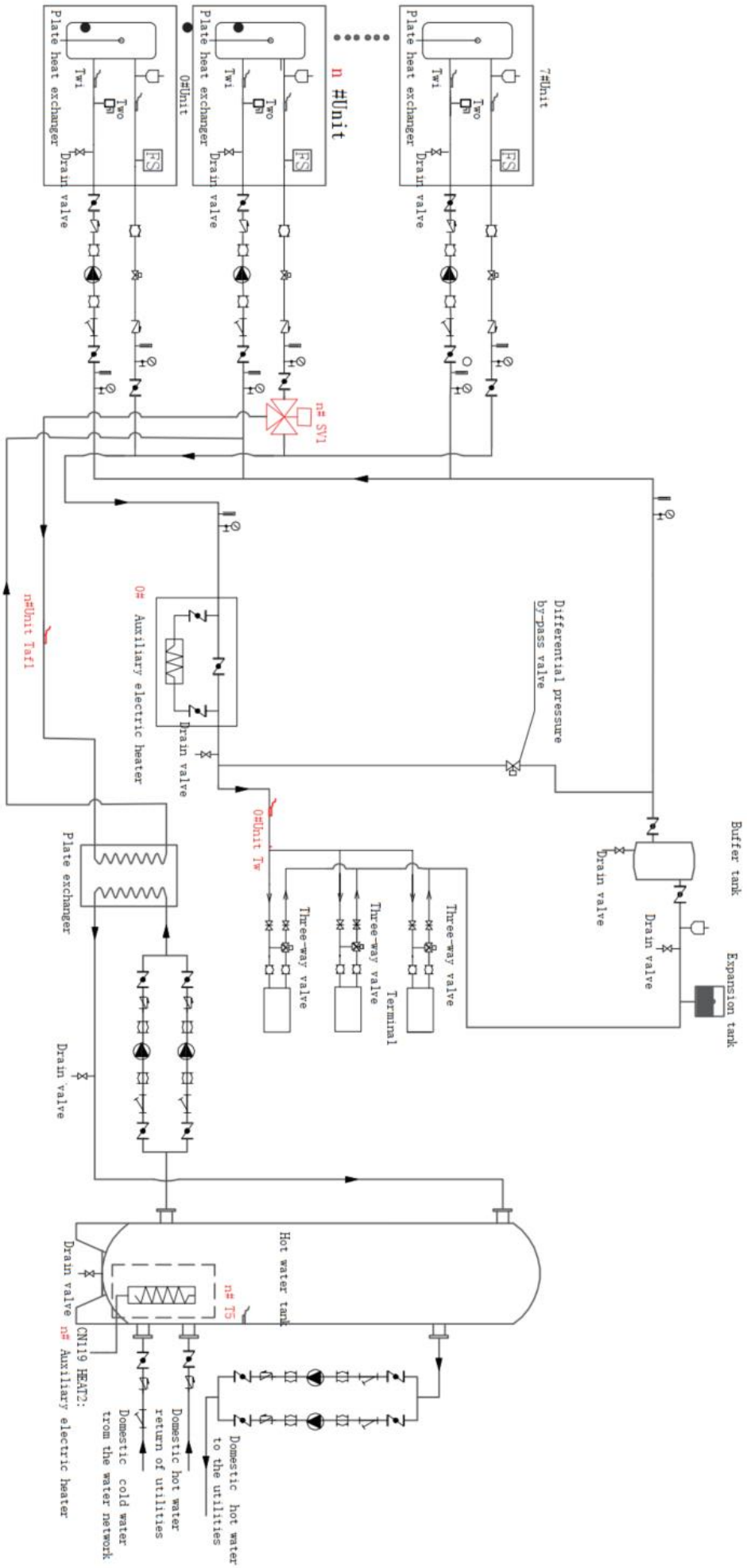
Water flow switch	Gate valve	Safety valve	Drain valve	Auto vent valve
Soft joint	Water pump	Shut off valve	Temperature sensor	Solenoid three-way valve
Water pressure meter	Check valve	Thermometer	Y-type strainer	

Note:

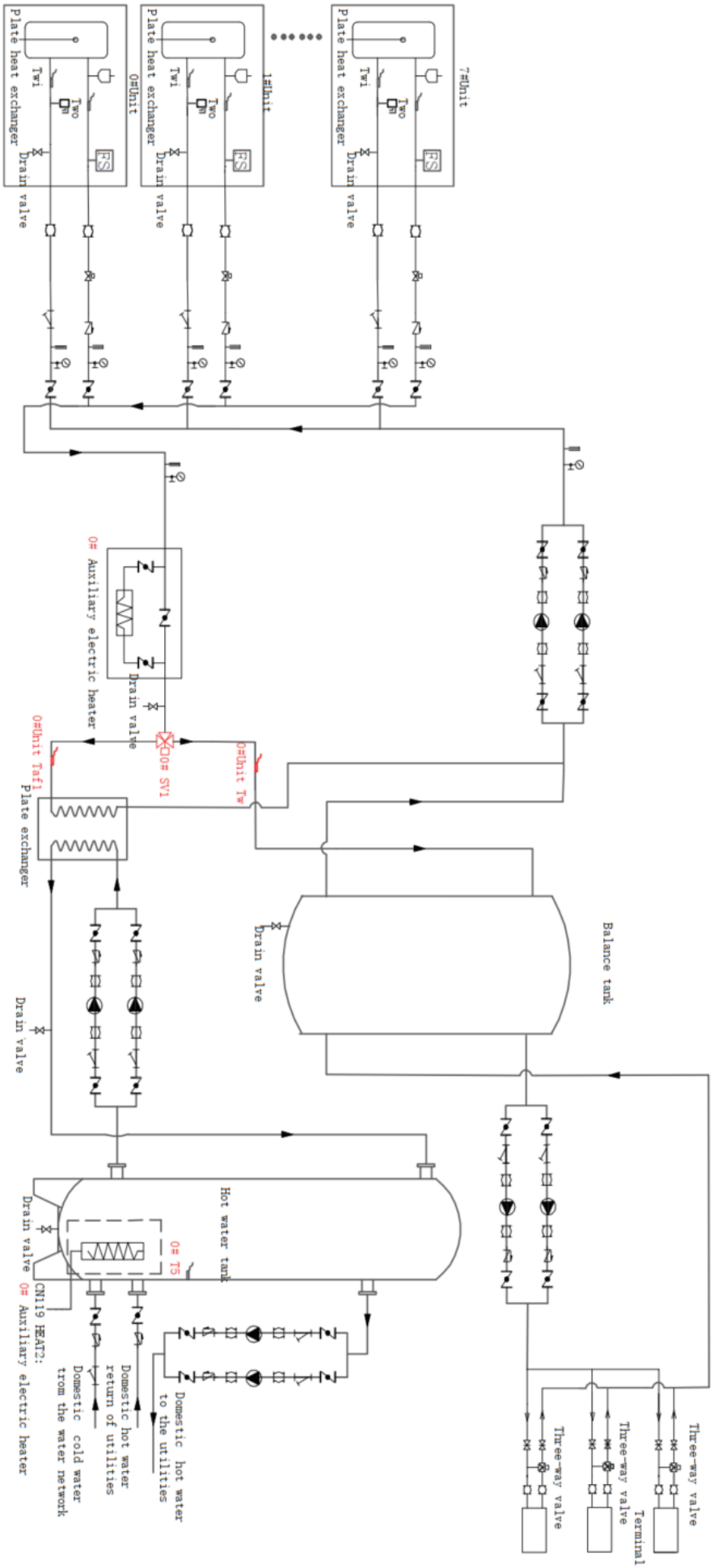
1. The ratio of the two - way valves on the terminal shall not exceed 50 percent.
2. The main outlet water temperature sensor (Tw) head of the unit at address 0 needs to be placed on the main outlet pipe.
3. The hot water tank and the hot water exchange pump of the unit use the CN125 (220 V) port control switch on the slave board of the 0 # unit, pump output is controlled through CN108 (0-10 V).
4. To avoid backsiphonage, it is required to install a non-return valve on the water inlet of the domestic hot water tank or water loop in accordance with the applicable legislation.



Primary pump system with buffer tank (S1-3 OFF)

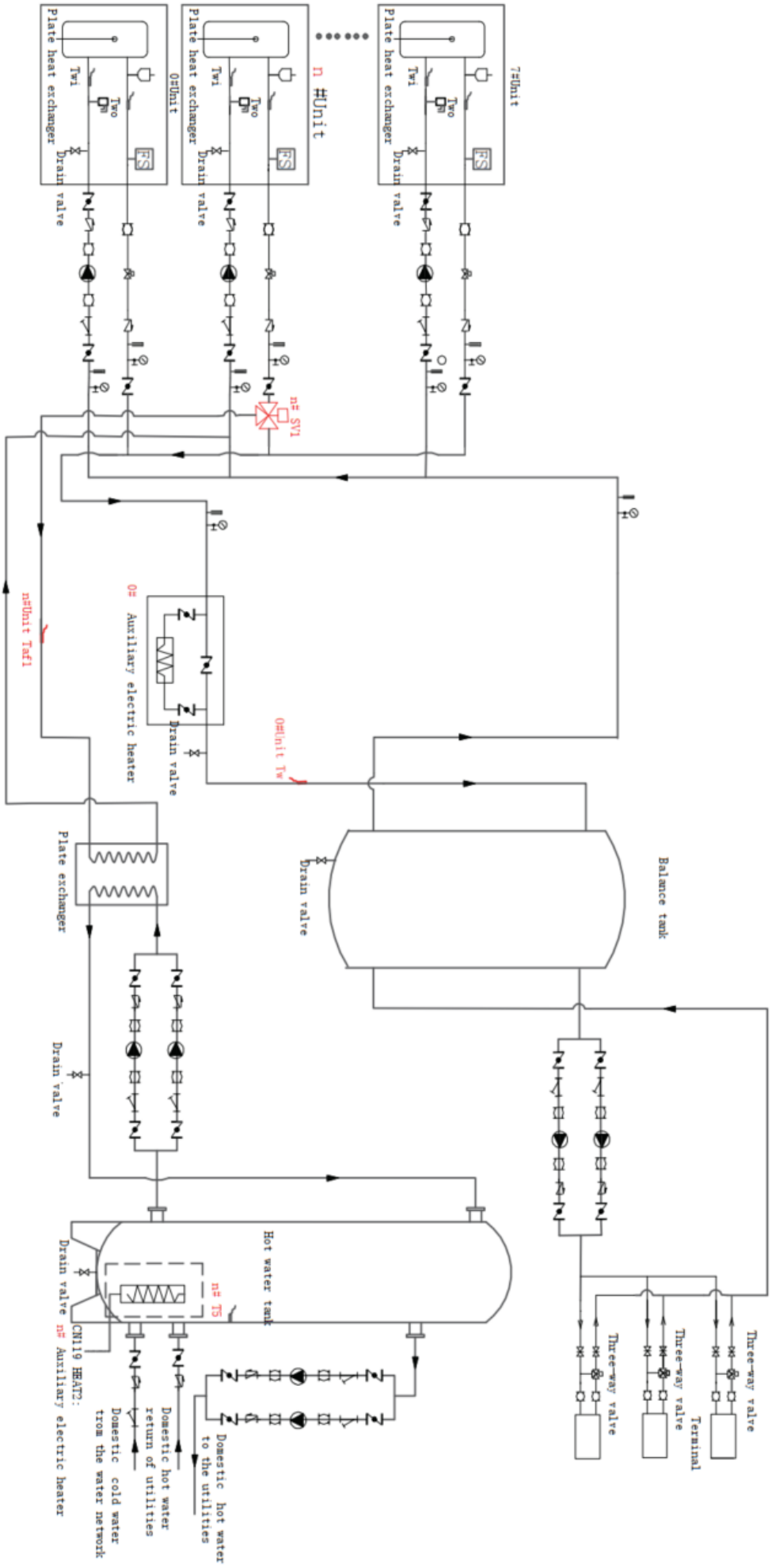


Primary pump system with buffer tank (S1-3 ON)



Secondary pump system with buffer tank (S1-3 OFF)

Secondary pump system with buffer tank (S1-3 ON)



2 Product lineup

Model	MHS-SVC50-RN7TL-B	MHS-SVC60-RN7TL-B	MHS-SVC70-RN7TL-B
Power supply	380-415V/3N/50Hz		
Appearance			

3 Nomenclature

M	HS	-	S	VC	50	M	-	R	N7	TL	-	B
1	2		3	4	5	6		7	8	9		10

Legend		
No.	**Code**	**Remarks**
1	M	Brand: Midea brand
2	HS	H: Heat pump S: Space cooling/heating
3	S	Series code
4	VC	Special function code V: Inverter Compressor & Fan Motor C: Cycle
5	50	Rated heating capacity (kW) 50: 50 kW /h;
6	M	M: With hydronic module Omitted: Without hydronic module
7	R	Power supply: 380-415V~-50Hz-3Ph
8	N7	Refrigerant type N7: R290
9	L	T: T3 application L: Low temperature refrigeration function Omitted: Without low temperature refrigeration function
10	B	Design series code B: 2nd designed

4 System Design and Unit Selection

For more water system component selection/recommendations, please refer to the installation manual (IOM).

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 enable or disable auxiliary electric heater

Step 3: Selection of outdoor units

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

Provisionally select Mars Large unit capacity[1] based on nominal capacity

Correct capacity of the outdoor units for the following items:
Outdoor air temperature / Outdoor humidity / Water outlet temperature[2] / Altitude / Anti-freeze type

Is corrected Mars Large capacity ≥ Required total heat load on outdoor units[3]

Yes → Mars Large system selection is complete

No → Select a larger model or enable auxiliary electric heater operation → (back to correction step)

Notes:

1. Up to 8 units can be connected together, giving a system cooling/heating capacity range from 50kW to 560kW.
2. If the required water temperatures of the heat emitters are not all the same, the outlet water temperature of Mars Large 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.
3. Select Mars Large which satisfies both total heating and cooling load requirements.

4.2 Chiller Leaving Water Temperature (LWT) Selection

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

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

*If you have specific temperature range requirements, please consult our technical support.

4.3 Optimizing System Design

To get the most comfort with the lowest energy consumption with Mars Large, 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 selected weather dependency curve matches the installation environment (building structure, climate) as well as end user's demands.

4.4 Design of the buffer tank in the system

4.4.1 Selection of buffer tank

The role of the buffer water tank:

In cooling mode, it prevents frequent opening and stopping of the equipment, thus protecting it.

The buffer water tank serves different purposes depending on whether the system is in cooling or heating mode. In heating mode, it ensures system stability during defrosting and reduces the need for frequent start-stop of the unit under small load conditions.

Design calculation method:

a) Calculation of defrosting time under heating conditions

The most significant factor affecting the air source heat pump heating system is the defrosting of the winter unit. To ensure thermal stability, the main engine's defrosting time should be limited to 4 minutes during winter operation. Additionally, the water temperature before and after defrosting should not decrease by more than 3℃. The buffer tank's volume should be calculated based on the above data.

Heating conditions, minimum effective water capacity calculation:

$$M_H = [Q_h \times H_{min} \times T_H/(C \times \triangle T_H)] / \rho$$

Where:

M_H: minimum water capacity of the system, m^3;

Q_h: rated heat production of the main engine, kW;

H_{min}: coefficient of defrosting ability, %; generally take: 50%;

△TH : Water temperature drop before and after defrosting,℃; Conventional units generally take 3℃;

C: specific heat gain of water 4.18 kJ/(kg·℃);

ρ : Density of water, 1000 kg/m3;

TH: defrosting time, S; generally take 240 s

b) Cooling running time calculation method

During the cooling process, avoid frequently opening and stopping the equipment to protect it. Ensure that there is enough water to allow the equipment to run continuously for at least 5 minutes.

Refrigeration conditions, the minimum effective water capacity calculation:

$$M_C = [Q_C \times C_A \times C_{min} \times T_C/(C \times \triangle T_C)] / \rho$$

Where:

M_C: minimum system water capacity, m3;

Q_c: cooling rated capacity, kW;

CA: Capacity coefficient of small load condition: generally: 1.6.

C_{min}: the minimum operating capacity ratio of the unit, %; Fixed frequency according to 100%; Frequency conversion unit according to 30%;

△TC: Control temperature range, ℃; Factory default 4℃;

C: specific heat gain of water 4.18 kJ/(kg·℃);

ρ : Density of water, 1000 kg/m3;

Tc: cooling operation time, S, generally 300S;

C) Calculate the system capacity according to the cooling and heating conditions, and take the maximum value;

M=MAX (M_H,M_c)

Single cooling unit takes Mc, single heating unit takes M_H;

d) The effective water capacity of a water system refers to its total capacity, including the main pipeline, water storage tank, and the normally open end of the two-way valve involved in circulation during operation.

M2 =V× L

Where: M2: effective water capacity of water system, m^3;

L: Total length of system pipeline, m;

V: Water capacity m^3/m per meter pipe length of each model system pipeline.

e) Buffer tank volume refers to the minimum water capacity required to meet the normal operation of the unit:

V_{min} = M – M2

V_{min} - Minimum volume of buffer tank, m^3.

4.4.2 Empirical Estimation Method

For renovation projects where the system water capacity cannot be estimated, the volume of the buffer tank can be estimated empirically using the following formula:

V_{min} = Q × K. Here, V_{min} represents the minimum volume of the buffer tank in liters.

The comfort air conditioning requires 10 L/kW and the process air conditioning requires 15. The stability of the system water temperature increases with a higher K value.

The main mechanism for heat is measured in kW.

4.4.3 Precautions for buffer tank selection:

a) The configuration of the buffer tank depends on the specific project instance. If the water system capacity is large or the end form is in the form of floor heating, the buffer tank should not be added. However, increasing the size of the buffer water tank has several advantages for the system's operation. It helps to avoid frequent opening and stopping of the main engine under small load conditions, prevents defrosting of the main engine, and ensures that there is enough water in the system to meet the unit defrosting requirements. This improves the comfort of the unit. Therefore, it is necessary to comprehensively consider various factors on the site from an investment perspective.

b) There are two methods to calculate the volume of the buffer tank. The results differ, with method 1 being more accurate as it is based on actual operation data analysis. Therefore, it is recommended to use method 1 for actual design and selection. Method 2 is an empirical estimate.

C) When using multiple units in parallel, it is recommended to base the calculation on the maximum capacity of the parallel unit.

Part 2

Engineering Data

1 Specifications

Model			MHS-SVC70-RN7TL-B	MHS-SVC60-RN7TL-B	MHS-SVC50-RN7TL-B
Power supply		V/Ph/Hz	380-415V/3Ph/50Hz		
Cooling (A35W7)	Capacity	kW	65	60	50
	Input	kW	23.21	20.00	15.15
	EER		2.80	3.00	3.00
Cooling (A35W18)	Capacity	kW	70	60	50
	Input	kW	16.865	13.33	10.415
	EER		4.15	4.5	4.8
Heating (A7W35)	Capacity	kW	70	60	50
	Input	kW	17.5	13.95	10.635
	COP		4	4.3	4.7
Heating (A7W45)	Capacity	kW	70	60	50
	Input	kW	20.895	17.045	13.155
	COP		3.35	3.52	3.80
Heating (A7W55)	Capacity	kW	70	60	50
	Input	kW	23.725	19.605	15.15
	COP		2.95	3.06	3.30
Heating (A7W65)	Capacity	kW	70	60	50
	Input	kW	27.45	22.22	17.855
	COP		2.55	2.70	2.80
Heating (A2W35)	Capacity	kW	60	51	43
	Input	kW	19.045	14.655	11.375
	COP		3.15	3.48	3.78
Heating (A2W45)	Capacity	kW	59.5	50	40.5
	Input	kW	21.4	16.665	12.85
	COP		2.78	3.00	3.15
Heating (A2W55)	Capacity	kW	58.5	49.5	40
	Input	kW	23.875	18.675	14.545
	COP		2.45	2.65	2.75
Heating (A-7W35)	Capacity	kW	56.5	49	39.5
	Input	kW	22.42	17.25	13.165
	COP		2.52	2.84	3.00
Heating (A-7W45)	Capacity	kW	54.8	47.5	39
	Input	kW	23.22	18.7	14.77
	COP		2.36	2.54	2.64
Heating (A-7W55)	Capacity	kW	51.9	43.8	35.5
	Input	kW	23.59	18.795	14.85
	COP		2.20	2.33	2.39
TOCA (Total over-current Amps.)		A	70	70	70
MOP (Maximum overcurrent protector)		A	80	80	80
MCA (Minimum Circuit Amps)		A	64	62	60
MFA (Maximum fuse amps)		A	80	80	80
Compressor	Type		Scroll Type		

	Poles		4 Poles		
	Speed range	rps	14 ~ 130rps		
	Capacity (60rps)	KW	18.44		
	Input (60rps)	KW	5.590		
	Max. heating frequency	Hz	14 ~ 130Hz		
	Max. cooling frequency	Hz	14 ~ 130Hz		
	RLA	A	15.45		
Fan	Motor type		Dc brushless motor		
	Number of fans		2		
	Air flow	m3/h	28670		
	Rated Motor input	KW	0.92		
	FLA(Full Load Amps)	A	4		
Air side heat exchanger	Number of rows		3		
	Number of circuits		19		
Refrigerant	Type (GWP)		R290 (3)		
	Charged volume	kg	2.8*2		
Throttle type			EEV		
sound power Level	Heating A7W35	dB(A)	86.4	84.4	80
	Heating max	dB(A)	86.7	/	/
	heating silence mode 1	dB(A)	75.9	/	/
	heating silence mode 2	dB(A)	72.6	/	/
	Cooling A35W7	dB(A)	84.8	82.7	80.1
	Cooling max	dB(A)	84.4	/	/
	Cooling silence mode1	dB(A)	75.1	/	/
	Cooling silence mode3	dB(A)	72	/	/
sound pressure Level (1m, 2m)	Heating A7W35	dB(A)	69.5	67.6	63.4
	Heating max	dB(A)	70.2	/	/
	heating silence mode 1	dB(A)	59.3	/	/
	heating silence mode 2	dB(A)	55.4	/	/
	Cooling A35W7	dB(A)	67.3	65.2	62.6
	Cooling max	dB(A)	67.5	/	/
	Cooling silence mode1	dB(A)	56.7	/	/
	Cooling silence mode2	dB(A)	53.8	/	/
Unit dimension (W×H×D)		mm	960*2000*1880		
Packing dimension (W×H×D)		mm	1030*2085*2050		
Net weight		kg	560		
Gross weight		kg	585		
Connection dimension	Water side	mm	DN50		
Connection method	Water side		hoop connection		
Outdoor air temperature range	Cooling	°C	-15-48 °C		
	Heating	°C	-25-43 °C		
	DHW	°C	-25-43 °C		
Water side heat exchanger	Type		plate heat exchanger		
Safety valve		MPa	0.6		
Flow switch		m^3/h	1.2		

Water flow range		m^3/h	1.8-14.4	1.8-12.4	1.8-10.3
Water outlet temperature setting range	Cooling	℃	5~25(-5~25)[1]		
	Heating	℃	25~70(25~85)[2]		
	DHW（tank）	℃	20~70(20~80)[2]		
Nominal return water temperature range	Cooling mode	℃	0~30		
	heating mode (DHW)	℃	20~80 （15-75）		

Note：

1. If the unit is operating in a the temperature range with Low temp mode, The antifreeze system must be used instead of the water system, and the antifreeze (especially the glycol solution) must meet the following two requirements at the same time:

- Volume concentration ≥30%;
- The freezing point temperature of antifreeze < the coldest temperature at the using site - 5.5℃; The dial code S1-2 needs to be set to ON. The frequency conversion water pump needs to be matched, and the minimum water flow of the water pump should be able to be as low as 1.8 m^3/h.

