MegaLife

Owner's Manual

Original Instructions

Direct Heating & Circulating Air Source Heat Pump Water Heater

Models:

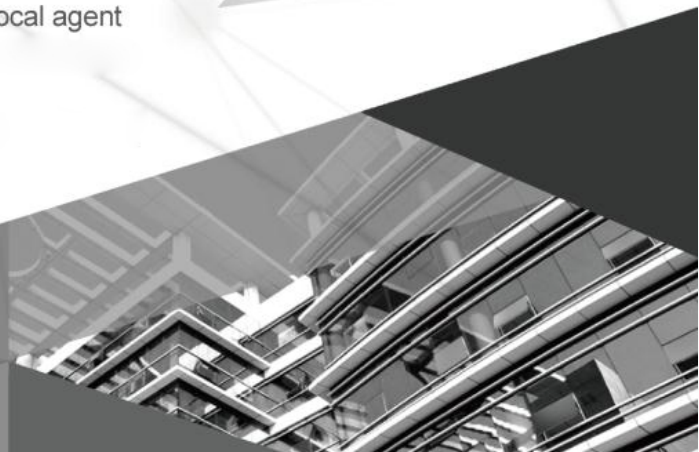
ML-RS-Dm30/NaA-M

ML-RS-Dm40/NaA-M

ML-RS-Dm60/NaA-M

Thank you for choosing commercial air conditioners. Please read this Owner’ s Manual carefully before operation and retain it for future reference.

If you have lost the Owner's Manual,please contact the local agent or visit www.megalife.ma.



To Users

Thank you for selecting our product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:

(1) This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsibility for their safety. Children should be supervised to ensure that they do not play with the appliance.

(2) In order to ensure reliability of product, the product may consume some power under stand-by status for maintaining normal communication of system and preheating refrigerant and lubricant. If the product is not to be used for long, cut off the power supply; please energize and preheat the unit in advance before reusing it.

(3) Please properly select the model according to actual using environment, otherwise it may impact the using convenience.

(4) This product has gone through strict inspection and operational test before leaving the factory. In order to avoid damage due to improper disassembly and inspection, which may impact the normal operation of unit, please do not disassemble the unit by yourself. You can contact with the special maintenance center of our company if necessary.

(5) When the product is faulted and cannot be operated, please contact with our maintenance center as soon as possible by providing the following information.

1) Contents of nameplate of product (model, cooling/heating capacity, product No., ex-factory date).

2) Malfunction status (specify the situations before and after the error occurs).

(6) All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation. We have the right to make necessary revision to the product from time to time due to the reason of sales or production, and reserve the right to revise the contents without further notice.

(7) The final right to interpret for this instruction manual belongs to ML Electronics.

Exception Clauses

Manufacturer will bear no responsibilities when personal injury or property loss is caused by the following reasons:

(1) Damage the product due to improper use or misuse of the product;

(2) Alter, change, maintain or use the product with other equipment without abiding by the instruction manual of manufacturer;

(3) After verification, the defect of product is directly caused by corrosive gas;

(4) After verification, defects are due to improper operation during transportation of product;

(5) Operate, repair, maintain the unit without abiding by instruction manual or related regulations;

(6) After verification, the problem or dispute is caused by the quality specification or performance of parts and components that produced by other manufacturers;

(7) The damage is caused by natural calamities, bad using environment or force majeure.

Contents

1 Safety Notices (Please be sure to abide)

Warning: If not abide strictly, it may cause severe damage to the unit or the people.

Note: If not abide strictly, it may cause slight or medium damage to the unit or the people.

This sign indicates that the operation must be prohibited. Improper operation may cause severe damage or death to people.

This sign indicates that the items must be observed. Improper operation may cause damage to people or property.

WARNING!

This product can't be installed at corrosive , inflammable or explosive environment or the place with special requirements, such as kitchen. Otherwise, it will affect the normal operation or shorten the service life of the unit, or even cause fire hazard or serious injury. As for above special places, please adopt special air conditioner with anti-corrosive or anti-explosion function .

WARNING!

(1) Installation work must be conducted by the appointed maintenance center. Improper installations might cause water leakage, electric shock, fire and other accidents.
(2) Be sure not to store or use dangerous materials such as flammable, explosive and poisonous objects near the unit.
(3) Turn off the main power of the water heater immediately upon malfunction (such as combustion is smelled and so on).
(4) Do not insert your fingers or other objects into the air outlet or air-in grille.
(5) Do not start or stop the unit through the way of inserting or pull out power cord.
(6) Do not refit, repair or move the unit. If it needs to be repaired, please contact dealer or professional installer.
(7) Earthing device must be set for hot water unit, heating water tank, thermal storage water tank, water pump and system pipe network.

Note:

(1) Before installation, please check whether the power is consist with that required on the nameplate, and then check the safety of the power.
(2) Before operation, please check and confirm whether electric wires and water pipes are connected correctly for preventing water leakage, electric shock, fire hazard and other accidents.
(3) The power socket must be equipped with earthing wire for ensuring reliable grounding for unit and preventing electric shock. Do not connect earthing wire to gas pipe, tap water pipe, lightening conductor or telephone wires.
(4) Do not operate the unit with wet hands. Do not let children play with the unit.

(5) Turn on or turn off the unit in this instruction manual is turning on or turning off the controller; Cut off the power indicates stop supplying power to the unit.
(6) Do not expose this unit in damp environment directly.
(7) If the outdoor ambient temperature is low in winter, do not cut off the power after stop operation. Otherwise, freeze prevention protection will be invalid.
(8) If the unit won't be used for a long time, please drain the residual water inside unit, water tank and pipeline through drainage valve.
(9) Please conduct leakage inspection after installation.

2 Product Type

Series name	Model	Heating capacity (kW)	Appearance
Direct Heating & Circulating Air Source Heat Pump Water Heater	ML- RS-Dm30/NaA-M	31	
	ML-RS-Dm40/NaA-M	40	
	ML-RS-Dm60/NaA-M	60	

3 Nomenclature

ML-RS	-	□	□	□				/			-	
1		2	3	4	5	6	7		8	9		10

SN	Description	Options
1	Product code	ML- RS—Export heat pump water heater
2	Heating method	D—Direct heating;C—Circulating heating;S—Static heating; Dm-Direct heating modular ; Cm- Circulating modular
3	Functions	Q—Multifunctional;Null for single function
4	Heating capacity code	Nominal heating capacity(Unit:kW)
5	Inverter system	Pd—DC inverter;Null for fixed speed
6	Water tank mode	E—100L;F—150L;G—200L;H—250L;Null in case of no water tank
7	Climate condition	Null for T1;T2-Low temp;T3-High temp
8	Refrigerant	Null for R22;R407c—N;R410A—Na;R134a—Nb;R417A—Ne
9	Design number	A,B,C…or A1,A2…,B1,B2…
10	Power supply	M:380-415V 3N~50Hz

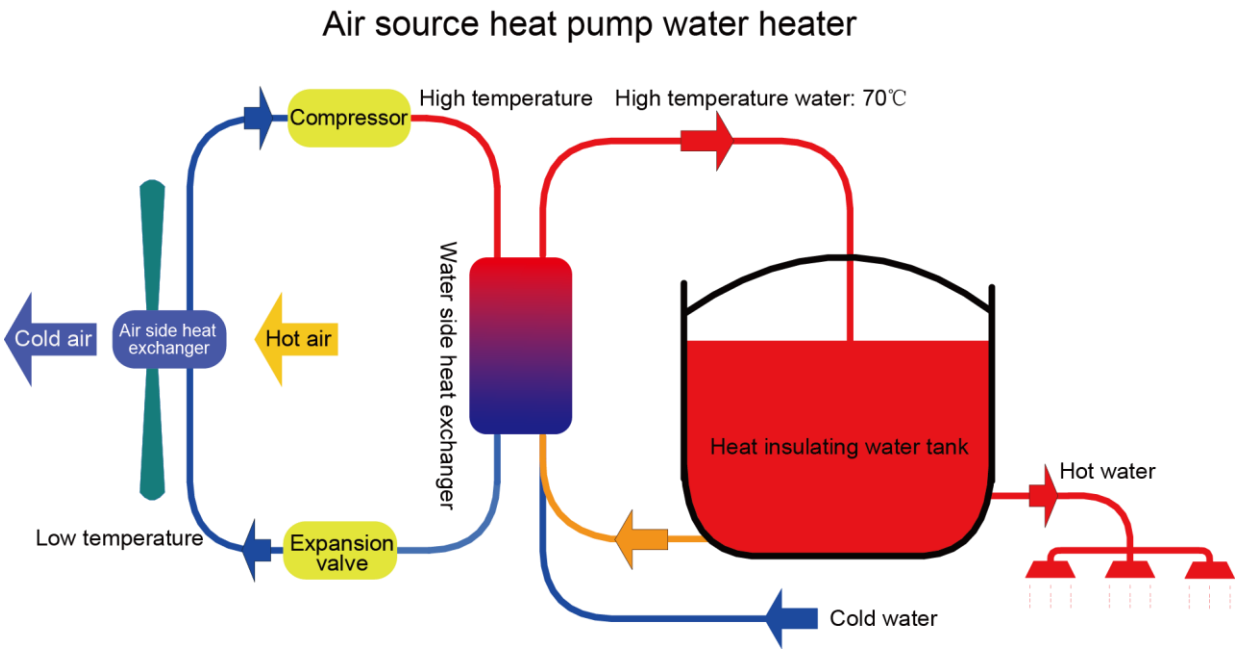
Example: ML- RS-Dm40/NaA-M means direct heating modular fixed-speed heat pump water heater, without water tank, heating capacity of 40kW, refrigerant of R410A, rated voltage of 380-415V 3N/50Hz and applicable for T1 climate.

4 Operating Principle

4.1 Operating Principle

Air source heat pump water heater is developed based on the principle of reverse Carnot cycle. Driven by a small amount of electricity, with refrigerant as the carrier, it can continuously absorb low grade heat (-26°C~46°C) in the air, and then transform the heat into usable high grade heat, which will be released into water so as to generate domestic hot water (Default temperature is 55°C, and maximum temperature is 70°C), which will be carried by the hot water pipes to users.

4.2 System Diagram



Notices:

Generally, air source heat pump water heating system is composed of direct recurrent model water heater and insulating water tank, including auxiliary devices such as connecting pipes, water pumps, valves and so on.

Air source heat pump water heater mainly consists of compressor, water side heat exchanger, air side heat exchanger, throttling device, waterway regulating valves and so on.

4.3 Process Descriptions

Water heater is connected with power. Then it starts to work and enter the heating process. The low temperature and low pressure refrigerant gas is compressed into high temperature and high pressure gas after being absorbed into compressor. Then it gets into the water side heat exchanger and exchanges heat with domestic water. The refrigerant after heat exchange becomes liquid, and enters into air side heat exchanger after its pressure and temperature is lowered by electronic expansion valves. It will exchange heat with surrounding air inside the air side heat exchanger, and evaporate into low temperature and low pressure refrigerant gas, and then back to compressor for the next circulation. Meanwhile, the domestic water which exchanges heat with refrigerant inside the water side heat exchanger is heated and flows to heat insulating water tank upon driving of the water pump.

5 Technical Data Table

Model				ML-RS-Dm30/NaA-M	ML-RS-Dm40/NaA-M	ML-RS-Dm60/NaA-M
Heating capacity		kW		31	40	60
Heating power input		kW		8.1	10	15
Heating current input		A		14.5	19	28
Coefficient of performance		W/W		3.83	4	4
Rated power input		kW		10.5	13	20
Rated current input		A		20	25	35.4
Nominal hot water output		L/h		667	860	1300
Set temperature		°C		Leaving water temperature: default setting is 55°C; adjustable in range of 35°C~70°C (temperature of water leaving from unit) Water tank temperature: default setting is 46°C; adjustable in range of 30°C~51°C (heat insulating function will be activated if it is lower than the temperature)		
Power				380-415V 3N~50Hz		
Compressor	Type			Totally-enclosed vortex compressor		
	Quantiry	Unit		1	1	1
Refrigrant	Name			R410A		
	Charge	kg		3.9	4.73	6.5
Heat exchanger	Air side			Fin heat exchanger		
	Water side			Tube in tube heat exchanger		
Water System	Circulating water flow	m^3/h		5.3	6.9	10.4
	Circulating water pressure drop	kPa		120	150	120
	Permissible maximum pressure	MPa		0.8		
	Maximum Inlet water pressure	MPa		0.4		
	Minimum Inlet water pressure	MPa		0.15		
	Specification of pipe joint	Direct model inlet	inch	G 3/4	G 1	G 1-1/4
		Cyclic model inlet		G 1-1/4	G 1-1/4	G 2
		Outlet		G 1-1/4	G 1-1/4	G 2
Outline size	Width × depth ×height	mm		930×800×1605	930×800×1605	1340×800×1605
Package size	Width × depth ×height	mm		1010×865×1780	1010×865×1780	1420×880×1775
Noise		dB(A)		≤67	≤67	≤67
Unit net weight /Gross weight		kg		238/252	264/286	362/378

Remarks:

① Data in the above table are based on the following test conditions:

Outdoor ambient temperature: 20°C DB/15°C WB; Water inlet temperature: 15°C; Water outlet temperature: 55°C; Voltage: 380V 3N/50Hz.

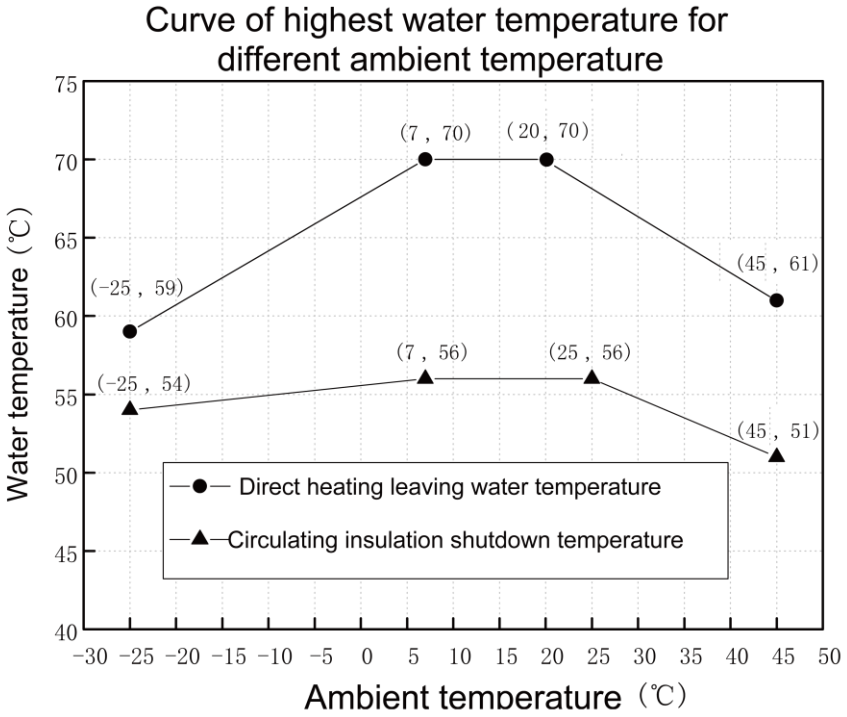
② Applicable range:ambient temperature of -26°C~46°C.

