



Engineering Data

King Plus



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Part 1

General Information

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1 System introduction

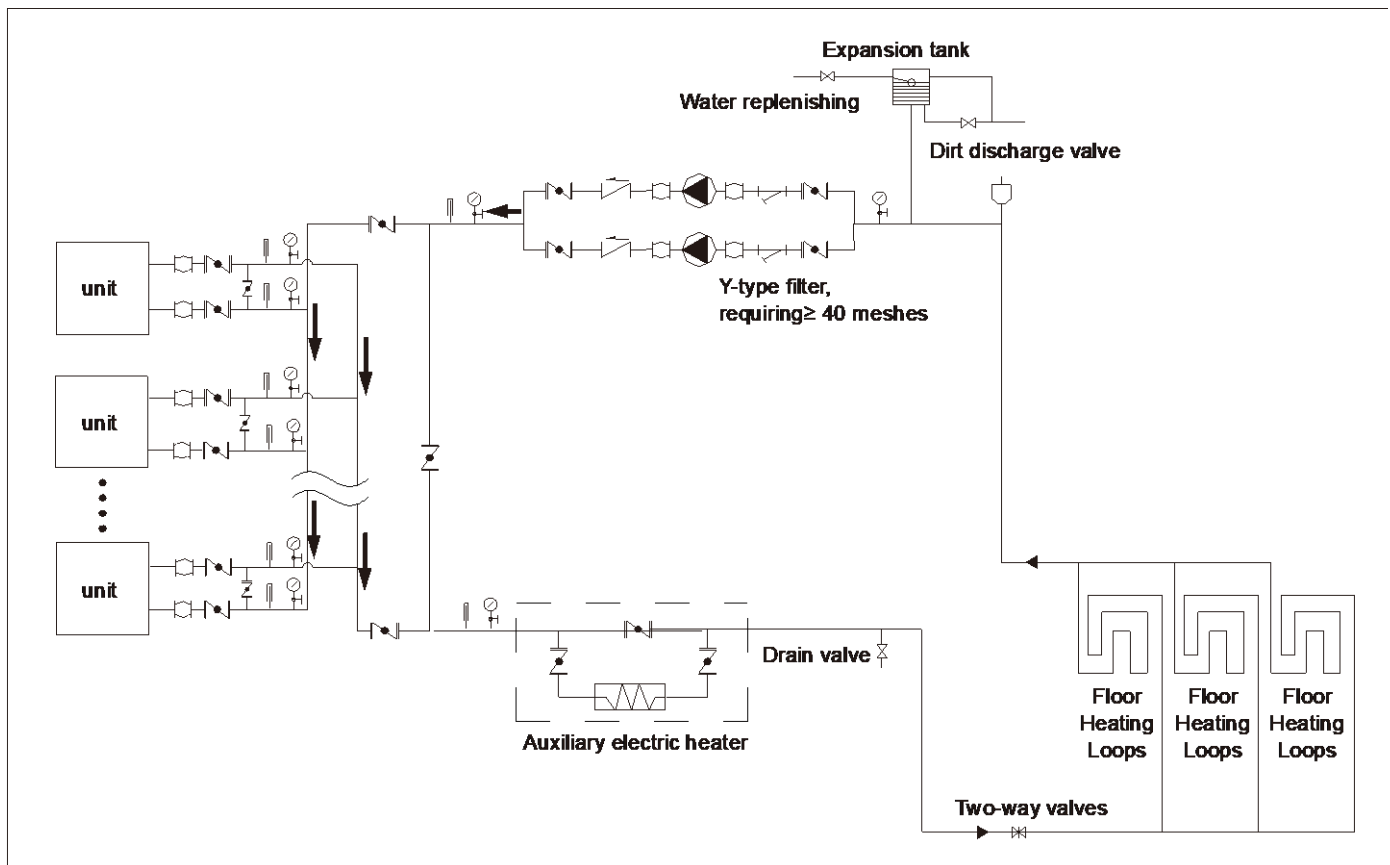
1.1 System Schematic

King Plus 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 ambient temperature. King Plus 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.

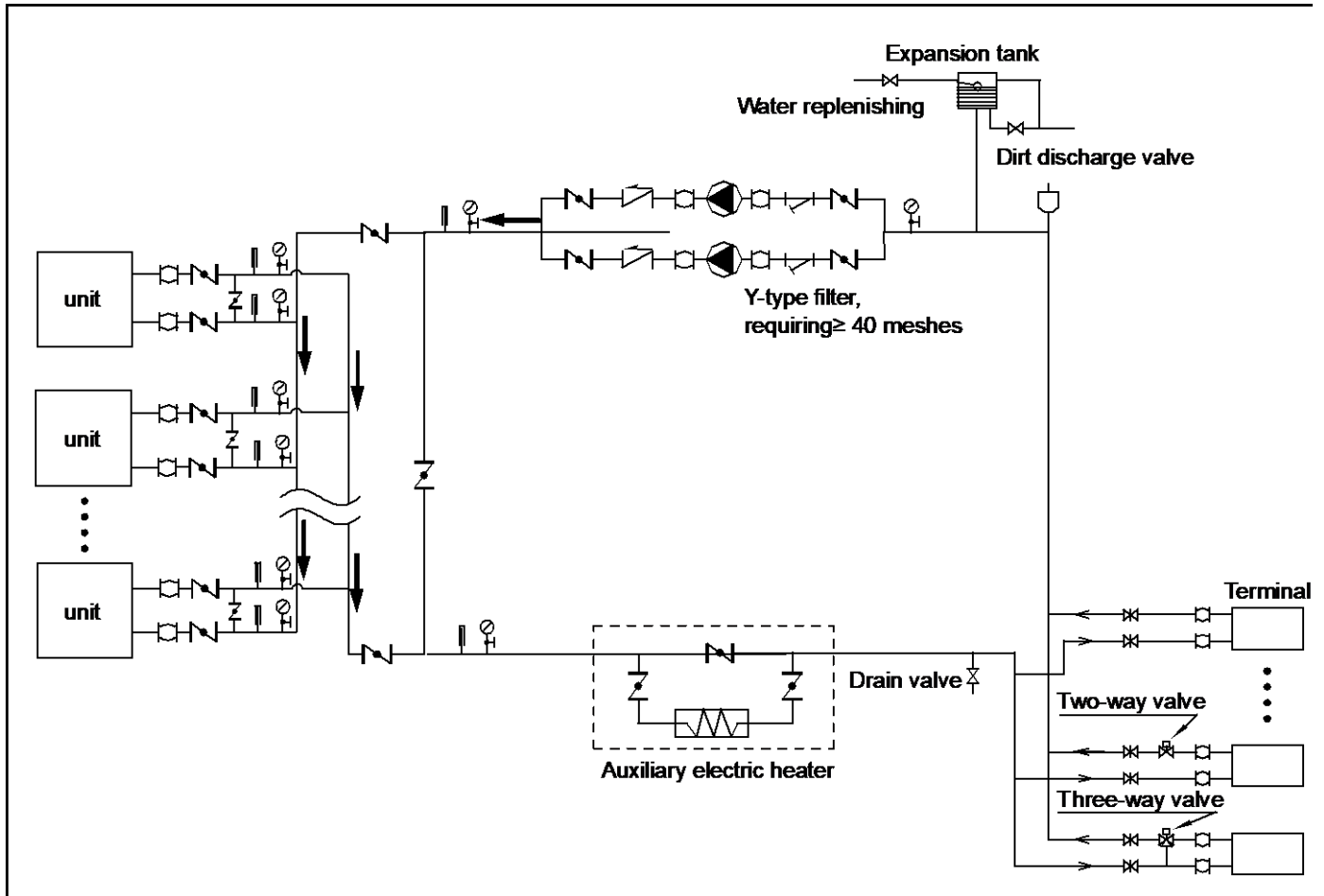
1.2 Typical Applications

1.2.1 Space Heating Through Floor Heating Loops



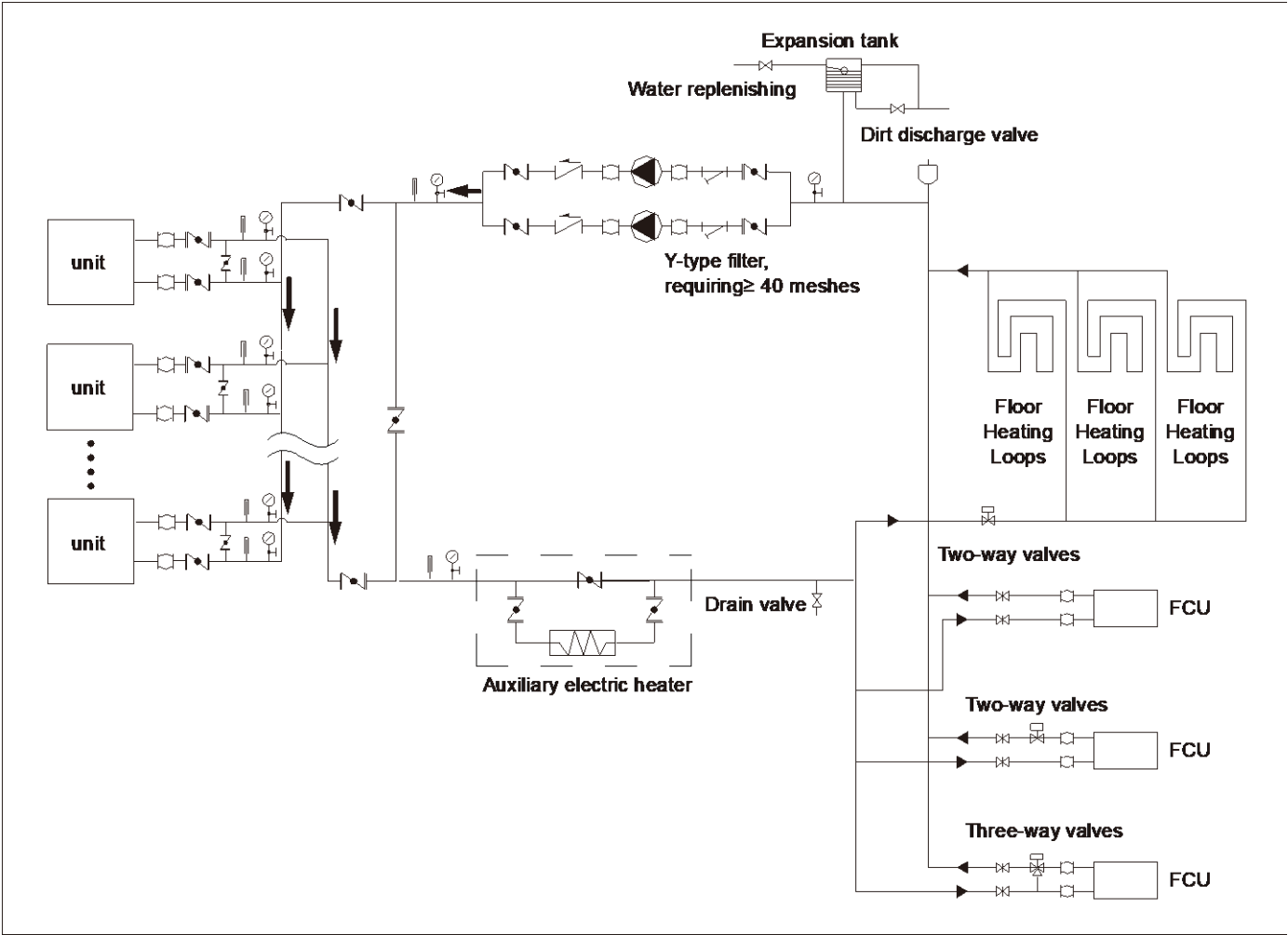
Legend				
Stop valve	Pressure gauge	Flexible joint	Gate valve	Automatic discharge valve
Y-shaped filter	Thermometer	Circulating pump	Check valve	

1.2.2 Space Cooling and Heating through Fan Coil Unit



Legend				
Stop valve	Pressure gauge	Flexible joint	Gate valve	Automatic discharge valve
Y-shaped filter	Thermometer	Circulating pump	Check valve	

1.2.3 Space Heating Through Floor Heating Loops and Space Cooling Through Fan Coil Unit



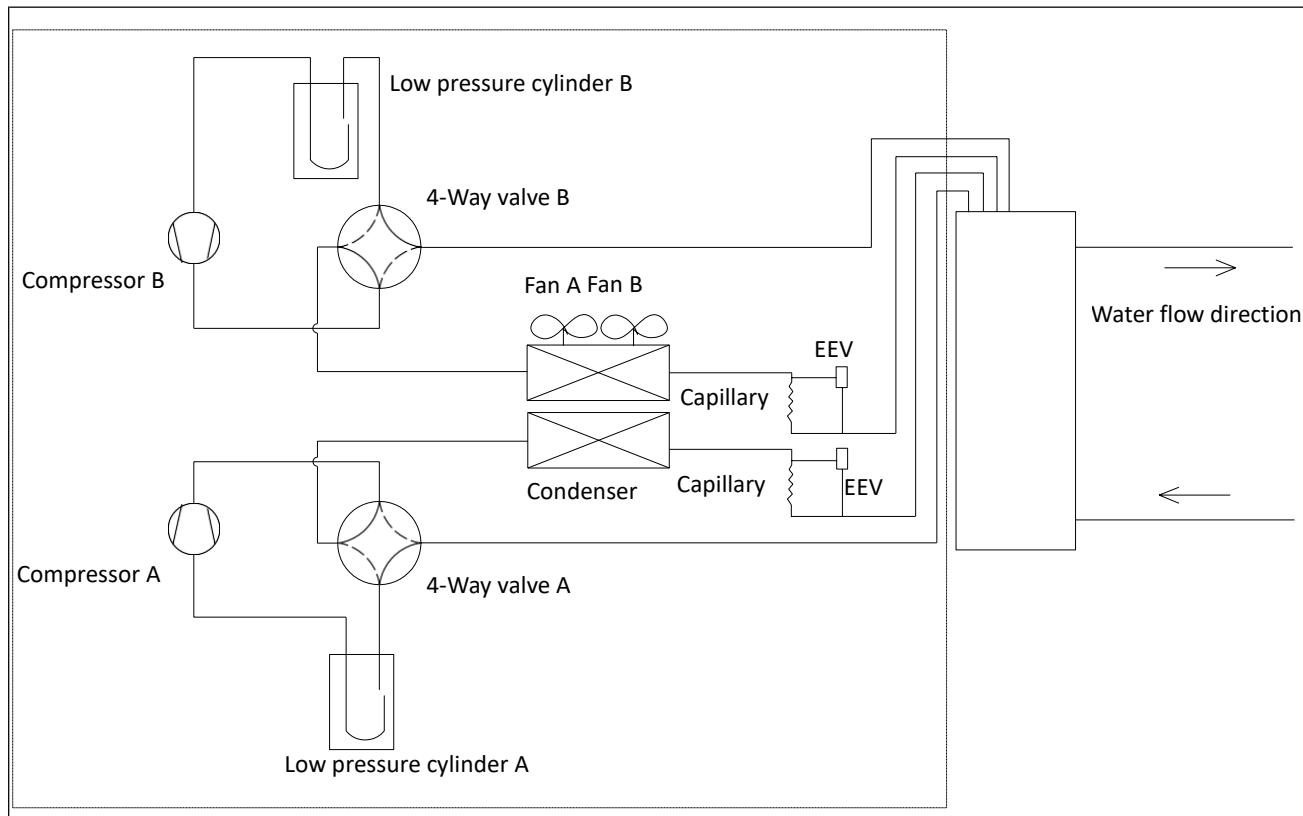
Legend				
Stop valve	Pressure gauge	Flexible joint	Gate valve	Automatic discharge valve
Y-shaped filter	Thermometer	Circulating pump	Check valve	

Note:
In space cooling mode, the 2-way valve on the floor heating branch circuit is closed to prevent cold water entering the floor heating loops.