2. If the unit is operating in the temperature range with High temp mode, the dial code S1-2 needs to be set to ON. The frequency conversion water pump needs to be matched, and the minimum water flow of the water pump should be able to be as low as 1.8 m^3/h.

*It is recommended to customize the centralized drainage module if operating under ambient temperature -15 ℃

2 Electrical Characteristics

Model	Outdoor unit				Power current				Compressor		Fan	
	Voltage (V)	Hz	Min. (V)	Max. (V)	MCA (A)	MOP (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	kW	FLA (A)
MHS-SVC50-RN7L-B	380-415	50	380	415	64	80	70	80	/	15.45	0.92	4
MHS-SVC60-RN7L-B	380-415	50	380	415	62	80	70	80	/	15.45	0.92	4
MHS-SVC70-RN7L-B	380-415	50	380	415	60	80	70	80	/	15.45	0.92	4

Note:

MCA: Min. Circuit Amps. (For wire diameter selection)

MOP: Maximum overcurrent protector

MSC: Max. Starting Amps.

FLA: Full Load Amps.

KW: Rated Motor Output

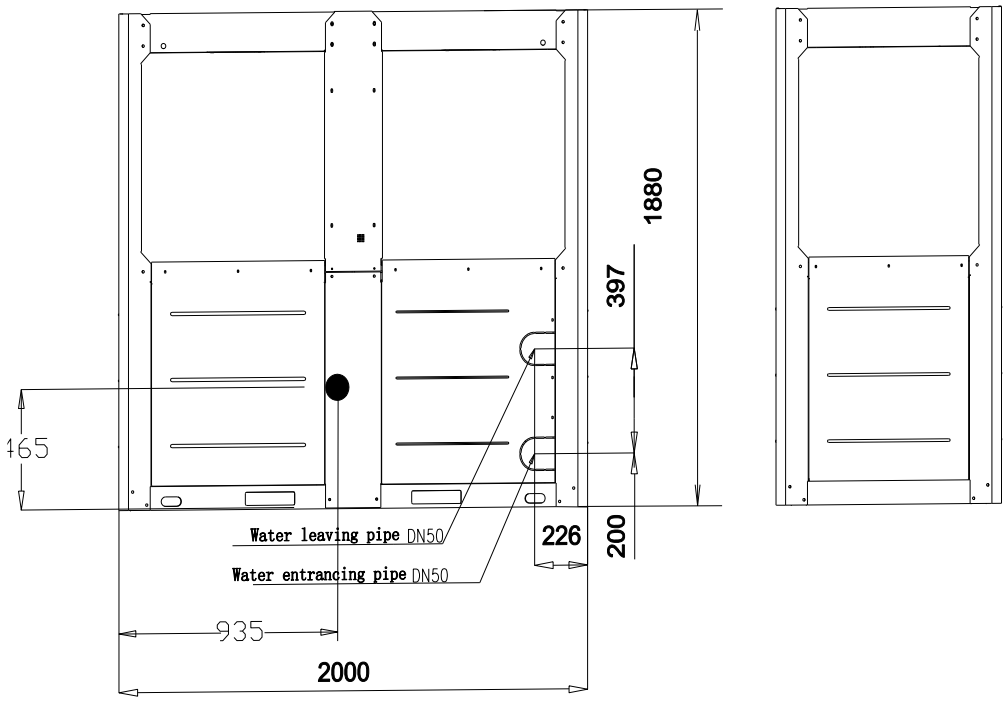
RLA: In nominal cooling or heating test condition, the input Amps of compressor where MAX. Hz can operate Rated Load Amps.

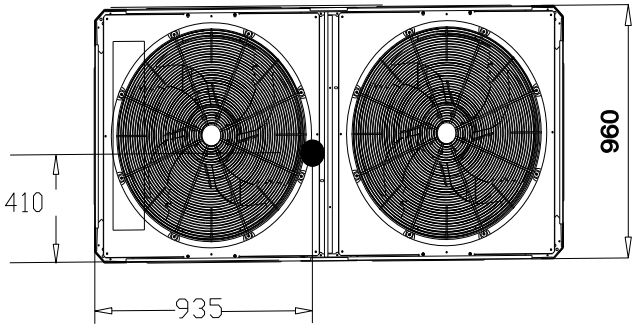
TOCA: Total over-current Amps.

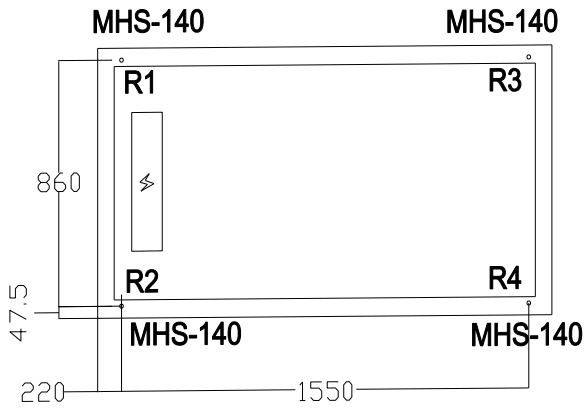
MFA: Maximum fuse amps

3 Dimensions and Center of Gravity

MHS-SVC50-XN8TL-B / MHS-SVC60-XN8TL-B / MHS-SVC70-XN8TL-B







Weight to be supported by spring isolator(kg)			
R1	R2	R3	R4
120	120	120	120

4 Capacity Tables

4.1 Heating Capacity Tables

4.1.1 MHS-SVC50-RN7TL-B

100% Load Heating capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-25			-20			-15			-10			-5	
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	27.28	13.41	2.03	33.55	14.12	2.38	39.93	14.70	2.72	43.08	13.72	3.14	46.23	12.54	3.69
	30	28.83	15.09	1.91	34.75	15.62	2.22	41.06	16.18	2.54	43.98	15.02	2.93	46.86	13.86	3.38
	35	30.37	17.00	1.79	35.94	17.33	2.07	42.20	17.88	2.36	44.89	16.52	2.72	47.48	15.44	3.07
	40	31.92	19.19	1.66	37.13	19.31	1.92	43.33	19.86	2.18	45.79	18.27	2.51	48.11	17.38	2.77
	45	33.46	21.73	1.54	38.33	21.62	1.77	44.46	22.18	2.00	46.70	20.35	2.29	48.73	19.80	2.46
	50	30.09	20.67	1.46	34.66	20.60	1.68	39.78	20.56	1.93	43.11	19.98	2.16	44.94	19.53	2.30
	55	26.72	19.48	1.37	30.99	19.45	1.59	35.09	18.82	1.86	39.53	19.57	2.02	41.14	19.23	2.14
	60	23.35	18.14	1.29	27.33	18.17	1.50	30.41	16.94	1.79	35.95	19.09	1.88	37.34	18.87	1.98
	65	19.98	16.61	1.20	23.66	16.73	1.41	25.72	14.91	1.73	32.37	18.54	1.75	33.54	18.46	1.82
	70	16.87	14.41	1.17	19.99	14.52	1.38	21.73	14.31	1.52	28.79	17.89	1.61	29.74	17.96	1.66
	75							19.77	15.63	1.27	25.21	17.13	1.47	25.94	17.35	1.50
	80													19.24	12.79	1.50
	85													17.43	14.86	1.17
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	53.22	12.68	4.20	59.50	12.72	4.68	62.90	12.15	5.18	65.47	11.43	5.73	70.35	11.02	6.38
	30	53.72	14.09	3.81	58.87	13.64	4.32	62.48	12.78	4.89	65.86	12.27	5.37	70.82	11.87	5.97
	35	54.23	15.82	3.43	58.24	14.73	3.95	62.05	13.49	4.60	66.26	13.23	5.01	71.30	12.84	5.55
	40	54.74	17.99	3.04	57.61	16.03	3.59	61.63	14.29	4.31	66.65	14.34	4.65	71.78	13.96	5.14
	45	55.24	20.78	2.66	56.98	17.63	3.23	61.20	15.20	4.03	67.05	15.63	4.29	72.25	15.29	4.73
	50	50.70	20.54	2.47	53.87	18.13	2.97	57.42	15.34	3.74	62.42	15.66	3.98	72.32	16.53	4.38
	55	46.15	20.25	2.28	50.75	18.72	2.71	53.65	15.50	3.46	57.79	15.70	3.68	72.38	17.98	4.03
	60	41.60	19.92	2.09	47.63	19.44	2.45	49.87	15.68	3.18	53.16	15.75	3.38	56.18	14.60	3.85
	65	37.05	19.52	1.90	44.51	20.33	2.19	46.10	15.91	2.90	48.53	15.80	3.07	50.82	14.30	3.55
	70	32.50	19.03	1.71	41.39	21.47	1.93	42.32	16.18	2.62	43.90	15.87	2.77	45.46	13.95	3.26
	75	27.96	18.42	1.52	38.27	22.95	1.67	38.55	16.51	2.33	39.27	15.96	2.46	40.11	13.52	2.97
	80	21.11	13.02	1.62	23.98	13.56	1.77	28.40	11.27	2.52	30.87	10.74	2.87			
	85	19.13	15.12	1.27	21.72	15.74	1.38	25.72	13.08	1.97	27.97	12.47	2.24			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

100% Load Heating capacity (continued)

Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43	
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	75.97	11.27	6.74	75.75	9.82	7.72	72.08	8.08	8.92	69.70	7.67	9.09	68.74	7.37	9.33
	30	75.39	11.99	6.29	74.67	10.38	7.19	71.56	8.69	8.24	69.20	8.25	8.39	68.24	7.93	8.61
	35	74.82	12.81	5.84	73.59	11.04	6.66	71.04	9.41	7.55	68.70	8.94	7.69	67.75	8.59	7.89
	40	74.25	13.77	5.39	72.51	11.81	6.14	70.52	10.28	6.86	68.20	9.76	6.99	67.26	9.38	7.17
	45	73.67	14.90	4.95	71.43	12.73	5.61	70.01	11.34	6.18	67.70	10.77	6.29	66.76	10.34	6.45
	50	73.44	15.91	4.62	64.08	12.11	5.29	62.80	10.79	5.82	57.80	9.76	5.92			
	55	73.20	17.07	4.29	56.73	11.42	4.97	55.60	10.17	5.47						
	60	57.77	13.92	4.15	54.64	12.50	4.37	48.13	9.89	4.86						
	65	52.47	13.50	3.89												
	70	47.16	13.02	3.62												
	75	41.86	12.47	3.36												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

90% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	24.55	11.50	2.14	30.20	12.11	2.49	35.94	12.60	2.85	38.77	11.76	3.30	41.61	10.75	3.87
	30	25.94	12.93	2.01	31.27	13.39	2.34	36.96	13.87	2.66	39.58	12.87	3.08	42.17	11.88	3.55
	35	27.34	14.57	1.88	32.34	14.85	2.18	37.98	15.33	2.48	40.40	14.16	2.85	42.73	13.24	3.23
	40	28.73	16.45	1.75	33.42	16.55	2.02	39.00	17.02	2.29	41.21	15.66	2.63	43.30	14.90	2.91
	45	30.12	18.63	1.62	34.49	18.53	1.86	40.02	19.02	2.10	42.03	17.44	2.41	43.86	16.97	2.58
	50	27.08	17.72	1.53	31.19	17.65	1.77	35.80	17.63	2.03	38.80	17.13	2.27	40.44	16.74	2.42
	55	24.05	16.70	1.44	27.90	16.67	1.67	31.58	16.13	1.96	35.58	16.77	2.12	37.02	16.48	2.25
	60	21.01	15.55	1.35	24.60	15.58	1.58	27.37	14.52	1.88	32.36	16.36	1.98	33.60	16.18	2.08
	65	17.98	14.24	1.26	21.30	14.34	1.49	23.15	12.78	1.81	29.14	15.89	1.83	30.19	15.82	1.91
	70	15.19	12.35	1.23	17.99	12.44	1.45	19.56	12.27	1.59	25.91	15.34	1.69	26.77	15.39	1.74
	75							17.79	13.40	1.33	22.69	14.68	1.55	23.35	14.87	1.57
	80													17.31	10.97	1.58
	85													15.68	12.73	1.23
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	47.89	10.87	4.41	53.55	10.90	4.91	56.61	10.42	5.43	58.92	9.80	6.01	63.31	9.45	6.70
	30	48.35	12.08	4.00	52.98	11.69	4.53	56.23	10.96	5.13	59.28	10.52	5.64	63.74	10.17	6.27
	35	48.81	13.56	3.60	52.42	12.62	4.15	55.85	11.56	4.83	59.63	11.34	5.26	64.17	11.00	5.83
	40	49.26	15.42	3.20	51.85	13.74	3.77	55.46	12.25	4.53	59.99	12.29	4.88	64.60	11.97	5.40
	45	49.72	17.81	2.79	51.29	15.11	3.39	55.08	13.03	4.23	60.34	13.40	4.50	65.03	13.10	4.96
	50	45.63	17.60	2.59	48.48	15.54	3.12	51.68	13.15	3.93	56.18	13.43	4.18	65.08	14.17	4.59
	55	41.53	17.36	2.39	45.67	16.05	2.85	48.28	13.28	3.63	52.01	13.46	3.86	65.14	15.41	4.23
	60	37.44	17.07	2.19	42.87	16.67	2.57	44.89	13.44	3.34	47.84	13.50	3.54	50.56	12.52	4.04
	65	33.35	16.73	1.99	40.06	17.43	2.30	41.49	13.63	3.04	43.68	13.55	3.22	45.74	12.26	3.73
	70	29.25	16.31	1.79	37.25	18.40	2.02	38.09	13.87	2.75	39.51	13.61	2.90	40.92	11.95	3.42
	75	25.16	15.79	1.59	34.44	19.67	1.75	34.69	14.15	2.45	35.34	13.68	2.58	36.10	11.59	3.12
	80	19.00	11.16	1.70	21.59	11.62	1.86	25.56	9.66	2.65	27.79	9.21	3.02			
	85	17.21	12.96	1.33	19.55	13.49	1.45	23.15	11.21	2.06	25.17	10.69	2.35			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

90% Load Heating capacity (continued)															
Load (%)/ Frequency （Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	68.37	9.66	7.08	68.18	8.41	8.10	64.87	6.92	9.37	62.73	6.58	9.54	61.86	6.32	9.79
	30	67.85	10.27	6.61	67.20	8.90	7.55	64.40	7.45	8.65	62.28	7.07	8.80	61.42	6.80	9.04
	35	67.34	10.98	6.13	66.23	9.46	7.00	63.94	8.07	7.93	61.83	7.66	8.07	60.98	7.36	8.28
	40	66.82	11.80	5.66	65.26	10.13	6.45	63.47	8.81	7.21	61.38	8.37	7.34	60.53	8.04	7.53
	45	66.31	12.77	5.19	64.28	10.91	5.89	63.00	9.72	6.48	60.93	9.23	6.60	60.09	8.87	6.78
	50	66.09	13.63	4.85	57.67	10.38	5.55	56.52	9.25	6.11	52.02	8.37	6.22			
	55	65.88	14.63	4.50	51.06	9.79	5.22	50.04	8.72	5.74						
	60	51.99	11.93	4.36	49.18	10.72	4.59	43.32	8.48	5.11						
	65	47.22	11.57	4.08												
	70	42.45	11.16	3.80												
	75	37.68	10.69	3.53												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

70% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	19.10	8.16	2.34	23.49	8.60	2.73	27.95	8.95	3.12	30.15	8.35	3.61	32.36	7.63	4.24
	30	20.18	9.18	2.20	24.32	9.51	2.56	28.74	9.85	2.92	30.79	9.14	3.37	32.80	8.44	3.89
	35	21.26	10.35	2.06	25.16	10.55	2.39	29.54	10.88	2.71	31.42	10.05	3.13	33.24	9.40	3.54
	40	22.34	11.68	1.91	25.99	11.75	2.21	30.33	12.09	2.51	32.05	11.12	2.88	33.68	10.58	3.18
	45	23.42	13.23	1.77	26.83	13.16	2.04	31.12	13.50	2.30	32.69	12.39	2.64	34.11	12.05	2.83
	50	21.06	12.58	1.67	24.26	12.54	1.94	27.85	12.52	2.22	30.18	12.16	2.48	31.45	11.89	2.65
	55	18.70	11.86	1.58	21.70	11.84	1.83	24.57	11.46	2.14	27.67	11.91	2.32	28.80	11.70	2.46
	60	16.34	11.04	1.48	19.13	11.06	1.73	21.29	10.31	2.06	25.17	11.62	2.17	26.14	11.49	2.28
	65	13.98	10.11	1.38	16.56	10.18	1.63	18.01	9.08	1.98	22.66	11.28	2.01	23.48	11.23	2.09
	70	11.81	8.77	1.35	13.99	8.84	1.58	15.21	8.71	1.75	20.15	10.89	1.85	20.82	10.93	1.90
	75							13.84	9.51	1.45	17.65	10.43	1.69	18.16	10.56	1.72
	80													13.47	7.79	1.73
	85													12.20	9.04	1.35
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	37.25	7.72	4.83	41.65	7.74	5.38	44.03	7.40	5.95	45.83	6.96	6.59	49.24	6.71	7.34
	30	37.61	8.58	4.38	41.21	8.30	4.96	43.73	7.78	5.62	46.10	7.47	6.17	49.58	7.22	6.86
	35	37.96	9.63	3.94	40.77	8.96	4.55	43.44	8.21	5.29	46.38	8.05	5.76	49.91	7.81	6.39
	40	38.32	10.95	3.50	40.33	9.76	4.13	43.14	8.70	4.96	46.66	8.73	5.35	50.24	8.50	5.91
	45	38.67	12.65	3.06	39.89	10.73	3.72	42.84	9.26	4.63	46.93	9.51	4.93	50.58	9.31	5.44
	50	35.49	12.50	2.84	37.71	11.04	3.42	40.20	9.34	4.30	43.69	9.53	4.58	50.62	10.06	5.03
	55	32.30	12.33	2.62	35.52	11.40	3.12	37.55	9.43	3.98	40.45	9.56	4.23	50.66	10.95	4.63
	60	29.12	12.13	2.40	33.34	11.84	2.82	34.91	9.55	3.66	37.21	9.59	3.88	39.33	8.89	4.42
	65	25.94	11.88	2.18	31.16	12.38	2.52	32.27	9.68	3.33	33.97	9.62	3.53	35.58	8.71	4.09
	70	22.75	11.58	1.96	28.97	13.07	2.22	29.63	9.85	3.01	30.73	9.66	3.18	31.82	8.49	3.75
	75	19.57	11.21	1.75	26.79	13.97	1.92	26.98	10.05	2.68	27.49	9.71	2.83	28.07	8.23	3.41
	80	14.78	7.93	1.86	16.79	8.25	2.03	19.88	6.86	2.90	21.61	6.54	3.31			
	85	13.39	9.20	1.45	15.21	9.58	1.59	18.00	7.96	2.26	19.58	7.59	2.58			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

70% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	53.18	6.86	7.75	53.03	5.98	8.87	50.45	4.92	10.26	48.79	4.67	10.45	48.12	4.49	10.73
	30	52.77	7.30	7.23	52.27	6.32	8.27	50.09	5.29	9.47	48.44	5.02	9.64	47.77	4.83	9.90
	35	52.37	7.80	6.72	51.51	6.72	7.66	49.73	5.73	8.68	48.09	5.44	8.84	47.43	5.23	9.07
	40	51.97	8.38	6.20	50.76	7.19	7.06	49.37	6.26	7.89	47.74	5.94	8.03	47.08	5.71	8.25
	45	51.57	9.07	5.69	50.00	7.75	6.45	49.00	6.90	7.10	47.39	6.55	7.23	46.73	6.30	7.42
	50	51.41	9.68	5.31	44.85	7.37	6.08	43.96	6.57	6.69	40.46	5.94	6.81			
	55	51.24	10.39	4.93	39.71	6.95	5.71	38.92	6.19	6.29						
	60	40.44	8.47	4.77	38.25	7.61	5.03	33.69	6.02	5.59						
	65	36.73	8.22	4.47												
	70	33.02	7.93	4.17												
	75	29.30	7.59	3.86												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

50% Load Heating capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	13.64	5.36	2.54	16.78	5.65	2.97	19.96	5.88	3.39	21.54	5.49	3.93	23.12	5.02	4.61
	30	14.41	6.03	2.39	17.37	6.25	2.78	20.53	6.47	3.17	21.99	6.01	3.66	23.43	5.54	4.23
	35	15.19	6.80	2.23	17.97	6.93	2.59	21.10	7.15	2.95	22.44	6.61	3.40	23.74	6.18	3.84
	40	15.96	7.68	2.08	18.57	7.72	2.40	21.67	7.94	2.73	22.90	7.31	3.13	24.05	6.95	3.46
	45	16.73	8.69	1.92	19.16	8.65	2.22	22.23	8.87	2.51	23.35	8.14	2.87	24.37	7.92	3.08
	50	15.05	8.27	1.82	17.33	8.24	2.10	19.89	8.23	2.42	21.56	7.99	2.70	22.47	7.81	2.88
	55	13.36	7.79	1.71	15.50	7.78	1.99	17.55	7.53	2.33	19.77	7.83	2.53	20.57	7.69	2.67
	60	11.67	7.26	1.61	13.66	7.27	1.88	15.20	6.78	2.24	17.98	7.64	2.35	18.67	7.55	2.47
	65	9.99	6.64	1.50	11.83	6.69	1.77	12.86	5.97	2.16	16.19	7.42	2.18	16.77	7.38	2.27
	70	8.44	5.77	1.46	9.99	5.81	1.72	10.86	5.73	1.90	14.40	7.16	2.01	14.87	7.18	2.07
	75							9.89	6.25	1.58	12.61	6.85	1.84	12.97	6.94	1.87
	80													9.62	5.12	1.88
	85													8.71	5.94	1.47
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	26.61	5.07	5.25	29.75	5.09	5.85	31.45	4.86	6.47	32.73	4.57	7.16	35.17	4.41	7.98
	30	26.86	5.64	4.77	29.44	5.46	5.40	31.24	5.11	6.11	32.93	4.91	6.71	35.41	4.75	7.46
	35	27.11	6.33	4.28	29.12	5.89	4.94	31.03	5.40	5.75	33.13	5.29	6.26	35.65	5.13	6.94
	40	27.37	7.19	3.80	28.81	6.41	4.49	30.81	5.72	5.39	33.33	5.73	5.81	35.89	5.59	6.43
	45	27.62	8.31	3.32	28.49	7.05	4.04	30.60	6.08	5.03	33.52	6.25	5.36	36.13	6.11	5.91
	50	25.35	8.21	3.09	26.93	7.25	3.71	28.71	6.14	4.68	31.21	6.27	4.98	36.16	6.61	5.47
	55	23.07	8.10	2.85	25.37	7.49	3.39	26.82	6.20	4.33	28.89	6.28	4.60	36.19	7.19	5.03
	60	20.80	7.97	2.61	23.81	7.78	3.06	24.94	6.27	3.97	26.58	6.30	4.22	28.09	5.84	4.81
	65	18.53	7.81	2.37	22.25	8.13	2.74	23.05	6.36	3.62	24.26	6.32	3.84	25.41	5.72	4.44
	70	16.25	7.61	2.14	20.70	8.59	2.41	21.16	6.47	3.27	21.95	6.35	3.46	22.73	5.58	4.08
	75	13.98	7.37	1.90	19.14	9.18	2.08	19.27	6.60	2.92	19.64	6.38	3.08	20.05	5.41	3.71
	80	10.56	5.21	2.03	11.99	5.42	2.21	14.20	4.51	3.15	15.44	4.30	3.59			
	85	9.56	6.05	1.58	10.86	6.30	1.73	12.86	5.23	2.46	13.98	4.99	2.80			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

50% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43	
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	37.98	4.51	8.42	37.88	3.93	9.65	36.04	3.23	11.16	34.85	3.07	11.36	34.37	2.95	11.66
	30	37.70	4.79	7.86	37.34	4.15	8.99	35.78	3.48	10.30	34.60	3.30	10.48	34.12	3.17	10.76
	35	37.41	5.12	7.30	36.79	4.42	8.33	35.52	3.76	9.44	34.35	3.58	9.61	33.88	3.43	9.86
	40	37.12	5.51	6.74	36.25	4.73	7.67	35.26	4.11	8.58	34.10	3.90	8.73	33.63	3.75	8.97
	45	36.84	5.96	6.18	35.71	5.09	7.02	35.00	4.53	7.72	33.85	4.31	7.86	33.38	4.14	8.07
	50	36.72	6.36	5.77	32.04	4.85	6.61	31.40	4.32	7.28	28.90	3.90	7.40			
	55	36.60	6.83	5.36	28.36	4.57	6.21	27.80	4.07	6.83						
	60	28.88	5.57	5.19	27.32	5.00	5.46	24.06	3.96	6.08						
	65	26.23	5.40	4.86												
	70	23.58	5.21	4.53												
	75	20.93	4.99	4.20												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

30% Load Heating capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	8.18	2.37	3.46	10.07	2.49	4.04	11.98	2.59	4.62	12.92	2.42	5.34	13.87	2.21	6.27
	30	8.65	2.66	3.25	10.42	2.76	3.78	12.32	2.86	4.31	13.19	2.65	4.98	14.06	2.45	5.75
	35	9.11	3.00	3.04	10.78	3.06	3.53	12.66	3.16	4.01	13.47	2.91	4.62	14.24	2.73	5.23
	40	9.58	3.39	2.83	11.14	3.41	3.27	13.00	3.50	3.71	13.74	3.22	4.26	14.43	3.07	4.71
	45	10.04	3.84	2.62	11.50	3.82	3.01	13.34	3.91	3.41	14.01	3.59	3.90	14.62	3.49	4.19
	50	9.03	3.65	2.47	10.40	3.63	2.86	11.93	3.63	3.29	12.93	3.53	3.67	13.48	3.45	3.91
	55	8.02	3.44	2.33	9.30	3.43	2.71	10.53	3.32	3.17	11.86	3.45	3.43	12.34	3.39	3.64
	60	7.00	3.20	2.19	8.20	3.21	2.56	9.12	2.99	3.05	10.79	3.37	3.20	11.20	3.33	3.36
	65	5.99	2.93	2.04	7.10	2.95	2.40	7.72	2.63	2.93	9.71	3.27	2.97	10.06	3.26	3.09
	70	5.06	2.54	1.99	6.00	2.56	2.34	6.52	2.53	2.58	8.64	3.16	2.74	8.92	3.17	2.82
	75							5.93	2.76	2.15	7.56	3.02	2.50	7.78	3.06	2.54
	80													5.77	2.26	2.56
	85													5.23	2.62	1.99
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	15.96	2.24	7.13	17.85	2.24	7.95	18.87	2.14	8.80	19.64	2.02	9.74	21.10	1.95	10.85
	30	16.12	2.49	6.48	17.66	2.41	7.34	18.74	2.26	8.31	19.76	2.17	9.12	21.25	2.09	10.15
	35	16.27	2.79	5.83	17.47	2.60	6.72	18.62	2.38	7.82	19.88	2.33	8.51	21.39	2.27	9.44
	40	16.42	3.17	5.17	17.28	2.83	6.11	18.49	2.52	7.33	20.00	2.53	7.90	21.53	2.46	8.74
	45	16.57	3.67	4.52	17.10	3.11	5.49	18.36	2.68	6.84	20.11	2.76	7.29	21.68	2.70	8.04
	50	15.21	3.62	4.20	16.16	3.20	5.05	17.23	2.71	6.36	18.73	2.76	6.77	21.69	2.92	7.44
	55	13.84	3.57	3.87	15.22	3.30	4.61	16.09	2.74	5.88	17.34	2.77	6.26	21.71	3.17	6.84
	60	12.48	3.52	3.55	14.29	3.43	4.16	14.96	2.77	5.41	15.95	2.78	5.74	16.85	2.58	6.54
	65	11.12	3.44	3.23	13.35	3.59	3.72	13.83	2.81	4.93	14.56	2.79	5.22	15.25	2.52	6.04
	70	9.75	3.36	2.90	12.42	3.79	3.28	12.70	2.85	4.45	13.17	2.80	4.70	13.64	2.46	5.54
	75	8.39	3.25	2.58	11.48	4.05	2.83	11.56	2.91	3.97	11.78	2.82	4.18	12.03	2.39	5.04
	80	6.33	2.30	2.76	7.20	2.39	3.01	8.52	1.99	4.29	9.26	1.90	4.89			
	85	5.74	2.67	2.15	6.52	2.78	2.35	7.72	2.31	3.34	8.39	2.20	3.81			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

30% Load Heating capacity (continued)																
Load (%)/ Frequency（Hz）	LWT	DB														
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	22.79	1.99	11.46	22.73	1.73	13.12	21.62	1.43	15.17	20.91	1.35	15.44	20.62	1.30	15.86
	30	22.62	2.12	10.69	22.40	1.83	12.22	21.47	1.53	14.00	20.76	1.46	14.26	20.47	1.40	14.63
	35	22.45	2.26	9.93	22.08	1.95	11.33	21.31	1.66	12.83	20.61	1.58	13.07	20.33	1.52	13.41
	40	22.27	2.43	9.17	21.75	2.08	10.43	21.16	1.81	11.67	20.46	1.72	11.88	20.18	1.65	12.19
	45	22.10	2.63	8.41	21.43	2.25	9.54	21.00	2.00	10.50	20.31	1.90	10.69	20.03	1.83	10.97
	50	22.03	2.81	7.85	19.22	2.14	8.99	18.84	1.90	9.90	17.34	1.72	10.07			
	55	21.96	3.01	7.29	17.02	2.02	8.45	16.68	1.79	9.29						
	60	17.33	2.46	7.06	16.39	2.21	7.43	14.44	1.75	8.27						
	65	15.74	2.38	6.61												
	70	14.15	2.30	6.16												
	75	12.56	2.20	5.71												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

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100% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	28.89	14.85	1.95	35.53	15.63	2.27	42.28	16.28	2.60	45.61	15.18	3.00	48.95	13.88	3.53
	30	30.52	16.70	1.83	36.79	17.29	2.13	43.48	17.91	2.43	46.57	16.62	2.80	49.61	15.34	3.23
	35	32.16	18.81	1.71	38.05	19.18	1.98	44.68	19.79	2.26	47.53	18.28	2.60	50.28	17.10	2.94
	40	33.80	21.24	1.59	39.32	21.37	1.84	45.88	21.98	2.09	48.48	20.23	2.40	50.94	19.24	2.65
	45	35.43	24.06	1.47	40.58	23.94	1.70	47.08	24.56	1.92	49.44	22.53	2.19	51.60	21.91	2.35
	50	31.86	22.88	1.39	36.70	22.80	1.61	42.12	22.76	1.85	45.65	22.12	2.06	47.58	21.62	2.20
	55	28.29	21.57	1.31	32.82	21.53	1.52	37.16	20.83	1.78	41.86	21.66	1.93	43.56	21.28	2.05
	60	24.72	20.08	1.23	28.94	20.11	1.44	32.20	18.75	1.72	38.07	21.13	1.80	39.53	20.89	1.89
	65	21.15	18.38	1.15	25.06	18.52	1.35	27.24	16.51	1.65	34.28	20.52	1.67	35.51	20.43	1.74
	70	17.87	15.96	1.12	21.16	16.07	1.32	23.01	15.85	1.45	30.49	19.81	1.54	31.49	19.88	1.58
	75							20.93	17.30	1.21	26.69	18.96	1.41	27.47	19.21	1.43
	80													20.37	14.16	1.44
	85													18.45	16.44	1.12
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	56.35	14.04	4.01	63.00	14.08	4.47	66.60	13.45	4.95	69.32	12.65	5.48	74.48	12.20	6.11
	30	56.88	15.60	3.65	62.33	15.10	4.13	66.15	14.15	4.68	69.74	13.58	5.13	74.99	13.14	5.71
	35	57.42	17.51	3.28	61.67	16.30	3.78	65.70	14.93	4.40	70.16	14.64	4.79	75.49	14.21	5.31
	40	57.96	19.91	2.91	61.00	17.75	3.44	65.25	15.82	4.13	70.57	15.87	4.45	76.00	15.46	4.92
	45	58.49	23.00	2.54	60.34	19.52	3.09	64.80	16.83	3.85	70.99	17.30	4.10	76.50	16.92	4.52
	50	53.68	22.73	2.36	57.03	20.07	2.84	60.80	16.98	3.58	66.09	17.34	3.81	76.57	18.29	4.19
	55	48.86	22.42	2.18	53.73	20.73	2.59	56.80	17.16	3.31	61.19	17.38	3.52	76.64	19.91	3.85
	60	44.05	22.05	2.00	50.43	21.52	2.34	52.81	17.36	3.04	56.29	17.43	3.23	59.48	16.17	3.68
	65	39.23	21.61	1.82	47.13	22.51	2.09	48.81	17.61	2.77	51.38	17.50	2.94	53.81	15.83	3.40
	70	34.42	21.06	1.63	43.83	23.76	1.84	44.81	17.91	2.50	46.48	17.57	2.65	48.14	15.44	3.12
	75	29.60	20.39	1.45	40.52	25.41	1.60	40.81	18.28	2.23	41.58	17.66	2.35	42.47	14.96	2.84
	80	22.36	14.41	1.55	25.39	15.01	1.69	30.07	12.47	2.41	32.69	11.89	2.75			
	85	20.25	16.74	1.21	23.00	17.43	1.32	27.23	14.48	1.88	29.61	13.80	2.15			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

100% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	80.43	12.48	6.45	80.21	10.87	7.38	76.32	8.94	8.54	73.80	8.49	8.69	72.78	8.16	8.92
	30	79.83	13.27	6.02	79.06	11.50	6.88	75.77	9.62	7.88	73.27	9.13	8.02	72.26	8.78	8.23
	35	79.22	14.18	5.59	77.92	12.22	6.37	75.22	10.42	7.22	72.74	9.89	7.35	71.74	9.50	7.55
	40	78.61	15.24	5.16	76.77	13.08	5.87	74.67	11.38	6.56	72.21	10.81	6.68	71.21	10.38	6.86
	45	78.01	16.49	4.73	75.63	14.09	5.37	74.12	12.55	5.91	71.68	11.92	6.01	70.69	11.45	6.17
	50	77.76	17.61	4.42	67.85	13.41	5.06	66.50	11.94	5.57	61.20	10.80	5.67			
	55	77.51	18.89	4.10	60.07	12.64	4.75	58.87	11.26	5.23						
	60	61.17	15.40	3.97	57.86	13.84	4.18	50.96	10.95	4.65						
	65	55.55	14.94	3.72												
	70	49.94	14.41	3.47												
	75	44.33	13.80	3.21												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

90% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	26.00	12.72	2.04	31.97	13.40	2.39	38.05	13.95	2.73	41.05	13.01	3.15	44.06	11.90	3.70
	30	27.47	14.32	1.92	33.11	14.82	2.23	39.13	15.35	2.55	41.91	14.25	2.94	44.65	13.15	3.40
	35	28.94	16.13	1.79	34.25	16.44	2.08	40.21	16.96	2.37	42.77	15.67	2.73	45.25	14.65	3.09
	40	30.42	18.21	1.67	35.38	18.32	1.93	41.29	18.84	2.19	43.64	17.34	2.52	45.84	16.49	2.78
	45	31.89	20.62	1.55	36.52	20.52	1.78	42.37	21.05	2.01	44.50	19.31	2.30	46.44	18.78	2.47
	50	28.68	19.62	1.46	33.03	19.54	1.69	37.91	19.51	1.94	41.09	18.96	2.17	42.82	18.53	2.31
	55	25.46	18.49	1.38	29.54	18.46	1.60	33.44	17.86	1.87	37.67	18.57	2.03	39.20	18.24	2.15
	60	22.25	17.21	1.29	26.04	17.24	1.51	28.98	16.08	1.80	34.26	18.11	1.89	35.58	17.91	1.99
	65	19.04	15.76	1.21	22.55	15.87	1.42	24.51	14.15	1.73	30.85	17.59	1.75	31.96	17.51	1.83
	70	16.08	13.68	1.18	19.05	13.78	1.38	20.71	13.58	1.52	27.44	16.98	1.62	28.34	17.04	1.66
	75							18.84	14.83	1.27	24.02	16.25	1.48	24.72	16.46	1.50
	80													18.33	12.14	1.51
	85													16.61	14.09	1.18
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	50.71	12.03	4.21	56.70	12.07	4.70	59.94	11.53	5.20	62.39	10.85	5.75	67.04	10.46	6.41
	30	51.19	13.37	3.83	56.10	12.94	4.33	59.54	12.13	4.91	62.76	11.64	5.39	67.49	11.26	5.99
	35	51.68	15.01	3.44	55.50	13.97	3.97	59.13	12.80	4.62	63.14	12.55	5.03	67.94	12.18	5.58
	40	52.16	17.07	3.06	54.90	15.21	3.61	58.73	13.56	4.33	63.52	13.60	4.67	68.40	13.25	5.16
	45	52.64	19.72	2.67	54.30	16.73	3.25	58.32	14.43	4.04	63.89	14.83	4.31	68.85	14.50	4.75
	50	48.31	19.49	2.48	51.33	17.20	2.98	54.72	14.56	3.76	59.48	14.86	4.00	68.91	15.68	4.39
	55	43.98	19.22	2.29	48.36	17.77	2.72	51.12	14.71	3.48	55.07	14.90	3.70	68.97	17.06	4.04
	60	39.64	18.90	2.10	45.39	18.45	2.46	47.53	14.88	3.19	50.66	14.94	3.39	53.54	13.86	3.86
	65	35.31	18.52	1.91	42.41	19.29	2.20	43.93	15.09	2.91	46.25	15.00	3.08	48.43	13.57	3.57
	70	30.97	18.06	1.72	39.44	20.37	1.94	40.33	15.35	2.63	41.83	15.06	2.78	43.32	13.23	3.27
	75	26.64	17.47	1.52	36.47	21.78	1.67	36.73	15.67	2.34	37.42	15.14	2.47	38.22	12.83	2.98
	80	20.12	12.35	1.63	22.85	12.86	1.78	27.06	10.69	2.53	29.42	10.19	2.89			
	85	18.23	14.34	1.27	20.70	14.94	1.39	24.51	12.41	1.98	26.65	11.83	2.25			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

90% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	72.39	10.70	6.77	72.19	9.31	7.75	68.68	7.66	8.96	66.42	7.28	9.12	65.50	6.99	9.37
	30	71.84	11.37	6.32	71.16	9.85	7.22	68.19	8.24	8.27	65.94	7.83	8.42	65.03	7.52	8.65
	35	71.30	12.15	5.87	70.13	10.48	6.69	67.70	8.93	7.58	65.47	8.48	7.72	64.56	8.15	7.92
	40	70.75	13.06	5.42	69.10	11.21	6.16	67.20	9.75	6.89	64.99	9.26	7.02	64.09	8.90	7.20
	45	70.21	14.14	4.97	68.06	12.08	5.64	66.71	10.76	6.20	64.51	10.22	6.31	63.62	9.81	6.48
	50	69.98	15.09	4.64	61.06	11.49	5.31	59.85	10.24	5.85	55.08	9.26	5.95			
	55	69.76	16.19	4.31	54.06	10.83	4.99	52.98	9.65	5.49						
	60	55.05	13.20	4.17	52.07	11.86	4.39	45.86	9.39	4.89						
	65	50.00	12.81	3.90												
	70	44.95	12.35	3.64												
	75	39.89	11.83	3.37												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

70% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	20.22	9.04	2.24	24.87	9.52	2.61	29.60	9.91	2.99	31.93	9.24	3.45	34.27	8.45	4.06
	30	21.37	10.17	2.10	25.75	10.52	2.45	30.44	10.90	2.79	32.60	10.12	3.22	34.73	9.34	3.72
	35	22.51	11.45	1.97	26.64	11.68	2.28	31.28	12.05	2.60	33.27	11.13	2.99	35.19	10.41	3.38
	40	23.66	12.93	1.83	27.52	13.01	2.12	32.12	13.38	2.40	33.94	12.31	2.76	35.66	11.71	3.04
	45	24.80	14.64	1.69	28.41	14.57	1.95	32.96	14.95	2.20	34.61	13.71	2.52	36.12	13.34	2.71
	50	22.30	13.93	1.60	25.69	13.88	1.85	29.48	13.86	2.13	31.96	13.46	2.37	33.30	13.16	2.53
	55	19.80	13.13	1.51	22.97	13.11	1.75	26.01	12.68	2.05	29.30	13.18	2.22	30.49	12.95	2.35
	60	17.30	12.22	1.42	20.26	12.24	1.65	22.54	11.42	1.97	26.65	12.86	2.07	27.67	12.72	2.18
	65	14.81	11.19	1.32	17.54	11.27	1.56	19.07	10.05	1.90	23.99	12.49	1.92	24.86	12.44	2.00
	70	12.51	9.71	1.29	14.82	9.78	1.51	16.10	9.64	1.67	21.34	12.06	1.77	22.04	12.10	1.82
	75							14.65	10.53	1.39	18.69	11.54	1.62	19.23	11.69	1.64
	80													14.26	8.62	1.65
	85													12.92	10.01	1.29
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	39.44	8.54	4.62	44.10	8.57	5.15	46.62	8.19	5.69	48.52	7.70	6.30	52.14	7.43	7.02
	30	39.82	9.50	4.19	43.63	9.19	4.75	46.31	8.61	5.38	48.82	8.27	5.90	52.49	8.00	6.57
	35	40.19	10.66	3.77	43.17	9.92	4.35	45.99	9.09	5.06	49.11	8.91	5.51	52.85	8.65	6.11
	40	40.57	12.12	3.35	42.70	10.80	3.95	45.68	9.63	4.74	49.40	9.66	5.11	53.20	9.41	5.65
	45	40.95	14.00	2.92	42.24	11.88	3.55	45.36	10.25	4.43	49.69	10.53	4.72	53.55	10.30	5.20
	50	37.57	13.84	2.72	39.92	12.22	3.27	42.56	10.34	4.12	46.26	10.55	4.38	53.60	11.14	4.81
	55	34.20	13.65	2.51	37.61	12.62	2.98	39.76	10.44	3.81	42.83	10.58	4.05	53.64	12.12	4.43
	60	30.83	13.42	2.30	35.30	13.10	2.69	36.96	10.57	3.50	39.40	10.61	3.71	41.64	9.84	4.23
	65	27.46	13.15	2.09	32.99	13.70	2.41	34.17	10.72	3.19	35.97	10.65	3.38	37.67	9.64	3.91
	70	24.09	12.82	1.88	30.68	14.46	2.12	31.37	10.90	2.88	32.54	10.69	3.04	33.70	9.40	3.59
	75	20.72	12.41	1.67	28.37	15.46	1.83	28.57	11.13	2.57	29.11	10.75	2.71	29.73	9.11	3.26
	80	15.65	8.77	1.78	17.78	9.14	1.95	21.05	7.59	2.77	22.88	7.24	3.16			
	85	14.18	10.19	1.39	16.10	10.61	1.52	19.06	8.81	2.16	20.73	8.40	2.47			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

70% Load Heating capacity (continued)															
Load (%)/ Frequency （Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	56.30	7.60	7.41	56.15	6.61	8.49	53.42	5.44	9.82	51.66	5.17	9.99	50.95	4.97	10.26
	30	55.88	8.08	6.92	55.34	7.00	7.91	53.04	5.85	9.06	51.29	5.56	9.22	50.58	5.34	9.47
	35	55.45	8.63	6.43	54.54	7.44	7.33	52.65	6.34	8.30	50.92	6.02	8.45	50.22	5.79	8.68
	40	55.03	9.28	5.93	53.74	7.96	6.75	52.27	6.92	7.55	50.55	6.58	7.69	49.85	6.32	7.89
	45	54.61	10.04	5.44	52.94	8.58	6.17	51.89	7.64	6.79	50.18	7.26	6.92	49.48	6.97	7.10
	50	54.43	10.72	5.08	47.49	8.16	5.82	46.55	7.27	6.40	42.84	6.58	6.51			
	55	54.26	11.50	4.72	42.05	7.69	5.46	41.21	6.85	6.01						
	60	42.82	9.38	4.57	40.50	8.43	4.81	35.67	6.67	5.35						
	65	38.89	9.09	4.28												
	70	34.96	8.77	3.98												
	75	31.03	8.40	3.69												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

50% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	14.44	5.94	2.43	17.76	6.25	2.84	21.14	6.51	3.25	22.81	6.07	3.76	24.48	5.55	4.41
	30	15.26	6.68	2.28	18.39	6.92	2.66	21.74	7.16	3.03	23.28	6.65	3.50	24.81	6.14	4.04
	35	16.08	7.53	2.14	19.03	7.67	2.48	22.34	7.92	2.82	23.76	7.31	3.25	25.14	6.84	3.68
	40	16.90	8.50	1.99	19.66	8.55	2.30	22.94	8.79	2.61	24.24	8.09	3.00	25.47	7.70	3.31
	45	17.72	9.62	1.84	20.29	9.57	2.12	23.54	9.82	2.40	24.72	9.01	2.74	25.80	8.77	2.94
	50	15.93	9.15	1.74	18.35	9.12	2.01	21.06	9.10	2.31	22.83	8.85	2.58	23.79	8.65	2.75
	55	14.15	8.63	1.64	16.41	8.61	1.91	18.58	8.33	2.23	20.93	8.66	2.42	21.78	8.51	2.56
	60	12.36	8.03	1.54	14.47	8.05	1.80	16.10	7.50	2.15	19.03	8.45	2.25	19.77	8.36	2.37
	65	10.58	7.35	1.44	12.53	7.41	1.69	13.62	6.60	2.06	17.14	8.21	2.09	17.76	8.17	2.17
	70	8.93	6.38	1.40	10.58	6.43	1.65	11.50	6.34	1.82	15.24	7.92	1.92	15.75	7.95	1.98
	75							10.47	6.92	1.51	13.35	7.58	1.76	13.73	7.68	1.79
	80													10.18	5.67	1.80
	85													9.23	6.58	1.40
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	28.17	5.61	5.02	31.50	5.63	5.59	33.30	5.38	6.19	34.66	5.06	6.85	37.24	4.88	7.63
	30	28.44	6.24	4.56	31.17	6.04	5.16	33.08	5.66	5.84	34.87	5.43	6.42	37.49	5.25	7.14
	35	28.71	7.01	4.10	30.83	6.52	4.73	32.85	5.97	5.50	35.08	5.86	5.99	37.75	5.68	6.64
	40	28.98	7.96	3.64	30.50	7.10	4.30	32.63	6.33	5.16	35.29	6.35	5.56	38.00	6.18	6.15
	45	29.25	9.20	3.18	30.17	7.81	3.86	32.40	6.73	4.81	35.50	6.92	5.13	38.25	6.77	5.65
	50	26.84	9.09	2.95	28.52	8.03	3.55	30.40	6.79	4.48	33.04	6.94	4.76	38.28	7.32	5.23
	55	24.43	8.97	2.72	26.87	8.29	3.24	28.40	6.86	4.14	30.59	6.95	4.40	38.32	7.96	4.81
	60	22.02	8.82	2.50	25.21	8.61	2.93	26.40	6.94	3.80	28.14	6.97	4.04	29.74	6.47	4.60
	65	19.62	8.64	2.27	23.56	9.00	2.62	24.40	7.04	3.47	25.69	7.00	3.67	26.91	6.33	4.25
	70	17.21	8.43	2.04	21.91	9.50	2.31	22.41	7.16	3.13	23.24	7.03	3.31	24.07	6.17	3.90
	75	14.80	8.15	1.82	20.26	10.16	1.99	20.41	7.31	2.79	20.79	7.07	2.94	21.23	5.99	3.55
	80	11.18	5.77	1.94	12.70	6.00	2.12	15.03	4.99	3.01	16.34	4.76	3.44			
	85	10.13	6.69	1.51	11.50	6.97	1.65	13.62	5.79	2.35	14.81	5.52	2.68			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

50% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	40.22	4.99	8.06	40.10	4.35	9.23	38.16	3.58	10.67	36.90	3.40	10.86	36.39	3.26	11.15
	30	39.91	5.31	7.52	39.53	4.60	8.60	37.88	3.85	9.85	36.63	3.65	10.03	36.13	3.51	10.29
	35	39.61	5.67	6.99	38.96	4.89	7.97	37.61	4.17	9.03	36.37	3.96	9.19	35.87	3.80	9.43
	40	39.31	6.10	6.45	38.39	5.23	7.34	37.34	4.55	8.21	36.10	4.32	8.35	35.61	4.15	8.58
	45	39.00	6.60	5.91	37.81	5.64	6.71	37.06	5.02	7.38	35.84	4.77	7.52	35.35	4.58	7.72
	50	38.88	7.04	5.52	33.92	5.36	6.33	33.25	4.78	6.96	30.60	4.32	7.08			
	55	38.75	7.56	5.13	30.03	5.06	5.94	29.44	4.50	6.54						
	60	30.58	6.16	4.96	28.93	5.54	5.23	25.48	4.38	5.82						
	65	27.78	5.98	4.65												
	70	24.97	5.76	4.33												
	75	22.16	5.52	4.02												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

30% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	8.67	2.62	3.31	10.66	2.76	3.86	12.68	2.87	4.42	13.68	2.68	5.11	14.69	2.45	6.00
	30	9.16	2.95	3.11	11.04	3.05	3.62	13.04	3.16	4.13	13.97	2.93	4.76	14.88	2.71	5.50
	35	9.65	3.32	2.91	11.42	3.39	3.37	13.40	3.49	3.84	14.26	3.23	4.42	15.08	3.02	5.00
	40	10.14	3.75	2.70	11.79	3.77	3.13	13.76	3.88	3.55	14.55	3.57	4.08	15.28	3.39	4.50
	45	10.63	4.25	2.50	12.17	4.22	2.88	14.12	4.33	3.26	14.83	3.98	3.73	15.48	3.87	4.00
	50	9.56	4.04	2.37	11.01	4.02	2.74	12.64	4.02	3.15	13.70	3.90	3.51	14.27	3.82	3.74
	55	8.49	3.81	2.23	9.85	3.80	2.59	11.15	3.68	3.03	12.56	3.82	3.29	13.07	3.76	3.48
	60	7.42	3.54	2.09	8.68	3.55	2.45	9.66	3.31	2.92	11.42	3.73	3.06	11.86	3.69	3.22
	65	6.35	3.24	1.96	7.52	3.27	2.30	8.17	2.91	2.81	10.28	3.62	2.84	10.65	3.61	2.96
	70	5.36	2.82	1.90	6.35	2.84	2.24	6.90	2.80	2.47	9.15	3.50	2.62	9.45	3.51	2.69
	75							6.28	3.05	2.06	8.01	3.35	2.39	8.24	3.39	2.43
	80													6.11	2.50	2.44
	85													5.54	2.90	1.91
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	16.90	2.48	6.82	18.90	2.48	7.61	19.98	2.37	8.42	20.80	2.23	9.31	22.35	2.15	10.38
	30	17.06	2.75	6.20	18.70	2.66	7.02	19.85	2.50	7.95	20.92	2.40	8.73	22.50	2.32	9.71
	35	17.23	3.09	5.57	18.50	2.88	6.43	19.71	2.64	7.48	21.05	2.58	8.14	22.65	2.51	9.03
	40	17.39	3.51	4.95	18.30	3.13	5.84	19.58	2.79	7.01	21.17	2.80	7.56	22.80	2.73	8.36
	45	17.55	4.06	4.32	18.10	3.44	5.25	19.44	2.97	6.55	21.30	3.05	6.98	22.95	2.99	7.69
	50	16.10	4.01	4.01	17.11	3.54	4.83	18.24	3.00	6.09	19.83	3.06	6.48	22.97	3.23	7.12
	55	14.66	3.96	3.70	16.12	3.66	4.41	17.04	3.03	5.63	18.36	3.07	5.98	22.99	3.51	6.55
	60	13.21	3.89	3.40	15.13	3.80	3.98	15.84	3.06	5.17	16.89	3.08	5.49	17.85	2.85	6.26
	65	11.77	3.81	3.09	14.14	3.97	3.56	14.64	3.11	4.71	15.42	3.09	4.99	16.14	2.79	5.78
	70	10.32	3.72	2.78	13.15	4.19	3.14	13.44	3.16	4.25	13.94	3.10	4.50	14.44	2.72	5.30
	75	8.88	3.60	2.47	12.16	4.48	2.71	12.24	3.23	3.80	12.47	3.12	4.00	12.74	2.64	4.82
	80	6.71	2.54	2.64	7.62	2.65	2.88	9.02	2.20	4.10	9.81	2.10	4.67			
	85	6.08	2.95	2.06	6.90	3.08	2.24	8.17	2.56	3.20	8.88	2.44	3.65			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

30% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	24.13	2.20	10.96	24.06	1.92	12.55	22.89	1.58	14.51	22.14	1.50	14.77	21.83	1.44	15.17
	30	23.95	2.34	10.23	23.72	2.03	11.69	22.73	1.70	13.39	21.98	1.61	13.64	21.68	1.55	14.00
	35	23.77	2.50	9.50	23.38	2.16	10.84	22.57	1.84	12.28	21.82	1.75	12.50	21.52	1.68	12.83
	40	23.58	2.69	8.77	23.03	2.31	9.98	22.40	2.01	11.16	21.66	1.91	11.36	21.36	1.83	11.66
	45	23.40	2.91	8.04	22.69	2.49	9.13	22.24	2.21	10.04	21.50	2.10	10.22	21.21	2.02	10.49
	50	23.33	3.11	7.51	20.35	2.37	8.60	19.95	2.11	9.47	18.36	1.91	9.63			
	55	23.25	3.33	6.98	18.02	2.23	8.08	17.66	1.99	8.89						
	60	18.35	2.72	6.75	17.36	2.44	7.11	15.29	1.93	7.91						
	65	16.67	2.64	6.32												
	70	14.98	2.54	5.89												
	75	13.30	2.44	5.46												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

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100% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	32.10	18.14	1.77	39.47	19.11	2.07	46.98	19.89	2.36	50.68	18.56	2.73	54.39	16.96	3.21
	30	33.91	20.41	1.66	40.88	21.13	1.93	48.31	21.89	2.21	51.74	20.31	2.55	55.13	18.75	2.94
	35	35.73	22.99	1.55	42.28	23.44	1.80	49.64	24.19	2.05	52.81	22.35	2.36	55.86	20.89	2.67
	40	37.55	25.96	1.45	43.68	26.12	1.67	50.98	26.86	1.90	53.87	24.72	2.18	56.60	23.51	2.41
	45	39.37	29.40	1.34	45.09	29.26	1.54	52.31	30.01	1.74	54.94	27.53	2.00	57.33	27.75	2.07
	50	35.40	27.97	1.27	40.78	27.86	1.46	46.80	27.82	1.68	50.72	27.04	1.88	52.86	26.42	2.00
	55	31.43	26.36	1.19	36.46	26.32	1.39	41.29	25.46	1.62	46.51	26.47	1.76	48.40	26.01	1.86
	60	27.47	24.54	1.12	32.15	24.58	1.31	35.78	22.92	1.56	42.30	25.83	1.64	43.93	25.53	1.72
	65	23.50	22.47	1.05	27.84	22.63	1.23	30.26	20.18	1.50	38.09	25.08	1.52	39.46	24.97	1.58
	70	19.85	19.50	1.02	23.52	19.64	1.20	25.56	19.37	1.32	33.87	24.21	1.40	34.99	24.30	1.44
	75							23.26	21.15	1.10	29.66	23.11	1.28	30.52	23.48	1.30
	80													22.63	17.31	1.31
	85													20.50	20.10	1.02
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	62.61	17.16	3.65	70.00	17.21	4.07	74.00	16.44	4.50	77.02	15.47	4.98	82.76	14.91	5.55
	30	63.20	19.07	3.31	69.26	18.45	3.75	73.50	17.29	4.25	77.49	16.60	4.67	83.32	16.05	5.19
	35	63.80	21.41	2.98	68.52	19.93	3.44	73.00	18.25	4.00	77.95	17.90	4.36	83.88	17.37	4.83
	40	64.40	24.34	2.65	67.78	21.69	3.12	72.50	19.33	3.75	78.41	19.40	4.04	84.44	18.89	4.47
	45	64.99	24.80	2.62	67.04	23.88	2.81	72.00	20.57	3.50	78.88	21.43	3.68	85.00	20.70	4.11
	50	59.64	27.79	2.15	63.37	24.53	2.58	67.56	20.76	3.26	73.43	21.19	3.47	85.08	22.36	3.81
	55	54.29	27.40	1.98	59.70	25.33	2.36	63.12	20.97	3.01	67.99	21.25	3.20	85.15	24.33	3.50
	60	48.94	26.95	1.82	56.03	26.31	2.13	58.67	21.22	2.77	62.54	21.31	2.94	66.09	19.76	3.35
	65	43.59	26.41	1.65	52.36	27.51	1.90	54.23	21.52	2.52	57.09	21.38	2.67	59.79	19.35	3.09
	70	38.24	25.75	1.49	48.70	29.04	1.68	49.79	21.89	2.28	51.65	21.47	2.41	53.49	18.87	2.84
	75	32.89	24.92	1.32	45.03	23.89	1.89	45.35	22.36	2.03	46.20	21.59	2.14	47.18	18.29	2.58
	80	24.84	17.60	1.41	28.22	18.34	1.54	33.41	15.24	2.19	36.32	14.53	2.50			
	85	22.50	20.45	1.10	25.56	21.30	1.20	30.26	17.68	1.71	32.90	16.91	1.95			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

100% Load Heating capacity (continued)																
Load (%)/ Frequency（Hz）	LWT	DB														
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
100	25	89.37	15.24	5.86	89.12	13.29	6.71	84.80	10.93	7.76	82.00	10.38	7.90	80.87	9.97	8.11
	30	88.70	16.22	5.47	87.85	14.05	6.25	84.19	11.75	7.16	81.41	11.16	7.29	80.29	10.73	7.49
	35	88.02	17.33	5.08	86.58	14.94	5.80	83.58	12.73	6.57	80.82	12.09	6.68	79.71	11.62	6.86
	40	87.35	18.62	4.69	85.30	15.98	5.34	82.97	13.90	5.97	80.23	13.21	6.08	79.13	12.69	6.24
	45	86.68	20.17	4.30	84.03	17.22	4.88	82.36	15.34	5.37	79.64	14.57	5.47	78.54	14.00	5.61
	50	86.40	21.52	4.02	75.39	16.39	4.60	73.89	14.60	5.06	68.00	13.20	5.15			
	55	86.12	23.09	3.73	66.74	15.47	4.31	65.41	13.76	4.75						
	60	67.96	18.83	3.61	64.29	16.92	3.80	56.62	13.39	4.23						
	65	61.73	18.26	3.38												
	70	55.49	17.62	3.15												
	75	49.25	16.87	2.92												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

90% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	28.89	15.55	1.86	35.53	16.38	2.17	42.28	17.05	2.48	45.61	15.91	2.87	48.95	14.54	3.37
	30	30.52	17.50	1.74	36.79	18.11	2.03	43.48	18.76	2.32	46.57	17.41	2.67	49.61	16.07	3.09
	35	32.16	19.71	1.63	38.05	20.10	1.89	44.68	20.73	2.15	47.53	19.15	2.48	50.28	17.91	2.81
	40	33.80	22.25	1.52	39.32	22.39	1.76	45.88	23.03	1.99	48.48	21.19	2.29	50.94	20.15	2.53
	45	35.43	25.20	1.41	40.58	25.08	1.62	47.08	25.73	1.83	49.44	23.60	2.10	51.60	22.96	2.25
	50	31.86	23.97	1.33	36.70	23.88	1.54	42.12	23.85	1.77	45.65	23.17	1.97	47.58	22.65	2.10
	55	28.29	22.60	1.25	32.82	22.56	1.45	37.16	21.83	1.70	41.86	22.69	1.84	43.56	22.30	1.95
	60	24.72	21.04	1.18	28.94	21.07	1.37	32.20	19.65	1.64	38.07	22.14	1.72	39.53	21.89	1.81
	65	21.15	19.26	1.10	25.06	19.40	1.29	27.24	17.29	1.58	34.28	21.50	1.59	35.51	21.40	1.66
	70	17.87	16.72	1.07	21.16	16.84	1.26	23.01	16.60	1.39	30.49	20.75	1.47	31.49	20.83	1.51
	75							20.93	18.12	1.16	26.69	19.86	1.34	27.47	20.12	1.37
	80													20.37	14.84	1.37
	85													18.45	17.23	1.07
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	56.35	14.71	3.83	63.00	14.75	4.27	66.60	14.10	4.73	69.32	13.26	5.23	74.48	12.78	5.83
	30	56.88	16.34	3.48	62.33	15.82	3.94	66.15	14.82	4.46	69.74	14.23	4.90	74.99	13.76	5.45
	35	57.42	18.35	3.13	61.67	17.08	3.61	65.70	15.64	4.20	70.16	15.34	4.57	75.49	14.89	5.07
	40	57.96	20.86	2.78	61.00	18.59	3.28	65.25	16.57	3.94	70.57	16.63	4.24	76.00	16.19	4.69
	45	58.49	24.10	2.43	60.34	20.45	2.95	64.80	17.63	3.68	70.99	18.13	3.92	76.50	17.73	4.32
	50	53.68	23.82	2.25	57.03	21.03	2.71	60.80	17.79	3.42	66.09	18.16	3.64	76.57	19.17	4.00
	55	48.86	23.49	2.08	53.73	21.71	2.47	56.80	17.97	3.16	61.19	18.21	3.36	76.64	20.85	3.68
	60	44.05	23.10	1.91	50.43	22.55	2.24	52.81	18.19	2.90	56.29	18.26	3.08	59.48	16.94	3.51
	65	39.23	22.64	1.73	47.13	23.58	2.00	48.81	18.45	2.65	51.38	18.33	2.80	53.81	16.59	3.24
	70	34.42	22.07	1.56	43.83	24.89	1.76	44.81	18.76	2.39	46.48	18.41	2.53	48.14	16.17	2.98
	75	29.60	21.36	1.39	40.52	26.62	1.52	40.81	19.15	2.13	41.58	18.50	2.25	42.47	15.68	2.71
	80	22.36	15.10	1.48	25.39	15.72	1.62	30.07	13.06	2.30	32.69	12.46	2.62			
	85	20.25	17.53	1.16	23.00	18.26	1.26	27.23	15.17	1.80	29.61	14.46	2.05			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