③ The above pressure values all belong to gauge pressure.

④ The listed water resistance refers to the water resistance under rated working conditions. If the ambient temperature and water inlet temperature are different, unit's hot water output will be changed accordingly, and the water resistance may be different from the listed value.

⑤ If the specifications are changed due to product improvement, please refer to parameters on the nameplate.

⑥ onsidering system's reliability and different requirements for water temperature under different ambient temperature, the highest water temperature is limited, as shown in the following curve:



⑦ Circulating water flow means the rated flow during the heating operation. When selecting the water pump model, it shall refer to the flow after overcoming the water resistance, that is, the flow of corresponding delivery lift, rather than the maximum flow labeled in the nameplate of water pump.

6 Capacity Correction Chart

model	Water inlet temperature(°C)		Circulating water flow 5.3m^3/h,Outdoor ambient temperature(DB/WB °C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm30/NaA-M	Heating Capacity(kW)	40	9.71	15.55	21.98	28.12	33.00	32.67	36.28
		45	9.51	15.49	21.95	27.86	32.47	32.45	36.25
		50	9.23	15.02	21.79	27.41	31.85	32.17	36.01
	Heating Power Input(kW)	40	6.11	7.35	7.18	7.61	7.96	7.39	7.74
		45	6.53	8.05	8.10	8.41	8.60	8.10	8.41
		50	6.85	8.42	9.04	9.31	9.30	8.78	9.07
	Coefficient of performance (W/W)	40	1.59	2.12	3.06	3.69	4.15	4.42	4.69
		45	1.46	1.92	2.71	3.31	3.78	4.01	4.31
		50	1.35	1.78	2.41	2.94	3.43	3.66	3.97

model	Water outlet temperature(°C)		Circulating water flow 5.3m^3/h,Outdoor ambient temperature(DB/WB °C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm30/NaA-M	Heating Capacity(kW)	45	9.51	15.43	22.35	28.02	33.00	32.49	36.70
		50	9.51	15.41	22.10	27.86	32.47	32.45	36.42
		55	9.27	15.20	21.96	27.72	31.85	32.04	36.03
	Heating Power Input(kW)	45	6.60	7.67	8.29	7.61	7.96	7.36	7.57
		50	7.33	8.52	8.99	8.41	8.60	8.10	8.28
		55	7.17	9.05	10.13	9.31	9.30	8.72	8.98
	Coefficient of Performance (W/W)	45	1.44	2.01	2.69	3.69	4.15	4.42	4.85
		50	1.30	1.81	2.46	3.31	3.78	4.01	4.40
		55	1.29	1.68	2.17	2.94	3.43	3.68	4.01

model	Water inlet temperature(°C)		Water outlet temperature 50°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm30/NaA-M	Heating Capacity(kW)	9	9.50	16.46	23.20	30.61	34.59	33.97	40.87
		15	9.06	16.56	23.49	31.03	34.76	34.31	40.07
		20	9.18	16.44	23.35	31.13	33.65	34.13	41.33
		25	9.27	15.78	23.34	31.45	34.27	33.09	41.16
	Heating Power Input(kW)	9	6.06	7.05	7.02	7.26	7.64	7.01	7.06
		15	6.21	7.00	7.34	7.69	7.71	7.12	7.14
		20	6.38	7.33	7.41	7.73	7.75	7.19	7.23
		25	6.68	7.30	7.46	7.74	8.12	7.28	7.39
	Coefficient of performance (W/W)	9	1.57	2.33	3.31	4.22	4.53	4.84	5.79
		15	1.46	2.37	3.20	4.04	4.51	4.82	5.61
		20	1.44	2.24	3.15	4.03	4.34	4.75	5.72
		25	1.39	2.16	3.13	4.06	4.22	4.54	5.57

model	Water inlet temperature(°C)		Water outlet temperature 55°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm30/NaA-M	Heating Capacity(kW)	9	9.21	16.38	23.32	30.55	34.60	34.36	40.94
		15	9.40	16.38	23.90	30.95	34.12	34.02	40.32
		20	9.49	16.23	23.28	31.22	33.68	33.81	41.01
		25	9.18	15.81	23.39	31.57	34.47	33.32	41.01
	Heating Power Input(kW)	9	6.39	7.45	7.66	7.84	8.24	7.63	7.57
		15	6.61	7.33	7.85	8.08	8.26	7.69	7.74
		20	6.70	7.65	8.03	8.19	8.32	7.82	7.81
		25	7.06	7.71	8.05	8.32	8.66	7.85	7.99
	Coefficient of performance (W/W)	9	1.44	2.20	3.04	3.90	4.20	4.50	5.41
		15	1.42	2.24	3.04	3.83	4.13	4.43	5.21
		20	1.42	2.12	2.90	3.81	4.05	4.32	5.25
		25	1.30	2.05	2.91	3.80	3.98	4.25	5.13

model	Water inlet temperature(°C)		Water outlet temperature 60°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm30/NaA-M	Heating Capacity(kW)	9	9.46	16.19	23.60	30.29	34.63	34.14	/
		15	9.33	16.17	23.71	31.00	34.01	34.44	/
		20	9.62	16.47	23.26	31.27	33.79	34.07	/
		25	9.39	15.97	23.44	31.84	34.56	33.46	/
	Heating Power Input(kW)	9	6.79	7.80	8.17	8.43	8.80	8.28	/
		15	7.01	7.67	8.50	8.71	8.84	8.24	/
		20	7.03	7.93	8.58	8.88	8.84	8.43	/
		25	7.42	8.01	8.63	8.89	9.27	8.34	/
	Coefficient of performance (W/W)	9	1.39	2.07	2.89	3.59	3.93	4.13	/
		15	1.33	2.11	2.79	3.56	3.85	4.18	/
		20	1.37	2.08	2.71	3.52	3.82	4.04	/
		25	1.27	1.99	2.72	3.58	3.73	4.01	/

model	Water inlet temperature(°C)		Water outlet temperature 65°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm30/NaA-M	Heating Capacity(kW)	9	/	/	23.56	30.84	/	/	/
		15	/	/	23.98	30.74	/	/	/
		20	/	/	23.22	31.59	/	/	/
		25	/	/	23.33	31.39	/	/	/
	Heating Power Input(kW)	9	/	/	8.69	9.06	/	/	/
		15	/	/	9.05	9.26	/	/	/
		20	/	/	9.08	9.43	/	/	/
		25	/	/	9.25	9.49	/	/	/
	Coefficient of performance (W/W)	9	/	/	2.71	3.41	/	/	/
		15	/	/	2.65	3.32	/	/	/
		20	/	/	2.56	3.35	/	/	/
		25	/	/	2.52	3.31	/	/	/

model	Water inlet temperature(°C)		Water outlet temperature 70°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm30/NaA-M	Heating Capacity(kW)	9	/	/	23.35	30.66	/	/	/
		15	/	/	23.69	31.21	/	/	/
		20	/	/	23.63	31.07	/	/	/
		25	/	/	23.27	31.72	/	/	/
	Heating Power Input(kW)	9	/	/	9.24	9.60	/	/	/
		15	/	/	9.55	9.86	/	/	/
		20	/	/	9.63	10.05	/	/	/
		25	/	/	9.78	10.05	/	/	/
	Coefficient of performance (W/W)	9	/	/	2.53	3.19	/	/	/
		15	/	/	2.48	3.17	/	/	/
		20	/	/	2.45	3.09	/	/	/
		25	/	/	2.38	3.16	/	/	/

model	Water inlet temperature(°C)		Circulating water flow 6.9m^3/h,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm40/NaA-M	Heating Capacity(kW)	40	13.36	19.99	29.38	36.87	43.66	43.41	47.66
		45	13.48	20.33	28.69	35.95	42.81	42.83	47.22
		50	13.21	19.86	27.87	34.78	41.95	41.20	46.73
	Heating Power Input(kW)	40	8.29	9.24	9.36	9.50	9.95	9.29	9.71
		45	9.25	10.37	10.25	10.30	10.72	10.07	10.51
		50	9.99	10.98	11.31	11.11	11.55	10.92	11.40
	Coefficient of performance (W/W)	40	1.61	2.16	3.14	3.88	4.39	4.67	4.91
		45	1.46	1.96	2.80	3.49	3.99	4.25	4.49
		50	1.32	1.81	2.46	3.13	3.63	3.77	4.10

model	Water outlet temperature(°C)		Circulating water flow 6.9m^3/h,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm40/NaA-M	Heating Capacity(kW)	45	13.10	20.60	27.34	36.87	43.66	43.41	47.75
		50	13.47	19.46	28.28	35.95	42.81	42.83	47.31
		55	13.60	19.82	27.92	34.78	41.95	41.20	46.82
	Heating Power Input(kW)	45	8.84	9.99	9.95	9.50	9.95	9.29	9.54
		50	9.79	10.46	10.60	10.30	10.72	10.07	10.34
		55	10.66	11.63	12.39	11.11	11.55	10.92	11.23
	Coefficient of performance (W/W)	45	1.48	2.06	2.75	3.88	4.39	4.67	5.01
		50	1.38	1.86	2.67	3.49	3.99	4.25	4.58
		55	1.28	1.70	2.25	3.13	3.63	3.77	4.17

model	Water inlet temperature(°C)		Water outlet temperature 50°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm40/NaA-M	Heating Capacity(kW)	9	12.93	22.65	32.41	40.45	46.79	46.86	52.58
		15	13.39	22.80	33.23	40.25	46.83	46.05	51.21
		20	13.37	22.53	32.62	39.71	47.20	45.94	51.58
		25	13.24	21.82	32.35	39.21	46.74	45.52	51.12
	Heating Power Input(kW)	9	7.99	8.86	8.97	9.20	9.60	8.79	8.94
		15	8.15	8.88	9.17	9.31	9.70	9.06	9.03
		20	8.29	9.08	9.37	9.60	9.77	9.16	9.22
		25	8.47	9.23	9.52	9.58	9.95	9.39	9.37
	Coefficient of performance (W/W)	9	1.62	2.56	3.61	4.40	4.87	5.33	5.88
		15	1.64	2.57	3.62	4.32	4.83	5.08	5.67
		20	1.61	2.48	3.48	4.14	4.83	5.02	5.59
		25	1.56	2.36	3.40	4.09	4.70	4.85	5.46

model	Water inlet temperature(°C)		Water outlet temperature 55°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm40/NaA-M	Heating Capacity(kW)	9	12.61	22.47	34.10	40.43	46.16	46.08	52.10
		15	13.18	22.21	33.49	40.22	46.20	45.01	51.21
		20	13.08	22.10	32.47	39.33	46.46	45.20	51.27
		25	13.03	21.79	32.46	39.18	45.77	45.20	50.80
	Heating Power Input(kW)	9	8.33	9.23	9.51	9.75	10.15	9.37	9.46
		15	8.49	9.32	9.76	9.88	10.29	9.58	9.57
		20	8.68	9.44	9.96	10.12	10.33	9.72	9.74
		25	8.84	9.53	9.98	10.18	10.56	9.77	9.94
	Coefficient of performance (W/W)	9	1.51	2.41	3.59	4.15	4.55	4.92	5.51
		15	1.55	2.38	3.43	4.07	4.49	4.70	5.35
		20	1.51	2.34	3.26	3.89	4.50	4.65	5.26
		25	1.47	2.29	3.25	3.85	4.33	4.63	5.11

model	Water inlet temperature(°C)		Water outlet temperature 60°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm40/NaA-M	Heating Capacity(kW)	9	/	21.80	33.91	40.33	45.28	45.03	/
		15	/	21.80	32.99	40.23	45.70	44.47	/
		20	/	21.70	32.82	40.05	45.57	44.56	/
		25	/	20.85	32.61	39.13	44.94	44.39	/
	Heating Power Input(kW)	9	/	9.60	10.12	10.26	10.76	9.96	/
		15	/	9.85	10.36	10.41	10.91	10.18	/
		20	/	9.80	10.55	10.60	10.94	10.20	/
		25	/	9.96	10.74	10.92	11.08	10.28	/
	Coefficient of performance (W/W)	9	/	3.23	3.35	3.93	4.21	4.52	/
		15	/	2.21	3.18	3.86	4.19	4.37	/
		20	/	2.21	3.11	3.78	4.17	4.37	/
		25	/	2.09	3.04	3.58	4.06	4.32	/

model	Water inlet temperature(°C)		Water outlet temperature 65°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm40/NaA-M	Heating Capacity(kW)	9	/	/	33.97	40.37	/	/	/
		15	/	/	33.46	40.19	/	/	/
		20	/	/	33.16	39.68	/	/	/
		25	/	/	32.53	39.11	/	/	/
	Heating Power Input(kW)	9	/	/	10.74	10.80	/	/	/
		15	/	/	10.90	11.01	/	/	/
		20	/	/	11.05	11.22	/	/	/
		25	/	/	11.23	11.50	/	/	/
	Coefficient of performance (W/W)	9	/	/	3.16	3.74	/	/	/
		15	/	/	3.07	3.65	/	/	/
		20	/	/	3.00	3.54	/	/	/
		25	/	/	2.90	3.40	/	/	/

model	Water inlet temperature(°C)		Water outlet temperature 70°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm40/NaA-M	Heating Capacity(kW)	9	/	/	32.51	40.35	/	/	/
		15	/	/	33.35	40.15	/	/	/
		20	/	/	32.52	39.47	/	/	/
		25	/	/	32.36	39.07	/	/	/
	Heating Power Input(kW)	9	/	/	11.34	11.30	/	/	/
		15	/	/	11.52	11.63	/	/	/
		20	/	/	11.60	11.78	/	/	/
		25	/	/	11.80	12.32	/	/	/
	Coefficient of performance (W/W)	9	/	/	2.87	3.57	/	/	/
		15	/	/	2.89	3.45	/	/	/
		20	/	/	2.80	3.35	/	/	/
		25	/	/	2.74	3.17	/	/	/