1.3 Refrigeration System Drawings (for 60 kW, 180 kW, 200 kW)

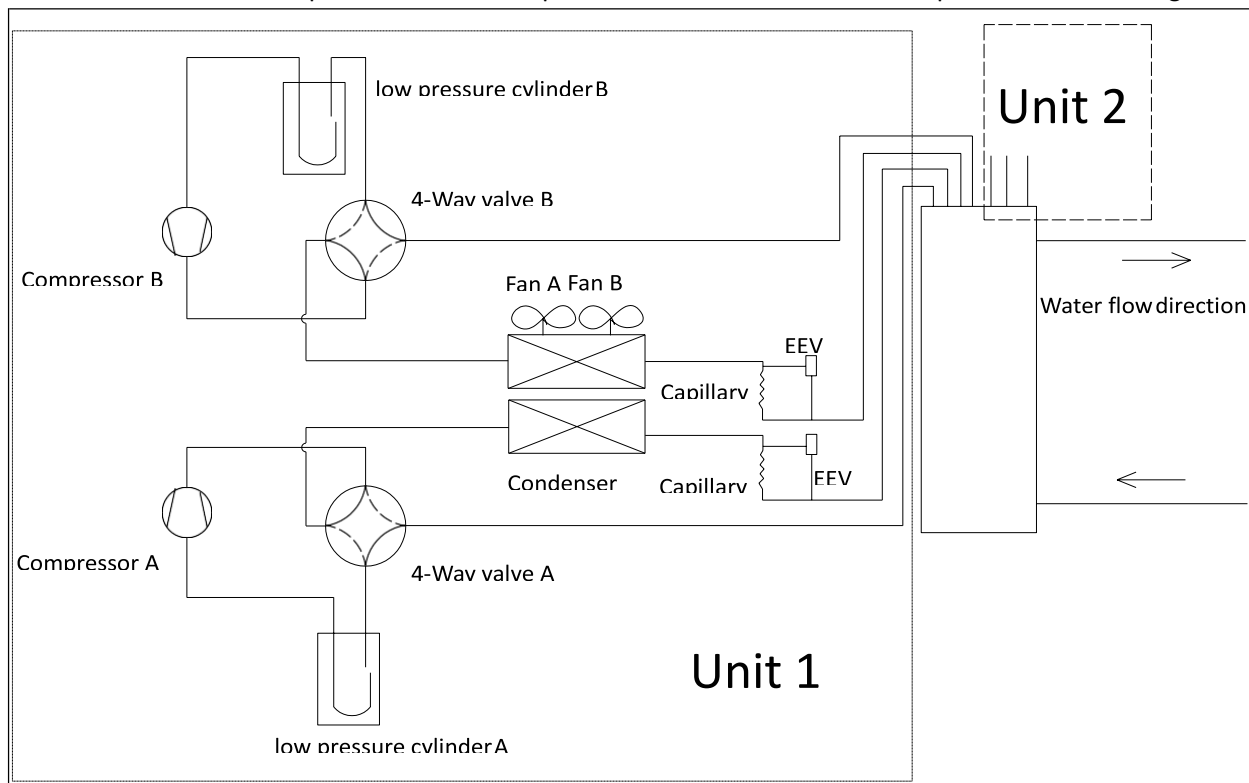
1.3.1 60kW module

Each module has two compressors with one separate unit, one shell and tube evaporator for two refrigerant systems.



1.3.2 120kW module

Each module has four compressors with two separate unit, one shell and tube evaporator for four refrigerant systems.

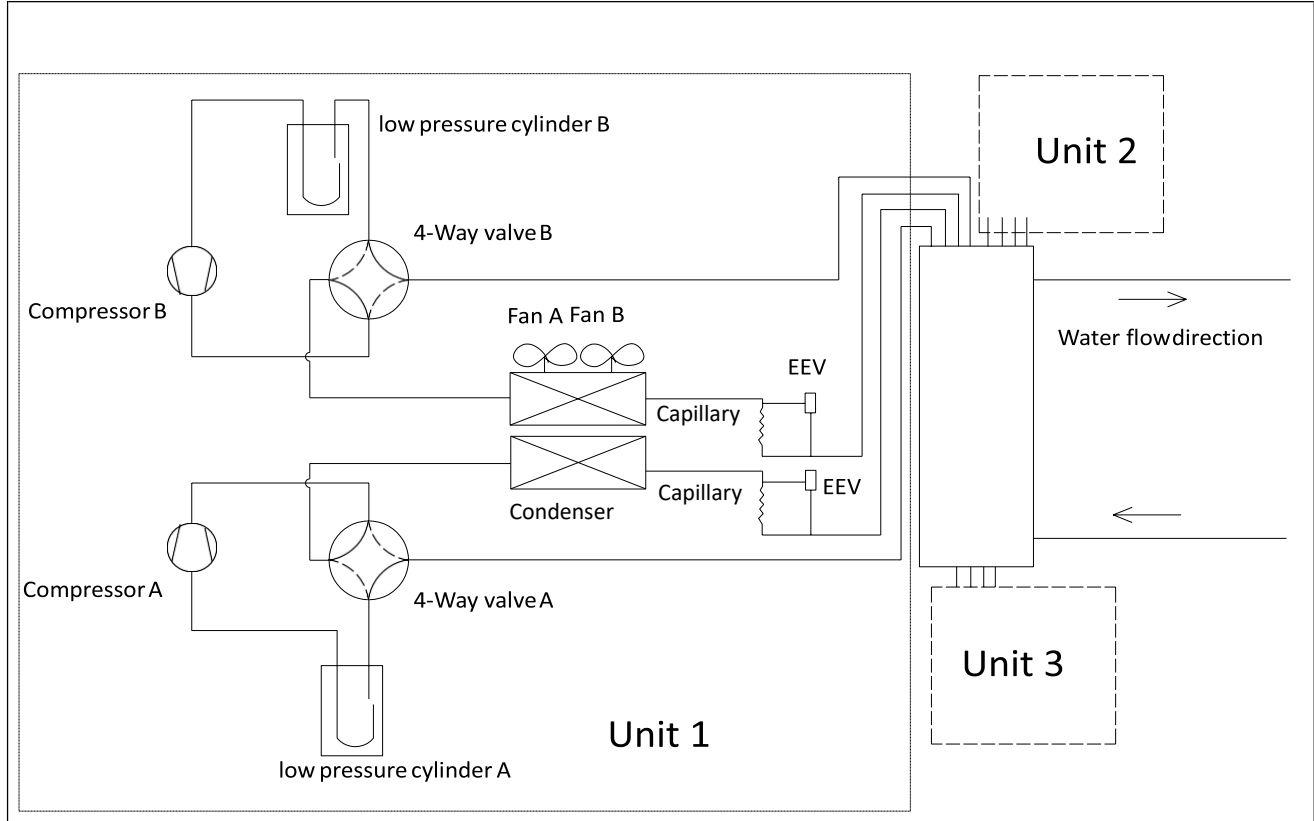


King Plus



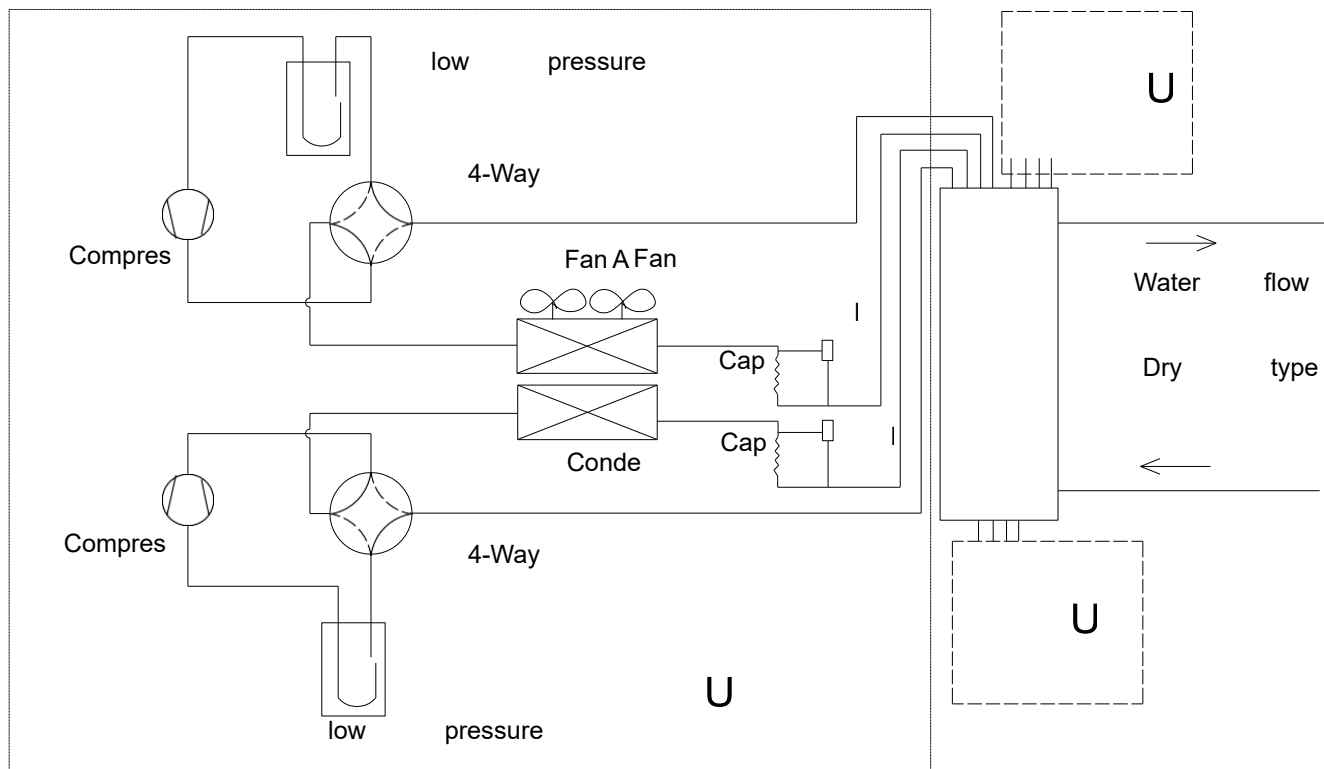
1.3.3 180kW module

Each module has six compressors with three separate unit, one shell and tube evaporator for six refrigerant systems.



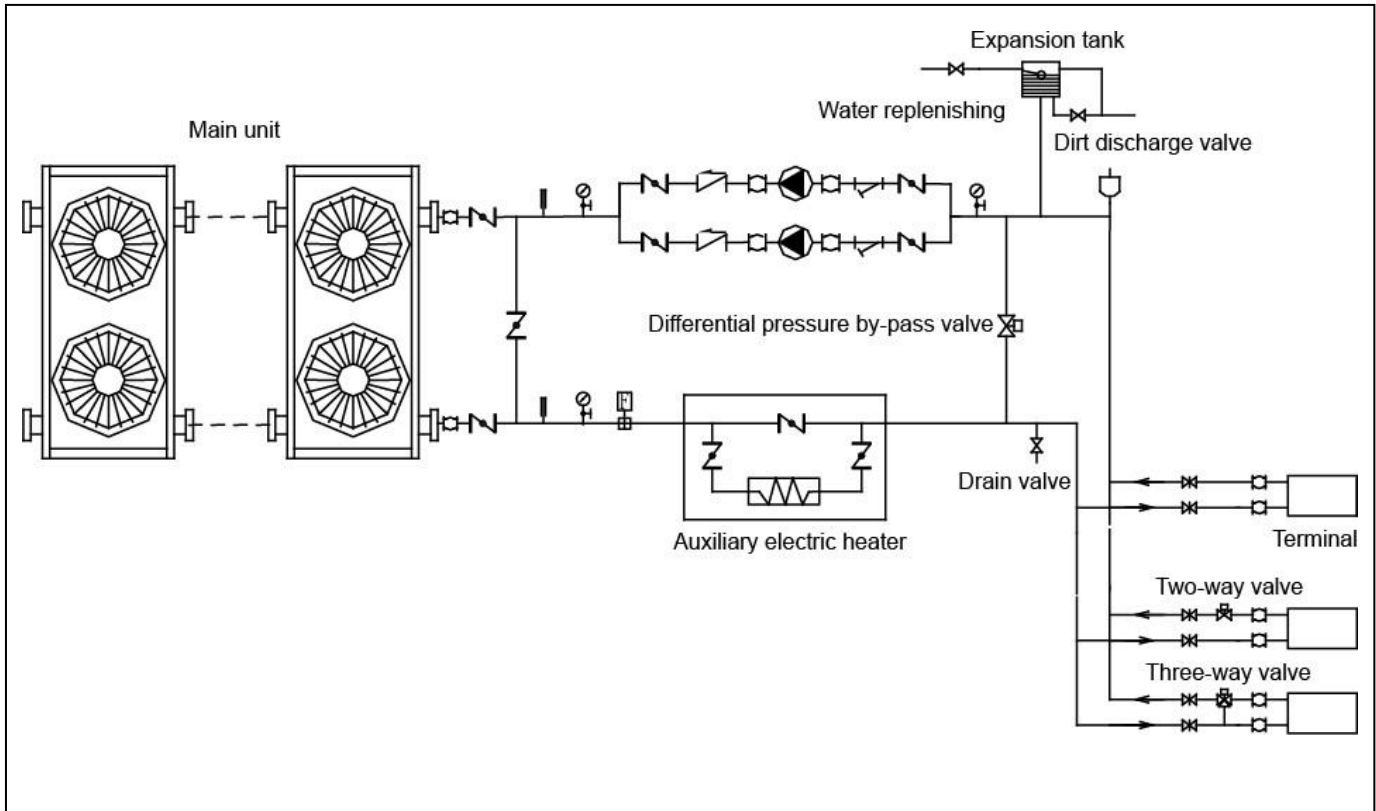
1.3.4 200kW module

Each module has six compressors with three separate units, one shell and tube evaporator for six refrigerant systems.



1.4 Pipe connection drawing

1.4.1 60kW module



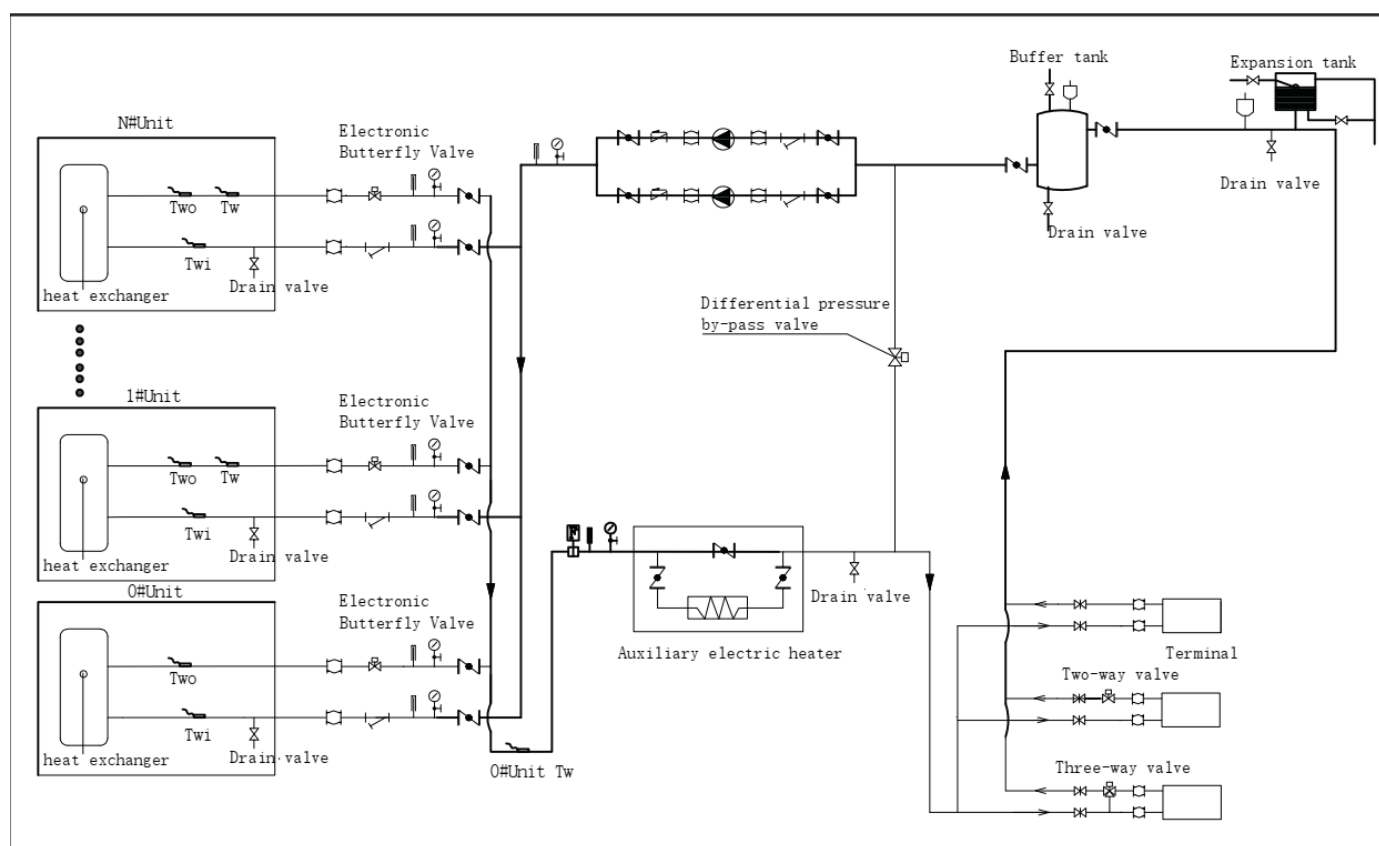
The table below describes the symbols.