90% Load Heating capacity (continued)																
Load (%)/ Frequency（Hz）	LWT	DB														
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
90	25	80.43	13.07	6.15	80.21	11.38	7.05	76.32	9.37	8.15	73.80	8.90	8.30	72.78	8.55	8.52
	30	79.83	13.90	5.74	79.06	12.04	6.57	75.77	10.07	7.52	73.27	9.57	7.66	72.26	9.19	7.86
	35	79.22	14.85	5.33	77.92	12.81	6.08	75.22	10.91	6.89	72.74	10.37	7.02	71.74	9.96	7.20
	40	78.61	15.96	4.92	76.77	13.70	5.60	74.67	11.92	6.27	72.21	11.32	6.38	71.21	10.87	6.55
	45	78.01	17.28	4.52	75.63	14.76	5.12	74.12	13.15	5.64	71.68	12.49	5.74	70.69	12.00	5.89
	50	77.76	18.44	4.22	67.85	14.05	4.83	66.50	12.51	5.31	61.20	11.32	5.41			
	55	77.51	19.79	3.92	60.07	13.24	4.54	58.87	11.79	4.99						
	60	61.17	16.14	3.79	57.86	14.50	3.99	50.96	11.47	4.44						
	65	55.55	15.65	3.55												
	70	49.94	15.10	3.31												
	75	44.33	14.46	3.07												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

70% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	22.47	11.04	2.03	27.63	11.63	2.38	32.88	12.11	2.72	35.48	11.30	3.14	38.07	10.33	3.69
	30	23.74	12.42	1.91	28.61	12.86	2.22	33.82	13.32	2.54	36.22	12.37	2.93	38.59	11.41	3.38
	35	25.01	14.00	1.79	29.60	14.27	2.07	34.75	14.72	2.36	36.97	13.60	2.72	39.10	12.72	3.07
	40	26.29	15.80	1.66	30.58	15.90	1.92	35.68	16.35	2.18	37.71	15.05	2.51	39.62	14.31	2.77
	45	27.56	17.90	1.54	31.56	17.81	1.77	36.62	18.27	2.00	38.46	16.76	2.29	40.13	16.30	2.46
	50	24.78	17.03	1.46	28.54	16.96	1.68	32.76	16.93	1.93	35.51	16.46	2.16	37.01	16.08	2.30
	55	22.00	16.05	1.37	25.52	16.02	1.59	28.90	15.50	1.86	32.56	16.11	2.02	33.88	15.83	2.14
	60	19.23	14.94	1.29	22.51	14.96	1.50	25.04	13.95	1.79	29.61	15.72	1.88	30.75	15.54	1.98
	65	16.45	13.68	1.20	19.49	13.78	1.41	21.18	12.28	1.73	26.66	15.27	1.75	27.62	15.20	1.82
	70	13.90	11.87	1.17	16.46	11.96	1.38	17.89	11.79	1.52	23.71	14.74	1.61	24.49	14.79	1.66
	75							16.28	12.87	1.27	20.76	14.10	1.47	21.36	14.29	1.50
	80													15.84	10.54	1.50
	85													14.35	12.23	1.17
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	43.82	10.44	4.20	49.00	10.47	4.68	51.80	10.01	5.18	53.92	9.41	5.73	57.93	9.08	6.38
	30	44.24	11.61	3.81	48.48	11.23	4.32	51.45	10.53	4.89	54.24	10.11	5.37	58.33	9.77	5.97
	35	44.66	13.03	3.43	47.96	12.13	3.95	51.10	11.11	4.60	54.57	10.90	5.01	58.72	10.57	5.55
	40	45.08	14.81	3.04	47.45	13.20	3.59	50.75	11.77	4.31	54.89	11.81	4.65	59.11	11.50	5.14
	45	45.49	17.11	2.66	46.93	14.52	3.23	50.40	12.52	4.03	55.21	12.87	4.29	59.50	12.59	4.73
	50	41.75	16.91	2.47	44.36	14.93	2.97	47.29	12.63	3.74	51.40	12.90	3.98	59.55	13.61	4.38
	55	38.00	16.68	2.28	41.79	15.42	2.71	44.18	12.76	3.46	47.59	12.93	3.68	59.61	14.81	4.03
	60	34.26	16.41	2.09	39.22	16.01	2.45	41.07	12.92	3.18	43.78	12.97	3.38	46.27	12.03	3.85
	65	30.51	16.07	1.90	36.65	16.75	2.19	37.96	13.10	2.90	39.96	13.02	3.07	41.85	11.78	3.55
	70	26.77	15.67	1.71	34.09	17.68	1.93	34.85	13.32	2.62	36.15	13.07	2.77	37.44	11.48	3.26
	75	23.02	15.17	1.52	31.52	18.90	1.67	31.74	13.60	2.33	32.34	13.14	2.46	33.03	11.13	2.97
	80	17.39	10.72	1.62	19.75	11.17	1.77	23.38	9.28	2.52	25.43	8.85	2.87			
	85	15.75	12.45	1.27	17.89	12.96	1.38	21.18	10.77	1.97	23.03	10.27	2.24			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

70% Load Heating capacity (continued)																
Load (%)/ Frequency（Hz）	LWT	DB														
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
70	25	62.56	9.28	6.74	62.39	8.08	7.72	59.36	6.65	8.92	57.40	6.32	9.09	56.61	6.07	9.33
	30	62.09	9.87	6.29	61.49	8.55	7.19	58.93	7.15	8.24	56.99	6.80	8.39	56.20	6.53	8.61
	35	61.62	10.55	5.84	60.60	9.09	6.66	58.50	7.75	7.55	56.58	7.36	7.69	55.79	7.07	7.89
	40	61.14	11.34	5.39	59.71	9.73	6.14	58.08	8.46	6.86	56.16	8.04	6.99	55.39	7.72	7.17
	45	60.67	12.27	4.95	58.82	10.48	5.61	57.65	9.34	6.18	55.75	8.87	6.29	54.98	8.52	6.45
	50	60.48	13.10	4.62	52.77	9.98	5.29	51.72	8.88	5.82	47.60	8.04	5.92			
	55	60.28	14.05	4.29	46.72	9.40	4.97	45.79	8.38	5.47						
	60	47.57	11.46	4.15	45.00	10.30	4.37	39.64	8.15	4.86						
	65	43.21	11.12	3.89												
	70	38.84	10.72	3.62												
	75	34.48	10.27	3.36												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

50% Load Heating capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	16.05	7.26	2.21	19.74	7.64	2.58	23.49	7.96	2.95	25.34	7.42	3.41	27.19	6.79	4.01
	30	16.96	8.16	2.08	20.44	8.45	2.42	24.15	8.76	2.76	25.87	8.13	3.18	27.56	7.50	3.67
	35	17.87	9.20	1.94	21.14	9.38	2.25	24.82	9.68	2.57	26.40	8.94	2.95	27.93	8.36	3.34
	40	18.78	10.38	1.81	21.84	10.45	2.09	25.49	10.75	2.37	26.94	9.89	2.72	28.30	9.41	3.01
	45	19.68	11.76	1.67	22.54	11.70	1.93	26.16	12.01	2.18	27.47	11.01	2.49	28.67	10.71	2.68
	50	17.70	11.19	1.58	20.39	11.15	1.83	23.40	11.13	2.10	25.36	10.81	2.35	26.43	10.57	2.50
	55	15.72	10.54	1.49	18.23	10.53	1.73	20.64	10.19	2.03	23.26	10.59	2.20	24.20	10.41	2.33
	60	13.73	9.82	1.40	16.08	9.83	1.63	17.89	9.17	1.95	21.15	10.33	2.05	21.96	10.21	2.15
	65	11.75	8.99	1.31	13.92	9.05	1.54	15.13	8.07	1.88	19.04	10.03	1.90	19.73	9.99	1.98
	70	9.93	7.80	1.27	11.76	7.86	1.50	12.78	7.75	1.65	16.94	9.68	1.75	17.49	9.72	1.80
	75							11.63	8.46	1.38	14.83	9.27	1.60	15.26	9.39	1.63
	80													11.32	6.92	1.63
	85													10.25	8.04	1.28
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	31.30	6.86	4.56	35.00	6.88	5.08	37.00	6.58	5.63	38.51	6.19	6.23	41.38	5.96	6.94
	30	31.60	7.63	4.14	34.63	7.38	4.69	36.75	6.92	5.31	38.74	6.64	5.83	41.66	6.42	6.49
	35	31.90	8.56	3.73	34.26	7.97	4.30	36.50	7.30	5.00	38.98	7.16	5.44	41.94	6.95	6.04
	40	32.20	9.73	3.31	33.89	8.68	3.91	36.25	7.73	4.69	39.21	7.76	5.05	42.22	7.56	5.59
	45	32.50	11.25	2.89	33.52	9.54	3.51	36.00	8.23	4.38	39.44	8.46	4.66	42.50	8.27	5.14
	50	29.82	11.11	2.68	31.69	9.81	3.23	33.78	8.30	4.07	36.72	8.48	4.33	42.54	8.94	4.76
	55	27.15	10.96	2.48	29.85	10.13	2.95	31.56	8.39	3.76	33.99	8.50	4.00	42.58	9.73	4.38
	60	24.47	10.78	2.27	28.02	10.52	2.66	29.34	8.49	3.46	31.27	8.52	3.67	33.05	7.90	4.18
	65	21.80	10.56	2.06	26.18	11.00	2.38	27.12	8.61	3.15	28.55	8.55	3.34	29.90	7.74	3.86
	70	19.12	10.30	1.86	24.35	11.62	2.10	24.90	8.75	2.84	25.82	8.59	3.01	26.74	7.55	3.54
	75	16.45	9.97	1.65	22.51	12.42	1.81	22.67	8.94	2.54	23.10	8.64	2.68	23.59	7.32	3.23
	80	12.42	7.05	1.76	14.11	7.34	1.92	16.70	6.10	2.74	18.16	5.81	3.12			
	85	11.25	8.18	1.38	12.78	8.52	1.50	15.13	7.08	2.14	16.45	6.75	2.44			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

50% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
50	25	44.69	6.10	7.33	44.56	5.31	8.39	42.40	4.37	9.70	41.00	4.15	9.88	40.43	3.99	10.14
	30	44.35	6.49	6.84	43.92	5.62	7.82	42.09	4.70	8.95	40.71	4.47	9.11	40.14	4.29	9.36
	35	44.01	6.93	6.35	43.29	5.98	7.24	41.79	5.09	8.21	40.41	4.84	8.35	39.85	4.65	8.58
	40	43.67	7.45	5.86	42.65	6.39	6.67	41.48	5.56	7.46	40.12	5.28	7.59	39.56	5.07	7.80
	45	43.34	8.06	5.38	42.02	6.89	6.10	41.18	6.13	6.71	39.82	5.83	6.83	39.27	5.60	7.02
	50	43.20	8.61	5.02	37.69	6.56	5.75	36.94	5.84	6.33	34.00	5.28	6.44			
	55	43.06	9.24	4.66	33.37	6.18	5.40	32.71	5.50	5.94						
	60	33.98	7.53	4.51	32.14	6.77	4.75	28.31	5.35	5.29						
	65	30.86	7.30	4.23												
	70	27.74	7.05	3.94												
	75	24.63	6.75	3.65												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

30% Load Heating capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-25			-20			-15			-10			-5		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	9.63	3.20	3.01	11.84	3.37	3.51	14.09	3.51	4.01	15.20	3.27	4.64	16.32	2.99	5.45
	30	10.17	3.60	2.82	12.26	3.73	3.29	14.49	3.86	3.75	15.52	3.58	4.33	16.54	3.31	5.00
	35	10.72	4.06	2.64	12.68	4.14	3.07	14.89	4.27	3.49	15.84	3.94	4.02	16.76	3.69	4.54
	40	11.27	4.58	2.46	13.11	4.61	2.84	15.29	4.74	3.23	16.16	4.36	3.70	16.98	4.15	4.09
	45	11.81	5.19	2.28	13.53	5.16	2.62	15.69	5.30	2.96	16.48	4.86	3.39	17.20	4.73	3.64
	50	10.62	4.94	2.15	12.23	4.92	2.49	14.04	4.91	2.86	15.22	4.77	3.19	15.86	4.66	3.40
	55	9.43	4.65	2.03	10.94	4.64	2.36	12.39	4.49	2.76	13.95	4.67	2.99	14.52	4.59	3.16
	60	8.24	4.33	1.90	9.65	4.34	2.22	10.73	4.05	2.65	12.69	4.56	2.78	13.18	4.51	2.92
	65	7.05	3.97	1.78	8.35	3.99	2.09	9.08	3.56	2.55	11.43	4.43	2.58	11.84	4.41	2.69
	70	5.96	3.44	1.73	7.05	3.47	2.04	7.67	3.42	2.24	10.16	4.27	2.38	10.50	4.29	2.45
	75							6.98	3.73	1.87	8.90	4.09	2.18	9.16	4.14	2.21
	80													6.79	3.05	2.22
	85													6.15	3.55	1.73
	LWT	DB													
		0			5			10			15			20		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	18.78	3.03	6.20	21.00	3.04	6.92	22.20	2.90	7.65	23.11	2.73	8.47	24.83	2.63	9.44
	30	18.96	3.36	5.64	20.78	3.26	6.38	22.05	3.05	7.23	23.25	2.93	7.93	25.00	2.83	8.82
	35	19.14	3.78	5.07	20.56	3.52	5.85	21.90	3.22	6.80	23.39	3.16	7.40	25.16	3.06	8.21
	40	19.32	4.29	4.50	20.33	3.83	5.31	21.75	3.41	6.38	23.52	3.42	6.87	25.33	3.33	7.60
	45	19.50	4.96	3.93	20.11	4.21	4.78	21.60	3.63	5.95	23.66	3.73	6.34	25.50	3.65	6.99
	50	17.89	4.90	3.65	19.01	4.33	4.39	20.27	3.66	5.53	22.03	3.74	5.89	25.52	3.95	6.47
	55	16.29	4.84	3.37	17.91	4.47	4.01	18.93	3.70	5.12	20.40	3.75	5.44	25.55	4.29	5.95
	60	14.68	4.76	3.09	16.81	4.64	3.62	17.60	3.74	4.70	18.76	3.76	4.99	19.83	3.49	5.69
	65	13.08	4.66	2.81	15.71	4.86	3.24	16.27	3.80	4.28	17.13	3.77	4.54	17.94	3.41	5.25
	70	11.47	4.54	2.53	14.61	5.13	2.85	14.94	3.86	3.87	15.49	3.79	4.09	16.05	3.33	4.82
	75	9.87	4.40	2.24	13.51	5.48	2.47	13.60	3.94	3.45	13.86	3.81	3.64	14.16	3.23	4.39
	80	7.45	3.11	2.40	8.46	3.24	2.61	10.02	2.69	3.73	10.90	2.56	4.25			
	85	6.75	3.61	1.87	7.67	3.76	2.04	9.08	3.12	2.91	9.87	2.98	3.32			

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

30% Load Heating capacity (continued)															
Load (%)/ Frequency（Hz）	LWT	DB													
		25			30			35			40			43		
		HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
30	25	26.81	2.69	9.96	26.74	2.34	11.41	25.44	1.93	13.19	24.60	1.83	13.43	24.26	1.76	13.79
	30	26.61	2.86	9.30	26.35	2.48	10.63	25.26	2.07	12.18	24.42	1.97	12.40	24.09	1.89	12.73
	35	26.41	3.06	8.64	25.97	2.64	9.85	25.07	2.25	11.16	24.25	2.13	11.36	23.91	2.05	11.66
	40	26.20	3.29	7.97	25.59	2.82	9.07	24.89	2.45	10.14	24.07	2.33	10.33	23.74	2.24	10.60
	45	26.00	3.56	7.31	25.21	3.04	8.30	24.71	2.71	9.13	23.89	2.57	9.29	23.56	2.47	9.54
	50	25.92	3.80	6.83	22.62	2.89	7.82	22.17	2.58	8.61	20.40	2.33	8.76			
	55	25.84	4.07	6.34	20.02	2.73	7.34	19.62	2.43	8.08						
	60	20.39	3.32	6.14	19.29	2.99	6.46	16.99	2.36	7.19						
	65	18.52	3.22	5.75												
	70	16.65	3.11	5.36												
	75	14.78	2.98	4.96												
	80															
	85															

Notes：

HC: Total heating capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Performance specifications measured with water pump operating at rated water flow rate.

4.2 Cooling Capacity Tables

4.2.1 MHS-SVC50-RN7TL-B

100% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
100	-5															
	0	27.88	6.44	4.33	28.30	7.05	4.02	29.78	8.22	3.62	30.15	8.76	3.44	31.12	10.19	3.06
	5	30.98	5.72	5.41	31.45	6.26	5.02	33.09	7.31	4.53	33.50	7.79	4.30	34.58	9.05	3.82
	10	38.55	6.57	5.87	39.13	7.19	5.44	41.18	8.39	4.91	41.69	8.94	4.66	43.03	10.39	4.14
	15	46.12	7.29	6.33	46.82	7.98	5.87	49.26	9.31	5.29	49.87	9.92	5.03	51.48	11.54	4.46
	20	50.73	7.29	6.96	51.50	7.98	6.45	54.19	9.31	5.82	54.86	9.92	5.53	56.63	11.54	4.91
	25	53.27	7.09	7.51	54.07	7.76	6.97	56.90	9.05	6.28	57.60	9.65	5.97	59.46	11.22	5.30
	LWT	DB													
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
100	-5	31.44	11.68	2.69	32.37	12.36	2.62	31.76	12.70	2.50	31.21	13.00	2.40	30.71	13.20	2.33
	0	36.99	12.37	2.99	38.08	13.09	2.91	37.36	13.45	2.78	36.72	13.76	2.67	36.13	13.98	2.58
	5	40.43	10.75	3.76	55.27	17.54	3.15	52.64	17.21	3.06	50.14	16.58	3.02	47.75	15.97	2.99
	10	50.31	12.34	4.08	59.44	15.85	3.75	57.81	16.06	3.60	55.95	15.77	3.55	54.52	15.83	3.44
	15	60.19	13.70	4.39	63.60	14.63	4.35	62.97	15.21	4.14	61.76	15.17	4.07	61.29	15.72	3.90
	20	66.21	13.70	4.83	70.53	14.78	4.77	70.09	15.09	4.65	69.32	15.15	4.58	67.26	15.11	4.45
	25	69.52	13.32	5.22	77.46	14.90	5.20	77.21	14.99	5.15	76.88	15.12	5.08	73.23	14.64	5.00
	LWT	DB													
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
100	-5	29.81	12.97	2.30	16.73	10.19	1.64	12.44	8.24	1.51	7.06	5.46	1.29			
	0	35.08	13.73	2.55	19.68	10.79	1.82	14.64	8.72	1.68	8.31	5.78	1.44			
	5	46.36	15.69	2.96	22.35	7.81	2.86	18.00	7.11	2.53	10.73	5.87	1.83			
	10	53.51	16.13	3.32	32.54	9.98	3.26	23.20	8.07	2.88	14.20	5.95	2.39			
	15	60.67	16.49	3.68	42.74	11.69	3.66	28.41	8.82	3.22	17.66	6.00	2.94			
	20	66.79	15.47	4.32	43.34	10.57	4.10	32.44	8.79	3.69	20.19	6.04	3.34			
	25	67.35	13.59	4.96	43.94	9.67	4.54	36.48	8.76	4.16	22.73	6.08	3.74			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC50-RN7TL-B

90% Load Cooling capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
90	-5															
	0	25.09	5.52	4.55	25.47	6.04	4.22	26.80	7.05	3.80	27.14	7.51	3.61	28.01	8.73	3.21
	5	27.88	4.90	5.69	28.30	5.37	5.27	29.78	6.26	4.75	30.15	6.68	4.52	31.12	7.76	4.01
	10	34.70	5.63	6.16	35.22	6.16	5.71	37.06	7.19	5.15	37.52	7.66	4.90	38.73	8.91	4.35
	15	41.51	6.25	6.64	42.13	6.84	6.16	44.33	7.98	5.55	44.89	8.51	5.28	46.33	9.89	4.69
	20	45.66	6.25	7.31	46.35	6.84	6.77	48.77	7.98	6.11	49.38	8.51	5.80	50.97	9.89	5.15
	25	47.94	6.08	7.89	48.67	6.65	7.32	51.21	7.76	6.60	51.84	8.27	6.27	53.51	9.61	5.57
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
90	-5	28.30	10.01	2.83	29.13	10.60	2.75	28.58	10.89	2.62	28.09	11.14	2.52	27.64	11.32	2.44
	0	33.29	10.60	3.14	34.27	11.22	3.05	33.62	11.53	2.92	33.05	11.80	2.80	32.52	11.98	2.71
	5	36.39	9.22	3.95	49.75	15.04	3.31	47.38	14.75	3.21	45.12	14.21	3.18	42.97	13.69	3.14
	10	45.28	10.58	4.28	53.49	13.59	3.94	52.03	13.77	3.78	50.35	13.52	3.73	49.07	13.57	3.62
	15	54.17	11.74	4.61	57.24	12.54	4.56	56.68	13.04	4.35	55.58	13.00	4.27	55.16	13.48	4.09
	20	59.59	11.74	5.07	63.48	12.67	5.01	63.08	12.93	4.88	62.39	12.98	4.81	60.53	12.95	4.67
	25	62.57	11.42	5.48	69.72	12.77	5.46	69.49	12.85	5.41	69.19	12.96	5.34	65.91	12.55	5.25
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
90	-5	26.83	11.11	2.41	15.06	8.74	1.72	11.20	7.06	1.59	6.36	4.68	1.36			
	0	31.57	11.77	2.68	17.71	9.25	1.91	13.18	7.47	1.76	7.48	4.96	1.51			
	5	41.72	13.44	3.10	20.12	6.69	3.01	16.20	6.10	2.66	9.66	5.03	1.92			
	10	48.16	13.83	3.48	29.29	8.56	3.42	20.88	6.92	3.02	12.78	5.10	2.51			
	15	54.60	14.13	3.86	38.46	10.02	3.84	25.57	7.56	3.38	15.89	5.14	3.09			
	20	60.11	13.26	4.53	39.00	9.06	4.30	29.20	7.53	3.88	18.17	5.18	3.51			
	25	60.62	11.65	5.20	39.54	8.29	4.77	32.83	7.51	4.37	20.46	5.21	3.92			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