model	Water inlet temperature(°C)		Circulating water flow 10.4m^3/h,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm60/NaA-M	Heating Capacity(kW)	40	19.20	28.04	40.52	52.53	61.92	60.96	64.68
		45	19.23	27.87	40.23	51.78	61.00	60.44	64.44
		50	19.17	27.71	39.69	50.85	59.54	59.30	64.03
	Heating Power Input(kW)	40	12.68	13.49	13.32	13.83	14.38	13.33	13.85
		45	14.15	14.85	14.84	15.24	15.39	14.51	15.14
		50	15.66	16.11	16.67	16.86	16.66	16.06	16.57
	Coefficient of performance (W/W)	40	1.51	2.08	3.04	3.80	4.31	4.57	4.67
		45	1.36	1.88	2.71	3.40	3.96	4.17	4.26
		50	1.22	1.72	2.38	3.02	3.57	3.69	3.86

model	Water outlet temperature(°C)		Circulating water flow 10.4m^3/h,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm60/NaA-M	Heating Capacity(kW)	45	19.26	27.65	40.62	52.53	61.92	60.96	64.68
		50	19.20	27.51	40.45	51.78	61.00	60.44	64.44
		55	19.02	27.49	40.27	50.85	59.54	59.30	64.03
	Heating Power Input(kW)	45	14.24	14.12	15.16	13.83	14.38	13.33	13.85
		50	15.65	15.49	16.28	15.24	15.39	14.51	15.14
		55	15.64	17.13	18.63	16.86	16.66	16.06	16.57
	Coefficient of performance (W/W)	45	1.35	1.96	2.68	3.80	4.31	4.57	4.67
		50	1.23	1.78	2.48	3.40	3.96	4.17	4.26
		55	1.22	1.60	2.16	3.02	3.57	3.69	3.86

model	Water inlet temperature(°C)		Water outlet temperature 50°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm60/NaA-M	Heating Capacity(kW)	9	19.66	28.71	47.60	59.35	67.57	66.60	72.50
		15	19.54	27.37	48.08	59.31	67.42	67.18	72.39
		20	19.51	28.37	47.89	59.16	67.33	67.00	72.43
		25	19.48	28.33	47.81	59.26	67.05	66.96	72.32
	Heating Power Input(kW)	9	10.58	11.66	13.03	13.70	13.99	13.67	13.73
		15	10.72	11.81	13.22	13.81	14.13	13.89	13.94
		20	10.89	11.95	13.37	13.96	14.30	14.04	14.12
		25	11.03	12.12	13.49	14.15	14.44	14.20	14.28
	Coefficient of performance (W/W)	9	1.86	2.46	3.65	4.33	4.83	4.87	5.28
		15	1.82	2.32	3.64	4.30	4.77	4.84	5.19
		20	1.79	2.37	3.58	4.24	4.71	4.77	5.13
		25	1.77	2.34	3.54	4.19	4.64	4.72	5.06

model	Water inlet temperature(°C)		Water outlet temperature 55°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm60/NaA-M	Heating Capacity(kW)	9	19.66	28.78	48.28	59.60	67.62	67.26	72.66
		15	19.56	28.67	48.23	59.48	67.56	67.20	72.64
		20	19.54	28.56	48.08	59.32	67.52	67.08	72.53
		25	19.50	28.48	47.93	59.32	67.46	67.03	72.33
	Heating Power Input(kW)	9	10.99	12.06	13.73	14.40	14.68	14.37	14.43
		15	11.13	12.21	13.91	14.52	14.83	14.59	14.63
		20	11.29	12.35	14.06	14.67	15.00	14.74	14.81
		25	11.44	12.52	14.20	14.85	15.12	14.90	14.98
	Coefficient of performance (W/W)	9	1.79	2.39	3.52	4.14	4.61	4.68	5.03
		15	1.76	2.35	3.47	4.10	4.56	4.60	4.97
		20	1.73	2.31	3.42	4.04	4.50	4.55	4.90
		25	1.70	2.27	3.38	3.99	4.46	4.50	4.83

model	Water inlet temperature(°C)		Water outlet temperature 60°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm60/NaA-M	Heating Capacity(kW)	9	/	28.83	48.19	59.62	67.72	67.25	/
		15	/	28.72	48.21	59.41	67.56	67.22	/
		20	/	28.54	48.23	59.23	67.51	67.17	/
		25	/	28.46	47.94	59.23	67.46	67.14	/
	Heating Power Input(kW)	9	/	12.47	14.44	15.12	15.38	15.07	/
		15	/	12.63	14.63	15.21	15.55	15.30	/
		20	/	12.76	14.78	15.38	15.71	15.46	/
		25	/	12.94	14.91	15.55	15.84	15.62	/
	Coefficient of performance (W/W)	9	/	2.31	3.34	3.94	4.40	4.46	/
		15	/	2.27	3.30	3.91	4.35	4.39	/
		20	/	2.24	3.26	3.85	4.30	4.35	/
		25	/	2.20	3.21	3.81	4.26	4.30	/

model	Water inlet temperature(°C)		Water outlet temperature 65°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm60/NaA-M	Heating Capacity(kW)	9	/	/	48.12	59.51	/	/	/
		15	/	/	48.27	59.35	/	/	/
		20	/	/	48.21	59.31	/	/	/
		25	/	/	47.85	59.13	/	/	/
	Heating Power Input(kW)	9	/	/	15.16	15.83	/	/	/
		15	/	/	15.35	15.91	/	/	/
		20	/	/	15.50	16.11	/	/	/
		25	/	/	15.63	16.26	/	/	/
	Coefficient of performance (W/W)	9	/	/	3.17	3.76	/	/	/
		15	/	/	3.15	3.73	/	/	/
		20	/	/	3.11	3.68	/	/	/
		25	/	/	3.06	3.64	/	/	/

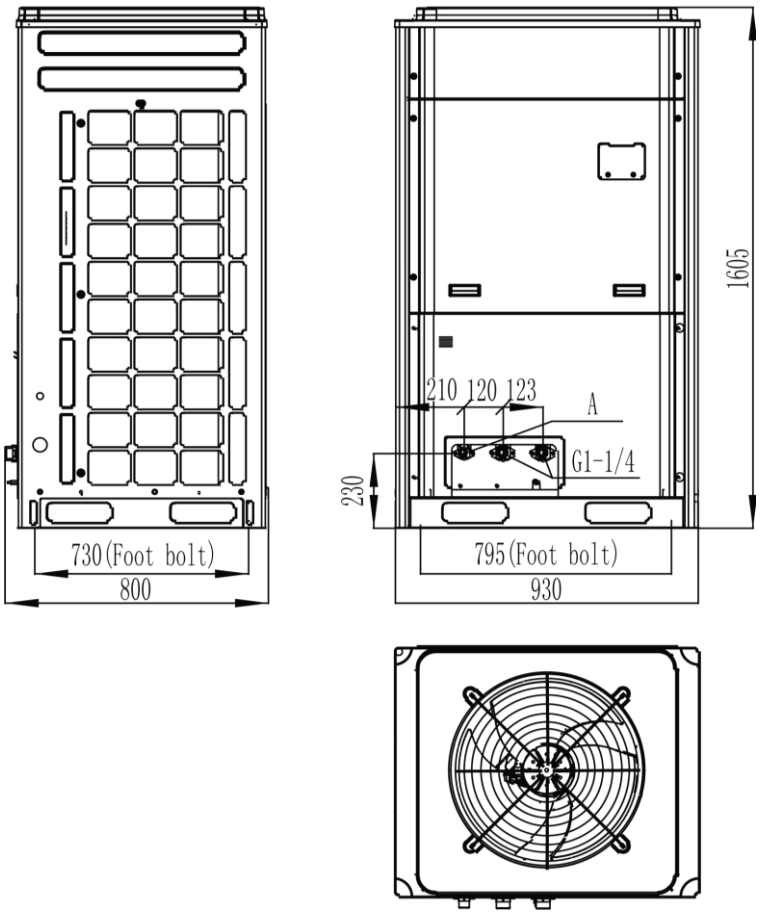
model	Water inlet temperature(°C)		Water outlet temperature 70°C,Outdoor ambient temperature(DB/WB°C)						
			-20	-7/-8	7/6	20/15	30/22	35/24	46/28
ML-RS-Dm60/ NaA-M	Heating Capacity(kW)	9	/	/	48.24	59.55	/	/	/
		15	/	/	48.13	59.38	/	/	/
		20	/	/	48.14	59.34	/	/	/
		25	/	/	47.86	59.17	/	/	/
	Heating Power Input(kW)	9	/	/	15.87	16.55	/	/	/
		15	/	/	16.05	16.63	/	/	/
		20	/	/	16.21	16.81	/	/	/
		25	/	/	16.34	16.96	/	/	/
	Coefficient of performance (W/W)	9	/	/	3.04	3.60	/	/	/
		15	/	/	3.00	3.57	/	/	/
		20	/	/	2.97	3.53	/	/	/
		25	/	/	2.93	3.49	/	/	/

7 Installation Requirements

7.1 Unit Outline Dimension and Installation Dimension

(1) Outline dimension for the installation space of ML-RS-Dm30/NaA-M, ML-RS-Dm40/NaA-M:

Unit: mm



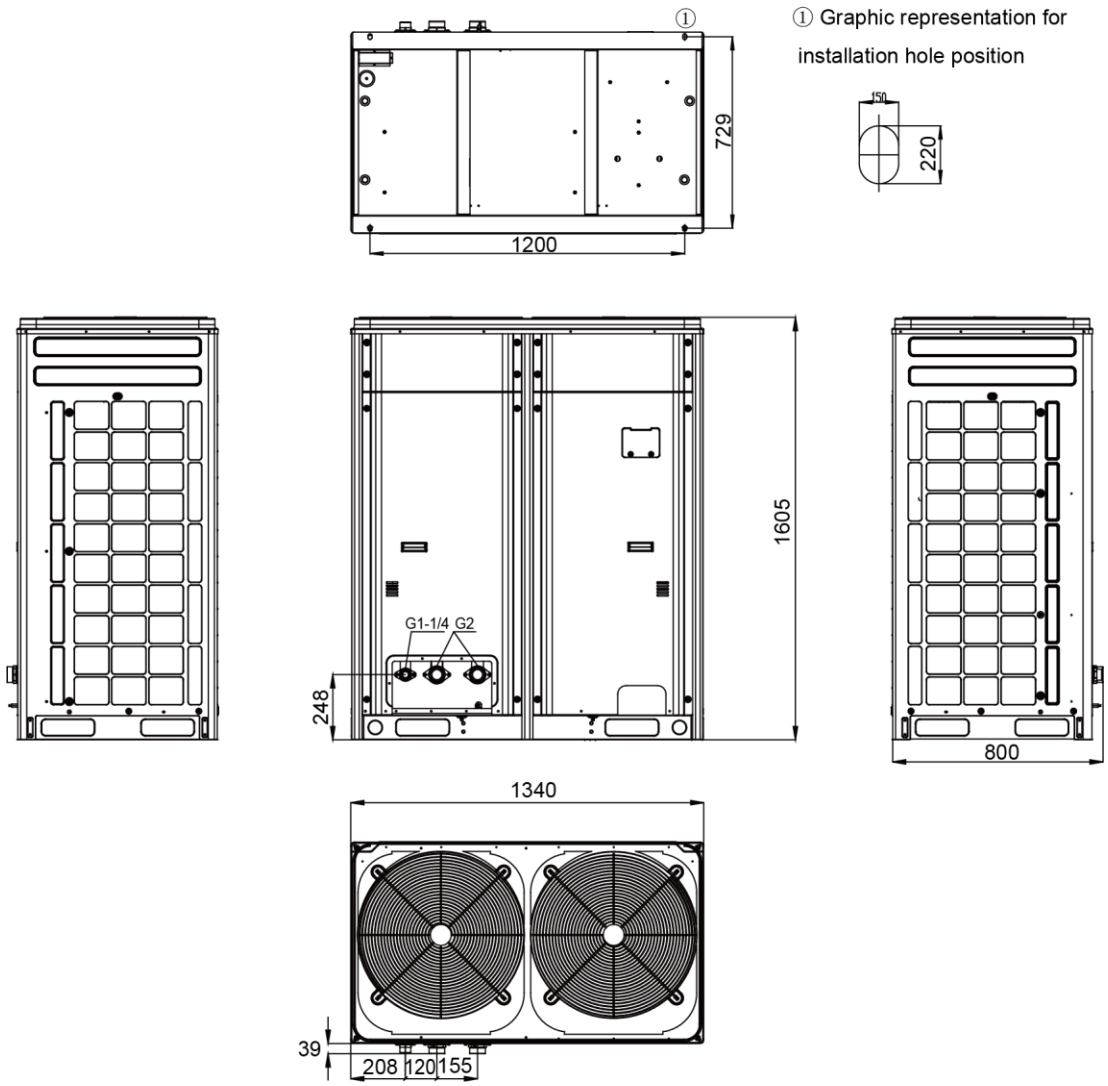
Notice:

① Pipe joint type of ML-RS-Dm30/NaA-M at location A is G3/4.

② Pipe joint type of ML-RS-Dm40/NaA-M at location A is G1.

(2) Outline size for ML-RS-Dm60/A-M.