Symbol	Symbol explanation	Symbol	Symbol explanation
	Stop valve		Y-shaped filter
	Pressure gauge		Thermometer
	Water flow switch		Circulating pump
	Gate valve		Check valve
	Flexible joint		Automatic discharge valve

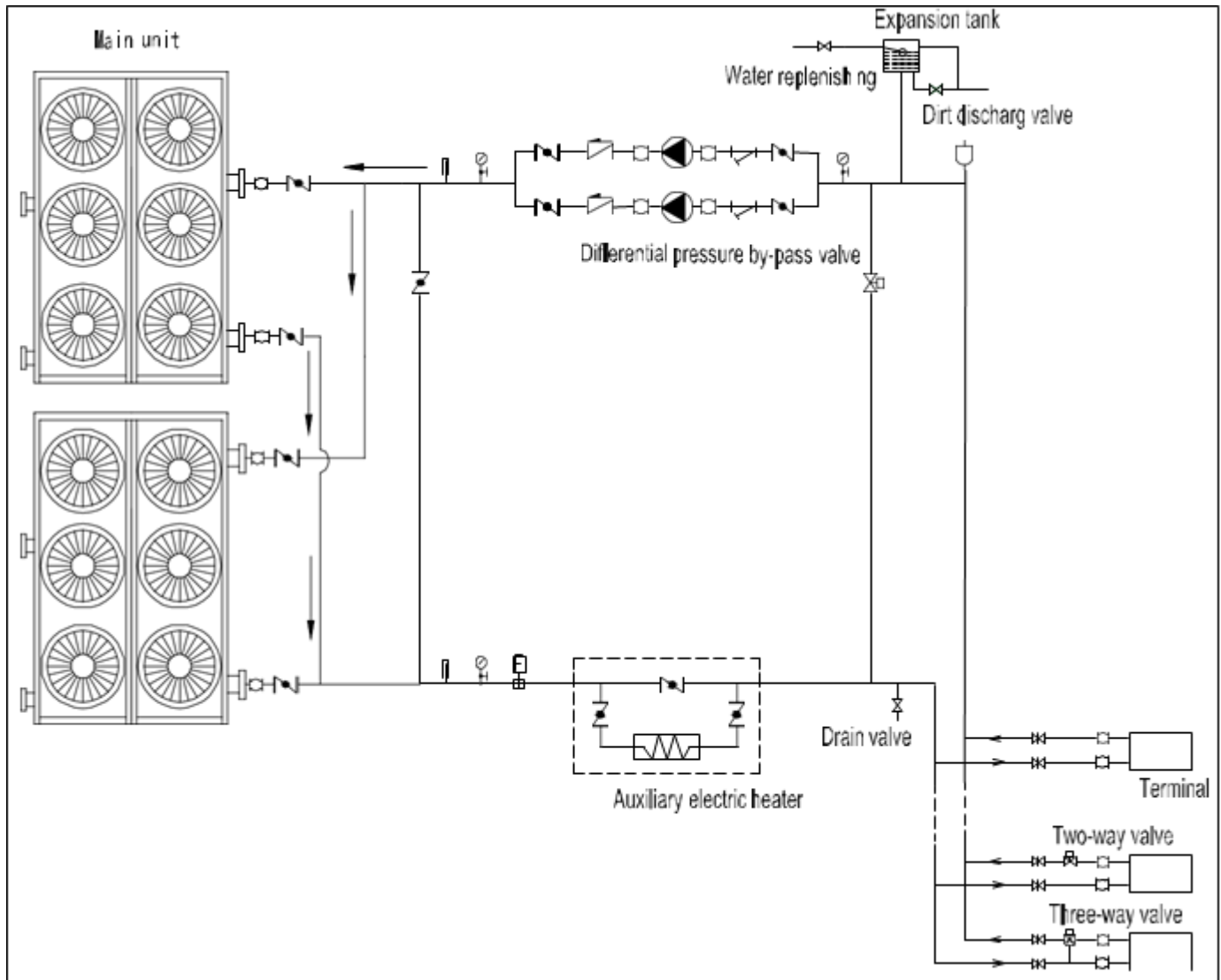
King Plus



1.4.2 130kW module

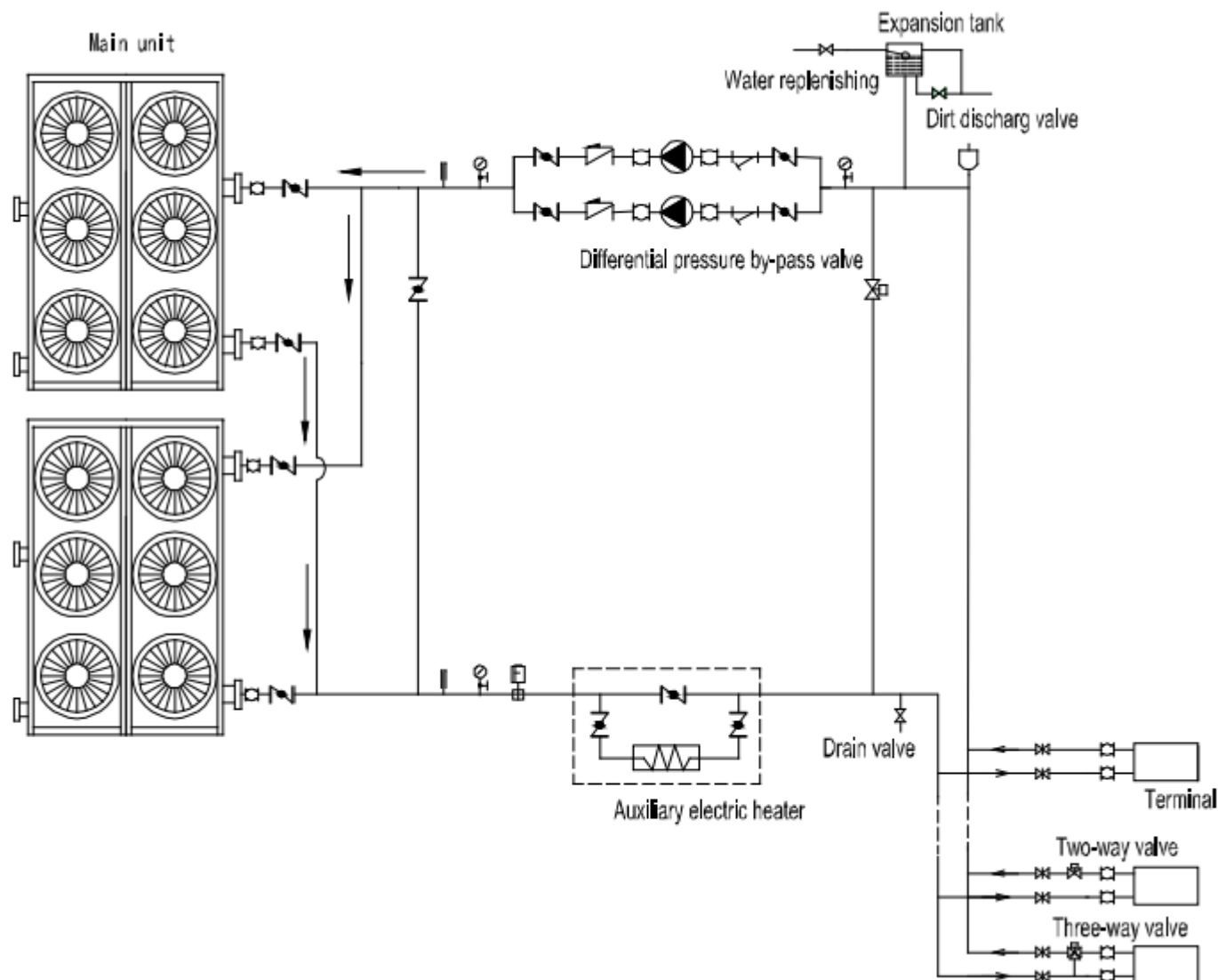


Symbol explanation				
Drain valve	Water pressure instrument	Water flow switch	Gate valve	Differential pressure by-pass valve
Y-filter	Thermometer	Pump	Check valve	Atmospheric exhaust valve
Expansion tank	Safety valve	Soft joint	Solenoid three-way valve	

1.4.3 180kW module


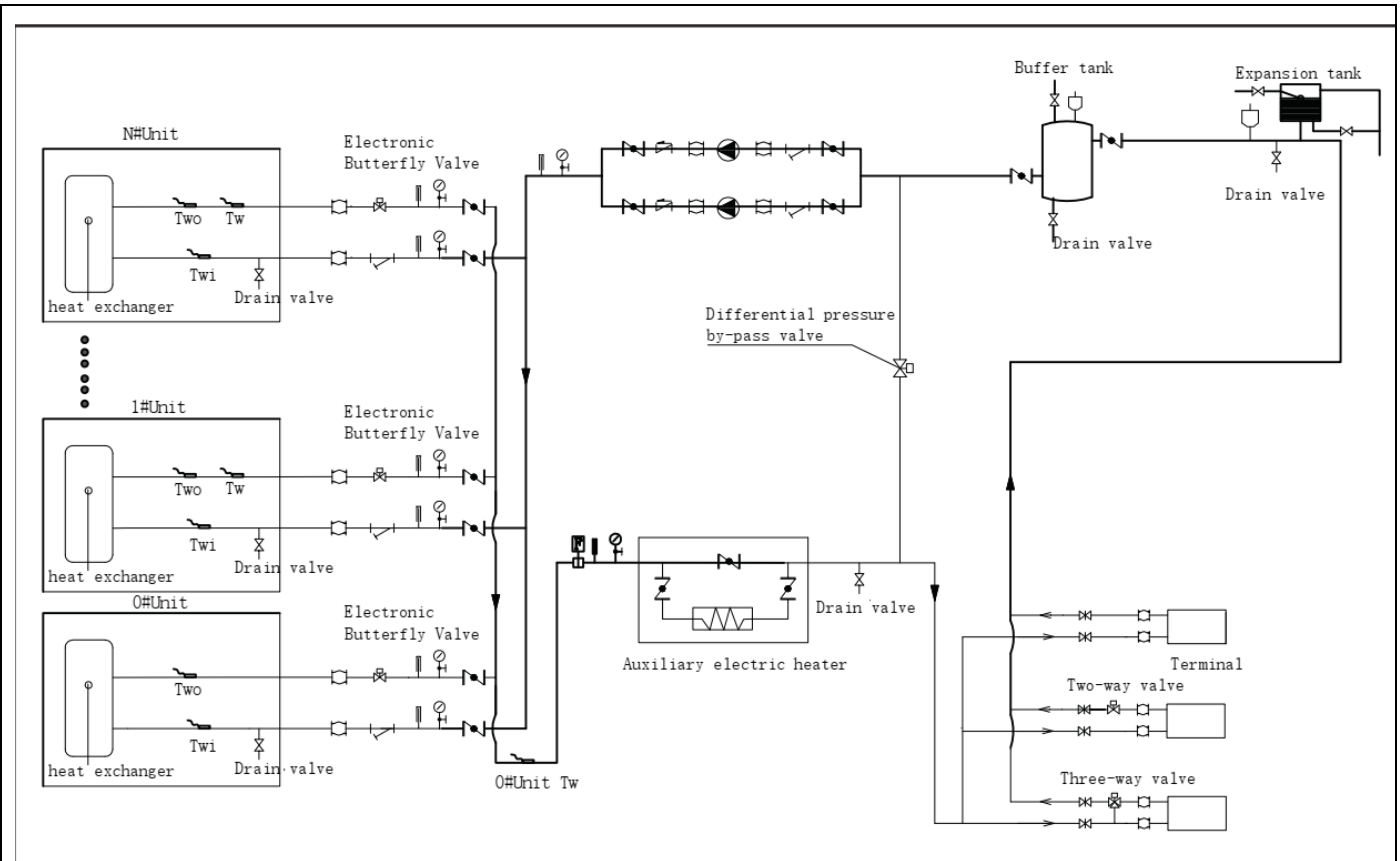
The table below describes the symbols.

Symbol	Symbol explanation	Symbol	Symbol explanation
	Stop valve		Y-shaped filter
	Pressure gauge		Thermometer
	Water flow switch		Circulating pump
	Gate valve		Check valve
	Flexible joint		Automatic discharge valve



The table below describes the symbols.

Symbol	Symbol explanation	Symbol	Symbol explanation
	Stop valve		Y-shaped filter
	Pressure gauge		Thermometer
	Water flow switch		Circulating pump
	Gate valve		Check valve
	Flexible joint		Automatic discharge valve

1.4.5 260kW module


Symbol explanation				
Drain valve	Water pressure instrument	Water flow switch	Gate valve	Differential pressure by-pass valve
Y-filter	Thermometer	Pump	Check valve	Atmospheric exhaust valve
Expansion tank	Safety valve	Soft joint	Solenoid three-way valve	

2 Product lineup

Model	MDVM-60BR1-PT	MDVM-130BR1-KS
Power supply	380-415V/3Ph/50Hz	380-415V/3Ph/50Hz
Appearance		

Model	MDVM-180BR1-PT	MDVM-200BR1-P	MDVM-260BR1-KS
Power supply	380-415V/3Ph/50Hz	380-415V/3Ph/50Hz	380-415V/3Ph/50Hz
Appearance			

3 Nomenclature

For MDVM-130BR1-KS and MDVM-260BR1-KS

<u>MDV</u>	<u>M</u>	<u>-</u>	<u>null</u>	<u>130</u>	<u>null</u>	<u>null</u>	<u>B</u>	<u>R1</u>	<u>-</u>	<u>KS</u>
<u>1</u>	<u>2</u>		<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>		<u>9</u>

Legend		
No.	Code	Remarks
1	MDV	MDV Brand
2	M	Air cooled chiller
3	null	Compressor attribute code Null: Fixed speed V: Inverter System
4	130	130kW
5	null	Hydraulic module code null: Without hydraulic module M: With hydraulic module
6	null	Compressor and fan motor types null: Fixed speed compressor and fan D2: DC inverter compressor and fan
7	B	Power supply for ODU B: 380-415V 3N~ 50Hz
8	R1	Refrigerant R1: R410A
9	KS	Series code KS: King Plus

<u>MDV</u>	<u>M</u>	<u>-</u>	<u>null</u>	<u>130</u>	<u>null</u>	<u>null</u>	<u>B</u>	<u>R1</u>	<u>-</u>	<u>PT</u>
<u>1</u>	<u>2</u>		<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>		<u>9</u>

Legend		
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1	MDV	MDV Brand
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3	null	Compressor attribute code Null: Fixed speed V: Inverter System
4	130	130kW
5	null	Hydraulic module code null: Without hydraulic module M: With hydraulic module
6	null	Compressor and fan motor types null: Fixed speed compressor and fan D2: DC inverter compressor and fan
7	B	Power supply for ODU B: 380-415V 3N~ 50Hz
8	R1	Refrigerant R1: R410A
9	PT	T3 condition

4 System Design and Unit Selection

4.1 Selection Procedure

Step 1: Total heat load calculation

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

Step 2: System configuration

Decide whether to 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 Aqua thermal Series unit capacity¹ based on nominal capacity

Correct capacity of the outdoor units for the following items:
Outdoor air temperature / Outdoor humidity / Water outlet temperature² /
Altitude / Anti-freeze type

Is corrected capacity $\geq$ Required total heat load on outdoor units³

Yes

System selection is
complete

No

Select a larger model or enable
auxiliary electric heater operation

Notes:

- Up to 16 units of 130kW (8 units of 260kW) can be connected together, giving a system cooling/heating capacity range from 130kW to 2080kW.
- If the required water temperatures of the heat emitters are not all the same, the outlet water temperature setting should be set at the highest of the heat emitter required water temperatures. If the water outlet design temperature falls between two temperatures listed in the outdoor unit's capacity table, calculate the corrected capacity by interpolation.
- Select unit which satisfies both total heating and cooling load requirements.

