

CIRCULATING AIR SOURCE HEAT PUMP WATER HEATER

(GC201510-II)

TECHNICAL SALES GUIDE-50Hz

CAPACITY RANGE:28~53kW

OPERATION RANGE :AMBIENT OPERATION -26 °C ~46 °C



R410A



GREE ELECTRIC APPLIANCES INC.OF ZHUHAI

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1 Product LIST

Series Name	Model	Heating Capacity(kW)	Outline Diagram of Product
Circulating Air Source Heat Pump Water Heater	GRS-Cm28/NaA-M GRS-Cm28/NaA1-M	28	
	GRS-Cm36/NaA-M GRS-Cm36/NaA1-M	36	
	GRS-Cm53/NaA-M GRS-Cm53/NaA1-M	53	

2 Denomination Regulation

GRS	-							/			-	
1		2	3	4	5	6	7		8	9		10

SN	Description	Options
1	Product code	GRS—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

Model example

Example: GRS-Cm28/NaA-M means circulating heating modular fixed-speed heat pump water heater,without water tank, heating capacity of 28kW, refrigerant of R410A, rated voltage of 380-415V 3N~50Hz and applicable for T1 climate.

3 Product Definition

This product is based on the principle of reverse Carnot cycle, driven by a small amount of electricity, with refrigerant as the carrier, continuously absorbs low grade heat in the air and transforms them into usable high grade heat, which is then released into water so as to generate domestic hot water, and finally transports the hot water to users through hot water pipes. With the same working principle as heat pump air conditioner that obtains heat from the environment to heat the indoor air, heat pump water heater uses the heat to generate hot water.

Heat pump water heater is a highly efficient, energy saving and environmental friendly product.

The optimized design can ensure the heating efficiency under low ambient temperature, with higher low-temperature heating capacity, COP and reliability. The unit adopts multiple modular network control and maximum 16 sets unit can be controlled at the same time. The heating capacity is 28~848kW, which can be widely used for factory, hotel, restaurant, hospital, beauty parlor, laundry, bath center, large scale floor heating project and so on.

4 Product Data

Model			GRS-Cm28/NaA-M GRS-Cm28/NaA1-M	GRS-Cm36/NaA-M GRS-Cm36/NaA1-M	GRS-Cm53/NaA-M GRS-Cm53/NaA1-M
Hot water mode	Heating capacity	kW	28	36	53
	Heating Power Input	kW	7.3	9.3	13
	Heating Current Input	A	13.9	16.9	26
	Nominal Water Output	L/h	602	775	1140
Rated Input		kW	10.1	13.2	19
Rated current Input		A	20	24	38
Set temperature		°C	defaulted at 50°C . 30°C ~60°C adjustable (water tank temperature)		
Power			380-415V 3N ~ 50Hz		
Refrigerant	Name		R410A	R410A	R410A
	Refrigerant charge volume	kg	4.2	4.2	5.9
Compressor	Type		Totally-enclosed scroll compressor		
	Q'ty	Set	1	1	1
Heat exchanger	Wind side		Finned type heat exchanger		
	Water side		Shell-and-tube heat exchanger		
Fan	Type		Low noise axial flow fan		
	Air discharge type		Top air discharge		
	Airflow(ambient temperature 25°C)	m ³ /h	11400	11400	12400
Water system	Circulating Water Flow	m ³ /h	4.8	6.2	9.2
	Water pressure	kPa	70	130	70
	Maximum bearing pressure	MPa	0.8	0.8	0.8
	Diameter of air inlet pipe and air outlet pipe	in	G 1-1/4	G 1-1/4	G 2
Outline dimension	W×D×H	mm	930×800×1605	930×800×1605	1340×800×1605
Packing size	W×D×H	mm	1010×865×1775	1010×865×1775	1420×880×1775
Noise		dB(A)	≤67	≤67	≤67
Unit net weight		kg	243、242	260、262	358、364

Note

1.Data in the above table are based on the following test conditions: outdoor ambient temperature: 20 °C DB/15 °C WB; initial water temperature: 15 °C ; final water temperature:55 °C ; Voltage: 380V 3N ~ 50Hz.

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

3.The above pressure values all belong to gauge pressure.

4.Noise is tested in the semi-silencing room. The actual noise will be a little higher in the actual operation environment.

5.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.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.

7.If the specification is changed due to the product improvement, please refer to the nameplate.

8.The system reliability and the different water temperature requirement under different water temperature are considered for this product and limit the maximum water tank temperature for stop operation.