70% Load Cooling capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
70	-5															
	0	19.52	3.92	4.98	19.81	4.29	4.62	20.85	5.00	4.17	21.11	5.33	3.96	21.79	6.20	3.51
	5	21.69	3.48	6.23	22.01	3.81	5.77	23.16	4.45	5.21	23.45	4.74	4.95	24.21	5.51	4.39
	10	26.99	4.00	6.75	27.39	4.38	6.26	28.82	5.11	5.65	29.18	5.44	5.36	30.12	6.33	4.76
	15	32.28	4.44	7.27	32.77	4.86	6.74	34.48	5.67	6.08	34.91	6.04	5.78	36.04	7.02	5.13
	20	35.51	4.44	8.00	36.05	4.86	7.42	37.93	5.67	6.69	38.40	6.04	6.36	39.64	7.02	5.64
	25	37.29	4.32	8.64	37.85	4.72	8.01	39.83	5.51	7.23	40.32	5.87	6.87	41.62	6.83	6.10
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
70	-5	22.01	7.11	3.09	22.66	7.52	3.01	22.23	7.73	2.87	21.85	7.91	2.76	21.50	8.04	2.68
	0	25.89	7.53	3.44	26.66	7.97	3.35	26.15	8.19	3.19	25.70	8.38	3.07	25.29	8.51	2.97
	5	28.30	6.54	4.32	38.69	10.68	3.62	36.85	10.48	3.52	35.10	10.09	3.48	33.42	9.72	3.44
	10	35.22	7.51	4.69	41.61	9.65	4.31	40.47	9.78	4.14	39.16	9.60	4.08	38.16	9.63	3.96
	15	42.13	8.34	5.05	44.52	8.91	5.00	44.08	9.26	4.76	43.23	9.23	4.68	42.90	9.57	4.48
	20	46.35	8.34	5.56	49.37	9.00	5.49	49.06	9.18	5.34	48.52	9.22	5.26	47.08	9.20	5.12
	25	48.66	8.11	6.00	54.22	9.07	5.98	54.05	9.12	5.92	53.82	9.21	5.85	51.26	8.91	5.75
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
70	-5	20.87	7.89	2.64	11.71	6.21	1.89	8.71	5.01	1.74	4.94	3.33	1.49			
	0	24.55	8.36	2.94	13.78	6.57	2.10	10.25	5.31	1.93	5.82	3.52	1.65			
	5	32.45	9.55	3.40	15.65	4.75	3.29	12.60	4.33	2.91	7.51	3.57	2.10			
	10	37.46	9.82	3.82	22.78	6.08	3.75	16.24	4.91	3.31	9.94	3.62	2.74			
	15	42.47	10.04	4.23	29.92	7.11	4.21	19.89	5.37	3.70	12.36	3.65	3.39			
	20	46.75	9.41	4.97	30.34	6.43	4.71	22.71	5.35	4.25	14.13	3.68	3.84			
	25	47.15	8.27	5.70	30.76	5.89	5.22	25.54	5.33	4.79	15.91	3.70	4.30			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

50% Load Cooling capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
50	-5															
	0	13.94	2.57	5.41	14.15	2.82	5.02	14.89	3.29	4.53	15.08	3.50	4.30	15.56	4.07	3.82
	5	15.49	2.29	6.77	15.72	2.51	6.28	16.55	2.92	5.66	16.75	3.12	5.38	17.29	3.62	4.77
	10	19.28	2.63	7.34	19.57	2.88	6.80	20.59	3.35	6.14	20.84	3.58	5.83	21.52	4.16	5.18
	15	23.06	2.92	7.91	23.41	3.19	7.33	24.63	3.72	6.61	24.94	3.97	6.28	25.74	4.61	5.58
	20	25.37	2.92	8.70	25.75	3.19	8.06	27.09	3.72	7.27	27.43	3.97	6.91	28.31	4.61	6.14
	25	26.63	2.84	9.39	27.04	3.10	8.71	28.45	3.62	7.86	28.80	3.86	7.46	29.73	4.49	6.63
	LWT	DB													
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
50	-5	15.72	4.67	3.36	16.18	4.94	3.27	15.88	5.08	3.12	15.61	5.20	3.00	15.35	5.28	2.91
	0	18.50	4.95	3.74	19.04	5.24	3.64	18.68	5.38	3.47	18.36	5.51	3.34	18.06	5.59	3.23
	5	20.22	4.30	4.70	27.64	7.02	3.94	26.32	6.88	3.82	25.07	6.63	3.78	23.87	6.39	3.74
	10	25.16	4.94	5.10	29.72	6.34	4.69	28.90	6.42	4.50	27.97	6.31	4.43	27.26	6.33	4.31
	15	30.09	5.48	5.49	31.80	5.85	5.43	31.49	6.08	5.18	30.88	6.07	5.09	30.64	6.29	4.87
	20	33.10	5.48	6.04	35.27	5.91	5.97	35.05	6.03	5.81	34.66	6.06	5.72	33.63	6.05	5.56
	25	34.76	5.33	6.52	38.73	5.96	6.50	38.60	5.99	6.44	38.44	6.05	6.35	36.62	5.86	6.25
	LWT	DB													
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
50	-5	14.91	5.19	2.87	8.36	4.08	2.05	6.22	3.29	1.89	3.53	2.19	1.62			
	0	17.54	5.49	3.19	9.84	4.32	2.28	7.32	3.49	2.10	4.15	2.31	1.80			
	5	23.18	6.27	3.69	11.18	3.12	3.58	9.00	2.85	3.16	5.37	2.35	2.29			
	10	26.76	6.45	4.15	16.27	3.99	4.08	11.60	3.23	3.59	7.10	2.38	2.98			
	15	30.34	6.59	4.60	21.37	4.67	4.57	14.20	3.53	4.03	8.83	2.40	3.68			
	20	33.40	6.19	5.40	21.67	4.23	5.12	16.22	3.52	4.61	10.10	2.42	4.18			
	25	33.68	5.44	6.20	21.97	3.87	5.68	18.24	3.51	5.20	11.36	2.43	4.67			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

30% Load Cooling capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
30	-5															
	0	8.36	1.14	7.36	8.49	1.24	6.83	8.93	1.45	6.16	9.05	1.55	5.85	9.34	1.80	5.19
	5	9.29	1.01	9.20	9.43	1.11	8.53	9.93	1.29	7.70	10.05	1.37	7.31	10.37	1.60	6.49
	10	11.57	1.16	9.98	11.74	1.27	9.25	12.35	1.48	8.35	12.51	1.58	7.93	12.91	1.83	7.04
	15	13.84	1.29	10.75	14.04	1.41	9.97	14.78	1.64	8.99	14.96	1.75	8.54	15.44	2.04	7.59
	20	15.22	1.29	11.83	15.45	1.41	10.97	16.26	1.64	9.89	16.46	1.75	9.40	16.99	2.04	8.34
	25	15.98	1.25	12.77	16.22	1.37	11.84	17.07	1.60	10.68	17.28	1.70	10.15	17.84	1.98	9.01
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
30	-5	9.43	2.06	4.57	9.71	2.18	4.45	9.53	2.24	4.25	9.36	2.29	4.08	9.21	2.33	3.95
	0	11.10	2.18	5.08	11.42	2.31	4.95	11.21	2.37	4.72	11.02	2.43	4.54	10.84	2.47	4.39
	5	12.13	1.90	6.39	16.58	3.10	5.36	15.79	3.04	5.20	15.04	2.93	5.14	14.32	2.82	5.08
	10	15.09	2.18	6.93	17.83	2.80	6.37	17.34	2.83	6.12	16.78	2.78	6.03	16.36	2.79	5.86
	15	18.06	2.42	7.47	19.08	2.58	7.39	18.89	2.68	7.04	18.53	2.68	6.92	18.39	2.77	6.63
	20	19.86	2.42	8.21	21.16	2.61	8.11	21.03	2.66	7.90	20.80	2.67	7.78	20.18	2.67	7.57
	25	20.86	2.35	8.87	23.24	2.63	8.84	23.16	2.64	8.76	23.06	2.67	8.64	21.97	2.58	8.50
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
30	-5	8.94	2.29	3.91	5.02	1.80	2.79	3.73	1.45	2.57	2.12	0.96	2.20			
	0	10.52	2.42	4.34	5.90	1.90	3.10	4.39	1.54	2.85	2.49	1.02	2.44			
	5	13.91	2.77	5.02	6.71	1.38	4.87	5.40	1.26	4.30	3.22	1.04	3.11			
	10	16.05	2.85	5.64	9.76	1.76	5.54	6.96	1.42	4.89	4.26	1.05	4.06			
	15	18.20	2.91	6.26	12.82	2.06	6.22	8.52	1.56	5.47	5.30	1.06	5.00			
	20	20.04	2.73	7.34	13.00	1.87	6.97	9.73	1.55	6.28	6.06	1.07	5.68			
	25	20.21	2.40	8.43	13.18	1.71	7.72	10.94	1.55	7.08	6.82	1.07	6.35			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

4.2.2 MHS-SVC60-RN7TL-B

100% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
100	-5															
	0	31.37	7.57	4.14	31.84	8.29	3.84	33.50	9.67	3.47	33.92	10.30	3.29	35.01	11.98	2.92
	5	34.85	6.73	5.18	35.38	7.37	4.80	37.23	8.59	4.33	37.69	9.16	4.11	38.90	10.65	3.65
	10	43.37	7.72	5.61	44.02	8.46	5.21	46.32	9.86	4.70	46.90	10.51	4.46	48.41	12.22	3.96
	15	51.89	8.58	6.05	52.67	9.39	5.61	55.42	10.95	5.06	56.11	11.67	4.81	57.92	13.57	4.27
	20	57.07	8.58	6.66	57.93	9.39	6.17	60.96	10.95	5.57	61.72	11.67	5.29	63.71	13.57	4.69
	25	59.93	8.34	7.19	60.83	9.13	6.66	64.01	10.65	6.01	64.81	11.35	5.71	66.89	13.19	5.07
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
100	-5	35.37	13.74	2.57	36.41	14.54	2.50	35.73	14.94	2.39	35.11	15.29	2.30	34.55	15.53	2.22
	0	41.61	14.55	2.86	42.84	15.39	2.78	42.03	15.82	2.66	41.31	16.19	2.55	40.64	16.44	2.47
	5	45.49	12.65	3.60	62.18	20.63	3.01	59.22	20.24	2.93	56.40	19.50	2.89	53.72	18.78	2.86
	10	56.60	14.51	3.90	66.87	18.65	3.59	65.03	18.89	3.44	62.94	18.55	3.39	61.33	18.62	3.29
	15	67.71	16.11	4.20	71.55	17.21	4.16	70.85	17.89	3.96	69.48	17.84	3.89	68.95	18.49	3.73
	20	74.48	16.11	4.62	79.35	17.38	4.57	78.85	17.74	4.44	77.99	17.81	4.38	75.67	17.77	4.26
	25	78.21	15.67	4.99	87.15	17.53	4.97	86.86	17.63	4.93	86.49	17.79	4.86	82.39	17.22	4.79
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
100	-5	33.54	15.25	2.20	18.82	11.99	1.57	14.00	9.69	1.45	7.95	6.43	1.24			
	0	39.46	16.15	2.44	22.14	12.70	1.74	16.47	10.26	1.61	9.35	6.80	1.37			
	5	52.15	18.45	2.83	25.15	9.18	2.74	20.25	8.37	2.42	12.08	6.90	1.75			
	10	60.20	18.97	3.17	36.61	11.74	3.12	26.10	9.49	2.75	15.97	7.00	2.28			
	15	68.26	19.39	3.52	48.08	13.74	3.50	31.96	10.38	3.08	19.86	7.05	2.82			
	20	75.14	18.19	4.13	48.75	12.43	3.92	36.50	10.34	3.53	22.72	7.11	3.20			
	25	75.77	15.98	4.74	49.43	11.38	4.35	41.04	10.31	3.98	25.57	7.15	3.58			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC60-RN7TL-B

90% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
90	-5															
	0	28.23	6.49	4.35	28.66	7.10	4.03	30.15	8.29	3.64	30.53	8.83	3.46	31.51	10.27	3.07
	5	31.37	5.77	5.44	31.84	6.31	5.04	33.50	7.37	4.55	33.92	7.85	4.32	35.01	9.13	3.84
	10	39.03	6.62	5.90	39.62	7.25	5.47	41.69	8.46	4.93	42.21	9.01	4.68	43.57	10.48	4.16
	15	46.70	7.35	6.35	47.40	8.05	5.89	49.88	9.39	5.31	50.50	10.00	5.05	52.12	11.63	4.48
	20	51.37	7.35	6.99	52.14	8.05	6.48	54.86	9.39	5.84	55.55	10.00	5.55	57.34	11.63	4.93
	25	53.93	7.15	7.55	54.75	7.82	7.00	57.61	9.13	6.31	58.32	9.73	6.00	60.20	11.31	5.32
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
90	-5	31.83	11.78	2.70	32.77	12.46	2.63	32.15	12.81	2.51	31.60	13.10	2.41	31.09	13.31	2.34
	0	37.45	12.47	3.00	38.56	13.19	2.92	37.83	13.56	2.79	37.18	13.87	2.68	36.58	14.09	2.60
	5	40.94	10.84	3.78	55.97	17.68	3.16	53.30	17.35	3.07	50.76	16.71	3.04	48.35	16.10	3.00
	10	50.94	12.44	4.09	60.18	15.98	3.77	58.53	16.19	3.62	56.65	15.90	3.56	55.20	15.96	3.46
	15	60.94	13.81	4.41	64.40	14.75	4.37	63.76	15.33	4.16	62.53	15.29	4.09	62.05	15.85	3.92
	20	67.04	13.81	4.85	71.41	14.90	4.79	70.97	15.21	4.67	70.19	15.27	4.60	68.10	15.24	4.47
	25	70.39	13.43	5.24	78.43	15.02	5.22	78.17	15.11	5.17	77.84	15.25	5.11	74.15	14.76	5.02
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
90	-5	30.19	13.07	2.31	16.94	10.28	1.65	12.60	8.30	1.52	7.15	5.51	1.30			
	0	35.51	13.84	2.57	19.93	10.88	1.83	14.82	8.79	1.69	8.41	5.83	1.44			
	5	46.94	15.81	2.97	22.63	7.87	2.88	18.23	7.17	2.54	10.87	5.92	1.84			
	10	54.18	16.26	3.33	32.95	10.06	3.27	23.49	8.14	2.89	14.37	6.00	2.40			
	15	61.43	16.62	3.70	43.27	11.78	3.67	28.76	8.89	3.23	17.88	6.05	2.96			
	20	67.63	15.59	4.34	43.88	10.66	4.12	32.85	8.86	3.71	20.44	6.09	3.36			
	25	68.19	13.70	4.98	44.49	9.75	4.56	36.94	8.83	4.18	23.01	6.13	3.75			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

70% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
70	-5															
	0	21.96	4.61	4.76	22.29	5.05	4.42	23.45	5.89	3.98	23.75	6.27	3.79	24.51	7.29	3.36
	5	24.40	4.10	5.96	24.77	4.48	5.52	26.06	5.23	4.98	26.38	5.58	4.73	27.23	6.48	4.20
	10	30.36	4.70	6.46	30.82	5.15	5.99	32.43	6.00	5.40	32.83	6.40	5.13	33.89	7.44	4.55
	15	36.32	5.22	6.96	36.87	5.71	6.45	38.79	6.67	5.82	39.28	7.10	5.53	40.54	8.26	4.91
	20	39.95	5.22	7.65	40.55	5.71	7.10	42.67	6.67	6.40	43.20	7.10	6.08	44.59	8.26	5.40
	25	41.95	5.08	8.27	42.58	5.56	7.66	44.81	6.48	6.91	45.36	6.91	6.57	46.82	8.03	5.83
	LWT	DB													
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
70	-5	24.76	8.36	2.96	25.49	8.85	2.88	25.01	9.10	2.75	24.58	9.31	2.64	24.18	9.45	2.56
	0	29.13	8.86	3.29	29.99	9.37	3.20	29.42	9.63	3.06	28.92	9.85	2.93	28.45	10.01	2.84
	5	31.84	7.70	4.14	43.53	12.56	3.47	41.46	12.32	3.36	39.48	11.87	3.33	37.60	11.43	3.29
	10	39.62	8.83	4.48	46.81	11.35	4.12	45.52	11.50	3.96	44.06	11.29	3.90	42.93	11.33	3.79
	15	47.40	9.81	4.83	50.09	10.47	4.78	49.59	10.89	4.55	48.64	10.86	4.48	48.26	11.25	4.29
	20	52.14	9.81	5.32	55.54	10.58	5.25	55.20	10.80	5.11	54.59	10.84	5.03	52.97	10.82	4.90
	25	54.75	9.54	5.74	61.00	10.67	5.72	60.80	10.73	5.67	60.54	10.83	5.59	57.67	10.48	5.50
	LWT	DB													
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
70	-5	23.48	9.28	2.53	13.17	7.30	1.80	9.80	5.90	1.66	5.56	3.91	1.42			
	0	27.62	9.83	2.81	15.50	7.73	2.01	11.53	6.24	1.85	6.54	4.14	1.58			
	5	36.51	11.23	3.25	17.60	5.59	3.15	14.18	5.09	2.78	8.45	4.20	2.01			
	10	42.14	11.55	3.65	25.63	7.15	3.59	18.27	5.78	3.16	11.18	4.26	2.62			
	15	47.78	11.80	4.05	33.66	8.37	4.02	22.37	6.32	3.54	13.90	4.29	3.24			
	20	52.60	11.07	4.75	34.13	7.57	4.51	25.55	6.29	4.06	15.90	4.33	3.67			
	25	53.04	9.73	5.45	34.60	6.92	5.00	28.73	6.27	4.58	17.90	4.35	4.11			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC60-RN7TL-B

50% Load Cooling capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
50	-5															
	0	15.68	3.03	5.18	15.92	3.32	4.80	16.75	3.87	4.33	16.96	4.12	4.11	17.51	4.79	3.65
	5	17.43	2.69	6.47	17.69	2.95	6.00	18.61	3.44	5.41	18.85	3.66	5.14	19.45	4.26	4.57
	10	21.68	3.09	7.02	22.01	3.38	6.51	23.16	3.95	5.87	23.45	4.21	5.58	24.20	4.89	4.95
	15	25.94	3.43	7.56	26.33	3.76	7.01	27.71	4.38	6.33	28.05	4.67	6.01	28.96	5.43	5.34
	20	28.54	3.43	8.32	28.97	3.76	7.71	30.48	4.38	6.96	30.86	4.67	6.61	31.85	5.43	5.87
	25	29.96	3.34	8.98	30.42	3.65	8.33	32.00	4.26	7.51	32.40	4.54	7.14	33.45	5.28	6.34
	LWT	DB													
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
50	-5	17.69	5.50	3.22	18.21	5.82	3.13	17.86	5.98	2.99	17.56	6.12	2.87	17.27	6.21	2.78
	0	20.81	5.82	3.58	21.42	6.16	3.48	21.01	6.33	3.32	20.66	6.47	3.19	20.32	6.58	3.09
	5	22.74	5.06	4.50	31.09	8.25	3.77	29.61	8.10	3.66	28.20	7.80	3.62	26.86	7.51	3.58
	10	28.30	5.81	4.87	33.43	7.46	4.48	32.52	7.56	4.30	31.47	7.42	4.24	30.67	7.45	4.12
	15	33.86	6.45	5.25	35.78	6.88	5.20	35.42	7.16	4.95	34.74	7.14	4.87	34.47	7.40	4.66
	20	37.24	6.45	5.78	39.67	6.95	5.71	39.43	7.10	5.56	38.99	7.13	5.47	37.83	7.11	5.32
	25	39.10	6.27	6.24	43.57	7.01	6.22	43.43	7.05	6.16	43.25	7.12	6.08	41.19	6.89	5.98
	LWT	DB													
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
50	-5	16.77	6.10	2.75	9.41	4.80	1.96	7.00	3.87	1.81	3.97	2.57	1.55			
	0	19.73	6.46	3.05	11.07	5.08	2.18	8.24	4.10	2.01	4.67	2.72	1.72			
	5	26.08	7.38	3.53	12.57	3.67	3.42	10.13	3.35	3.03	6.04	2.76	2.19			
	10	30.10	7.59	3.97	18.31	4.70	3.90	13.05	3.80	3.44	7.98	2.80	2.85			
	15	34.13	7.76	4.40	24.04	5.50	4.37	15.98	4.15	3.85	9.93	2.82	3.52			
	20	37.57	7.28	5.16	24.38	4.97	4.90	18.25	4.13	4.41	11.36	2.84	3.99			
	25	37.89	6.39	5.93	24.71	4.55	5.43	20.52	4.12	4.98	12.78	2.86	4.47			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC60-RN7TL-B