4.2 Modular Chiller Leaving Water Temperature (LWT) Selection

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

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

4.3 Optimizing System Design

To get the most comfort with the lowest energy consumption, 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.

Part 2

Engineering Data

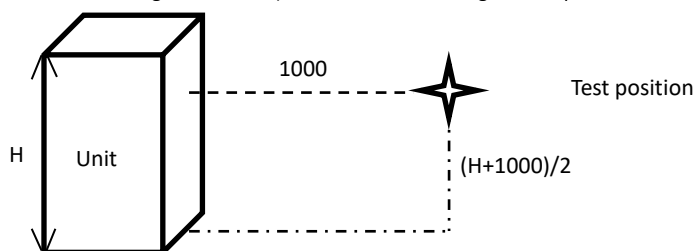
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1 Specifications

Model name			MDVM-60BR1-PT	MDVM-120BR1-PT
Power supply		V/Ph/Hz	380~415/3/50	380~415/3/50
Cooling ¹	Capacity	kW	60	120
	EER		3.11	3.12
Cooling ²	Capacity	kW	51.6	103.2
	EER		2.20	2.23
Heating ³	Capacity	kW	65	128
	COP		3.23	3.08
Air side heat exchanger	Type		Fin-coil	Fin-coil
	Fan motor rated	W	900*2	900*4
	Fan motor quantity		2	4
	Air flow rate	m³/h	24000	48000
Water side heat exchanger	Type		Shell- tube	Shell and tube
	Volume	L	42	64
	Rated water flow	m³/h	10.3	22.4
	Max. Pressure	MPa	1	1
	Water pressure	kPa	15	25
Refrigerant system	Refrigerant type		R410A	R410A
	Refrigerant charge	kg	6.0*2	6.0*4
	Throttle type		EXV+ capillary	EXV+ capillary
Sound pressure level (semi-anechoic)		dB(A)	65	70
Net dimensions (W×H×D)	mm		2000×1880×900	2000×1685×2090
Packed dimensions	mm		2090×2095×985	2090×1755×2240
Net weight	kg		831	1150
Gross weight	kg		852	1200
Water pipe connections	mm		DN100	DN65
Water pressure range	MPa		1.0	1.0
Controller			KJRM-120D/BMK-E	KJRM-120D/BMK-E
Operating temperature range	Cooling	℃	10~52	10~52
	Heating	℃	-10~21	-10~21
Water outlet temperature range	Cooling ⁴	℃	5~17	5~17
	Heating	℃	45~50	45~50

Notes:

1. Outdoor ambient temperature 35°C DB. EWT 12°C, LWT 7°C;
2. Outdoor ambient temperature 46°C DB. EWT 12°C, LWT 7°C;
3. Outdoor ambient temperature 7°C DB/6°C WB. EWT 40°C, LWT 45°C;
4. Sound pressure level is the test average measured in a semi-anechoic chamber. The test position is 1m right in front of the unit for four sides and $(1+H)/2$ m (where H is the height of the unit) above the floor. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.



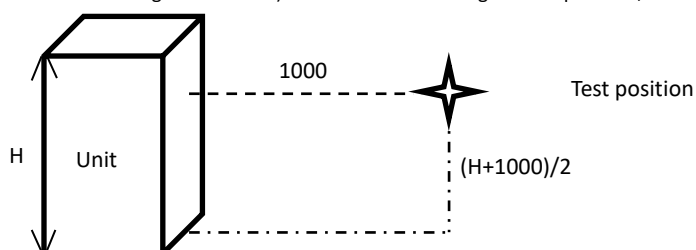
5. Antifreeze liquid is needed when water outlet temperature is less than 5°C.

Specifications (cont)

Model name			MDVM-130BR1-KS	MDVM-180BR1-PT
Power supply		V/Ph/Hz	380-415V/3P/50	380~415/3/50
Cooling ¹	Capacity	kW	130	180
	EER		3.07	3.11
Cooling ²	Capacity	kW	/	155.8
	EER		/	2.66
Heating ³	Capacity	kW	138	195
	COP		3.21	3.28
Air side heat exchanger	Type		Finned tube	Fin-coil
	Fan motor rated	W	1600	900*6
	Fan motor quantity		2	6
	Air flow rate	m³/h	39000	72000
Water side heat exchanger	Type		Shell- tube	Shell- tube
	Volume	L	Tube side: 12L / Shell side: 42L	90L
	Rated water flow	m³/h	22.4	31.0
	Water flow range	m³/h	17.9-26.8	/
	Max. Pressure	MPa	1	1
	Water pressure drop	kPa	40	30
Refrigerant system	Refrigerant type		R410A	R410A
	Refrigerant charge	kg	20	6.0*6
	Throttle type		EXV	EXV+ capillary
Sound pressure level(1m) ⁴	Cooling ¹	dB(A)	74.8	/
	Heating ²	dB(A)	77.5	
Sound pressure level (semi-anechoic)		dB(A)	/	74
Net dimensions (W×H×D)	mm		1120*2300*2200	2850×2000×2110
Packed dimensions	mm		1180*2445*2250	2980×2135×2260
Net weight	kg		831	1890
Gross weight	kg		852	1900
Water pipe connections	mm		DN65	DN80
Water pressure range	MPa		1.0	1.0
Controller			KJRM-120D/BMK-E(Modbus)	KJRM-120D/BMK-E
Operating temperature range	Cooling	℃	-10~52	10~52
	Heating	℃	-15~24	-10~21
Water outlet temperature range	Cooling ⁴	℃	0-25	5~17
	Heating	℃	25-50	45~50

Notes:

1. Outdoor ambient temperature 35°C DB. EWT 12°C, LWT 7°C;
2. Outdoor ambient temperature 46°C DB. EWT 12°C, LWT 7°C;
3. Outdoor ambient temperature 7°C DB/6°C WB. EWT 40°C, LWT 45°C;
4. Sound pressure level is the test average measured in a semi-anechoic chamber. The test position is 1m right in front of the unit for four sides and (1+H)/2m (where H is the height of the unit) above the floor. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.



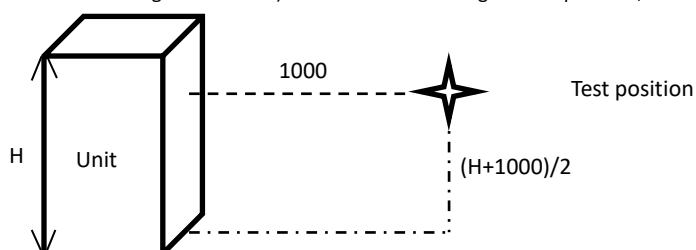
5. Antifreeze liquid is needed when water outlet temperature is less than 5°C.

Specifications (cont)

Model name			MDVM-200BR1-P	MDVM-260BR1-KS
Power supply		V/Ph/Hz	380-400/3/50	380-415V/3P/50
Cooling ¹	Capacity	kW	185	265
	EER		2.94	3.15
Cooling ²	Capacity	kW	/	/
	EER		/	/
Heating ³	Capacity	kW	200	280
	COP		3.28	3.30
Air side heat exchanger	Type		Fin-coil	Finned tube
	Fan motor rated	W	865*6	1600
	Fan motor quantity		6	4
	Air flow rate	m³/h	72000	78000
Water side heat exchanger	Type		Shell- tube	Shell- tube
	Volume	L	90L	Tube side: 12L / Shell side: 42L
	Rated water flow	m³/h	31.8	45.6
	Water flow range	m³/h	/	36.5-54.7
	Max. Pressure	MPa	1	1
	Water pressure drop	kPa	30	60
Refrigerant system	Refrigerant type		R410A	R410A
	Refrigerant charge	kg	7.0*6	40
	Throttle type		EXV+ capillary	EXV
Sound pressure level(1m) ⁴	Cooling ¹	dB(A)	/	78.0
	Heating ²	dB(A)		79.9
Sound pressure level (semi-anechoic)		dB(A)	74	/
Net dimensions (W×H×D)	mm		2850×2110×2000	2753*2415*2220
Packed dimensions	mm		2980×2260×2135	2810*2450*2290
Net weight	kg		1730	1890
Gross weight	kg		2000	1900
Water pipe connections	mm		DN80	DN100
Water pressure range	MPa		1.0	1.0
Controller			KJRM-120D/BMK-E	KJRM-120D/BMK-E(Modbus)
Operating temperature range	Cooling	℃	-10～46	-10~52
	Heating	℃	-10～21	-15~24
Water outlet temperature range	Cooling ⁴	℃	0～17	0-25
	Heating	℃	22～50	25-50

Notes:

1. Outdoor ambient temperature 35°C DB. EWT 12°C, LWT 7°C;
2. Outdoor ambient temperature 46°C DB. EWT 12°C, LWT 7°C;
3. Outdoor ambient temperature 7°C DB/6°C WB. EWT 40°C, LWT 45°C;
4. Sound pressure level is the test average measured in a semi-anechoic chamber. The test position is 1m right in front of the unit for four sides and (1+H)/2m (where H is the height of the unit) above the floor. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.



5. Antifreeze liquid is needed when water outlet temperature is less than 5°C.

2 Electrical Characteristics

System	Outdoor unit				Power current				Compressor			Fan	
	Voltage	Hz	Min.	Max.	MCA	MOP	TOCA	MFA	MSC	LRA	RLA	kW	FLA
	(V)		(V)	(V)	(A)	(A)	(A)	(A)	(A)	(A)	(A)		(A)
MDVM-60BR1-PT	380-415	50	342	456	//		52	100	/	118	20.7	0.9x2	1.8x2
MDVM-130BR1-KS	380-415	50	323	433	150	200	/	/	62	/	44.3	1.6	4
MDVM-180BR1-PT	380-415	50	342	456	/	/	135	300	/	118	20.7	0.9x6	1.8x6
MDVM-200BR1-P	380-415	50	342	456	/	/	150	200	/	147	21.4	0.865x6	4.0x6
MDVM-260BR1-KS	380-415	50	323	433	250	320	/	/	62	/	44.3	1.6	4

Note:

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

MOP: Maximum overcurrent protector (A)

MSC : Max. Starting Amps. (A)

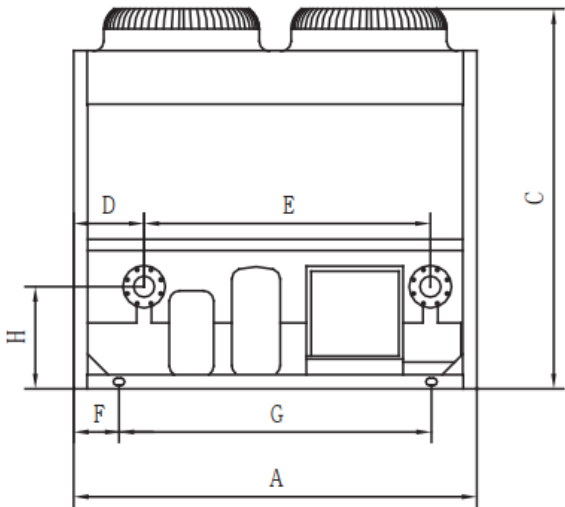
RLA: Rated load amps. The input amps of compressor where maximum Hz can operate for nominal cooling or heating test condition

kW: Rated Motor Output

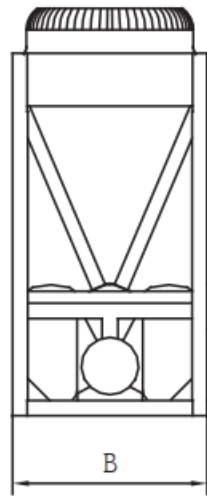
FLA: Full Load Amps. (A)

3 Dimensions and Center of Gravity

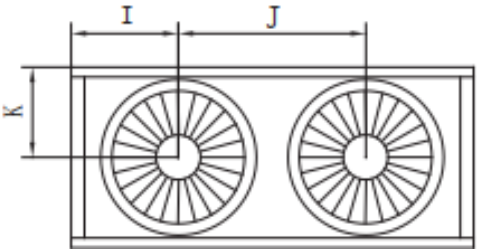
MDVM-60BR1-PT



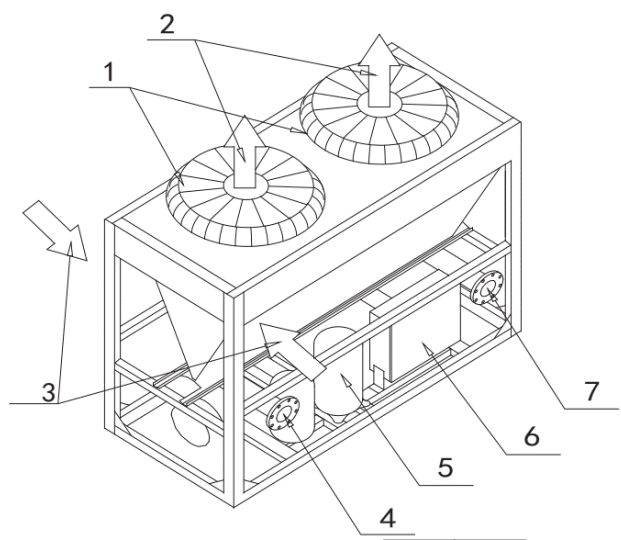
Front view



Left view

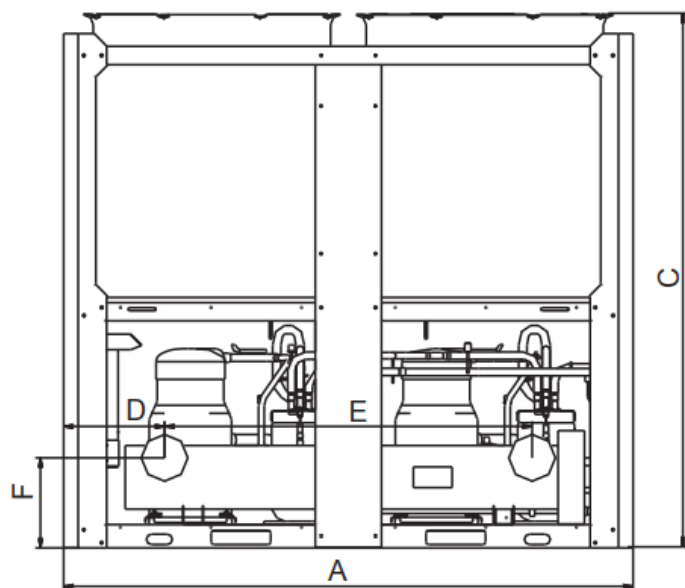
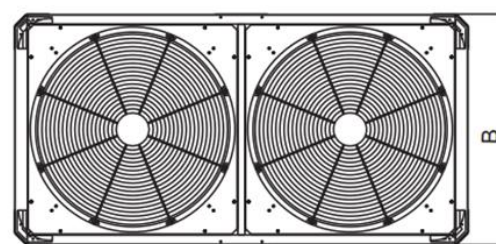
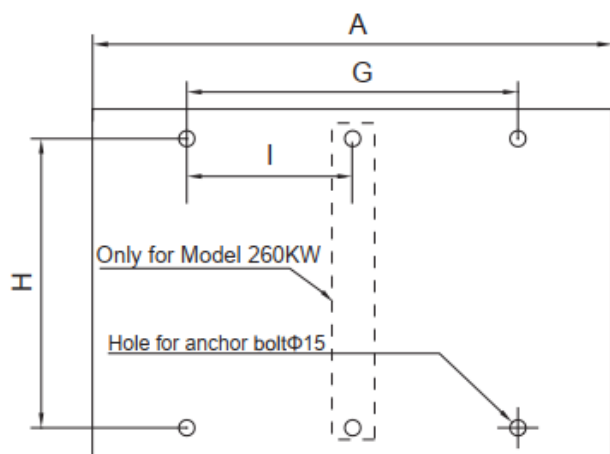
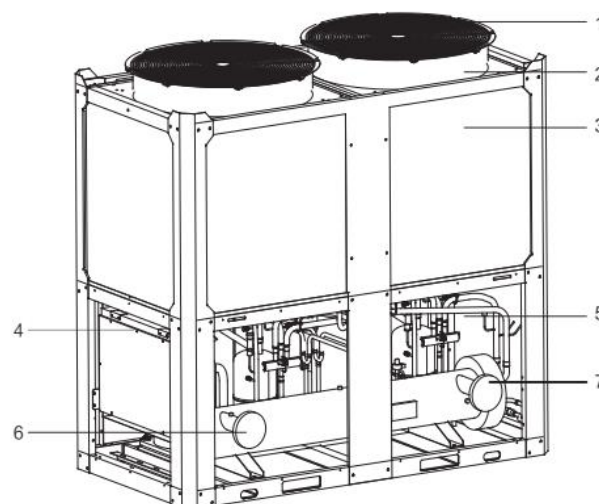