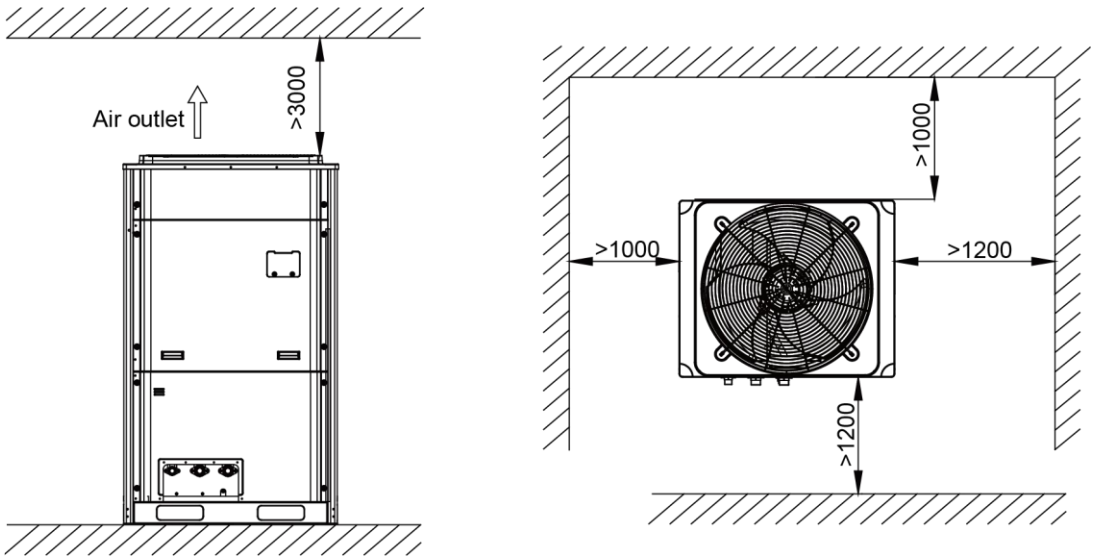
Unit: mm



7.2 Requirements for Heat Exchange and Maintenance Space

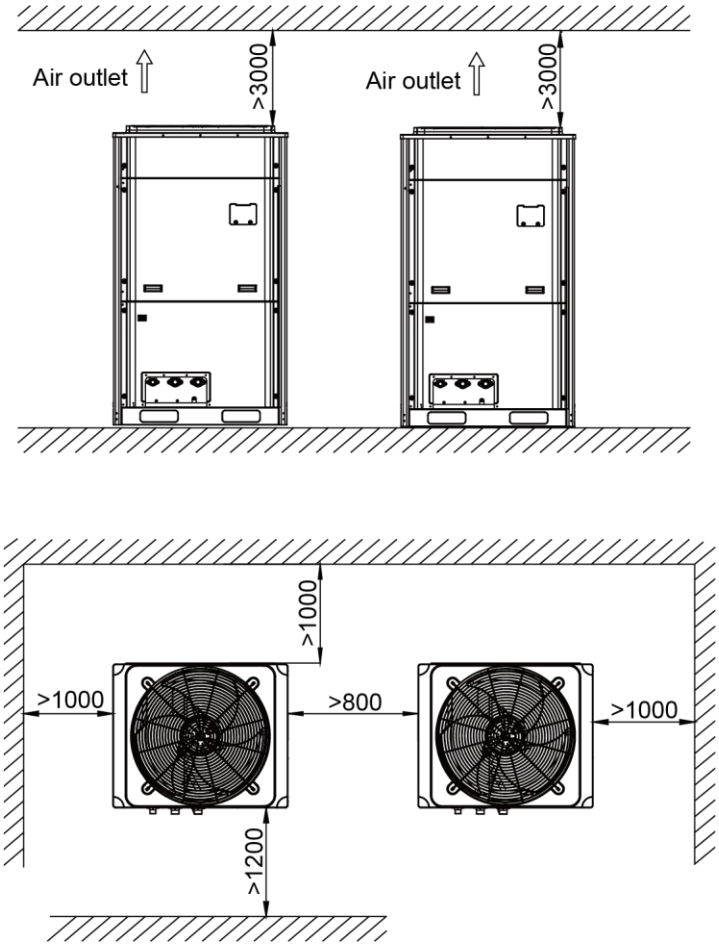
(1) Installation space for a single unit of ML-RS-Dm30/NaA-M, ML-RS-Dm40/NaA-M or ML-RS-Dm60/NaA-M.

Unit: mm



(2) Installation space for modular units of ML-RS-Dm30/NaA-M, ML-RS-Dm40/NaA-M and ML-RS-Dm60/NaA-M.

Unit: mm



7.3 Installation Notes

Notice:

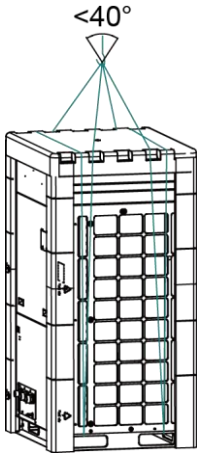
- ◆The design and installation of the project must be executed by qualified processional staff in accordance with relative laws and regulations as well as this manual.
- ◆When installing modular units, parallel connection should be adopted. Up to 16 water heaters can be connected in parallel at the same time, each of which should be installed with ball valve at the water inlet to adjust water inflow.
- ◆In different working conditions, water output would be different. As a result, please calculate and define the calibers of water outlet and inlet according to the double rated flow and recommended flow rate.

(1) Installation location:

- ◆Installation location must bear the weight of water heater. Meanwhile operation noise, discharge gas and condensate water won't affect neighbors.
- ◆Never install units at places with flammable or explosive objects, or places where explosive and flammable gas may leak out.
- ◆Never install units at places with corrosive gas, heavy dust, salt fog or oil fume.
- ◆Installation location should be well-ventilated and has enough space for air inlet and

maintenance. Make sure there is no obstacle at the air inlet or outlet and the air circulation is smooth.

◆Place that is convenient for connecting pipe and electrical system.



(2) Goods reception check:

◆Water heater should be transferred to the possibly nearest location from the installation location before taken out from package.

◆Reception check should be done after the unit arrives at the installation location.

1) Check whether the attached papers and accessories are complete.

2) Check the model number and specifications according to the attached papers.

3) Check whether the unit is damaged, whether the parts are complete and whether there is refrigerant leakage.

If there is any damage or question, please contact our company or local office in time to get a proper solution.

(3) Transporting and installation:

◆When lifting the water heater, add protection board on the surface that contacts with steel wire to avoid metal plate damage. Use two steel cables that are larger than φ6 mm and long enough to lift the unit steadily from 4 directions when transporting. The angle between the cable and the vertical direction shall not be above 20°, while the tilt angle of the water heater shall be less than 15°. Handle carefully to avoid fierce collision. The right drawing is ML-RS-Dm40/NaA-M. Other units are similar.

◆Install the water heater vertically on cement block or U-steel, and secure the supporting feet with M12 bolts. Install shock absorbing spring or rubber shock pad at the 4 corners so as to meet the requirements for noise and shock. When building the cement block, ground screws must be 50mm higher than the fixed position. Meanwhile make sure the water drainage of water tray and the drain ditch is smooth.

◆Before moving the water heater to the cement block, put on a rubber pad which is 20mm's thick to prevent shock and absorb vibration. Then move the water heater onto the cement block, with the rubber pad pressed underneath. Then fix 4 ground screws with spanner. Make sure screws are fixed tightly and the water heater is placed vertically. The tilt angle after installation is finished shall be within 5°.

◆When multiple units are installed together, make sure there is enough space for repair and heat exchange. Airflow short circuit is forbidden, because it will degrade the heating performance or even damage the units.

◆If the unit should be installsd in a place where is below 0°C or the snow will be accumulated easily for long time operation, the unit must be raised to make it at least 300 mm above the ground and ensure that the condensate water can be discharged smoothly. If necesarary, it is recommended to add the ice-melting tracing cable for the water tray, drain pipe and drainage ditch for improving the drainage effect.

◆In case that the water heater is not under the lightning protection of the building, then lightning protection measures should be taken according to the existing local national standards.

(4) Water pipe connection:

◆The design and construction of water system must comply with the current national and related design standards of water-heating system.

◆PPR pipes are recommended, yet expansion of pipe between the main unit and water tank should be considered. Please calculate and determine the calibers of water outlet and inlet for direct heat model units according to double rated flow and recommended flow rate. The table below shows the recommended specs for PPR pipes:

Inlet/outlet/circulating pipe selection for ML-RS-Dm30/NaA-M			
Unit Qty	Main inlet pipe	Main outlet pipe	Main circulating pipe
1unit	DN25	DN32	DN32
2 units in parallel	DN32	DN40	DN40
3 units in parallel	DN32	DN50	DN50
4 ~ 5 units in parallel	DN40	DN65	DN65
6 ~ 8 units in parallel	DN50	DN80	DN80
9 ~ 14 units in parallel	DN65	DN100	DN100
15 ~ 16 units in parallel	DN80	DN125	DN125

Inlet/outlet/circulating pipe selection for ML-RS-Dm40/NaA-M			
Unit Qty	Main inlet pipe	Main outlet pipe	Main circulating pipe
1unit	DN25	DN32	DN32
2 units in parallel	DN32	DN50	DN50
3 units in parallel	DN40	DN65	DN65
4 ~ 5 units in parallel	DN50	DN80	DN80
6 ~ 8 units in parallel	DN65	DN100	DN100
9 ~ 14 units in parallel	DN80	DN125	DN125
15 ~ 16 units in parallel	DN100	DN150	DN150

Inlet/outlet/circulating pipe selection for ML-RS-Dm60/NaA-M			
Unit Qty	Main inlet pipe	Main outlet pipe	Main circulating pipe
1unit	DN32	DN50	DN50
2 units in parallel	DN32	DN80	DN80
3 units in parallel	DN40	DN100	DN100
4 ~ 5 units in parallel	DN50	DN125	DN125
6 ~ 8 units in parallel	DN65	DN150	DN150
9 ~ 14 units in parallel	DN80	DN200	DN200
15 ~ 16 units in parallel	DN100	DN250	DN250

◆If pipes are made of metal such as steel or copper, the unit must be connected with PPR connecting pipes. Then connect units with metal pipes through the PPR connecting pipes.

◆Water pipes should be installed straight and plumb with appropriate pipeline arrangement to avoid possible bending.

◆Filter (above 30 mesh) must be installed at the water inlet to prevent blocking of tube in tube heat exchanger inside the unit. Clean them periodically.

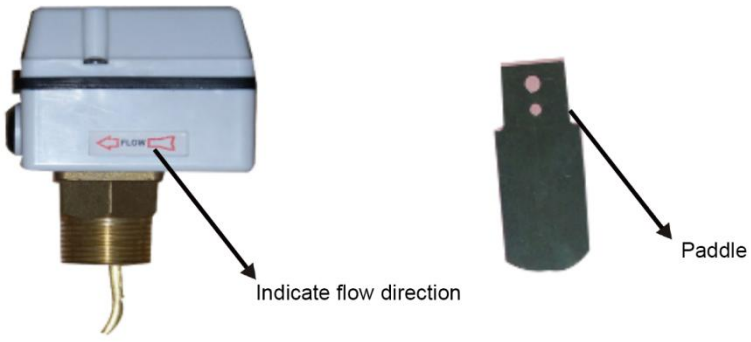
◆Usually service valve needs to be installed in front of the electromagnetic valve on the system pipeline for future maintenance. For the convenience of system cleaning, install drainage valve and discharge valve at the lowest point and the highest point of the system respectively.

When pipe connection of the water system is completed, perform water pressure leak test and drainage according to relative HVAC standards to make sure the water pipes are clean inside and without rust or dirt. Pipelines as well as the heat exchanger and water pump of the units can't be blocked; otherwise, units may get damaged.

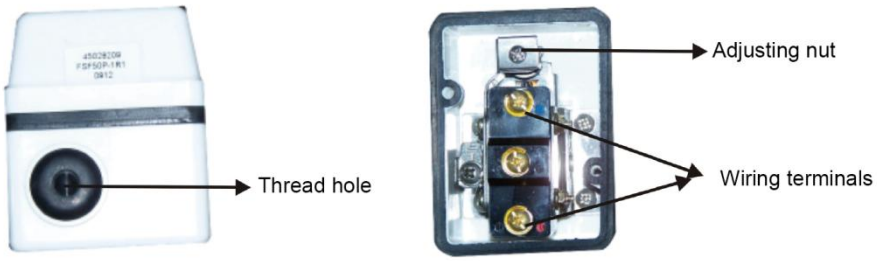
◆After the water system passes the leak test, perform heat insulation at the inlet and outlet pipes as well as the water replenishing pipes in order to prevent heat loss or frost cracking of pipes in winter. Heat insulation is necessary for each valve.

7.4 Installation of Water Flow Switch

The water flow switch is used for measuring water flow of the circulating water side. When the circulating flow reaches its closed flow, it is used to output closed loop circuit; and when water flow is smaller than a certain flow, water flow switch will send out a break-off signal to stop the units and thus protect compressor, water pump and other important components.



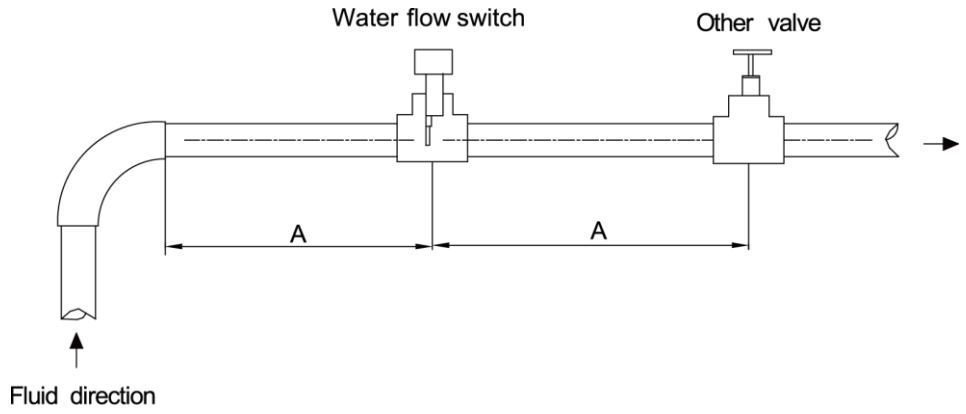
Water flow switch outline diagram



Water flow switch wiring diagram

(1) Usually water flow switch contains detachable paddles that are 45mm, 65mm, 75mm or 85mm's long and 16mm's wide. The paddle can be trimmed conditionally during

installation.Please make sure the rear part forms an arc that matches the pipe and the bottom of the paddle should be 10%-20% above the pipe central line, thus avoiding collision between the paddle and the inner surface of pipes as well as other objects inside.