30% Load Cooling capacity																
Load (%)/ Frequency （Hz）	LWT	DB														
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
30	-5															
	0	9.41	1.34	7.04	9.55	1.46	6.53	10.05	1.71	5.89	10.18	1.82	5.60	10.50	2.11	4.97
	5	10.46	1.19	8.80	10.61	1.30	8.16	11.17	1.52	7.36	11.31	1.62	7.00	11.67	1.88	6.21
	10	13.01	1.36	9.54	13.21	1.49	8.85	13.90	1.74	7.98	14.07	1.86	7.58	14.52	2.16	6.73
	15	15.57	1.51	10.29	15.80	1.66	9.54	16.63	1.93	8.60	16.83	2.06	8.17	17.37	2.39	7.26
	20	17.12	1.51	11.31	17.38	1.66	10.49	18.29	1.93	9.46	18.52	2.06	8.99	19.11	2.39	7.98
	25	17.98	1.47	12.22	18.25	1.61	11.33	19.20	1.88	10.22	19.44	2.00	9.71	20.07	2.33	8.62
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
30	-5	10.61	2.43	4.38	10.92	2.57	4.26	10.72	2.64	4.06	10.53	2.70	3.90	10.36	2.74	3.78
	0	12.48	2.57	4.86	12.85	2.72	4.73	12.61	2.79	4.52	12.39	2.86	4.34	12.19	2.90	4.20
	5	13.65	2.23	6.11	18.66	3.64	5.12	17.77	3.57	4.97	16.92	3.44	4.92	16.12	3.31	4.86
	10	16.98	2.56	6.63	20.06	3.29	6.10	19.51	3.33	5.85	18.88	3.27	5.77	18.40	3.29	5.60
	15	20.31	2.84	7.14	21.47	3.04	7.07	21.25	3.16	6.73	20.84	3.15	6.62	20.68	3.26	6.34
	20	22.35	2.84	7.86	23.80	3.07	7.76	23.66	3.13	7.55	23.40	3.14	7.44	22.70	3.14	7.24
	25	23.46	2.76	8.49	26.14	3.09	8.45	26.06	3.11	8.38	25.95	3.14	8.27	24.72	3.04	8.13
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
30	-5	10.06	2.69	3.74	5.65	2.12	2.67	4.20	1.71	2.46	2.38	1.13	2.10			
	0	11.84	2.85	4.15	6.64	2.24	2.96	4.94	1.81	2.73	2.80	1.20	2.34			
	5	15.65	3.26	4.81	7.54	1.62	4.66	6.08	1.48	4.11	3.62	1.22	2.97			
	10	18.06	3.35	5.39	10.98	2.07	5.30	7.83	1.68	4.68	4.79	1.23	3.88			
	15	20.48	3.42	5.98	14.42	2.43	5.95	9.59	1.83	5.24	5.96	1.24	4.79			
	20	22.54	3.21	7.02	14.63	2.19	6.67	10.95	1.82	6.00	6.81	1.25	5.43			
	25	22.73	2.82	8.06	14.83	2.01	7.39	12.31	1.82	6.77	7.67	1.26	6.08			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

4.2.3 MHS-SVC70-RN7TL-B

100% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
100	-5															
	0	34.85	9.25	3.77	35.38	10.13	3.49	37.23	11.82	3.15	37.69	12.59	2.99	38.90	14.64	2.66
	5	38.73	8.23	4.71	39.31	9.00	4.37	41.36	10.50	3.94	41.88	11.20	3.74	43.23	13.01	3.32
	10	48.19	9.44	5.10	48.92	10.34	4.73	51.47	12.06	4.27	52.11	12.85	4.06	53.79	14.94	3.60
	15	57.65	10.50	5.49	58.52	11.47	5.10	61.58	13.39	4.60	62.34	14.27	4.37	64.35	16.59	3.88
	20	63.42	10.48	6.05	64.37	11.47	5.61	67.73	13.39	5.06	68.58	14.27	4.81	70.79	16.59	4.27
	25	66.59	10.19	6.53	67.59	11.16	6.06	71.12	13.01	5.46	72.01	13.87	5.19	74.32	16.12	4.61
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
100	-5	39.30	16.80	2.34	40.46	17.77	2.28	39.69	18.26	2.17	39.02	18.69	2.09	38.39	18.98	2.02
	0	46.24	17.78	2.60	47.60	18.81	2.53	46.70	19.34	2.42	45.90	19.78	2.32	45.16	20.09	2.25
	5	50.54	15.46	3.27	69.09	25.22	2.74	65.80	24.74	2.66	62.67	23.83	2.63	59.69	22.96	2.60
	10	62.89	17.74	3.55	74.30	22.79	3.26	72.26	23.09	3.13	69.93	22.67	3.09	68.15	22.75	3.00
	15	75.24	19.70	3.82	79.50	21.03	3.78	78.72	21.87	3.60	77.20	21.81	3.54	76.61	22.61	3.39
	20	82.76	19.70	4.20	88.17	21.24	4.15	87.61	21.69	4.04	86.65	21.77	3.98	84.08	21.72	3.87
	25	86.90	19.15	4.54	96.83	21.42	4.52	96.51	21.54	4.48	96.10	21.74	4.42	91.54	21.04	4.35
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
100	-5	37.27	18.64	2.00	20.91	14.65	1.43	15.56	11.84	1.31	8.83	7.85	1.12			
	0	43.85	19.74	2.22	24.60	15.52	1.59	18.30	12.53	1.46	10.39	8.32	1.25			
	5	57.95	22.52	2.57	27.94	11.23	2.49	22.50	10.23	2.20	13.42	8.46	1.59			
	10	66.89	23.19	2.89	40.68	14.35	2.84	29.01	11.60	2.50	17.74	8.55	2.08			
	15	75.84	23.69	3.20	53.42	16.79	3.18	35.51	12.68	2.80	22.07	8.62	2.56			
	20	83.49	22.23	3.76	54.17	15.20	3.57	40.56	12.63	3.21	25.24	8.69	2.91			
	25	84.19	19.56	4.31	54.92	13.90	3.95	45.60	12.60	3.62	28.41	8.73	3.25			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC70-RN7TL-B

90% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
90	-5															
	0	31.37	7.93	3.95	31.84	8.68	3.67	33.50	10.13	3.31	33.92	10.80	3.14	35.01	12.55	2.79
	5	34.85	7.05	4.94	35.38	7.72	4.58	37.23	9.00	4.13	37.69	9.60	3.93	38.90	11.16	3.49
	10	43.37	8.09	5.36	44.02	8.86	4.97	46.32	10.33	4.48	46.90	11.01	4.26	48.41	12.80	3.78
	15	51.89	8.98	5.78	52.67	9.84	5.36	55.42	11.47	4.83	56.11	12.23	4.59	57.92	14.22	4.07
	20	57.07	8.98	6.35	57.93	9.84	5.89	60.96	11.47	5.31	61.72	12.23	5.05	63.71	14.22	4.48
	25	59.93	8.73	6.86	60.83	9.56	6.36	64.01	11.15	5.74	64.81	11.89	5.45	66.89	13.82	4.84
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
90	-5	35.37	14.40	2.46	36.41	15.23	2.39	35.73	15.65	2.28	35.11	16.02	2.19	34.55	16.27	2.12
	0	41.61	15.24	2.73	42.84	16.13	2.66	42.03	16.57	2.54	41.31	16.96	2.44	40.64	17.22	2.36
	5	45.49	13.25	3.43	62.18	21.61	2.88	59.22	21.20	2.79	56.40	20.42	2.76	53.72	19.68	2.73
	10	56.60	15.21	3.72	66.87	19.53	3.42	65.03	19.79	3.29	62.94	19.43	3.24	61.33	19.50	3.14
	15	67.71	16.88	4.01	71.55	18.03	3.97	70.85	18.74	3.78	69.48	18.69	3.72	68.95	19.37	3.56
	20	74.48	16.88	4.41	79.35	18.21	4.36	78.85	18.59	4.24	77.99	18.66	4.18	75.67	18.62	4.06
	25	78.21	16.41	4.77	87.15	18.36	4.75	86.86	18.46	4.70	86.49	18.64	4.64	82.39	18.04	4.57
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
90	-5	33.54	15.98	2.10	18.82	12.56	1.50	14.00	10.15	1.38	7.95	6.73	1.18			
	0	39.46	16.92	2.33	22.14	13.30	1.66	16.47	10.74	1.53	9.35	7.13	1.31			
	5	52.15	19.33	2.70	25.15	9.62	2.61	20.25	8.77	2.31	12.08	7.23	1.67			
	10	60.20	19.87	3.03	36.61	12.30	2.98	26.10	9.94	2.63	15.97	7.33	2.18			
	15	68.26	20.31	3.36	48.08	14.40	3.34	31.96	10.87	2.94	19.86	7.39	2.69			
	20	75.14	19.06	3.94	48.75	13.02	3.74	36.50	10.83	3.37	22.72	7.45	3.05			
	25	75.77	16.74	4.53	49.43	11.92	4.15	41.04	10.80	3.80	25.57	7.49	3.41			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC70-RN7TL-B

70% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
70	-5															
	0	24.40	5.63	4.33	24.77	6.17	4.02	26.06	7.19	3.62	26.38	7.67	3.44	27.23	8.91	3.06
	5	27.11	5.01	5.41	27.52	5.48	5.02	28.95	6.39	4.53	29.32	6.81	4.30	30.26	7.92	3.82
	10	33.73	5.75	5.87	34.24	6.29	5.44	36.03	7.34	4.91	36.48	7.82	4.66	37.65	9.09	4.14
	15	40.36	6.38	6.33	40.96	6.98	5.87	43.10	8.15	5.29	43.64	8.68	5.03	45.05	10.10	4.46
	20	44.39	6.38	6.96	45.06	6.98	6.45	47.41	8.15	5.82	48.00	8.68	5.53	49.55	10.10	4.91
	25	46.61	6.20	7.51	47.31	6.79	6.97	49.78	7.92	6.28	50.40	8.44	5.97	52.03	9.81	5.30
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
70	-5	27.51	10.22	2.69	28.32	10.82	2.62	27.79	11.12	2.50	27.31	11.37	2.40	26.87	11.55	2.33
	0	32.37	10.82	2.99	33.32	11.45	2.91	32.69	11.77	2.78	32.13	12.04	2.67	31.61	12.23	2.58
	5	35.38	9.41	3.76	48.37	15.35	3.15	46.06	15.06	3.06	43.87	14.50	3.02	41.78	13.97	2.99
	10	44.02	10.80	4.08	52.01	13.87	3.75	50.58	14.05	3.60	48.95	13.80	3.55	47.70	13.85	3.44
	15	52.67	11.99	4.39	55.65	12.80	4.35	55.10	13.31	4.14	54.04	13.27	4.07	53.63	13.76	3.90
	20	57.93	11.99	4.83	61.72	12.93	4.77	61.33	13.20	4.65	60.66	13.25	4.58	58.85	13.22	4.45
	25	60.83	11.66	5.22	67.78	13.04	5.20	67.56	13.11	5.15	67.27	13.23	5.08	64.08	12.81	5.00
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
70	-5	26.09	11.35	2.30	14.64	8.92	1.64	10.89	7.21	1.51	6.18	4.78	1.29			
	0	30.69	12.01	2.55	17.22	9.45	1.82	12.81	7.63	1.68	7.27	5.06	1.44			
	5	40.56	13.72	2.96	19.56	6.83	2.86	15.75	6.23	2.53	9.39	5.14	1.83			
	10	46.83	14.11	3.32	28.48	8.73	3.26	20.30	7.06	2.88	12.42	5.21	2.39			
	15	53.09	14.43	3.68	37.40	10.23	3.66	24.86	7.72	3.22	15.45	5.25	2.94			
	20	58.44	13.53	4.32	37.92	9.25	4.10	28.39	7.69	3.69	17.67	5.29	3.34			
	25	58.93	11.89	4.96	38.44	8.46	4.54	31.92	7.67	4.16	19.89	5.32	3.74			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC70-RN7TL-B

50% Load Cooling capacity															
Load (%)/ Frequency （Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
50	-5															
	0	17.43	3.70	4.71	17.69	4.05	4.37	18.61	4.73	3.94	18.85	5.04	3.74	19.45	5.86	3.32
	5	19.36	3.29	5.89	19.66	3.60	5.46	20.68	4.20	4.92	20.94	4.48	4.68	21.61	5.21	4.15
	10	24.09	3.78	6.38	24.46	4.13	5.92	25.73	4.82	5.34	26.06	5.14	5.07	26.89	5.98	4.50
	15	28.83	4.19	6.88	29.26	4.59	6.38	30.79	5.35	5.75	31.17	5.71	5.46	32.18	6.63	4.85
	20	31.71	4.19	7.56	32.19	4.59	7.01	33.87	5.35	6.33	34.29	5.71	6.01	35.39	6.63	5.34
	25	33.29	4.08	8.17	33.80	4.46	7.57	35.56	5.21	6.83	36.00	5.55	6.49	37.16	6.45	5.76
	LWT	DB														
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
50	-5	19.65	6.72	2.93	20.23	7.11	2.85	19.85	7.31	2.72	19.51	7.47	2.61	19.19	7.59	2.53
	0	23.12	7.11	3.25	23.80	7.53	3.16	23.35	7.73	3.02	22.95	7.91	2.90	22.58	8.04	2.81
	5	25.27	6.18	4.09	34.55	10.09	3.43	32.90	9.90	3.33	31.33	9.53	3.29	29.84	9.18	3.25
	10	31.44	7.10	4.43	37.15	9.12	4.08	36.13	9.23	3.91	34.97	9.07	3.86	34.07	9.10	3.74
	15	37.62	7.88	4.78	39.75	8.41	4.73	39.36	8.75	4.50	38.60	8.72	4.43	38.31	9.04	4.24
	20	41.38	7.88	5.25	44.08	8.50	5.19	43.81	8.67	5.05	43.33	8.71	4.98	42.04	8.69	4.84
	25	43.45	7.66	5.67	48.42	8.57	5.65	48.26	8.62	5.60	48.05	8.70	5.53	45.77	8.42	5.44
	LWT	DB														
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
50	-5	18.63	7.46	2.50	10.46	5.86	1.78	7.78	4.74	1.64	4.41	3.14	1.41			
	0	21.92	7.89	2.78	12.30	6.21	1.98	9.15	5.01	1.83	5.19	3.33	1.56			
	5	28.97	9.02	3.21	13.97	4.49	3.11	11.25	4.09	2.75	6.71	3.38	1.99			
	10	33.45	9.27	3.61	20.34	5.74	3.54	14.50	4.64	3.13	8.87	3.42	2.59			
	15	37.92	9.48	4.00	26.71	6.72	3.98	17.76	5.07	3.50	11.04	3.45	3.20			
	20	41.75	8.89	4.69	27.09	6.08	4.46	20.28	5.05	4.01	12.62	3.48	3.63			
	25	42.10	7.81	5.39	27.46	5.56	4.94	22.80	5.04	4.53	14.21	3.50	4.06			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

MHS-SVC70-RN7TL-B

30% Load Cooling capacity															
Load (%)/ Frequency（Hz）	LWT	DB													
		-15			-10			-5			0			5		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
30	-5															
	0	10.46	1.63	6.40	10.61	1.79	5.94	11.17	2.09	5.36	11.31	2.22	5.09	11.67	2.58	4.52
	5	11.62	1.45	8.00	11.79	1.59	7.42	12.41	1.85	6.69	12.56	1.98	6.36	12.97	2.30	5.65
	10	14.46	1.67	8.68	14.67	1.82	8.05	15.44	2.13	7.26	15.63	2.27	6.89	16.14	2.64	6.12
	15	17.30	1.85	9.35	17.56	2.02	8.67	18.47	2.36	7.82	18.70	2.52	7.43	19.31	2.93	6.60
	20	19.02	1.85	10.29	19.31	2.02	9.54	20.32	2.36	8.60	20.57	2.52	8.17	21.24	2.93	7.26
	25	19.98	1.80	11.11	20.28	1.97	10.30	21.34	2.30	9.29	21.60	2.45	8.83	22.30	2.85	7.84
	LWT	DB													
		10			15			20			25			30		
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
30	-5	11.79	2.96	3.98	12.14	3.14	3.87	11.91	3.22	3.69	11.70	3.30	3.55	11.52	3.35	3.44
	0	13.87	3.14	4.42	14.28	3.32	4.30	14.01	3.41	4.11	13.77	3.49	3.94	13.55	3.55	3.82
	5	15.16	2.73	5.56	20.73	4.45	4.66	19.74	4.37	4.52	18.80	4.21	4.47	17.91	4.05	4.42
	10	18.87	3.13	6.03	22.29	4.02	5.54	21.68	4.07	5.32	20.98	4.00	5.24	20.44	4.02	5.09
	15	22.57	3.48	6.49	23.85	3.71	6.43	23.62	3.86	6.12	23.16	3.85	6.02	22.98	3.99	5.76
	20	24.83	3.48	7.14	26.45	3.75	7.06	26.28	3.83	6.87	26.00	3.84	6.77	25.22	3.83	6.58
	25	26.07	3.38	7.71	29.05	3.78	7.68	28.95	3.80	7.62	28.83	3.84	7.51	27.46	3.71	7.40
	LWT	DB													
		35			40			45			48					
		CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER			
30	-5	11.18	3.29	3.40	6.27	2.59	2.43	4.67	2.09	2.23	2.65	1.39	1.91			
	0	13.15	3.48	3.78	7.38	2.74	2.70	5.49	2.21	2.48	3.12	1.47	2.12			
	5	17.38	3.98	4.37	8.38	1.98	4.23	6.75	1.80	3.74	4.03	1.49	2.70			
	10	20.07	4.09	4.90	12.20	2.53	4.82	8.70	2.05	4.25	5.32	1.51	3.53			
	15	22.75	4.18	5.44	16.03	2.96	5.41	10.65	2.24	4.76	6.62	1.52	4.35			
	20	25.05	3.92	6.38	16.25	2.68	6.06	12.17	2.23	5.46	7.57	1.53	4.94			
	25	25.26	3.45	7.33	16.48	2.45	6.72	13.68	2.22	6.15	8.52	1.54	5.53			

Notes：

CC: Total cooling capacity (kW)

PI: Power input (kW)

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for outdoor air temperature (°C)

Notes: Performance specifications measured with water pump operating at rated water flow rate.

5 Performance Adjustment Factors

5.1 Ethylene and Propylene Glycol factors

The antifreeze must be required according to anyone condition as following:

- The ambient temperature is below 0 °C,
- The outlet water temperature is lower than 5 °C,
- Don't start up the unit for a long time,
- The power supply was cut off and needn't change the water in system.

Tsafe is set to -5 °C in the low water output control in service menu of the wired controller, allowing the unit to enter the cooling low water output mode control to obtain water output below 5 °C.
When switching from the antifreeze system to the water system, the Tsafe must be changed to 5 °C to avoid freezing of the water side pipes and heat exchanger!

A glycol solution is required when the unit with condition as mentioned. The use of glycol will reduce the performance of the unit depending on concentration.

Concentration of ethylene glycol (%)	Modification coefficient				Freezing point (°C)
	Cooling capacity	Power input	Water resistance	Water flow	
0	1.000	1.000	1.000	1.000	0
10	0.993	0.997	1.013	1.034	-3
20	0.984	0.994	1.149	1.051	-8
30	0.975	0.989	1.343	1.075	-14.1
40	0.969	0.984	1.623	1.110	-23.3
50	0.961	0.978	2.026	1.150	-33.8

Concentration of propylene glycol (%)	Modification coefficient				Freezing point (°C)
	Cooling capacity	Power input	Water resistance	Water flow	
0	1.000	1.000	1.000	1.000	0
10	0.987	0.992	1.071	1.007	-3
20	0.975	0.985	1.215	1.010	-7
30	0.962	0.978	1.420	1.021	-13
40	0.946	0.971	1.716	1.036	-21
50	0.929	0.965	2.228	1.061	-33

5.2 Evaporator temperature drop factors

Performance tables are based on a 5°C temperature drop through the evaporator. Temperature drops outside this range can affect the control system's capability to maintain acceptable control and are not recommended.