Top view



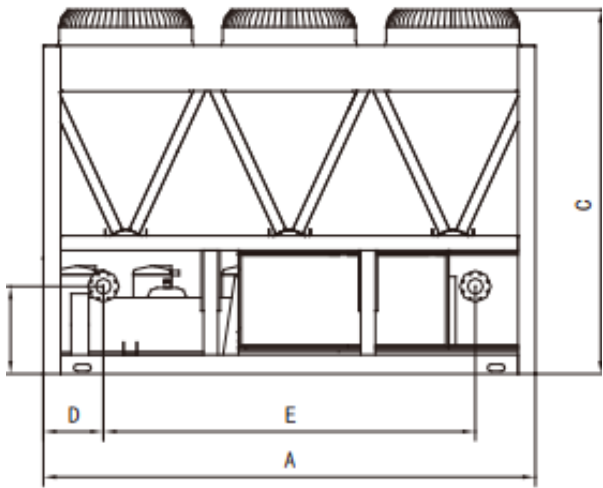
Model	unit	A	B	C	D	E	F	G	H	I	J	K
MDVM-60BR1-PT	mm	2000	900	1880	350	1420	225	1500	506	530	930	450

No.	Name	No.	Name
1	Top cover	5	Compressor
2	Air outlet	6	Electric control box
3	Air inlet	7	Water inlet
4	Water outlet		

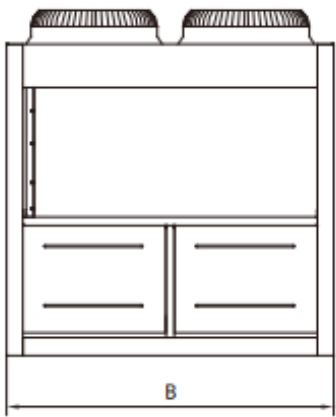

Front view

Top view

Bottom view


Model	unit	A	B	C	D	E	F	G	H
MDVM-130BR1-KS	mm	2200	1120	2315	390	1420	350	1460	1017

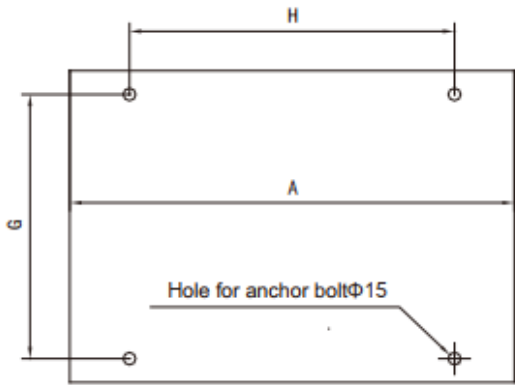
No.	Name	No.	Name
1	Air outlet	5	Compressor
2	Top cover	6	Water outlet
3	Air inlet	7	Water inlet
4	Electric control box		



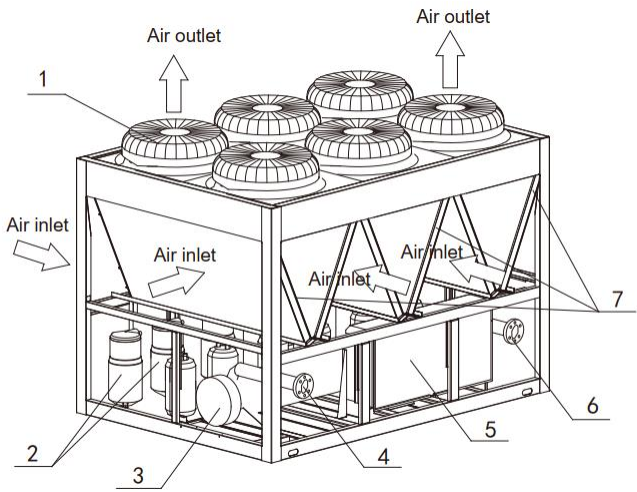
Front view



Left view



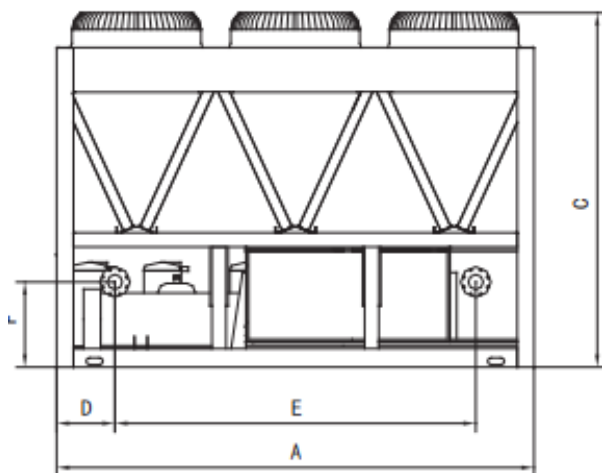
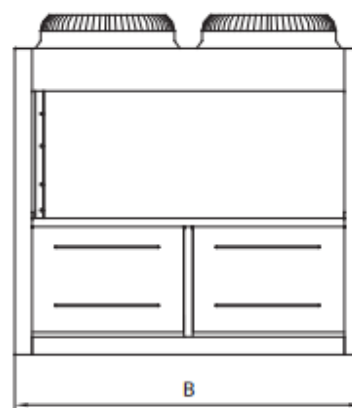
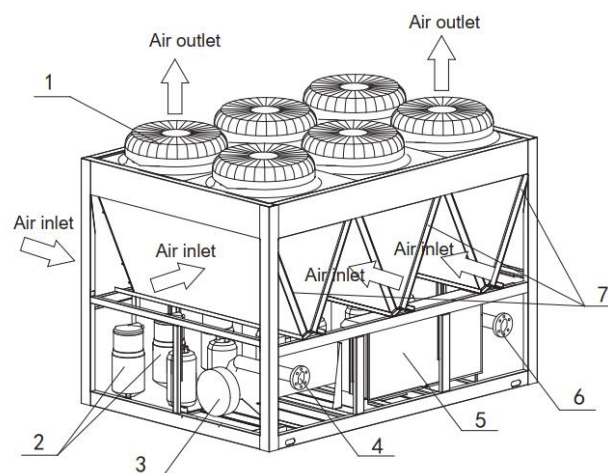
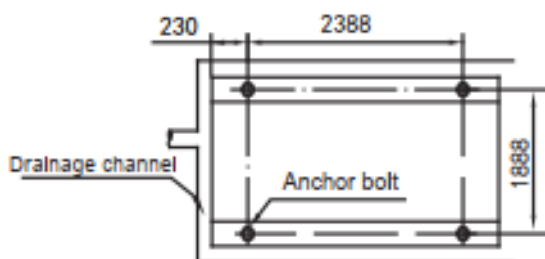
Bottom view



Model	unit	A	B	C	D	E	F	G	H
MDVM-180BR1-PT	mm	2850	2000	2110	347	2156	506	1888	2388

No.	Name	No.	Name
1	Top cover	5	Electric control box
2	Compressor	6	Water inlet
3	Evaporator	7	Condenser
4	Water outlet		

MDVM-200BR1-P


Front view

Left view


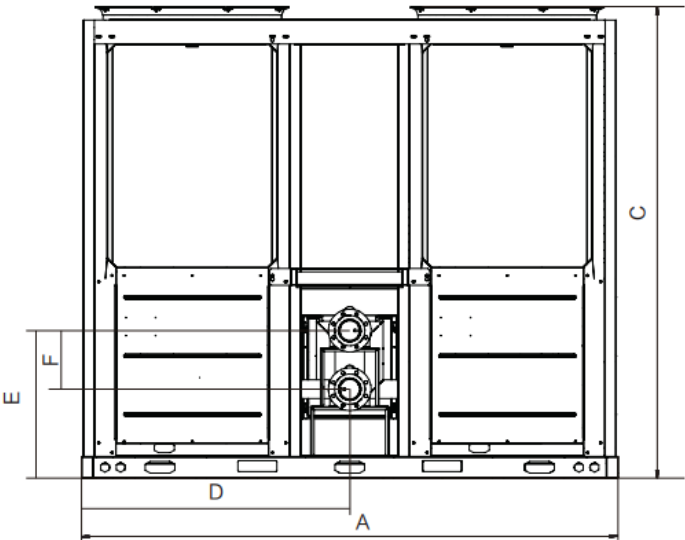
Model	unit	A	B	C	D	E	F
MDVM-200BR1-P	mm	2850	2000	2110	347	2156	506

No.	Name	No.	Name
1	Top cover	5	Electric control box
2	Compressor	6	Water inlet
3	Evaporator	7	Condenser
4	Water outlet		

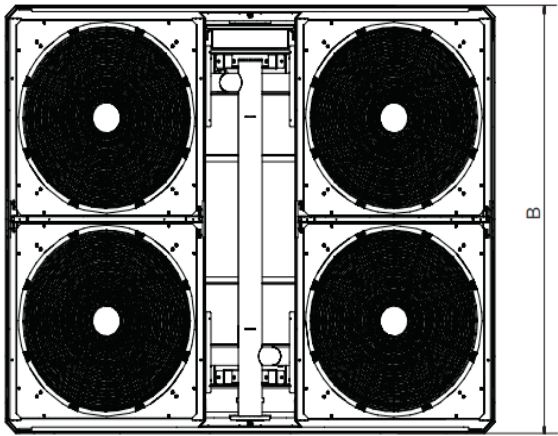
King Plus



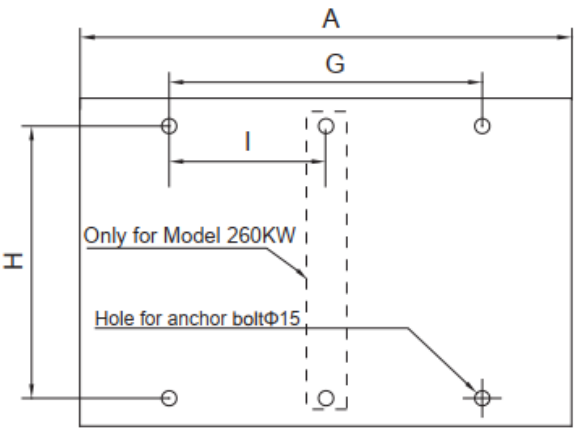
MDVM-260BR1-KS



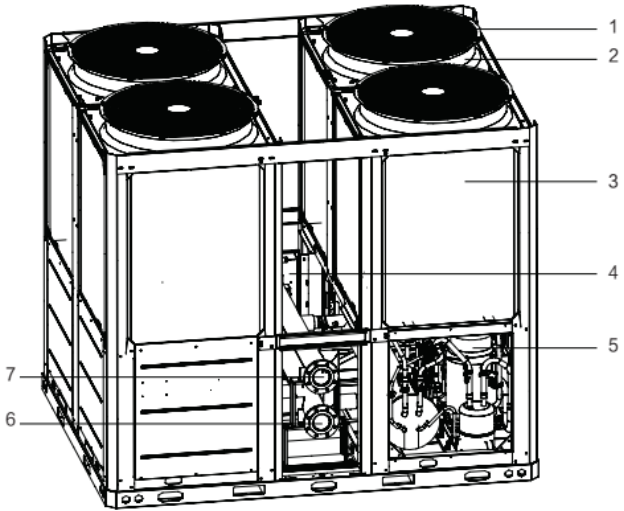
Front view



Top view



Bottom view

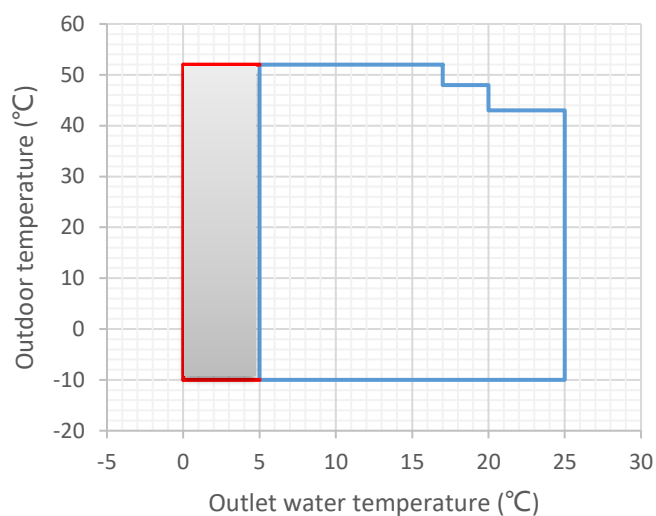


Model	unit	A	B	C	D	E	F	G	H	I
MDVM-260BR1-KS	mm	2753	2200	2415	1376.5	755.5	300	1947	2120	973.5

No.	Name	No.	Name
1	Air outlet	5	Compressor
2	Top cover	6	Water outlet
3	Air inlet	7	Water inlet
4	Electric control box		

4 Operating Limits

4.1 Cooling operating range



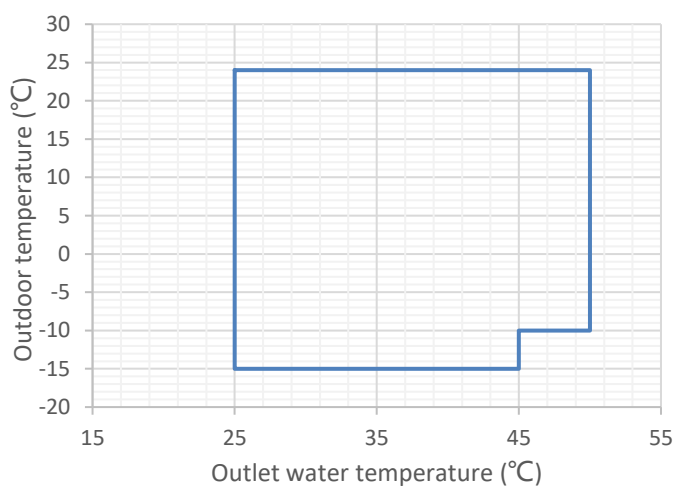
Notes:

- ① Normal mode
- ② Low leaving water temperature mode

Low leaving water temperature mode can be set through wired controller, please refer to the Operation Manual for details. If low leaving water temperature function is effective, the operation range will extend to the red frame above. When the set temperature is less than 5°C, antifreeze liquid (concentration above 15%) should be added in the water system, otherwise the unit will be damaged.

- ③ Part of the model can't reach, please refer to the Specifications.

4.2 Heating operating range



Part of the model can't reach, please refer to the Specifications.