The curve is as below:

Curve of maximum water tank temperature for stop operation with the change of ambient temperature					
Ambient temperature/°C	Tank temperature/°C	Ambient temperature/°C	Tank temperature/°C	Ambient temperature/°C	Tank temperature/°C
-26	53	-1	58	24	60
-25	53	0	58	25	60
-24	53	1	58	26	59
-23	53	2	58	27	59
-22	53	3	59	28	58
-21	54	4	59	29	58
-20	54	5	59	30	58
-19	54	6	59	31	57
-18	54	7	60	32	57
-17	54	8	60	33	57
-16	55	9	60	34	56
-15	55	10	60	35	56
-14	55	11	60	36	56
-13	55	12	60	37	55
-12	55	13	60	38	55
-11	56	14	60	39	55
-10	56	15	60	40	54
-9	56	16	60	41	54
-8	56	17	60	42	54
-7	57	18	60	43	53
-6	57	19	60	44	53
-5	57	20	60	45	53
-4	57	21	60	46	52
-3	57	22	60		
-2	58	23	60		

5 Specification Correction Table for the Unit

model	Water inlet temperature(°C)		Circulating water flow 4.8m ³ /h, Outdoor ambient temperature(wet/dry bulb °C)							
			-20	-15	-7/-8	7/6	20/15	30/22	35/24	46/28
GRS-Cm28/NaA-M GRS-Cm28/NaA1-M	Heating Capacity(KW)	50	9.94	11.13	13.35	20.22	27.93	30.91	31.67	37.52
		40	10.24	12.26	14.63	21.77	28.00	33.81	34.08	38.92
		30	10.34	12.48	15.50	22.53	28.65	35.82	34.58	39.32
	Heating Power Input(KW)	50	7.94	8.03	8.15	8.52	7.63	8.66	8.63	8.95
		40	6.63	6.76	6.89	7.28	7.51	7.82	7.27	7.54
		30	6.22	6.46	6.62	6.95	7.49	6.76	7.20	7.31
	Coefficient of performance(W/W)	50	1.25	1.39	1.64	2.37	3.66	3.57	3.67	4.19
		40	1.54	1.82	2.12	2.99	3.73	4.32	4.69	5.16
		30	1.66	1.93	2.34	3.24	3.83	5.30	4.80	5.38

model	Water inlet temperature(°C)		Circulating water flow 6.2m ³ /h, Outdoor ambient temperature(wet/dry bulb °C)							
			-20	-15	-7/-8	7/6	20/15	30/22	35/24	46/28
GRS-Cm36/NaA-M GRS-Cm36/NaA1-M	Heating Capacity(KW)	50	12.51	14.00	15.04	26.99	34.89	38.16	38.38	43.27
		40	12.70	14.62	18.70	27.73	36.08	41.68	40.41	44.32
		30	12.81	15.46	20.76	29.77	39.15	44.85	43.48	47.07
	Heating Power Input(KW)	50	9.39	9.49	9.62	11.06	11.12	10.91	11.06	11.41
		40	7.85	8.00	8.35	9.29	9.46	9.38	9.49	9.73
		30	7.34	7.63	8.12	8.87	9.25	9.68	9.26	9.56
	Coefficient of performance(W/W)	50	1.33	1.48	1.56	2.44	3.14	3.50	3.47	3.79
		40	1.62	1.83	2.24	2.98	3.81	4.44	4.26	4.55
		30	1.74	2.03	2.56	3.35	4.23	4.63	4.70	4.92