Installation diagram of water flow switch

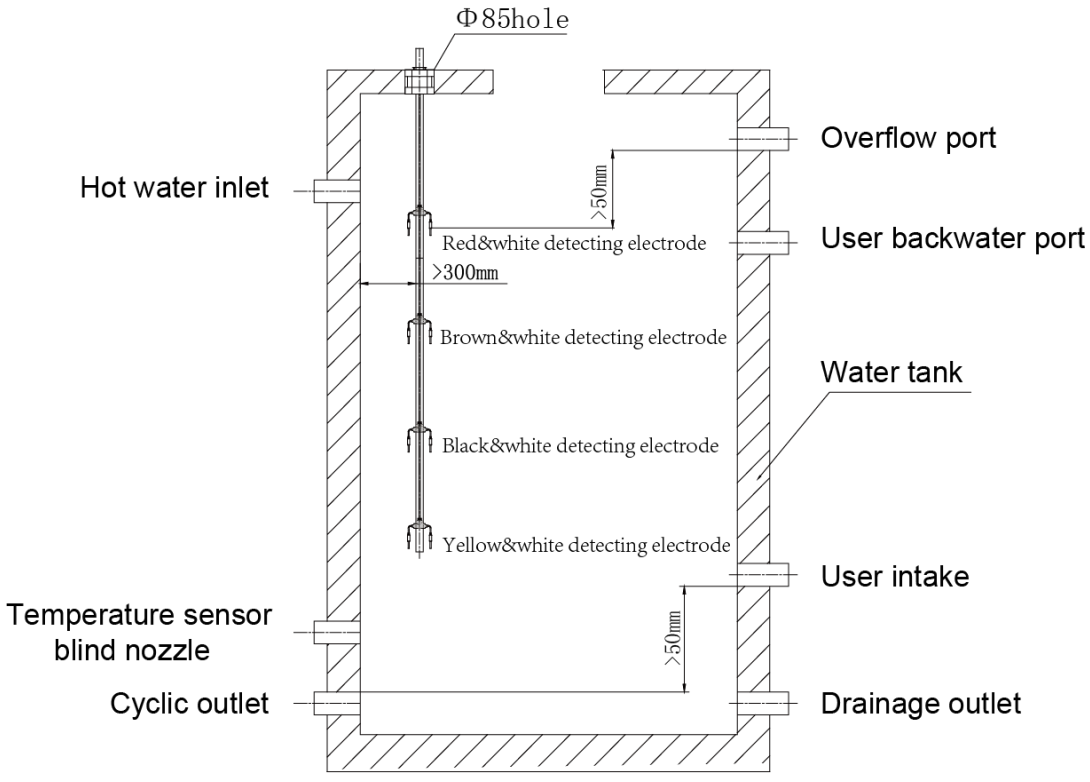
(2) Please make sure that the flow direction is consistent with marks on the water flow switch box cover;

(3) Water flow switch should be installed on horizontal pipes, and make sure that size of A in above diagram is at least 5 times larger than pipe caliber;

(4) The wiring distance between the water flow switch and the units should be less than 10m, and the water flow switch should be installed at a position where wiring is easy;

(5) Water flow switch project should be added by rain-proof equipment (Rainproof cover should be set up).

7.5 Requirements for Water Tank Installation



Electrode-type Water Level Switch

Water tank installation refers to the fitting-in between water tank and pipes as well as water level switch. Pay attention to the following points during installation:

(1) User intake should be at least 50mm above the cyclic outlet; to avoid possible water lack during unit operation.

(2) Overflow port should be more than 50mm above the highest water level float of the water level switch to avoid water leak of the water tank; And the overflow port must connect to the waterspout by tubes.

(3) Hot water inlet and user backwater port can't face the water level switch squarely to avoid inlet water flow lashing the water level float and causing malfunction of the switches.

(4) If electric auxiliary heater is installed on the water tank, make sure that electric auxiliary heat position is below user intake position.

(5) Water tank temperature sensor must be installed beneath user side water intake and placed in blind pipe so as to prevent inaccurate temperature sensing and water intake damage.

(6) Be sure of the effective volume of water tank in case the actual water output is smaller than user's water demand. Effective volume refers to: the volume between user side water intake and the highest detecting electrode or the float.

8 Installation Schematic Diagram

Notice:

(1) Hydraulic calculation must be taken after water pipe is selected. If the water side pipeline resistance is larger than the delivery lift of the selected water pump, then select a larger water pump or increase the water pipe to a bigger size.

(2) In winter when the ambient temperature is rather low or the unit is not started for a long time (24hours), supply power to the unit for at least 8 hours before startup.

(3) In winter when the ambient temperature is rather low, the power can't be disconnected after unit is turned off, otherwise the automatic anti-freezing protection will not function.

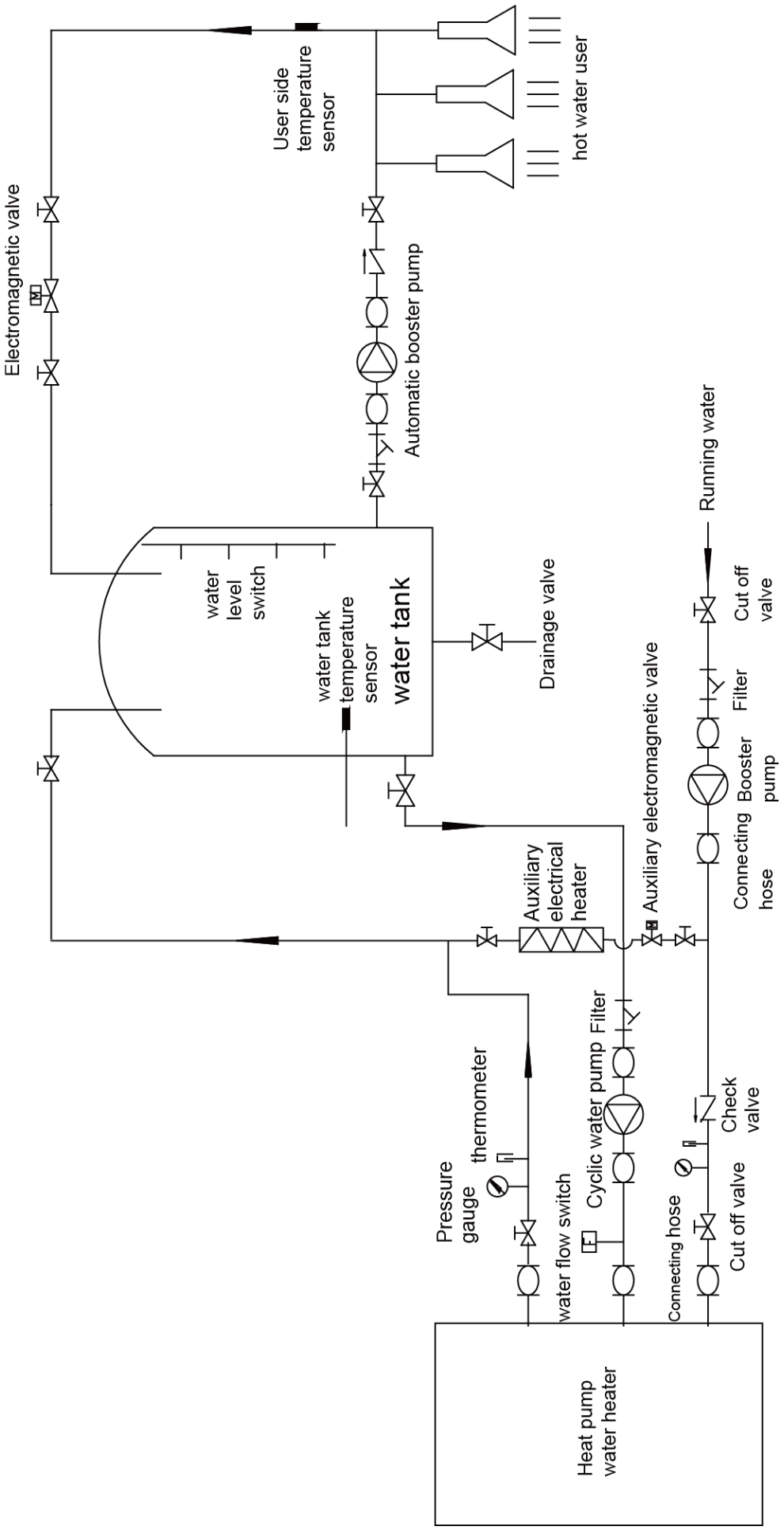
(4) Drain out all the water inside the unit, water tank and pipes through drainage valves when the unit is not used for a long period.

(5) Pipeline in front and back of water heater, heat accumulation water tank and water pump, as well as the pipe network of water supply must be installed with effective grounding devices.

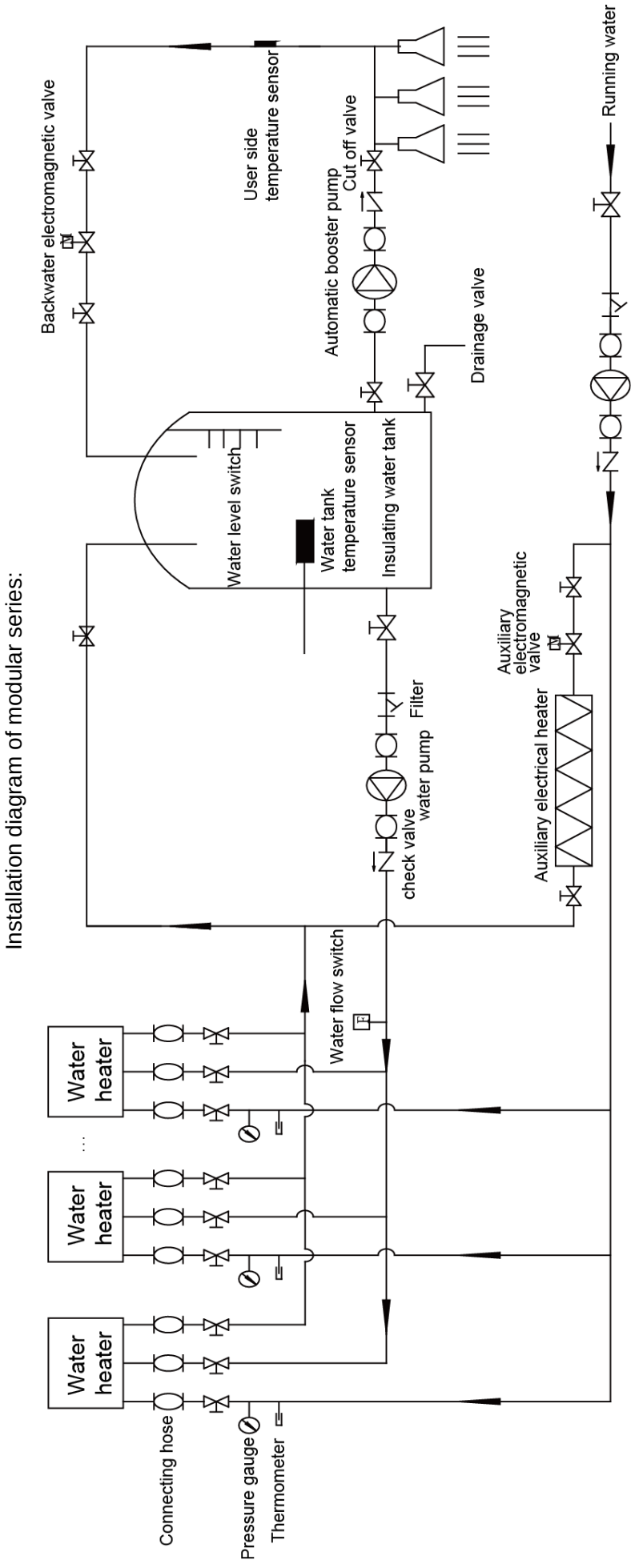
(6) When selecting cyclic water pump, make sure that the cyclic water flow of the unit is not less than the following regulated values.

Table 3 Unit cyclic insulation flow requirements

Model	Cyclic insulation flow(m^3/h)
ML-RS-Dm30/NaA-M	≥ 5.3
ML-RS-Dm40/NaA-M	≥ 6.9
ML-RS-Dm60/NaA-M	≥10.4


User side temperature sensor
hot water user
Electromagnetic valve
Automatic booster pump
water level switch
water tank temperature sensor
water tank
Drainage valve
Running water
Cut off valve
Filter
Booster pump
Connecting hose
Auxiliary electrical heater
Auxiliary electromagnetic valve
Pressure gauge
thermometer
water flow switch
Cyclic water pump
Filter
Check valve
Connecting hose
Cut off valve
Heat pump water heater

Installation diagram of modular series:



Notice:

(1) When the unit is installed below the water tank, the height difference between the water tank and the unit should not be above 8m, and middle transition water tank should be installed when it is above 8m; When the unit is installed above the water tank, pay attention to the selection of cyclic water pump; when the high drop is overcome, make sure that single unit cyclic flow is not less than the values stated in Table 3.

(2) Hot water cyclic water pump is needed, which is selected freely by the project. When selecting, make sure that the lowest flow of the single unit is guaranteed, which is stated in Table 3.

(3) When the running water pressure is less than 0.25MPa, in order to ensure the reliable operation of the unit, please add pressure water pump, and make sure that the rated delivery lift of the water pump is within the range of 15~25m.

(4) Water temperature received by the pressure water pump, recycle pump and the user supply water pump must not be less than 70°C.

(5) Filter (above 30 mesh) must be installed at the water inlet to prevent foreign substance from entering the water side heat exchanger of the unit and blocking it, which will cause unit damage; if the water quality is poor, install electronic water treatment instrument to ensure water quality.

(6) Cyclic insulation: When the temperature of water tank temperature sensor is below set temperature, cyclic insulation function will start.

(7) Backwater control: when the user side water system does not utilize water for a long time, water temperature inside system's water pipe will be decreased to a certain backwater setting value, and the backwater electromagnetic valve will open. User's supply-water pump starts up to push hot water of the heat accumulation water tank into the pipe network, thus raising water temperature inside the pipe; When water temperature inside the hot water pipe rises to backwater setting value+6°C or meets the running duration of backwater pump, backwater electromagnetic valve will be closed, thus ensuring the consistence between the intake water temperature and water temperature of heat accumulation water tank. Backwater electromagnetic valve should be controlled by control lead-out wire of user supply/backwater pump.

(8) When user begins to utilize water, electric contact pressure gauge, or water flow switch (selected by the project) will control the startup of user supply water pump, and at the same time give power-off order to backwater electromagnetic valve.

(9) Auxiliary electrical heater control: When installing the project, it is recommended to select electrical heater subassembly to supplement water generation, which may be insufficient due to unit capacity degradation in winter; selection of auxiliary electrical heater is presented hereafter. It should be installed in parallel with the main unit. After the installation, wait until the main unit runs stably (6 minutes after startup), then adjust the cut-off valve manually to adjust the water outlet temperature of auxiliary electrical heater.

(10) After unit passes the leakage inspection, in order to prevent heat loss of hot water pipe, it is necessary to apply heat insulation for the inlet and outlet pipe, makeup water pipelines and valve parts. In winter when the ambient temperature is below 0°C, heat tracing tape

needs to be installed on the water inlet pipelines of the outdoor unit, with good heat insulation as well. The common insulation materials are soft polyethylene foam (PEF), glass wool, and rubber insulation cotton. Thickness of insulation layer shall be ≥30mm.