5 Capacity Tables

5.1 Heating Capacity Tables

MDVM-60BR1-PT

LWT °C	DB °C													
	-10		-6		-2		2		7		10		13	
	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI
(°C)	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW
39	40.4	12.51	50.5	14.22	59.41	15.8	66.02	17.17	71.76	18.08	80.37	19.16	92.42	20.7
41	39.04	12.77	48.87	14.51	57.56	16.12	64.02	17.52	69.67	18.45	77.89	19.55	89.41	21.12
42	37.92	13.03	47.51	14.81	56.03	16.45	62.39	17.88	67.97	18.82	75.85	19.95	86.93	21.55
43	37	13.3	46.42	15.11	54.81	16.79	61.1	18.25	66.63	19.21	74.23	20.36	84.92	21.99
44	36.28	13.57	45.58	15.42	53.88	17.13	60.14	18.62	65.65	19.6	73	20.78	83.37	22.44
45	35.76	13.84	44.98	15.73	53.23	17.48	59.48	19	65	20	72.15	21.2	82.25	22.9
46	35.06	13.98	44.15	15.89	52.32	17.65	58.52	19.19	64.03	20.2	70.94	21.41	80.73	23.12
47	34.02	14.26	42.9	16.21	50.9	18.01	56.99	19.57	62.42	20.6	69.04	21.84	78.43	23.59
48	32.68	14.69	41.26	16.69	49.01	18.55	54.94	20.16	60.24	21.22	66.5	22.5	75.42	24.3
49	30.9	15.28	39.07	17.36	46.45	19.29	52.13	20.97	57.23	22.07	63.06	23.4	71.39	25.27
50	28.91	16.04	36.6	18.23	43.57	20.25	48.95	22.02	53.79	23.17	59.17	24.57	66.87	26.53

Note:

LWT: Leaving water temperature (°C)

HC: Total heating capacity (kW)

PI: Power input (kW)

The inlet/outlet water temperature difference is 5°C.

MDVM-130BR1-KS

LWT °C	DB °C														
	-15			-10			-5			0			5		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
25	72.58	17.81	4.08	87.58	20.81	4.21	109.20	24.13	4.53	136.12	28.70	4.74	148.69	32.78	4.54
30	70.39	18.24	3.86	85.39	21.24	4.02	108.33	24.88	4.35	134.40	30.01	4.48	147.28	34.07	4.32
35	70.42	20.63	3.41	85.42	23.63	3.61	107.12	27.18	3.94	133.70	32.21	4.15	146.94	35.43	4.15
40	70.61	23.91	2.95	85.61	26.91	3.18	107.01	30.57	3.50	132.90	35.45	3.75	146.58	37.89	3.87
45	60.92	26.76	2.28	75.92	29.76	2.55	95.49	33.82	2.82	119.64	39.22	3.05	132.75	41.92	3.17
50	/	/	/	70.33	33.03	2.13	77.70	39.19	1.98	98.22	45.44	2.16	109.64	48.58	2.26

LWT °C	DB °C														
	7			10			15			20			24		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
25	153.72	34.42	4.47	173.37	36.12	4.80	193.75	38.28	5.06	205.21	40.08	5.12	219.57	41.57	5.28
30	152.43	35.69	4.27	172.50	36.82	4.68	192.27	39.33	4.89	204.55	41.03	4.98	218.45	42.50	5.14
35	152.24	36.72	4.15	172.28	37.95	4.54	191.97	40.29	4.76	203.98	42.25	4.83	218.27	44.89	4.86
40	152.05	38.87	3.91	170.29	41.20	4.13	189.56	44.35	4.27	203.80	46.65	4.37	218.00	48.96	4.45
45	138.00	43.00	3.21	153.18	45.58	3.36	177.74	48.01	3.70	186.99	50.54	3.70	196.23	52.07	3.77
50	114.21	49.83	2.29	125.63	52.81	2.38	142.68	54.96	2.60	156.89	56.62	2.77	174.30	58.29	2.99

Abbreviations:

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

LWT: Leaving water temperature (°C)

HC: Total heating capacity (kW)

PI: Power input (kW)

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

MDVM-180BR1-PT

LWT °C	DB °C													
	-10		-6		-2		2		7		10		13	
	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI
(°C)	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW
39	121.21	37.54	151.51	42.66	178.24	47.4	198.05	51.52	215.27	54.24	241.1	57.49	277.27	62.09
41	117.13	38.31	146.6	43.53	172.67	48.37	192.07	52.57	209	55.34	233.66	58.66	268.24	63.36
42	113.75	39.09	142.54	44.42	168.09	49.36	187.18	53.65	203.9	56.47	227.56	59.86	260.78	64.65
43	111	39.89	139.27	45.33	164.43	50.36	183.31	54.74	199.9	57.62	222.69	61.08	254.76	65.97
44	108.85	40.7	136.75	46.25	161.64	51.39	180.41	55.86	196.95	58.8	219.01	62.33	250.11	67.31
45	107.28	41.53	134.94	47.2	159.69	52.44	178.43	57	195	60	216.45	63.6	246.75	68.69
46	105.18	41.95	132.46	47.67	156.95	52.96	175.56	57.57	192.08	60.6	212.82	64.24	242.19	69.37
47	102.07	42.79	128.71	48.62	152.69	54.02	170.98	58.72	187.27	61.81	207.12	65.52	235.29	70.76
48	98.04	44.07	123.79	50.08	147.02	55.64	164.82	60.48	180.72	63.67	199.51	67.49	226.25	72.89
49	92.7	45.83	117.2	52.08	139.35	57.87	156.4	62.9	171.68	66.21	189.19	70.19	214.17	75.8
50	86.73	48.12	109.79	54.69	130.7	60.76	146.86	66.05	161.38	69.52	177.52	73.7	200.6	79.59

Note:

LWT: Leaving water temperature (°C)

HC: Total heating capacity (kW)

PI: Power input (kW)

The inlet/outlet water temperature difference is 5 °C.

MDVM-200BR1-P

LWT °C	DB °C													
	-10		-6		-2		2		7		10		13	
	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI	HC	PI
(°C)	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
40	124.31	38.17	155.39	43.37	182.81	48.19	203.13	52.38	220.79	55.14	247.28	58.45	284.38	63.12
41	120.14	38.95	150.36	44.26	177.1	49.18	197	53.45	214.36	56.26	239.65	59.64	275.12	64.41
42	116.66	39.74	146.19	45.16	172.4	50.18	191.98	54.54	209.13	57.41	233.39	60.86	267.46	65.73
43	113.85	40.55	142.84	46.08	168.65	51.2	188.01	55.66	205.03	58.58	228.4	62.1	261.29	67.07
44	111.64	41.38	140.26	47.02	165.79	52.25	185.03	56.79	202	59.78	224.62	63.37	256.52	68.44
45	110.03	42.22	138.4	47.98	163.79	53.31	183	57.95	200	61	222	64.66	253.08	69.83
46	107.87	42.65	135.86	48.46	160.97	53.85	180.06	58.53	197	61.61	218.28	65.31	248.4	70.53
47	104.69	43.5	132.01	49.43	156.6	54.92	175.36	59.7	192.08	61.81	212.43	66.61	241.33	71.94
48	100.55	44.8	126.96	50.91	150.78	56.57	169.04	61.49	185.35	63.67	204.63	68.61	232.05	74.1
49	95.08	46.6	120.2	52.95	142.93	58.83	160.41	63.95	176.08	66.21	194.05	71.36	219.66	77.06
50	88.96	48.93	112.61	55.6	134.05	61.78	150.62	67.15	165.52	69.52	182.07	74.92	205.74	80.92

Note:

LWT: Leaving water temperature (°C)

HC: Total heating capacity (kW)

PI: Power input (kW)

The inlet/outlet water temperature difference is 5 °C.



MDVM-260BR1-KS

LWT °C	DB °C														
	-15			-10			-5			0			5		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
25	147.26	35.12	4.19	177.69	41.04	4.33	221.57	47.59	4.66	276.20	56.61	4.88	301.70	64.65	4.67
30	142.82	35.96	3.97	173.25	41.88	4.14	219.79	49.07	4.48	272.70	59.18	4.61	298.82	67.19	4.45
35	142.87	40.69	3.51	173.31	46.61	3.72	217.35	53.59	4.06	271.27	63.53	4.27	298.14	69.87	4.27
40	143.27	47.15	3.04	173.70	53.07	3.27	217.12	60.29	3.60	269.64	69.91	3.86	297.40	74.73	3.98
45	123.61	52.77	2.34	154.04	58.69	2.62	193.75	66.70	2.90	242.75	77.34	3.14	269.36	82.67	3.26
50	/	/	/	142.70	65.14	2.19	157.65	77.29	2.04	199.28	89.61	2.22	222.46	95.80	2.32
LWT °C	DB °C														
	7			10			15			20			24		
	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP	HC	PI	COP
25	311.90	67.87	4.60	351.77	71.24	4.94	393.12	75.50	5.21	416.38	79.05	5.27	445.50	81.98	5.43
30	309.27	70.39	4.39	350.00	72.61	4.82	390.10	77.57	5.03	415.02	80.92	5.13	443.23	83.82	5.29
35	308.88	72.41	4.27	349.56	74.84	4.67	389.51	79.46	4.90	413.87	83.31	4.97	442.87	88.52	5.00
40	308.51	76.66	4.02	345.52	81.25	4.25	384.62	87.46	4.40	413.50	92.00	4.49	442.32	96.55	4.58
45	280.00	84.80	3.30	310.80	89.89	3.46	360.62	94.67	3.81	379.40	99.67	3.81	398.15	102.69	3.88
50	231.73	98.27	2.36	254.90	104.15	2.45	289.50	108.38	2.67	318.34	111.66	2.85	353.66	114.95	3.08

Abbreviations:
 DB: Dry-bulb temperature for outdoor air temperature (°C)
 LWT: Leaving water temperature (°C)
 HC: Total heating capacity (kW)
 PI: Power input (kW)
 Performance specifications measured with water pump operating at rated water flow rate.

5.2 Cooling Capacity Tables

MDVM-60BR1-PT

LWT °C	DB °C													
	21		25		30		35		40		46		52	
	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI
	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW
5	67.17	17.61	63.25	18.16	59.67	18.72	56.4	19.3	52.85	20.27	48.62	21.28	43.76	22.34
6	69.44	17.89	65.33	18.44	61.57	19.01	58.14	19.6	54.54	20.58	50.23	21.61	45.25	22.69
7	71.87	18.25	67.54	18.82	63.6	19.4	60	20	56.34	21	51.95	22.05	46.85	23.15
8	74.09	18.8	69.57	19.38	65.44	19.98	61.68	20.6	57.98	21.63	53.51	22.71	48.32	23.85
9	76.18	18.98	71.46	19.57	67.16	20.18	63.24	20.8	59.51	21.84	54.99	22.93	49.71	24.08
10	79.06	19.27	74.1	19.86	69.58	20.48	65.45	21.11	61.66	22.17	57.03	23.28	51.61	24.44
11	81.27	19.46	76.09	20.06	71.38	20.68	67.09	21.32	63.27	22.39	58.58	23.51	53.08	24.68
12	83.13	19.74	77.76	20.35	72.88	20.98	68.43	21.63	64.6	22.71	59.88	23.85	54.31	25.04
13	84.61	19.9	79.08	20.52	74.04	21.15	69.46	21.81	65.64	22.9	60.91	24.04	55.31	25.24
14	86.72	20.04	80.97	20.66	75.74	21.3	70.99	21.96	67.15	23.05	62.38	24.21	56.71	25.42
15	87.83	20.14	81.93	20.76	76.57	21.4	71.7	22.06	67.9	23.17	63.14	24.33	57.46	25.54

Note:

LWT: Leaving water temperature (°C)

CC: Total cooling capacity (kW)

PI: Power input (kW)

The inlet/outlet water temperature difference is 5 °C.

MDVM-130BR1-KS

LWT °C	DB °C														
	-10			-5			0			5			10		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
0	120.89	29.15	4.15	116.61	29.75	3.92	112.33	30.35	3.70	106.78	31.34	3.41	104.22	31.33	3.33
5	148.33	33.99	4.36	143.71	34.50	4.16	140.08	35.02	4.00	135.97	35.57	3.82	130.86	36.12	3.62
7	156.70	35.25	4.45	151.49	35.80	4.23	147.29	36.34	4.05	144.65	36.89	3.92	142.00	37.44	3.79
10	168.46	37.19	4.53	163.29	37.75	4.33	160.12	38.32	4.18	156.62	38.92	4.02	153.12	39.52	3.87
15	189.10	38.86	4.87	184.52	39.46	4.68	179.94	40.06	4.49	172.18	40.68	4.23	169.09	41.51	4.07
17	196.87	39.73	4.96	190.30	40.07	4.75	188.14	40.67	4.63	180.84	41.30	4.38	178.54	41.93	4.26
20	204.87	41.03	4.99	198.30	41.37	4.79	196.14	41.97	4.67	188.84	42.60	4.43	186.54	43.23	4.31
25	212.87	42.33	5.03	206.30	42.67	4.84	204.14	43.27	4.72	196.84	43.90	4.48	194.54	44.53	4.37

LWT °C	DB °C														
	15			20			25			30			35		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
0	102.29	31.48	3.25	100.57	32.16	3.13	98.61	33.09	2.98	96.24	34.23	2.81	94.30	35.12	2.69
5	127.63	36.63	3.48	124.54	37.25	3.34	122.04	38.41	3.18	120.29	39.59	3.04	118.20	40.82	2.90
7	139.32	37.97	3.67	136.71	38.61	3.54	134.34	39.80	3.38	131.54	40.98	3.21	130.00	42.30	3.07
10	148.75	40.08	3.71	144.31	40.75	3.54	141.55	42.01	3.37	138.75	43.31	3.20	136.82	44.65	3.06
15	166.00	41.88	3.96	159.30	42.59	3.74	154.52	43.91	3.52	150.90	45.27	3.33	145.34	46.67	3.11
17	175.72	42.52	4.13	167.53	43.23	3.88	160.92	44.57	3.61	156.57	45.95	3.41	148.35	47.37	3.13
20	183.72	43.82	4.19	175.53	44.53	3.94	168.92	45.87	3.68	164.57	47.25	3.48	156.35	48.67	3.21
25	191.72	45.12	4.25	183.53	45.83	4.00	176.92	47.17	3.75	172.57	48.55	3.55	164.35	49.97	3.29

LWT °C	DB °C											
	40			43			48			52		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
0	92.21	37.49	2.46	91.15	39.32	2.32	90.15	41.32	2.18	88.15	43.32	2.03
5	115.50	41.86	2.76	111.34	43.00	2.59	108.34	45.00	2.41	106.34	47.00	2.26
7	127.07	43.42	2.93	122.55	45.17	2.71	117.55	47.17	2.49	115.55	49.17	2.35
10	132.59	45.88	2.89	128.57	47.23	2.72	122.57	49.23	2.49	120.57	51.23	2.35
15	139.11	48.00	2.90	136.81	49.45	2.77	129.81	51.45	2.52	127.81	53.45	2.39
17	141.17	48.74	2.90	137.82	50.22	2.74	132.82	52.22	2.54	130.82	54.22	2.41
20	149.17	50.04	2.98	145.82	51.52	2.83	140.42	53.62	2.62	/	/	/
25	157.17	51.34	3.06	153.82	52.82	2.91	/	/	/	/	/	/

Abbreviations:

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

LWT: Leaving water temperature (°C)

CC: Total cooling capacity (kW)

PI: Power input (kW)

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

MDVM-180BR1-PT

LWT °C	DB °C													
	21		25		30		35		40		46		52	
	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI
	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW	KW
5	201.52	51.52	189.75	53.12	179.01	54.76	169.2	56.45	158.54	59.28	145.86	62.24	131.27	65.35
6	208.32	52.32	195.98	53.94	184.71	55.61	174.42	57.33	163.61	60.2	150.68	63.21	135.76	66.37
7	215.6	53.39	202.63	55.04	190.8	56.75	180	58.5	169.02	61.43	155.84	64.5	140.56	67.72
8	222.26	54.99	208.7	56.69	196.33	58.45	185.04	60.26	173.94	63.27	160.54	66.43	144.97	69.75
9	228.53	55.53	214.38	57.24	201.48	59.01	189.72	60.84	178.53	63.88	164.96	67.08	149.12	70.43
10	237.19	56.36	222.3	58.1	208.73	59.9	196.36	61.75	184.97	64.84	171.1	68.08	154.84	71.49
11	243.81	56.92	228.28	58.68	214.15	60.49	201.27	62.36	189.8	65.48	175.75	68.75	159.23	72.19
12	249.38	57.75	233.29	59.53	218.64	61.38	205.29	63.27	193.8	66.44	179.65	69.76	162.94	73.25
13	253.84	58.21	237.23	60.01	222.13	61.87	208.37	63.78	196.91	66.97	182.74	70.32	165.92	73.83
14	260.15	58.61	242.91	60.43	227.23	62.3	212.96	64.22	201.46	67.43	187.15	70.81	170.12	74.35
15	263.49	58.9	245.79	60.72	229.71	62.6	215.09	64.54	203.69	67.77	189.43	71.15	172.38	74.71

Note:

LWT: Leaving water temperature (°C)

CC: Total cooling capacity (kW)

PI: Power input (kW)

The inlet/outlet water temperature difference is 5 °C.