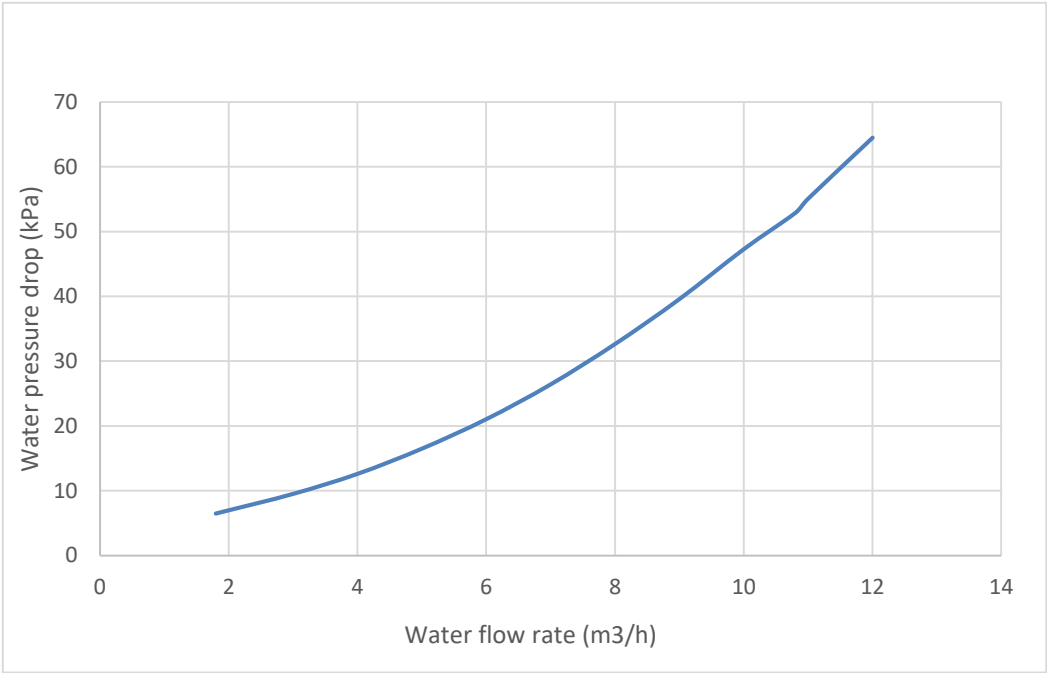
5.3 Altitude correction factors

Performance tables are based at sea level. Elevations other than sea level affect the performance of the unit. The decreased air density will reduce condenser capacity and reduce the unit's performance.

Altitude correction factors		
Altitude (m)	Capacity Correction Factor	Efficiency Correction Factor
0	1.000	1.000
500	0.993	0.984
1000	0.986	0.969
1500	0.978	0.953
2000	0.972	0.940
2500	0.968	0.932
3000	0.966	0.928

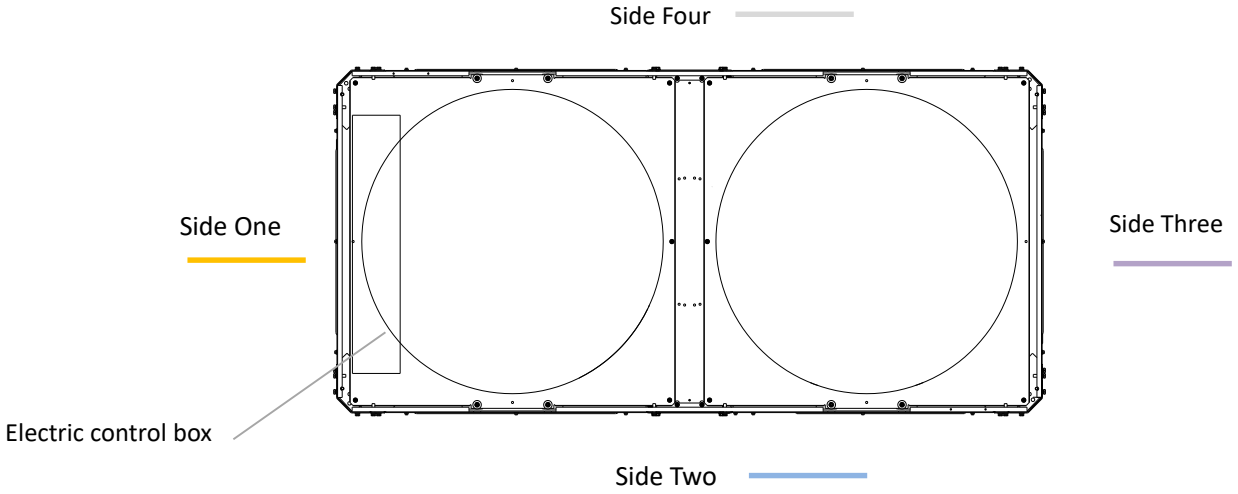
6 Hydronic Performance

MHS-SVC50-XN8TL-B / MHS-SVC60-XN8TL-B / MHS-SVC70-XN8TL-B

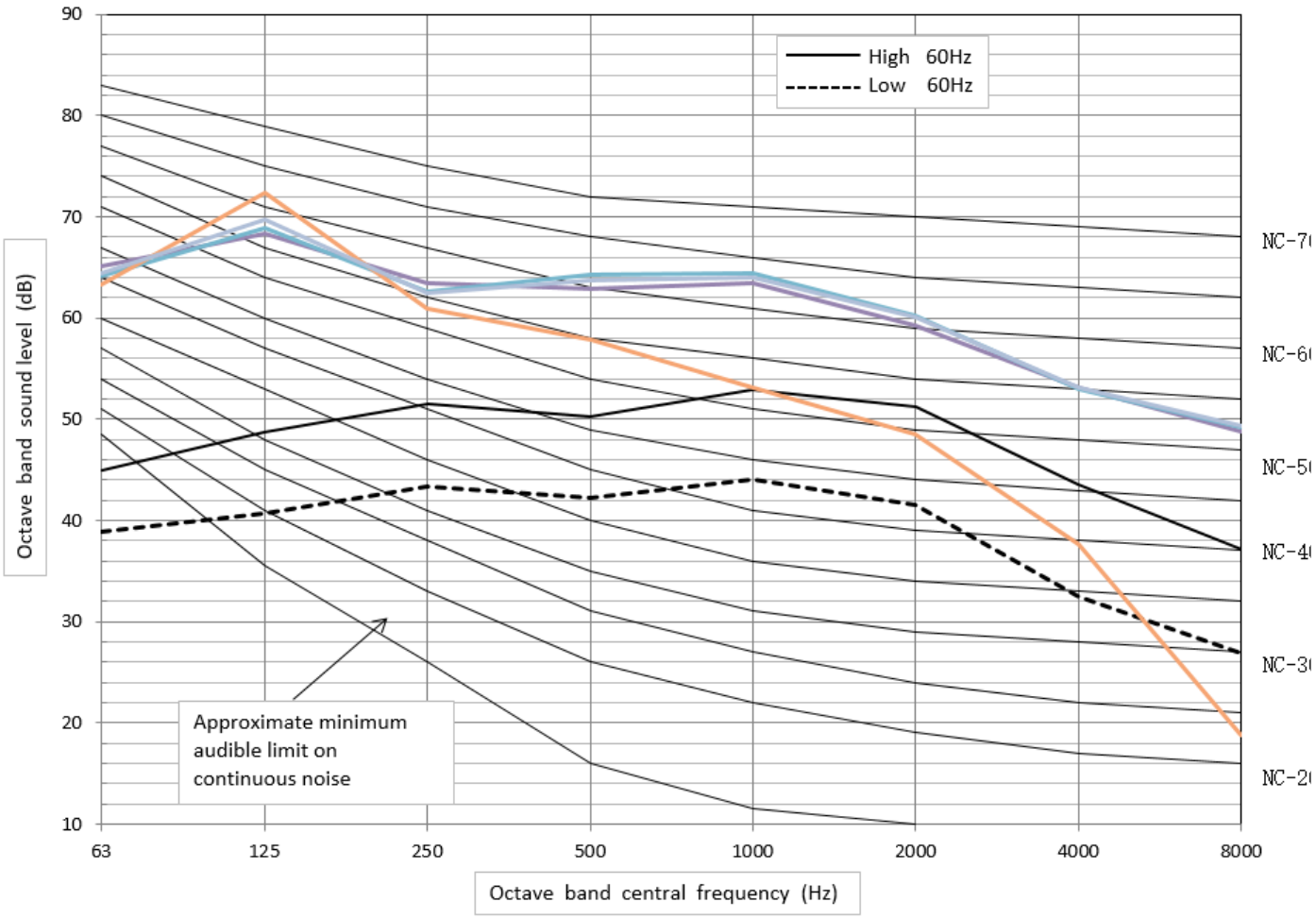


7 Octave Band Levels

NC

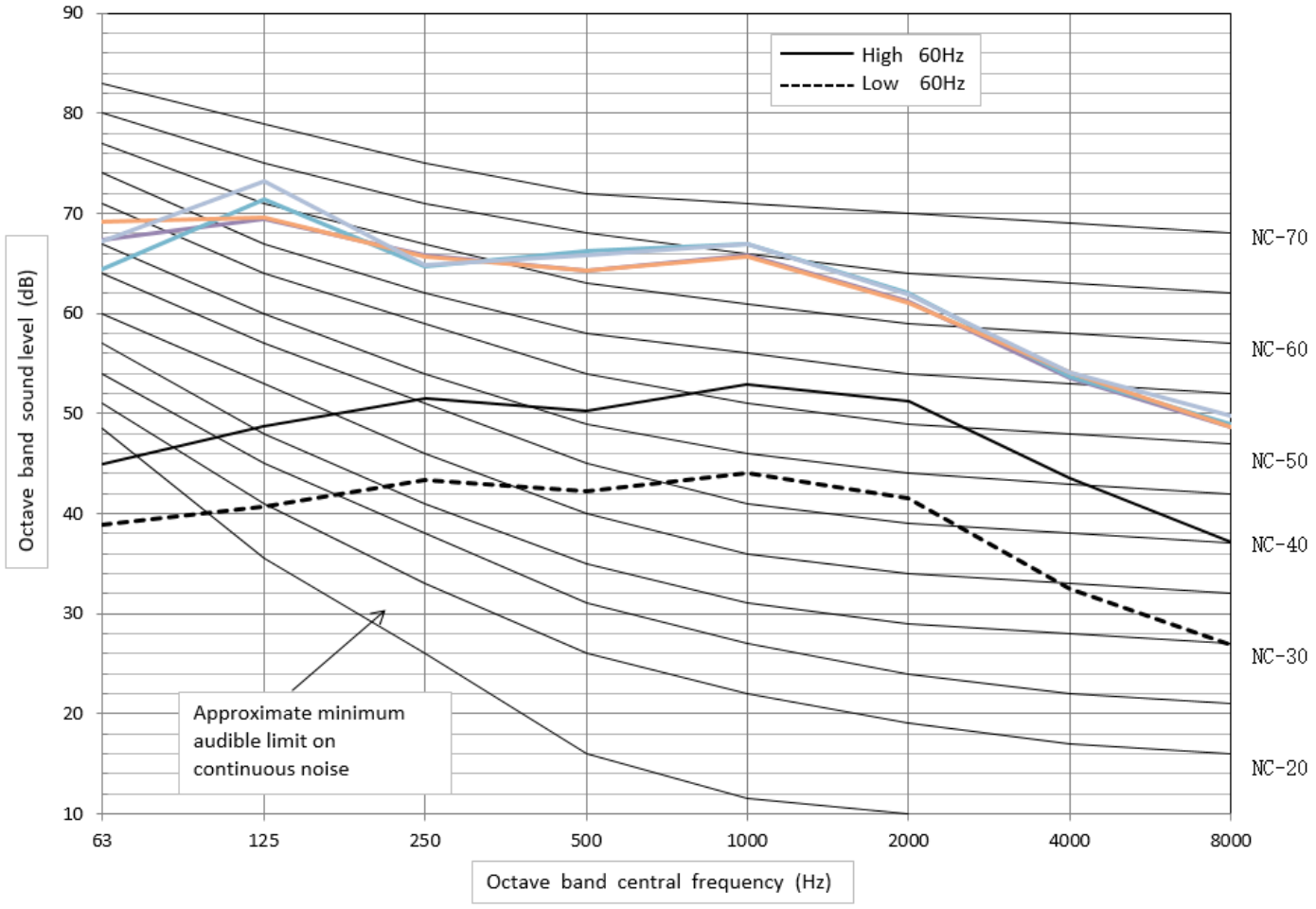


Test condition：Cooling；Outdoor ambient temperature 35°C DB. LWT 7°C

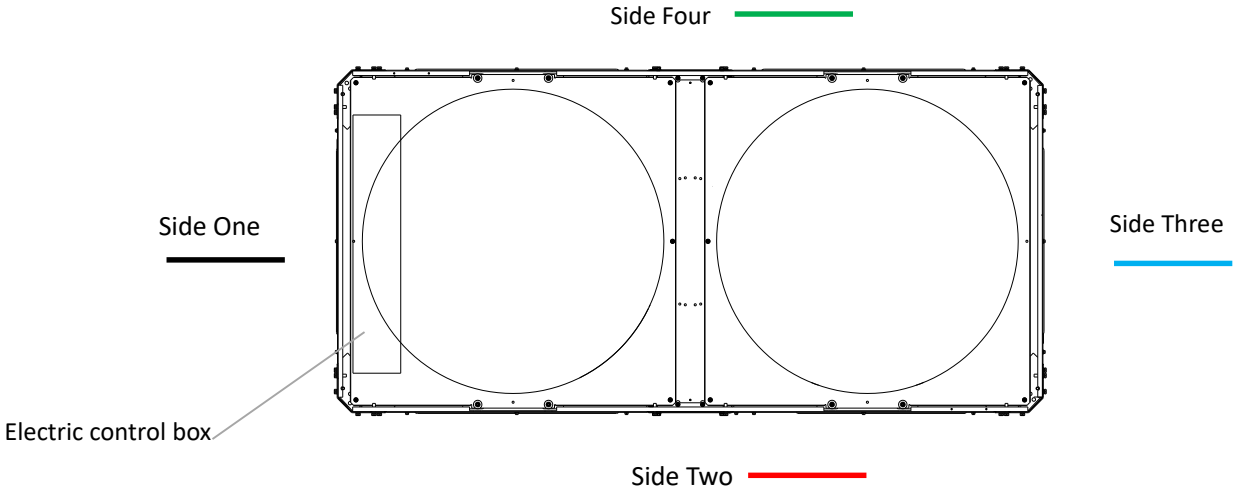


Mars Large

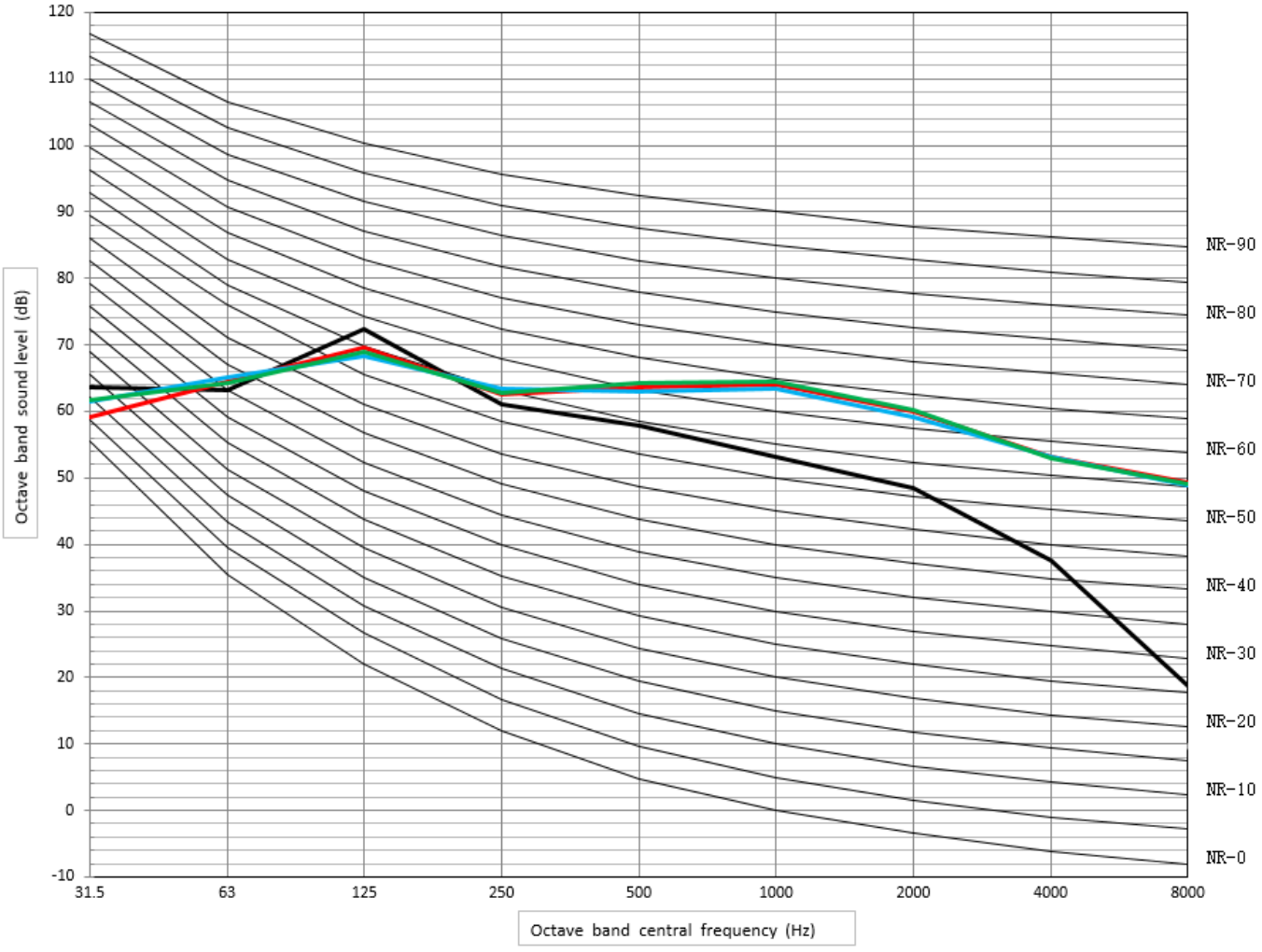
Test condition：Heating；Outdoor ambient temperature 7C DB. LWT 35°C



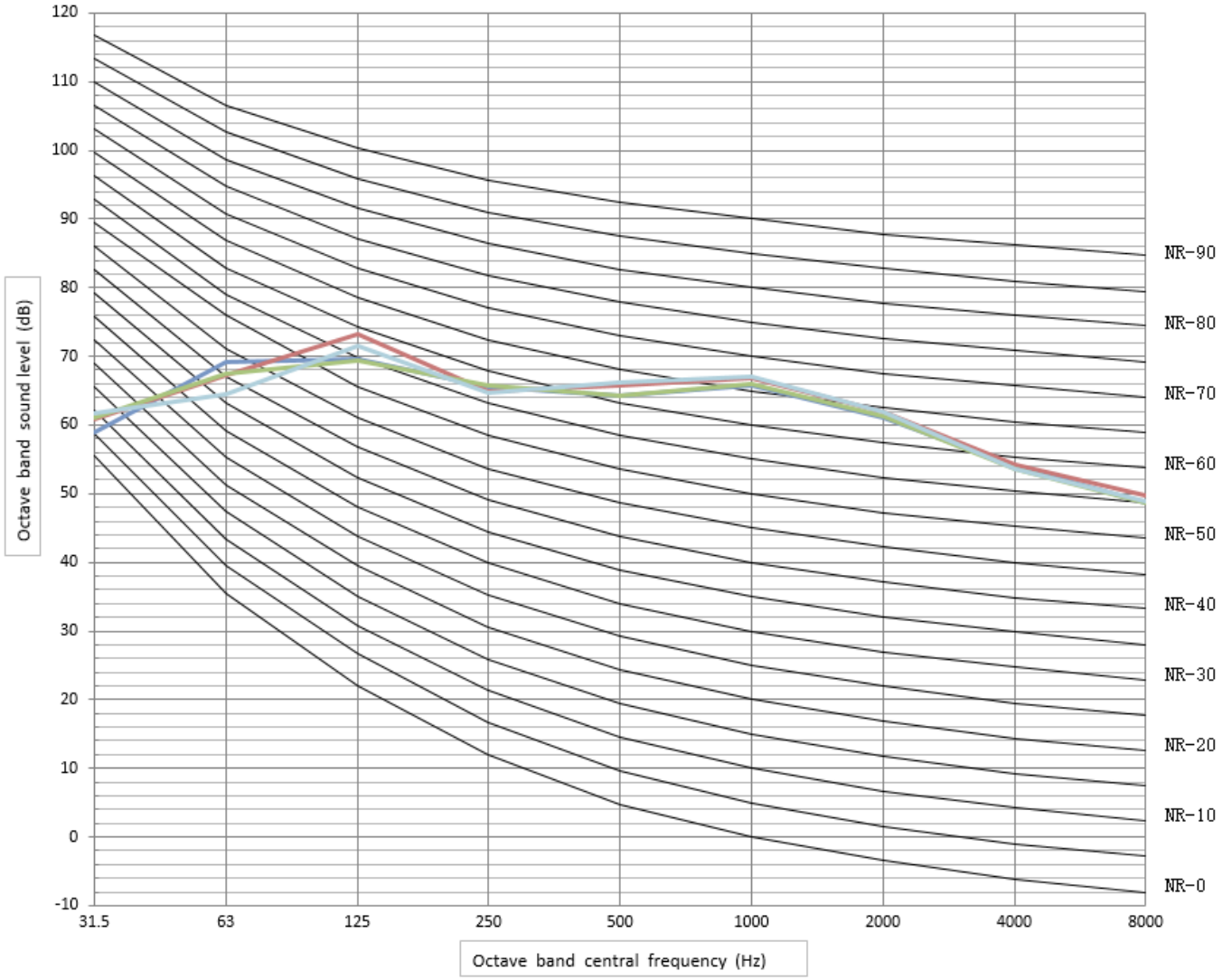
NR



Test condition：Cooling：Outdoor ambient temperature 35°C (95°F) DB. LWT 7°C(44.6°F)



Test condition：Heating：Outdoor ambient temperature 7C DB. LWT 35°C



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