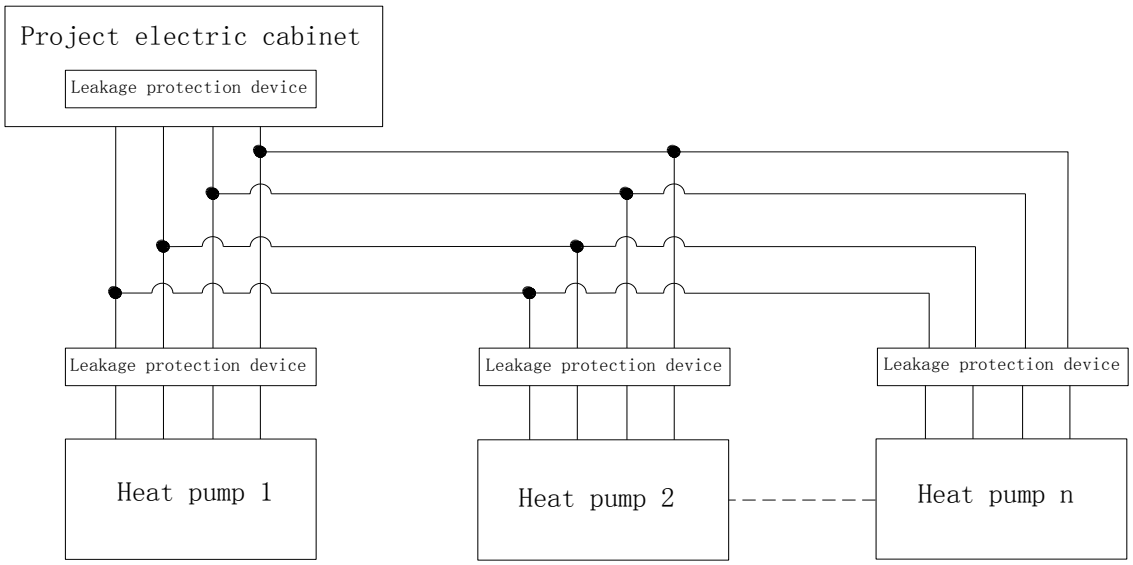
(11) When conducting modular installation, manual valve must be installed on the inlet and outlet of each unit. In order to ensure the evenness of water distribution, adjust water pressure and flow of each unit through the manual valve when unit is in commissioning.

9 Installation of Electrical System

Warning: All electrical installation must be performed by professional technicians in accordance with related laws and regulations as well as referring to this manual.

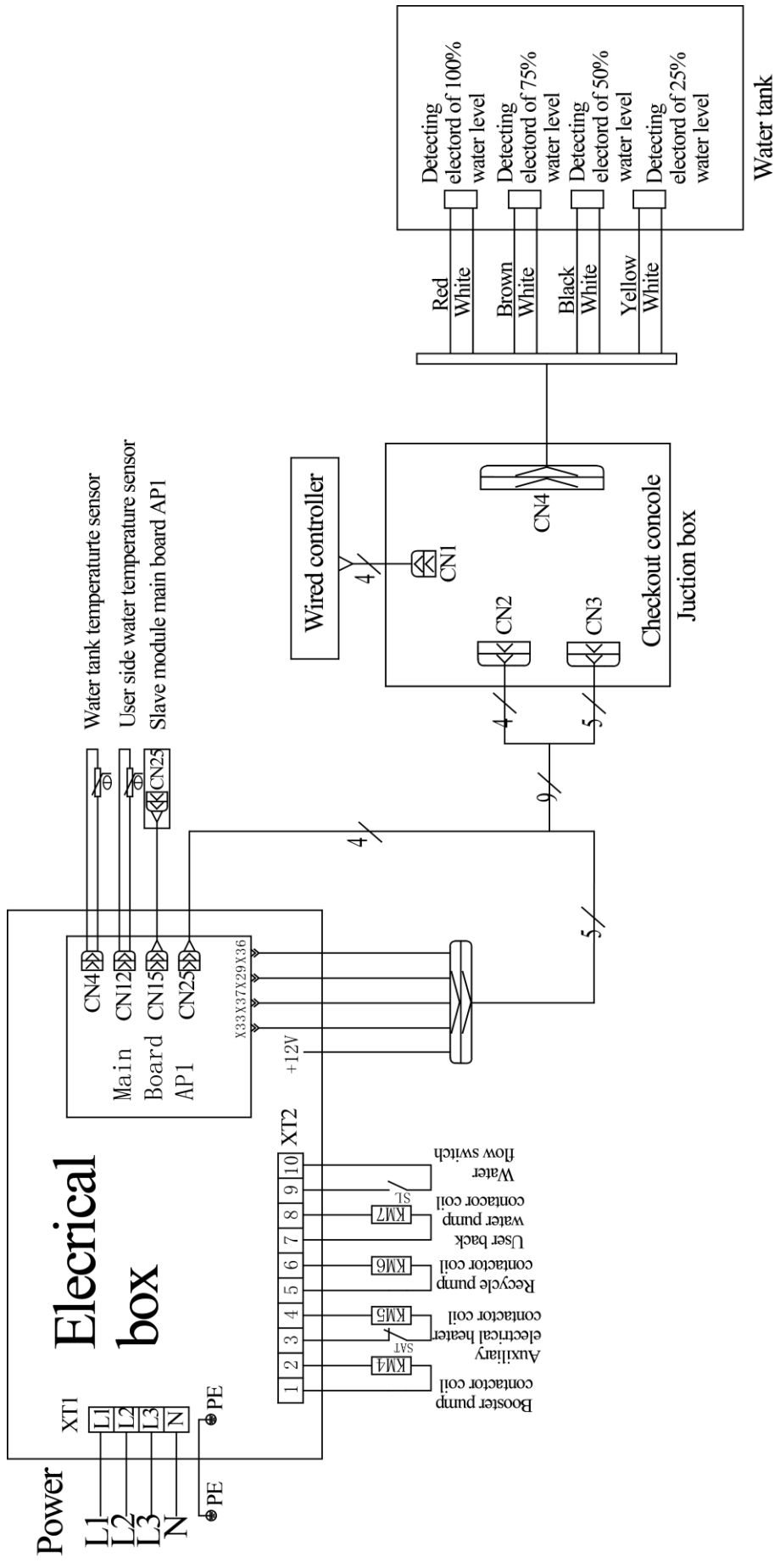
Notice: Power can only be connected after all installation is completed.

Notice: The leakage protector must be installed in power side as the diagram followed for safety.



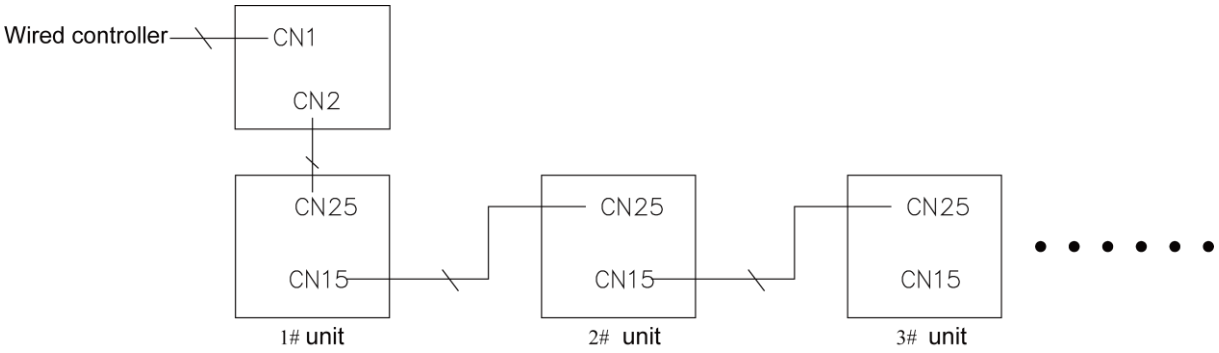
Please operate based on specific external wiring board, with reference to the below contents.

(1) External wiring diagram of ML-RS-Dm30/NaA-M, ML-RS-Dm40/NaA-M and ML-RS-Dm60/NaA-M:



Remarks: the electrode-type water lever switch shall be connected in checkout console with wired controller. Connect checkout console, water flow switch (install on circulating tube), circulating water pump, water supply/back water pump for user, blower pump, temperature sensor of water tank, and temperature sensor of user side to major module, sub-module needs not to be connected.

(2) Connection between modules:



(3) Wiring

1) Install according to local and national wiring regulations.

2) Owner must adopt rated voltage and power especially for air conditioner.

3) Power line wiring must go to wire slot or conduit.

4) Install cable cross loop correctly after knocking off the cable cross hole in order to avoid friction between power line and the metal plate; When connecting power line to the unit electrical cabinet, the line must be protected by rubber or plastic to avoid abrasion by the edge of metal plate.

5) Specification of on-site control lead wire is 1mm2 or above.

6) The signal connecting water level switch is DC light current signal. DO NOT run the wire in parallel with lead wire that is of 50V or higher voltage. In case parallel wiring can't be avoided, the distance between strong and light current signal must be kept above 150mm.

7) The control wire into the unit shall have proper surplus, and the extra wire can't be bundled up and put into the electrical box.

8) The power line should be reliably fixed to prevent wiring terminal from being stressed.

9) The power line diameter should satisfy the requirements in this instruction manual (see below drawing); If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

10) User must install circuit breaker and circuit breaker that can disconnect power of the entire system at the power terminal, and conduct validity check on the circuit breaker periodically every month (check by pressing the testing keys on the breaker).

11) The leakage protector must be installed in power side. Every unit must be solely equipped with a leakage protector whose action value I△n is not bigger than 30mA for safety.

12) The unit electrical box contains the control signals of water pump and the auxiliary electrical heater (220-240V AC: capacity of 5A), which can drive AC contactor of the water pump and the auxiliary electrical heater. DO NOT directly drive the water pump motor and the auxiliary electrical heater with the control signal of the water pump and the auxiliary electrical heater on the unit electrical box.

13) To ensure good appearance of the unit, cable cross holes that can be knocked off are reserved before ex-factory. If the holes are knocked off during wiring, then protective tube must be installed, otherwise wires might easily be cut.

(4) User power configuration

Unit model	Power type	Minimum sectional area of power line(mm^2)			Circuit breaker capacity (A)
		Phase line	Neutral wire	Earth wire	
ML-RS-Dm30/NaA-M	380-415V 3N ~ 50Hz	2.5	2.5	2.5	25
ML-RS-Dm40/NaA-M	380-415V 3N ~ 50Hz	4	4	4	32
ML-RS-Dm60/NaA-M	380-415V 3N ~ 50Hz	6	6	6	40

Remarks:

1) The circuit breaker and power specification in above table is selected based on the maximum power input of the unit (maximum current);

2) The power line specifications in above table are obtained under the conditions that the ambient temperature is 40°C, the working temperature of multi-core copper cable (such as YJV copper conductor, XLPE insulated, PVC sheathed power cable) is 90°C, and the cable is exposed and laid in cable troughs. In different applications, adjust the specifications based on national standards.

3) The circuit breaker specification in above table is obtained under the conditions that the surrounding ambient temperature is 40°C when circuit breaker is working, and circuit breaker is “D”. In different applications, adjust the specifications based on the specification manual of the circuit beaker.

4) If power line is longer than 15 meters, increase power line sectional area to a proper extent to avoid accidents caused by overload.

5) External auxiliary electrical heater for circuit breaker capacity and power line diameter is not considered;

6) The yellow and green double color line inside the unit is grounding wire, which CANNOT be connected to the following positions:

   a. running water pipe.

   b. gas pipe.

   c. drainage pipe.

   d. other places considered unreliable by professional staff.

7) Supply cord:

   ML-RS-Dm30/NaA-M:5X2.5mm2 (H07RN-F)

   ML-RS-Dm40/NaA-M:5X4.0mm2 (H07RN-F)

   ML-RS-Dm60/NaA-M:5X6.0mm2 (H07RN-F)

(5) Water security issues

Please connect PPR separately to the unit direct heat water inlet and cyclic water inlet and outlet, and then connect to external water pipeline. Plastic pipes offered by customers MUST meet the spec.: $L \geq 70 \times R^2$, L indicating the pipe length (unit: cm) and R indicating pipe inner radius (unit: cm).

For peripheral electrical parts offered by customer such as water pump, auxiliary electrical heater and electromagnetic valve, it is suggested to connect them with PPR plastic pipe. Same requirements for the plastic pipe section between the electrical parts and the parts where people can touch the water. In case it is connected with metal pipes, reliable grounding treatment must be conducted at both ends of the electrical parts.

Water heating tank, water supply pipe network must be fitted with reliable grounding devices.

10 Controller Installation

10.1 Controller Error Code

Water heater controller error code				
Code	Cause	Signal source	Unit status	Reset mode
F3	Outdoor ambient temperature sensor error	Outdoor ambient temperature sensor	Unit stop	Automatic
F4	Discharge temperature sensor error	Discharge temperature sensor	Unit stop	Automatic
F5	Outdoor inlet pipe temperature sensor error	Outdoor inlet pipe temperature sensor	Unit stop	Automatic
F7	Outdoor outlet pipe temperature sensor error	Outdoor outlet pipe temperature sensor	Unit stop	Automatic
F8	Inlet temperature sensor error	Inlet temperature sensor	/	Automatic
F9	Outlet temperature sensor error	Outlet temperature sensor	Unit stop	Automatic
E1	High pressure protection	High pressure switch	Unit stop	Manual
E3	Low pressure protection	Low pressure switch	Unit stop	Manual
E4	Discharge high temperature protection	Discharge temperature sensor	Unit stop	Manual
E5	Compressor load protection	Compressor overload protector	Unit stop	Manual
E6	Communication error	Wired controller signal wire	Unit stop	Automatic
E0	Water pump overload protection	Water pump	Unit stop	Manual
EF	External fan overload protection	Fan	Unit stop	Manual
Ec	Water flow switch protection	Water flow switch	Unit stop	Manual
L2	Water tank water level switch error	Water level switch	Unit stop	Automatic
d2	Automatic anti-freezing protection in winter	/	Running	Automatic

Water heater controller error code				
Code	Cause	Signal source	Unit status	Reset mode
L5	Water tank temperature sensor error	Water tank temperature sensor	Unit stop	Automatic
L7	Water pressure switch protection	Water pressure switch	Unit stop	Automatic
L6	Insufficient capability	/	Unit stop	Automatic
n6	Communication error of electrical expansion valve drive plate	electrical expansion valve drive plate	Unit stop	Automatic

Remarks:

Automatic reset:means when malfunctions are removed and the compressor stop protection time is satisfied, the unit will recover its running automatically.