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LWT °C	DB °C											
	21		25		30		35		40		46	
	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI	CC	PI
	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
5	207.12	55.49	195.03	57.2	183.99	58.97	173.9	60.8	162.94	63.83	149.91	67.03
6	214.11	56.35	201.42	58.09	189.84	59.89	179.27	61.74	168.15	64.83	154.87	68.07
7	221.59	57.5	208.26	59.28	196.1	61.11	185	63	173.72	66.15	160.17	69.46
8	228.44	59.22	214.49	61.06	201.78	62.94	190.18	64.89	178.77	68.13	165	71.54
9	234.87	59.8	220.33	61.65	207.08	63.55	194.99	65.52	183.49	68.8	169.54	72.24
10	237.19	60.7	222.3	62.57	208.73	64.51	196.36	66.5	184.97	69.83	171.1	73.32
11	243.81	61.29	228.28	63.19	214.15	65.14	201.27	67.16	189.8	70.52	175.75	74.04
12	249.38	62.19	233.29	64.11	218.64	66.1	205.29	68.14	193.8	71.55	179.65	75.13
13	253.84	62.69	237.23	64.63	222.13	66.63	208.37	68.69	196.91	72.12	182.74	75.73
14	260.15	63.12	242.91	65.08	227.23	67.09	212.96	69.16	201.46	72.62	187.15	76.25
15	263.49	63.43	245.79	65.4	229.71	67.42	215.09	69.5	203.69	72.98	189.43	76.63

Note:

LWT: Leaving water temperature (°C)

CC: Total cooling capacity (kW)

PI: Power input (kW)

The inlet/outlet water temperature difference is 5 °C.

LWT °C	DB °C														
	-10			-5			0			5			10		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
0	246.43	57.88	4.26	237.71	59.07	4.02	228.98	60.27	3.80	217.66	62.23	3.50	212.45	62.21	3.41
5	302.37	67.49	4.48	292.94	68.52	4.28	285.55	69.54	4.11	277.17	70.63	3.92	266.76	71.72	3.72
7	319.42	69.99	4.56	308.81	71.08	4.34	300.25	72.17	4.16	294.85	73.27	4.02	289.46	74.36	3.89
10	343.40	73.85	4.65	332.86	74.97	4.44	326.40	76.10	4.29	319.27	77.29	4.13	312.13	78.48	3.98
15	385.48	77.17	5.00	376.14	78.36	4.80	366.81	79.55	4.61	350.98	80.77	4.35	344.68	82.43	4.18
17	401.31	78.90	5.09	387.91	79.56	4.88	383.51	80.75	4.75	368.63	82.01	4.49	363.94	83.27	4.37
20	417.62	81.48	5.13	404.22	82.15	4.92	399.82	83.34	4.80	384.94	84.59	4.55	380.25	85.85	4.43
25	433.93	84.06	5.16	420.52	84.73	4.96	416.13	85.92	4.84	401.25	87.17	4.60	396.55	88.43	4.48

LWT °C	DB °C														
	15			20			25			30			35		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
0	208.51	62.51	3.34	205.00	63.86	3.21	201.01	65.72	3.06	196.18	67.98	2.89	192.23	69.74	2.76
5	260.16	72.75	3.58	253.87	73.97	3.43	248.77	76.28	3.26	245.21	78.62	3.12	240.95	81.06	2.97
7	284.00	75.41	3.77	278.68	76.67	3.63	273.85	79.04	3.46	268.14	81.38	3.29	265.00	84.00	3.15
10	303.23	79.59	3.81	294.17	80.92	3.64	288.54	83.42	3.46	282.84	86.01	3.29	278.90	88.67	3.15
15	338.38	83.17	4.07	324.73	84.58	3.84	314.98	87.20	3.61	307.60	89.90	3.42	296.27	92.68	3.20
17	358.19	84.44	4.24	341.50	85.85	3.98	328.03	88.51	3.71	319.16	91.25	3.50	302.41	94.07	3.21
20	374.50	87.02	4.30	357.81	88.43	4.05	344.34	91.09	3.78	335.47	93.83	3.58	318.71	96.65	3.30
25	390.80	89.60	4.36	374.12	91.01	4.11	360.64	93.67	3.85	351.78	96.41	3.65	335.02	99.23	3.38

LWT °C	DB °C											
	40			43			48			52		
	CC	PI	EER	CC	PI	EER	CC	PI	EER	CC	PI	EER
0	187.98	74.44	2.53	185.81	78.09	2.38	183.77	82.06	2.24	179.70	86.03	2.09
5	235.44	83.13	2.83	226.96	85.39	2.66	220.85	89.36	2.47	216.77	93.33	2.32
7	259.03	86.22	3.00	249.81	89.70	2.79	239.62	93.67	2.56	235.54	97.64	2.41
10	270.28	91.11	2.97	262.09	93.79	2.79	249.85	97.76	2.56	245.78	101.73	2.42
15	283.57	95.32	2.97	278.88	98.20	2.84	264.61	102.17	2.59	260.54	106.14	2.45
17	287.77	96.79	2.97	280.94	99.73	2.82	270.75	103.70	2.61	266.67	107.67	2.48
20	304.08	99.37	3.06	297.25	102.31	2.91	286.24	106.48	2.69	/	/	/
25	320.39	101.95	3.14	313.56	104.89	2.99	/	/	/	/	/	/

Abbreviations:

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

LWT: Leaving water temperature (°C)

CC: Total cooling capacity (kW)

PI: Power input (kW)

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

6 Performance Adjustment Factors

6.1 Ethylene and Propylene Glycol factors

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

- The ambient temperature is below 0 °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.

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	0.984	1.343	1.075	-14.1
40	0.969	0.981	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	1.006	-3
20	0.975	0.985	1.121	1.009	-7
30	0.962	0.978	1.420	1.020	-13
40	0.946	0.971	1.716	1.036	-22
50	0.929	0.929	2.223	1.061	-35

6.2 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.

6.3 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. Maximum allowable altitude is 1800 meters.

6.4 Fouling factor

Fouling refers to the accumulation of unwanted material on solid surfaces, most often in an aquatic environment. The fouling material can consist of either living organisms (biofouling) or a non-living substance (inorganic or organic). Fouling is usually distinguished from other surface-growth phenomena in that it occurs on a surface of a component, system or plant performing a defined and useful function, and that the fouling process impedes or interferes with this function.

Other terms used in the literature to describe fouling include: deposit formation, encrustation, crudding, deposition, scaling, scale formation, slagging, and sludge formation. The last six terms have a more narrow meaning than fouling within the scope of the

fouling science and technology, and they also have meanings outside of this scope; therefore, they should be used with caution.

Fouling phenomena are common and diverse, ranging from fouling of ship hulls, natural surfaces in the marine environment (marine fouling), fouling of heat-transfer components through ingredients contained in the cooling water or gases, and even the development of plaque or calculus on teeth, or deposits on solar panels on Mars, among other examples.

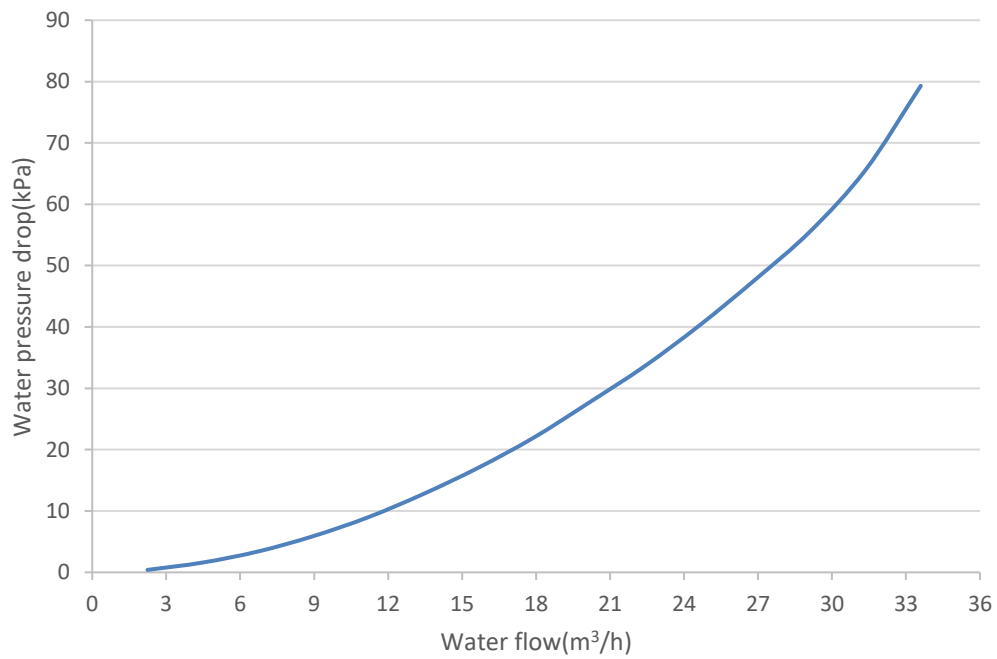
Foreign matter in the chilled water system will adversely affect the heat transfer capability of the evaporator, and could increase the pressure drop and reduce the water flow. To provide optimum unit operation, proper water treatment must be maintained. Refer to the table as following.

ALTITUDE (m)	Difference of water inlet and outlet temp. (°C)	Fouling Factor							
		0.018 m ² . °C /kW		0.044 m ² . °C /kW		0.086 m ² . °C /kW		0.172 m ² . °C /kW	
		C	P	C	P	C	P	C	P
Sea level	3	1.036	1.077	1.019	1.076	0.991	0.975	0.963	0.983
	4	1.039	1.101	1.022	1.080	0.994	0.996	0.971	0.984
	5	1.045	1.105	1.028	1.086	1.000	1.000	0.977	0.989
	6	1.051	1.109	1.034	1.093	1.006	1.004	0.983	0.994
600	3	1.024	1.087	1.008	1.064	0.980	0.984	0.951	0.991
	4	1.027	1.111	1.011	1.068	0.983	1.005	0.959	0.992
	5	1.034	1.115	1.017	1.074	0.989	1.009	0.965	0.997
	6	1.043	1.115	1.026	1.084	0.998	1.009	0.973	0.999
1200	3	1.013	1.117	0.996	1.052	0.969	1.011	0.942	1.002
	4	1.015	1.118	0.998	1.055	0.971	1.012	0.948	1.003
	5	1.023	1.122	1.006	1.063	0.979	1.015	0.955	1.005
	6	1.031	1.125	1.015	1.072	0.987	1.018	0.962	1.007
1800	3	1.002	1.128	0.986	1.042	0.959	1.021	0.935	1.007
	4	1.005	1.129	0.989	1.045	0.962	1.022	0.941	1.010
	5	1.012	1.132	0.995	1.051	0.968	1.024	0.945	1.012
	6	1.018	1.134	1.001	1.058	0.974	1.026	0.949	1.014

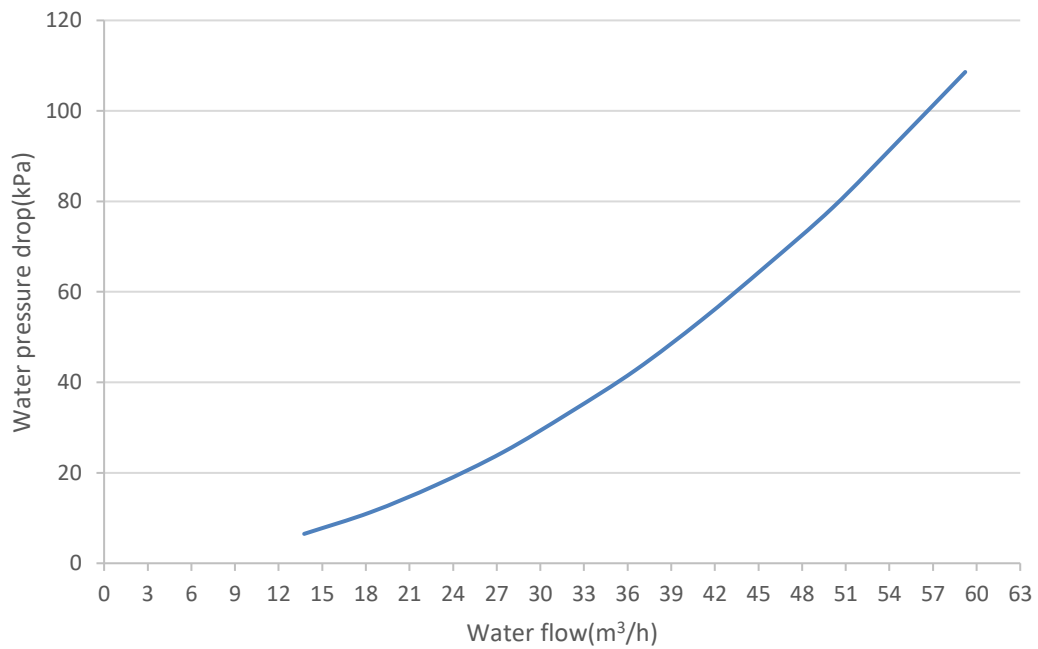
Abbreviations:
C: Cooling capacity
P: Power input

7 Hydronic Performance

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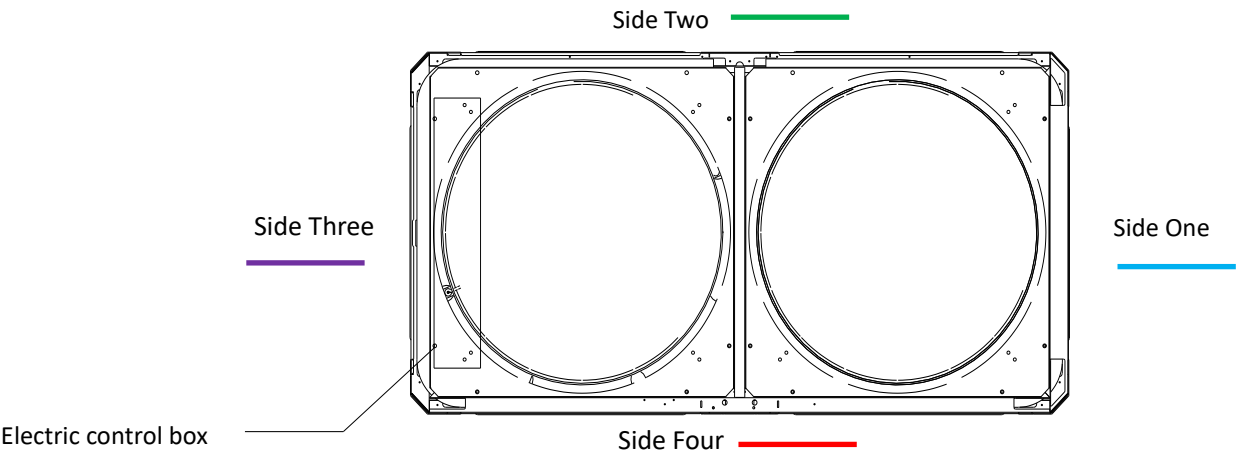