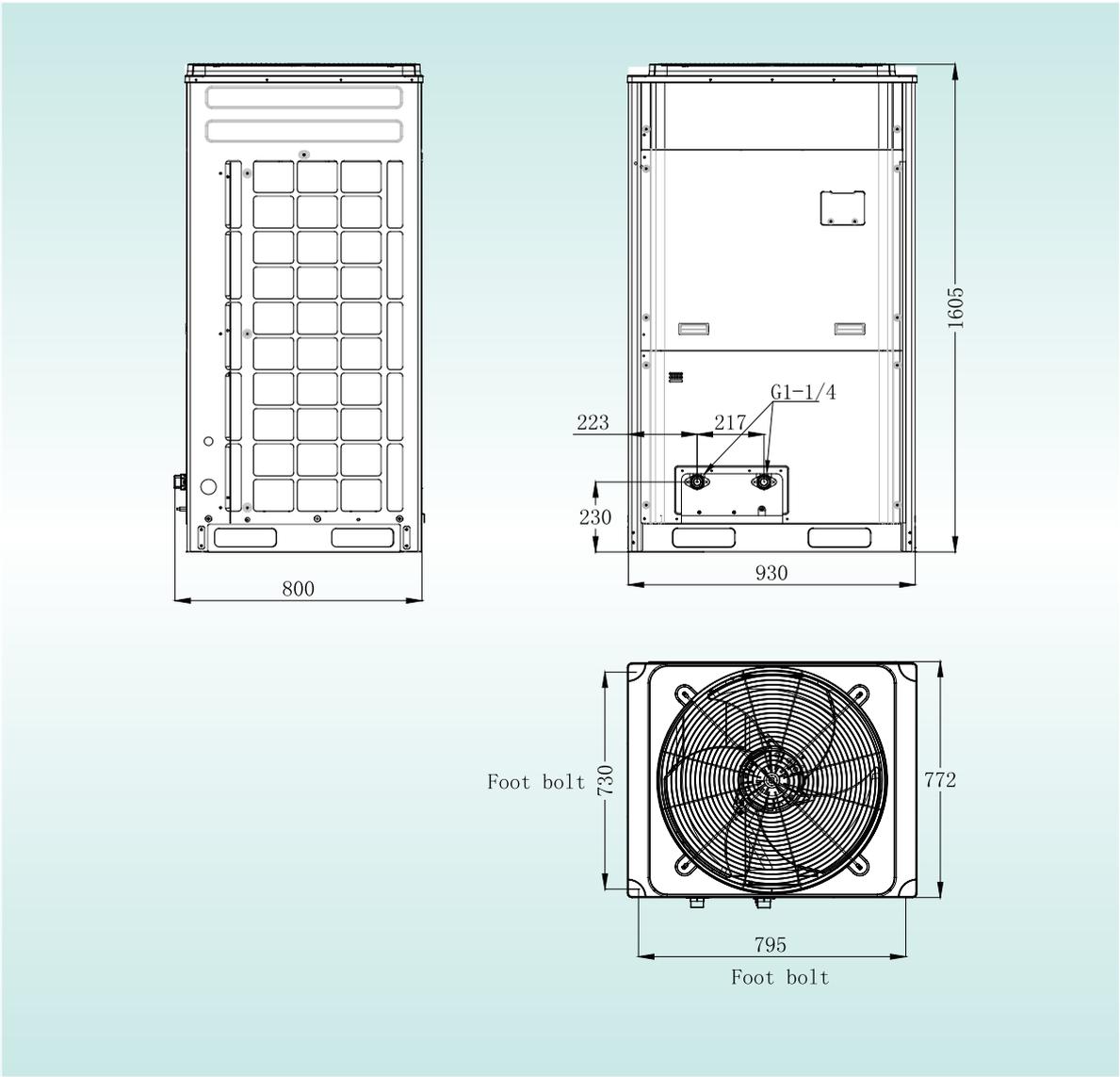
model	Water inlet temperature(°C)		Circulating water flow 9.2m ³ /h, Outdoor ambient temperature(wet/dry bulb °C)							
			-20	-15	-7/-8	7/6	20/15	30/22	35/24	46/28
GRS-Cm53/NaA-M GRS-Cm53/NaA1-M	Heating Capacity(KW)	50	17.72	19.84	21.31	38.25	49.44	54.08	54.39	61.32
		40	17.88	21.19	27.11	40.19	52.3	60.42	58.57	64.25
		30	17.97	21.69	29.12	41.76	54.92	62.91	61	66.03
	Heating Power Input(KW)	50	13.41	13.55	13.74	15.79	15.88	15.58	15.79	16.3
		40	11.21	11.42	11.92	13.27	13.51	13.4	13.55	13.9
		30	9.2	9.56	10.17	11.12	11.59	12.13	11.6	11.98
	Coefficient of performance(W/W)	50	1.32	1.46	1.55	2.42	3.11	3.47	3.44	3.76
		40	1.60	1.86	2.27	3.03	3.87	4.51	4.32	4.62
		30	1.95	2.27	2.86	3.76	4.74	5.19	5.26	5.51

6 Product operation range

Product operation range	
Item	Outdoor ambient temperature °C
Operation range for generating hot water	-26°C~46°C