Manual reset:press reset key to remove error code, the unit will run after the errors are removed.

If low pressure protection is detected twice in continuously 40 minutes, the reset mode will shift from automatic mode to manual mode.

If compressor or fan motor load is detected once, the reset mode will be manual mode.

10.2 Water Heater Main Board DIP Switch Instructions

Notice:

The instructions are only applicable to the main board of water heater.

DIP switch can only be operated by professional technicians. Users are not allowed to operate.

Disconnect power before operating DIP switch.

There are 2 sets of DIP switch on the main board of water heater. One is SA3 (4-figure), the address code of the unit, which is set to 1# unit uniformly before leaving the factory and can be operated correspondingly based on unit quantity by professional engineering installation and debugging personnel. The other one is SA5 (2-figure), the DIP switch of model parameters, which is already set before leaving the factory. Do not operate SA5.

The following are instructions for setting up DIP switch in two cases:

For a single unit:

For a system that contains only 1 unit, because the address code is already set to 1# unit uniformly before leaving the factory, installation and debugging personnel only need to test and confirm that the DIP switch is 1#. No operation is needed.

For a modular system:

For a modular system that contains multiple units, the address code needs to be set in the project by professional engineering installation and debugging personnel.

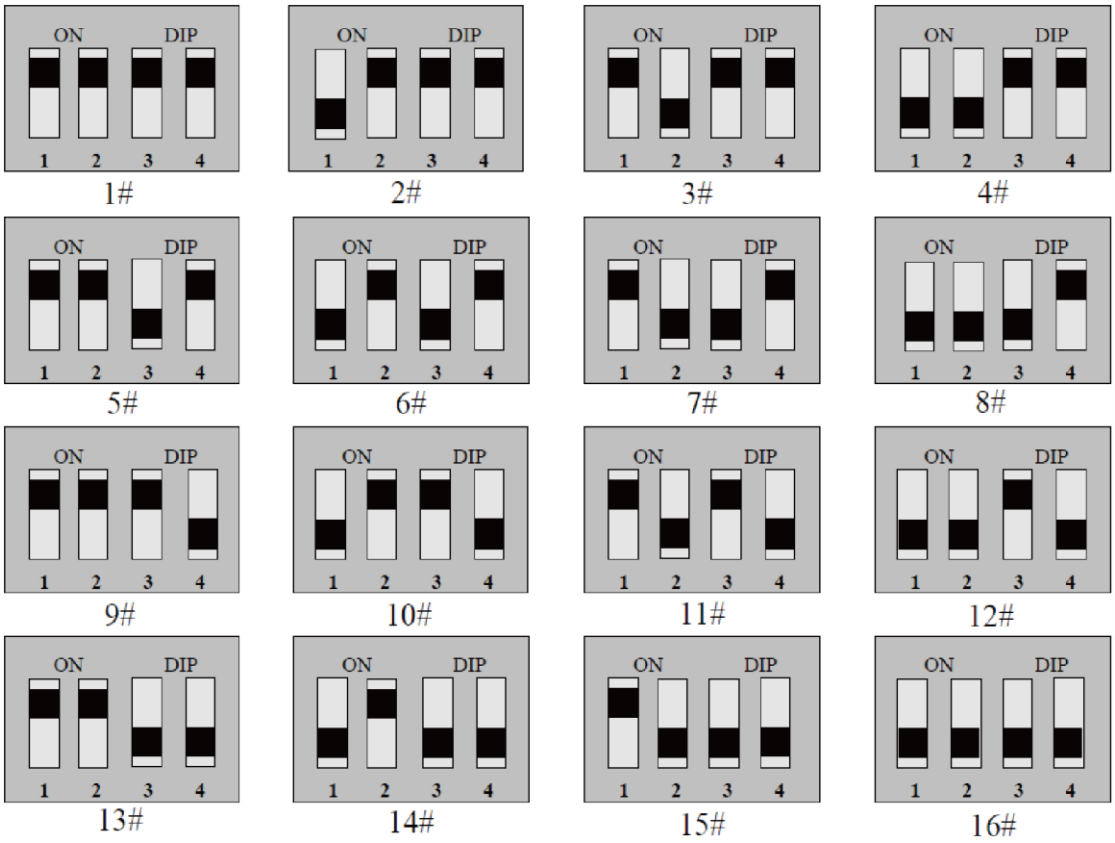
In this case, designate a certain unit as 1# unit, and other units are 2#, 3#...16# respectively.

Each unit is completely the same, so please select the most convenient one as 1# unit.

Look-up table of unit address DIP switch: (lever is black)

DIP switch	Position				Address	Remarks
	1	2	3	4		
SA3	ON	ON	ON	ON	1#	When the lever is dialed near to ON, the status is ON, and the opposite direction is OFF.
	OFF	ON	ON	ON	2#	
	ON	OFF	ON	ON	3#	
	OFF	OFF	ON	ON	4#	
	ON	ON	OFF	ON	5#	
	OFF	ON	OFF	ON	6#	
	ON	OFF	OFF	ON	7#	
	OFF	OFF	OFF	ON	8#	
	ON	ON	ON	OFF	9#	
	OFF	ON	ON	OFF	10#	
	ON	OFF	ON	OFF	11#	
	OFF	OFF	ON	OFF	12#	
	ON	ON	OFF	OFF	13#	
	OFF	ON	OFF	OFF	14#	
	ON	OFF	OFF	OFF	15#	
	OFF	OFF	OFF	OFF	16#	

Address DIP switch diagram:



11 Unit Debugging

11.1 Check Before Startup

To ensure personal and property safety, it's necessary to check before debugging the unit. The contents and steps should be in accordance with the table below:

The following checking items must be completed by experienced and qualified technical maintenance staff		
Confirm with sales engineer, distributor, installation contractor and customers whether the following items are completed or can be completed.		
No.	Installation status confirmation	√
1	Check the contents in the "Confirmation Sheet of Installation Party's Application for Debugging Water Heater" submitted by the installation party. If contents are not true, reject debugging.	
2	Whether a written report regarding the unqualified installation points is issued to the installation party for corrective measures?	
3	Whether the "Confirmation Sheet of Installation Party's Application for Debugging Water Heater" is filed together with the debugging sheet?	
No.	Steps of pre-checking	√
1	Check whether the unit appearance and inner pipeline system are damaged during transportation, moving or installation.	
2	Verify that all attached parts have arrived together with the unit, in right quantity and intact package, without damage.	
3	Make sure there are engineering drawings of the electrical system, control, pipeline design and others on the site.	
4	Check whether unit is installed securely and there is enough space for operation and maintenance.	
5	Check refrigerant pressure of each unit comprehensively and conduct system leakage test.	
6	Check whether the hot water tank is installed securely, and the bearing is safe when tank is full of water.	
7	Check whether the heat insulation for hot water tank, inlet and outlet pipe and water replenishing pipe is in good condition.	
8	Check whether the accessories such as water level switch, water temperature indicator, controller, pressure gauge, relief valve and automatic discharge valve for hot water tank are installed in place and	
9	Check whether the power is consistent with the nameplate, and wire model is consistent with related regulations.	
10	Check whether all power supply and control lines are connected correctly and wired correctly according to wiring drawing. Whether they are safely grounded. Whether wiring terminals are solid.	
11	Check whether all the connecting pipes, water pump, pressure gauge, thermometer, valves are installed correctly.	
12	Check whether all valves in the system are open or closed according to requirements.	
13	Confirm the attendance of customer and Party A inspectors.	
14	The installation status checking sheet is completed. It shall be confirmed and signed by the installation contractor.	

Notice: Inform contractor of items with"×". Above installation items are recommended by ML Electronics.

Confirmation items after pre-checking	Overall unit operation judge or suggestions from commissioning contractor: good □ improvement □
	Judge whether there are problems with below items (The unit installation and debug is considered qualified and consistent with regulation requirements when nothing is filled) :
	a:power and electrical control system problems b:load computation problems
	c:outdoor cooling system; d:noise;
	e: indoor and pipeline system problems; h:other problems.
	Paid service maintenance is necessary for malfunctions due to improper installation, maintenance, application and other non-quality problems during the running and use of the units.
	Transfer status to customer.
	Whether conduct user training program according to instructions and confirm by signing: YES( ) NO( )

11.2 Commissioning

This is to test whether unit can run normally through pilot running. If it can't, engineering or unit problems need to be found and solved during debugging until pilot running meets the requirements. The commissioning should start only after all pre-startup checking is qualified. Please follow the contents and steps in the table below when conducting commissioning:

The following checking items must be completed by experienced and qualified maintenance technical staff.		
No.	Start pre-checking operation processes	
Notice:Make sure to cut off all electric power, including remote power switch, or it may cause casualties.		
1	Make sure the unit compressor has been preheated for 8h.	
Warning: To avoid refrigerants mixing into lubricants and causing compressor damage during unit startup, preheat the lubricants for at least 8h.		
2	Confirm whether the compressor oil temperature is obviously higher than outdoor ambient temperature.	
Warning: When ambient temperature is below 2°C, if the compressor oil temperature is not obviously higher than outdoor ambient temperature, it indicates that the heating tape is damages, which will cause easy damage to compressor.. Thus the unit can only be used normally after repairing the compressor heating tape.		
3	Check whether the phase sequence of the main power is correct. If not, correct the phase sequence according to processes provided by instructions.	
Warning: The correct unit phase sequence must be re-confirmed before startup to avoid compressor reversal causing equipment damage.		
4	Use multimeter to test every phase insulation resistance to earth and between all phases of outdoor units.	
Warning: Bad grounding may cause the danger of electric shock.		
No.	Ready to start	
1	Remove all temporary powers, recover all fuses, and make a final electrical check.	
	Check the power voltage of control electric circuit:_____V, which must be ±10% within the rated working power range.	

No.	Start the unit	
1	Check all necessary conditions for unit startup:oil temperature, mode, load demand and so on.	
2	Start the unit, and observe the actions of compressor, electronical expansion valve, electromagnetic valve, fans, water pump and so on.	
	Notice:Operation of the unit under abnormal conditions will damage the unit. Don't allow the unit to run under high pressure and large current status.	
Additional information:		
Acceptance items after commission-ing	Overall unit operation judge or suggestions from commissioning contractor: good □ improvement □	
	Judge whether there are problems with below items (The unit installation and debug is considered qualified and consistent with regulation requirements when nothing is filled) :	
	a:power and electrical control system problems b:load computation problems	
	c:outdoor cooling system; d:noise;	
	e: indoor and pipeline system problems; h:other problems.	
	Paid service maintenance is necessary for malfunctions due to improper installation, maintenance, application and other non-quality problems during the running and use of the units.	
	Transfer status to customer.	
	Whether conduct user training program according to instructions and confirm by signing: YES( ) NO( )	

Notice:

(1) Connect power to the unit and switch on. Use three phase power the unit. If the power line sequence is reversed, the phase sequence protector will act, the main board inside the electrical box is not powered, and fans, compressor and water pump will not act. At this moment, cut off the power first, then exchange the two phases in the three phase power line, so the unit can be connected to power and started again.

(2) After running with power on, water pump should run stably. If not, and if the pressure gauge needle swings highly, it indicates air still exists in water system. At this moment, discharge all the air and re-start the unit.

(3) After the compressor starts, stop and check the unit immediately after finding abnormal sounds.

(4) After the completion of commissioning, clean the filter on the pipeline and then put it into normal running. Thereafter periodically dismantle and wash filter (once for 1 ~ 2 months is recommended) to ensure the normal running of the unit.

(5) During commissioning, DO NOT start the unit manually again within 3 minutes' interval time between stops. DO NOT stop the unit manually when running is less than 6 minutes.

(6) Because the unit adopts totally-closed vortex compressor, power phase sequence must be correct, and long time reversed running is not allowed.

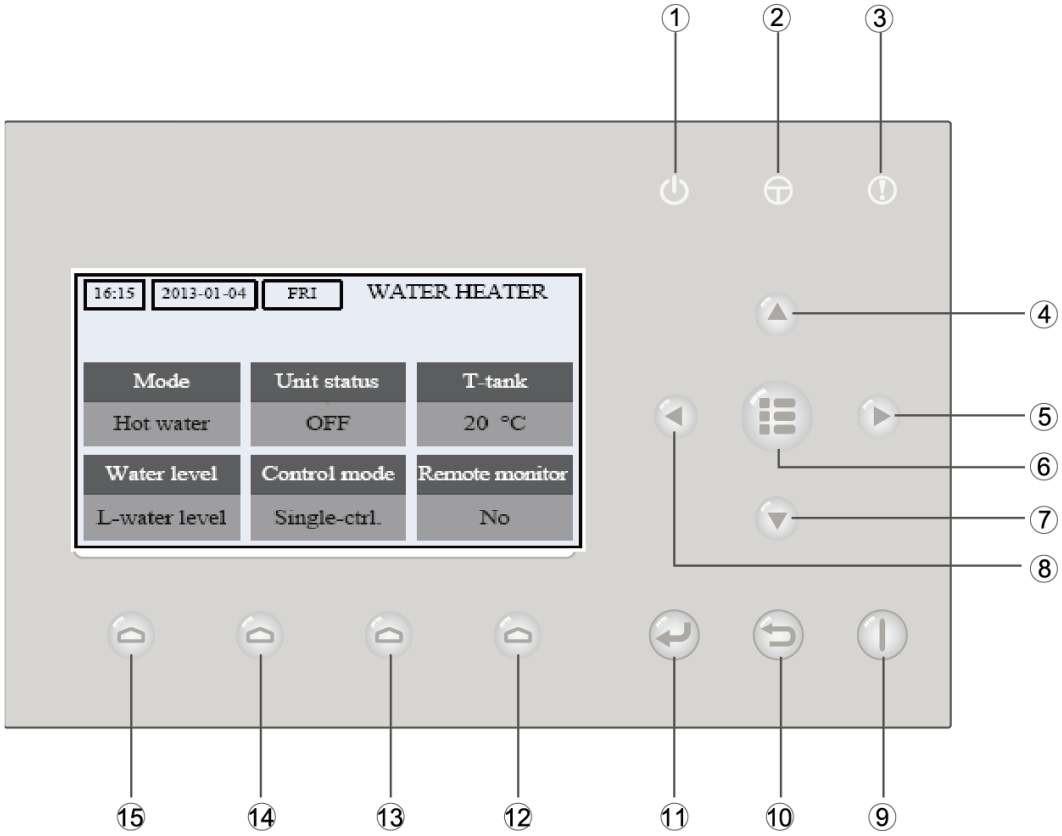
(7) After debugging, train the owner about the system, instructing the owner on basic operation and necessary maintenance and allowing them to command basic knowledge of the heat pump water heater.