MDVM-260BR1-KS



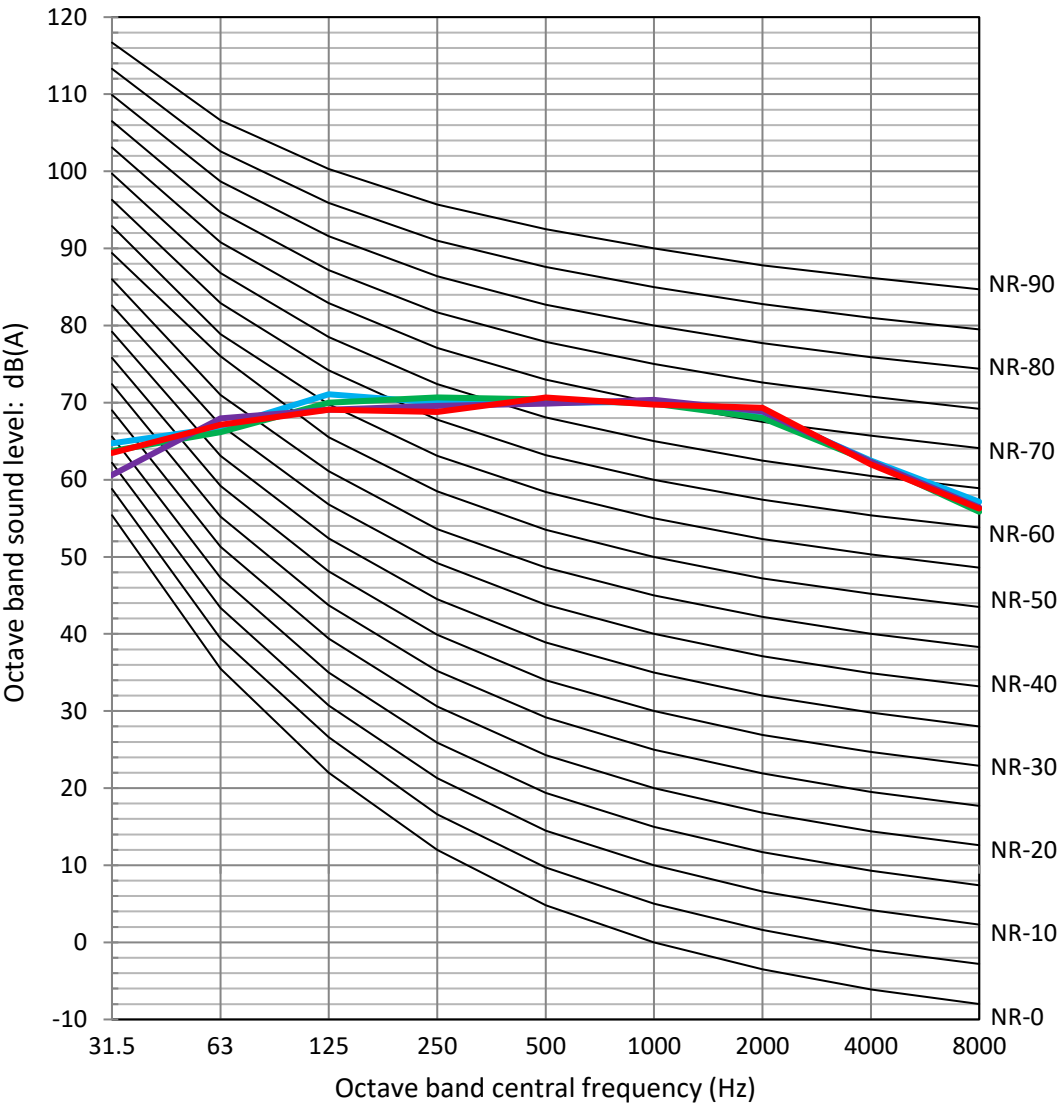
8 Octave Band Levels

Test bearing

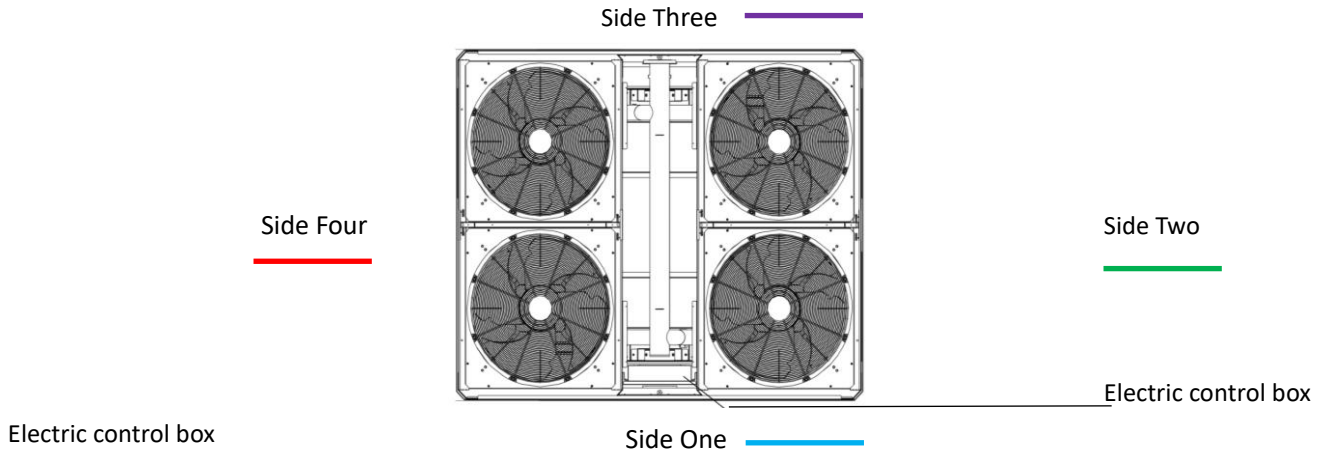


Test condition: Outdoor ambient temperature 35°C DB. EWT 12°C, LWT 7°C

MDVM-130BR1-KS

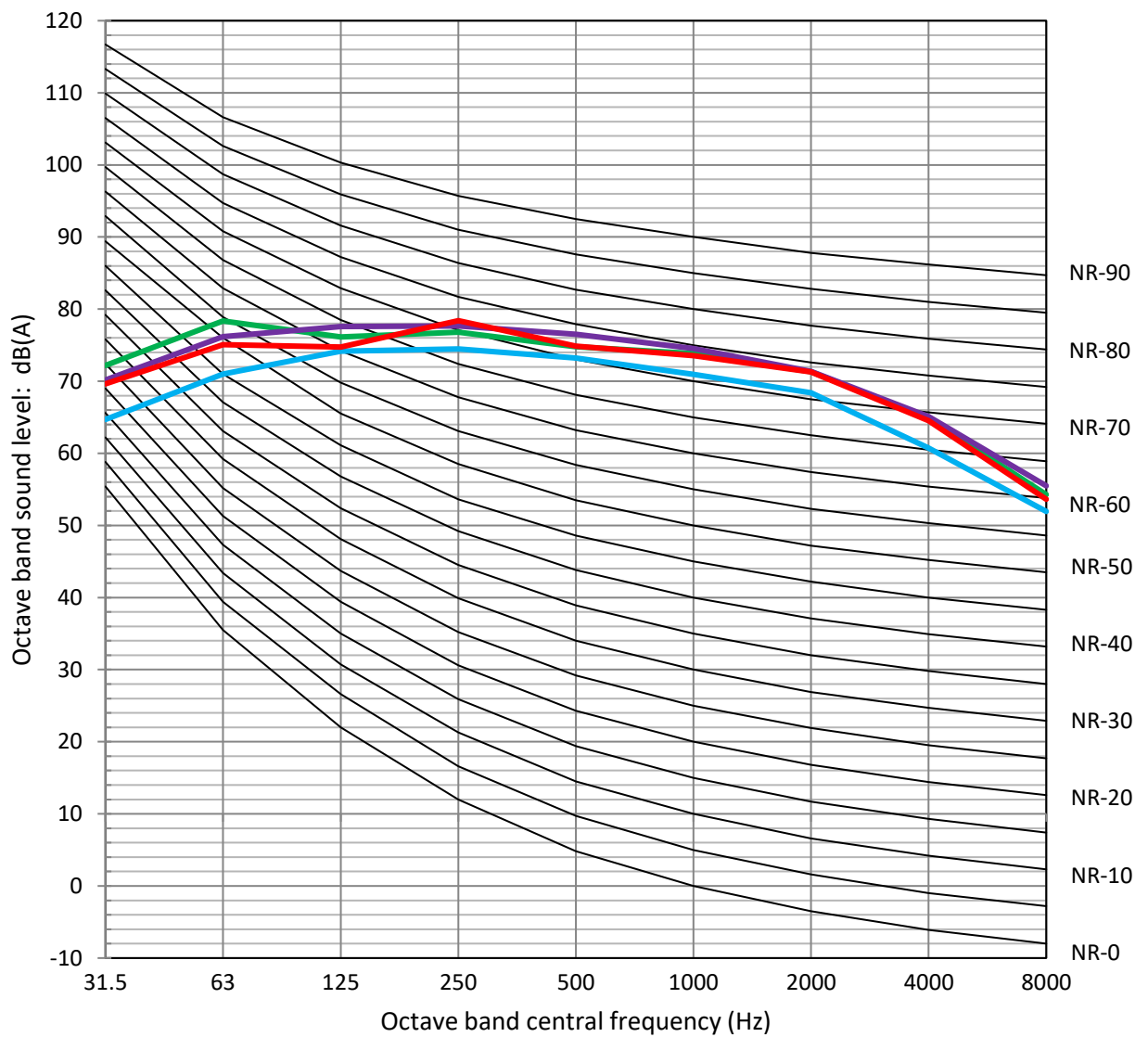


Test bearing



Test condition: Outdoor ambient temperature 35°C DB. EWT 12°C, LWT 7°C

MDVM-260BR1-KS



Part 3

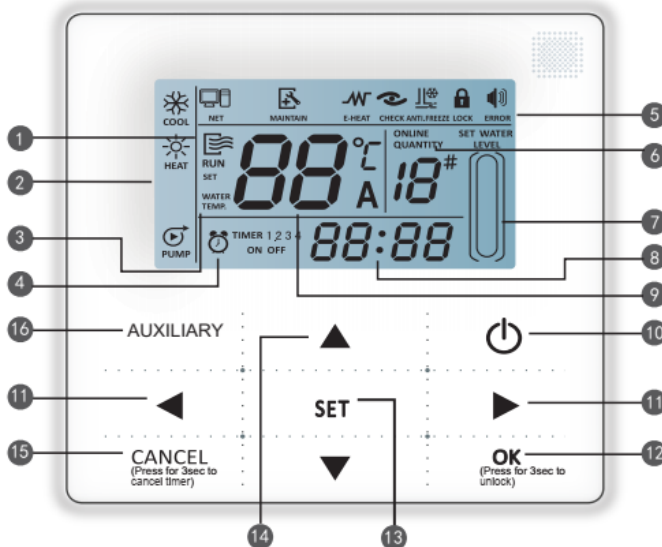
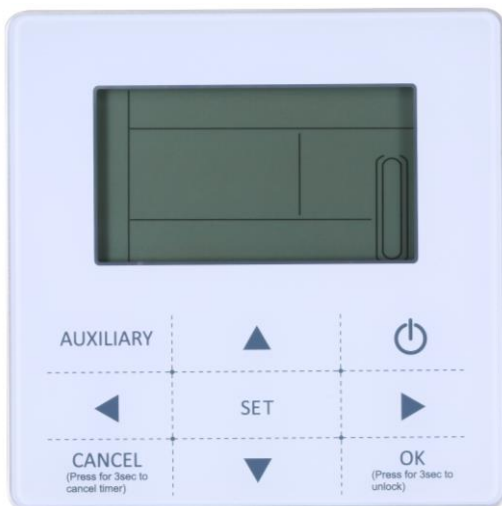
Wired Controller

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1. Specifications

Model	KJRM-120D/BMK-E(Modbus)	KJRM-120D/BMK-E
Adaptation model	MDVM-130BR1-KS / MDVM-260BR1-KS	MDVM-60BR1-PT & MDVM-180BR1-PT & MDVM-200BR1-P
Input Voltage	10V	10V
Operating environment temperature	-10°C~+43°C	-10°C~+43°C
Operating RH of wired controller	RH 40%~RH90%	RH 40%~RH90%

2. Introduction of function buttons



① **Operation icon** (RUN): Indicate the ON and OFF status; when it is ON, it will display; when it is OFF, it will disappear

② **Mode area**: Indicate the main unit operating mode;

③ **Setting temperature**: 2 statuses can be displayed - WATER TEMP. SET WATER TEMP.

④ **Timing ON/OFF indication** (TIMER 1 2 3): Indicate the timing information.

⑤ **Function icon**:

- ✧ : Display when unit connects to Modbus network;
- ✧ : Displays when unit maintenance is needed. Press and hold 'AUXILIARY' key for 3 seconds to cancel the icon and timing will restart until next maintenance.
- ✧ : Displays when electric auxiliary heating function is on.
- ✧ : Displays when check function is on.

- ✧  **ANTI.FREEZE:** Displays when ambient temperature is below 2°C which means the main unit need anti-freezing action.
- ✧  **LOCK** : Displays when no key operation for 2 minutes and all keys are locked. Press and hold 'OK' key for 3 seconds to unlock.
- ✧  **ERROR** : Displays when error or protection occurs and means the unit need maintenance by professionals.

⑥ **Online quantity indication:** Under normal status display the quantity of units connected to the wired controller; under check status display the device serial number.

⑦ **Reserved**

⑧ **Clock:** Under normal status displays clock; under timing setting displays the setting timing.

⑨ **Water temperature:** Under normal status display water temperature; under water temperature setting status displays the setting value; under check status displays check parameter.

⑩ **ON/OFF key (⏻):** Turn on and turn off functions.

⑪ **Right and left key (◀ and ▶):** Press these keys to check setting water temperature, setting timing etc; press right key to shift to the next step setting under timing setting status. Press these keys to turn over the unit parameter information under check status.

⑫ **OK key:** Press this key to confirm settings. Press and hold this key for 3 seconds to unlock under locking status.

⑬ **Setting key:** Setting water temperature, timing and mode, etc. Press and hold this key for 3 seconds to enter check status.

⑭ **Add and Reduce key (▲ and ▼):** Move up or move down values of temperature, timing, etc. Turn over #0~#15 units under check status.

⑮ **Cancel key:** Press this key to cancel parameter setting under setting status; press and hold this key for 3 seconds to cancel timing when timing is valid.

⑯ **Reserved**

3. Normal Operating Parameters

Unit in normal cooling mode operating parameters

Outdoor ambient temperature	°C	< -10	-10~0	0~15	15~30	30~43	43~48	48~52	> 52
Discharge temperature	°C	60~85	65~95	68~95	70~95	74~98	78~96	78~100	80~104
Discharge superheat	°C	22~30	27~42	28~42	27~40	28~40	22~35	18~36	18~50
Discharge pressure	Mpa	2.2~3.0	2.2~3.2	2.3~3.2	2.5~3.3	2.7~3.6	3.4~3.8	3.7~4.1	3.9~4.2
Suction pressure	Mpa	0.5~0.7	0.5~0.8	0.6~0.8	0.6~0.9	0.6~0.9	0.7~1.0	0.8~1.2	0.9~1.2
AC inverter compressor current	A	56~68	65~82	70~88	70~90	70~90	76~95	80~98	88~105

Unit in normal heating mode operating parameters

Outdoor ambient temperature	°C	< -10	-10to0	0to5	5to10	10to17	17to24	> 24
Discharge temperature	°C	66-105	70-100	70-90	74-85	70-100	68-100	65-100
Discharge superheat	°C	30-59	30-49	27-37	26-32	19-44	16-41	12-39
Discharge pressure	Mpa	2.1-2.7	2.3-3.0	2.4-3.2	2.8-3.2	3.0-3.4	3.1-3.6	3.2-3.8
Suction pressure	Mpa	0.2-0.5	0.3-0.5	0.4-0.6	0.5-0.7	0.5-0.8	0.6-0.9	0.7-1.0
AC inverter compressor current	A	54-68	60-75	68-80	70-85	78-92	83-96	86-100

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