12 Guides for System Discharge Operations

After the completion of the initial unit installation and confirmation of the correct wiring, air discharge must be conducted, because air existing in the system could cause abnormal running of the system. As a result, DO conduct air discharge operations during the debugging stage. The process is:

(1) Direct heat cleaning water-replenishing

(2) Cyclic cleaning air discharge



Detailed air discharge operation steps are as below:

No.	Name	No.	Name
1	Operation indicator	9	On/Off button
2	Power indicator	10	Exit/Return button
3	Error indicator	11	Confirm button
4	Up button	12	Functional button 4
5	Right button	13	Functional button 3
6	Menu button	14	Functional button 2
7	Down button	15	Functional button 1
8	Left button		

1. Press functional button 2 in menu page to enter into functional settings page, press left and right buttons to move to “directly-heated washing”, and then press up button to start up “directly-heated washing function”. After entering into directly-heated washing function, if not manually exit the mode, it will automatically exit 30 minutes later; if the connected unit is under power-on or defrosting status, then this function shall not be operated.

2. When step 1 is finished, and the water level inside the water tank has been over 50mm above the circulating outlet of water tank (hot water inlet unit)(if the added water has not reached

this requirement by one-time directly-heated washing, then it should conduct directly-heated washing for several times), and then conduct circulating washing. Press functional button 2 in menu page to enter into functional settings interface, press left and right buttons to move to “circulating washing”, and then press up button to start up “circulation washing function”. After entering into circulating washing function, if not manually exit the mode, it will automatically exit 30 minutes later.

The actual time for air discharging should be determined by the actual size of the system pipe network; but make sure that the normal running of water heating can be started only after discharging all air in the system.

13 Daily Operation and Maintenance

(1) All the safety guards inside the unit have been defined, and user should not adjust or remove by themselves to avoid unit damage.

(2) For the initial startup of the unit, or when starting after a long time (power cut off) stop(above 1 day), need to pre-connect the power supply of the unit to ensure a pre-heating period of above 8 hours and avoid damage caused by compulsory startup of the compressor.

(3) Don’t stack debris on the unit and the accessories. The surrounding environments should keep clean and has good ventilation. Clean severe ash deposition on condenser fin in time to avoid affecting the unit performance or causing unit protection and stop.

(4) Periodically clean the filter of the water system to avoid water system blocking, causing unit protection or damage, and constantly check whether the water makeup equipment of the water system is normal.

(5) When the ambient temperature is below 0°C in winter, DO NOT cut off power, or the unit anti-freezing protection will be out of action.

(6) When the unit is not used for a long time, besides draining water in the unit and pipe system, also open the water discharge plug on water tank to drain the water inside the water tank to prevent the unit bursting.

(7) DO NOT artificially start and stop the unit frequently, and DO NOT artificially shut the manual adjusting valve of the water system at will during the unit running.

(8) Constantly check working status of all parts of the unit. Check whether there are greasy dirt at the pipeline joint and inflating valve inside the unit, and make sure there is no leakage of unit refrigerant.

(9) When malfunctions arise and the user can’t fix, please contact our local privileged maintenance department in time for them to send staff to repair in time.

14 Cleaning of System

14.1 Cleaning of Air Side Heat Exchanger

For better heat exchanging, usually the water heater air-cooled finned heat exchanger is placed outdoor. Therefore, after a certain period running, fins can't avoid blocked by dirt, which will affect heat exchanging effect of the condenser and reduce the direct heating effect while increase energy consumption. As a result, the finned heat exchanger needs to be cleaned usually after a 6-12 month unit running. The cleaning cycle needs to be shortened when there are heavy pollutions around.

Methods of cleaning:

(1) Cut off water heater power.

(2) Repeatedly blow the fins with high pressure gas against the air inlet direction of the heat exchanger. The gas need to be vertical to the fins when blowing to prevent fins from falling.

(3) Cleaning can apply high pressure water too. When cleaning with high pressure water, control the water pressure to prevent fins from falling, meanwhile protect the electrical components. If there are oily materials sticking onto the fins, the water for cleaning should contain dissoluble neutral detergent.

(4) You can also use a vacuum cleaner with a nylon brush to clean the dust and foreign matters on the heat exchanger surface.

(5) Finally cleaning standard is based on being able to see the original color of the fin or the fact that all the water flowing down along the fin are all clean water.

14.2 Cleaning of Water System

After a long time use, the waterway system may get fouling. Clean waterway system or it will cause bad heat exchanging and heating effect, even blocking of waterway system and unit damage. Therefore, you must periodically clean waterway system, recommendedly once for a period of 6-12 months. Organic acid such as oxalic acid, ethylic acid, formic acid and others can be used for cleaning, excluding chloric strong acid, which may cause corrosion of heat exchanging copper pipe inside the heat exchanger, thus causing collusion between water and refrigerant. The following methods can be adopted when cleaning:

(1) Energize the unit, conduct "directly-heated washing" by referring to water system drainage operation;

(2) Apply certain percentage of abluent into the water tank;

(3) After applying abluent, please conduct "circulating washing function" by referring to water system drainage operation;

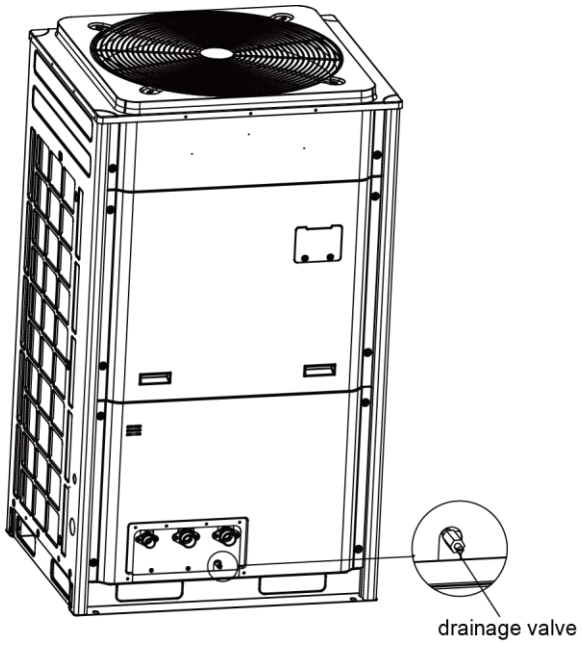
(4) Drain the water with abluent in the water tank and unit, and then conduct the aforesaid directly-heated and circulating washing function to wash the residual abluent inside the tubes and unit, till the water quality meets related requirements.

15 Unit Drainage Operations in Winter

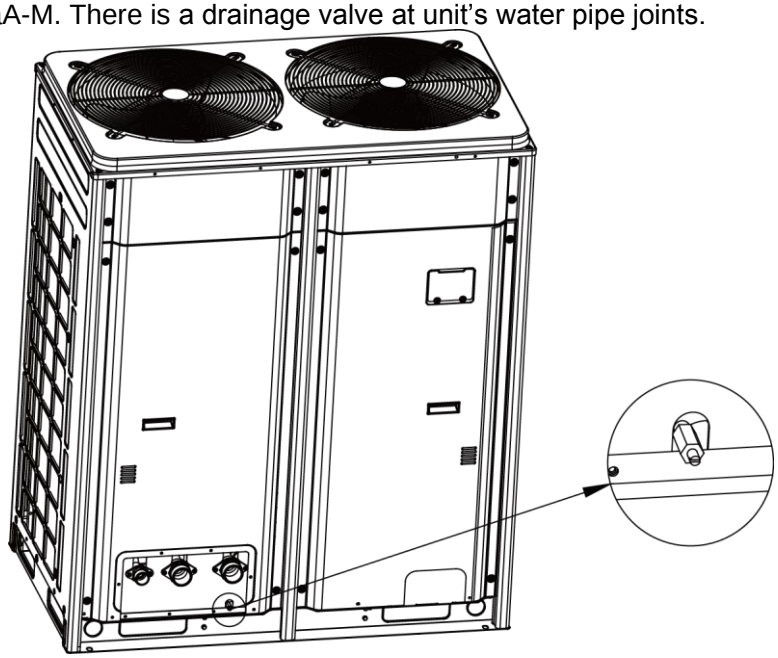
In winter when the ambient temperature is below 0°C,DO NOT cut power, or anti-freezing protection of the unit will be out of action. DO drain all the water in tube-in-tube heat exchanger to prevent system damaged by freeze. The detailed drainage operations are as below:

ML-RS-Dm30/NaA-M, ML-RS-Dm40/NaA-M

Use a straight screw driver to open the manual drainage valve core near the inlet and outlet joints, drain all the water inside the casing tube till no more water comes out of drainage valve port, then use straight screw driver tighten the drainage valve core.



Water drainage for ML-RS-Dm60/NaA-M is similar to that of ML-RS-Dm30/NaA-M and ML-RS-Dm40/NaA-M. There is a drainage valve at unit's water pipe joints.



16 Common Malfunction and Solutions

Notice:If users find problems during operation, please contact the nearest distributor or office.

(1) The following phenomena are not malfunctions:

1) When operating in winter, because the heat exchanger surface temperature is below outdoor ambient temperature, and when heat exchanger surface temperature is below 0°C,heat exchanger surface will frost which will affect heat exchanging effects, and control system will periodically defrost, melting the heat exchanger surface frost layer.

2) When operating in regions where winter outdoor temperature is below 0°C, system is on standby status (without cutting the power) ; and when ambient temperature and system water temperature is around 0°C, to prevent water system freezing, equipment damaging, the control system will automatically operate anti-freezing, start water pump and compressor till the water temperature reaches a safe point.

3) During operation, if ambient temperature is relatively high, the unit supply air fan may run at low fan speed.

4) When re-operating or turning on the manual switch immediately after unit stops, the unit will not run in 3 minutes. This is compressor delayed protection.

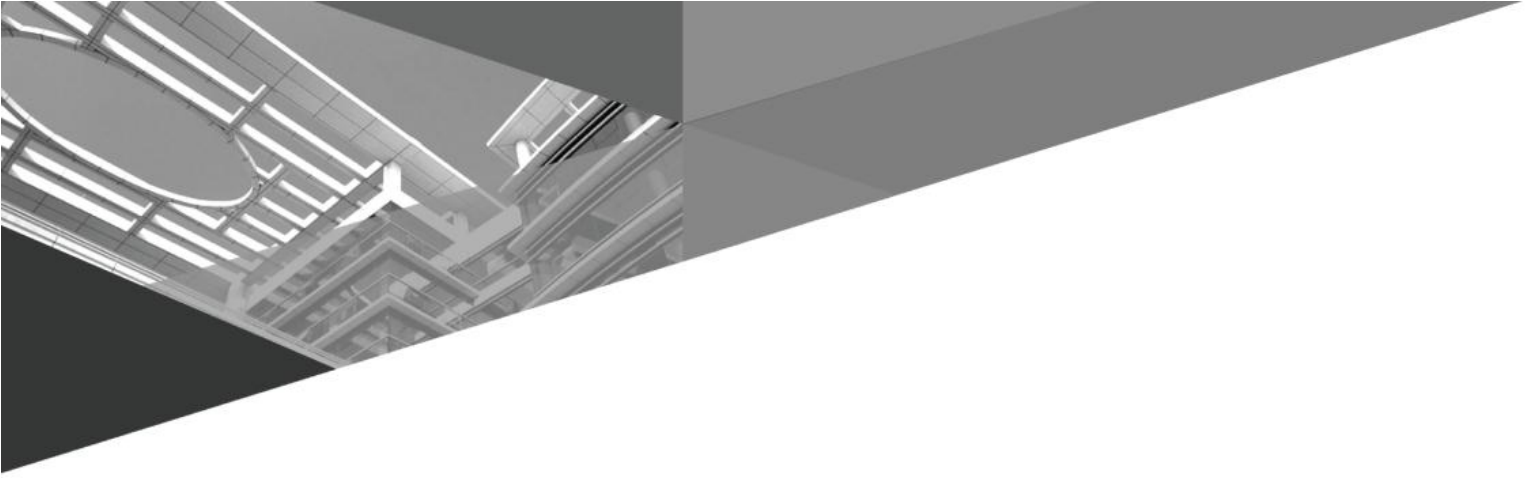
5) The fluctuation of the outlet temperature is due to the difference of pressure under special working conditions. This is normal phenomenon, which will not affect the normal use. Water pressure could be adjusted appropriately to improve the phenomenon.

6) Low temperature outlet temperature can't reach set temperature is because under low temperature condition, in order to protect the unit, outlet temperature maybe can't reach relatively high set temperature. This is normal phenomenon, which will not affect the normal use.

(2) When professional technical staff fix problems, the following table can be referred to exclude malfunction:

Phenomena	Reasons	Solutions
Compressor does not start	Power has a problem. Wiring is loose. Relay or fuse malfunction. Compressor malfunction.	Whether the phase sequence is connected reversely. Detect and re-tighten. Detect malfunction reason and repair. Change compressor.
Fan has big noise	Fan fixing bolt is loose. Fan blade touches shell or guard. Fan runs unstably.	Re-tighten fan fixing bolt. Detect reason and adjust. Change fan.
Compressor has big noise	Fluid refrigerant has entered compressor. and caused slugging. Compressor inner parts damage.	Check whether expansion valve is valid, and whether temperature sensor is loose and repair. Change compressor.
Water pump does not run or run normally	Power malfunction or wiring malfunction . Relay malfunction. Gas has entered water pipe.	Detect reason and repair. Change relay. Discharge gas.

Phenomena	Reasons	Solutions
Compressor frequently starts and stops	Refrigerant is too high or low. Bad water system circulation. Low load.	Lose or increase some refrigerants. Water system is blocked or air enters. Check water pump, valve, and pipeline. Clean water filter or discharge air. Adjust load or increase energy accumulation device.
Compressor runs while the unit does not heat	Refrigerant leakage. Compressor malfunction.	Detect leakage, repair and increase refrigerant. Change compressor.
The unit does not generate hot water with evident effect	Bad water system insulation. Bad heat exchange of unit evaporator. The unit refrigerant too low. Water side heat exchanger blocked.	Enforce system insulation. Check whether the air inlet and outlet is normal and clean vaporator. Check whether the unit leaks refrigerant. Clean or change heat exchanger.



MegaLife

www.megalife.ma

Made BY ML ELECTRONICS

66129931304