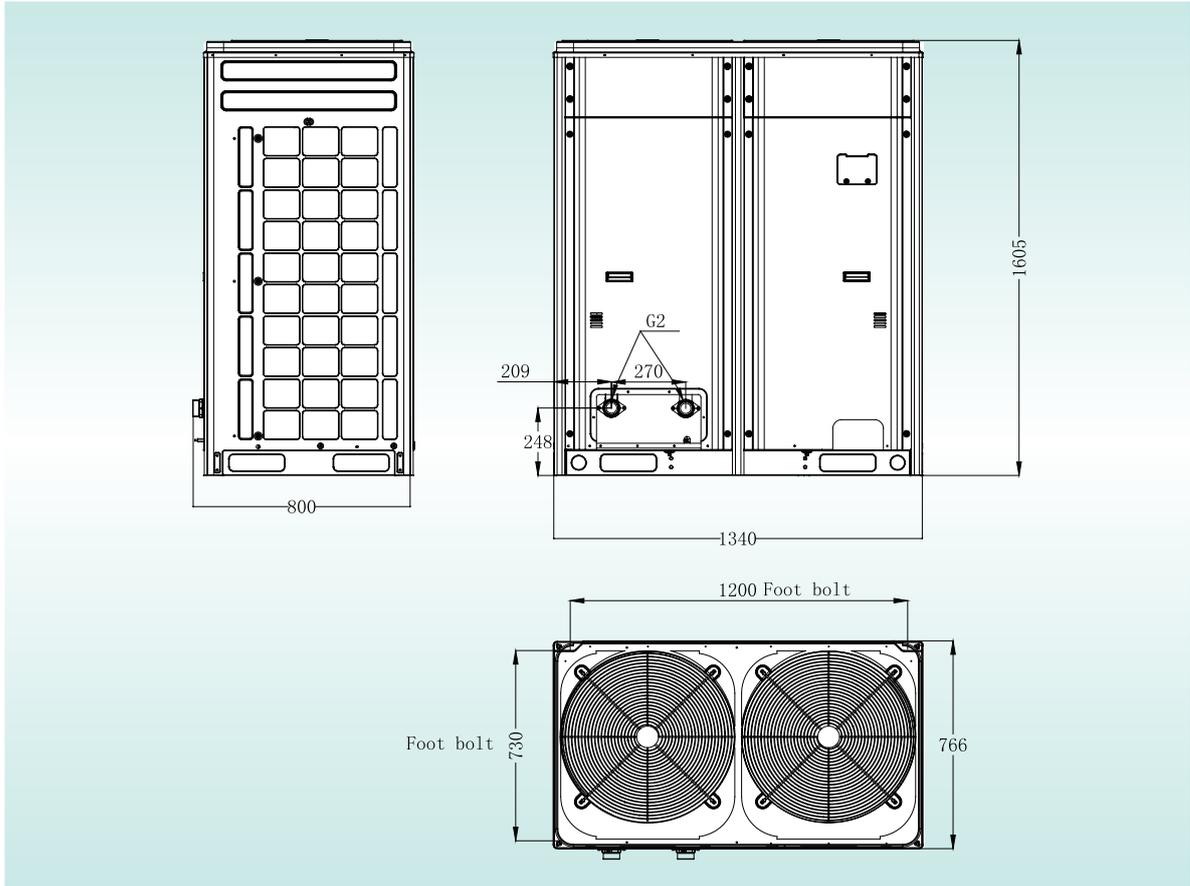
7 Product outline dimension

➔ 7.1 Outline size for GRS-Cm28/NaA-M, GRS-Cm28/NaA1-M, GRS-Cm36/NaA-M, GRS-Cm36/NaA1-M,



➔ 7.2 Outline size for GRS-Cm53/NaA-M, GRS-Cm53/NaA1-M

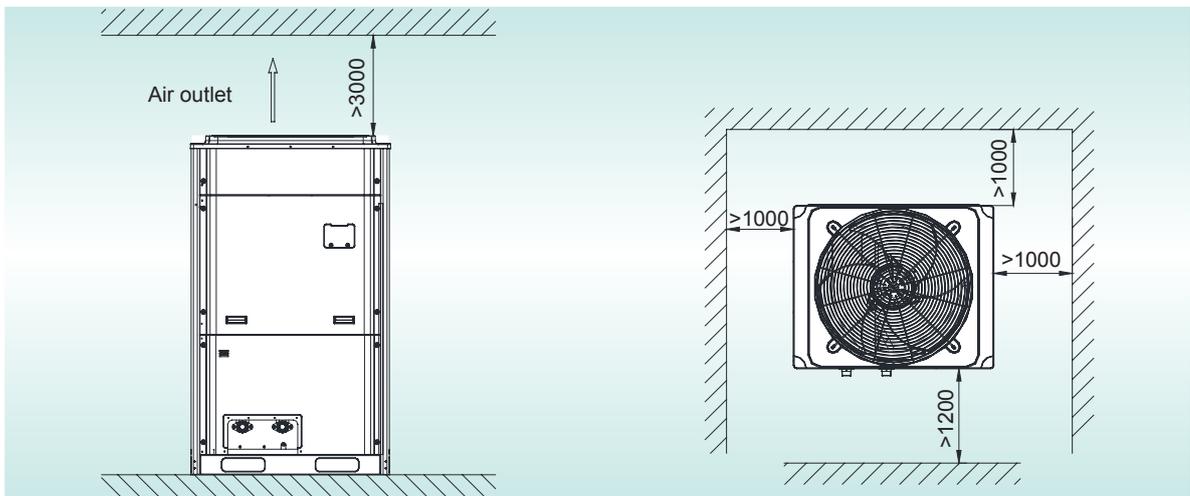
Unit: mm



8 Installation and maintenance space

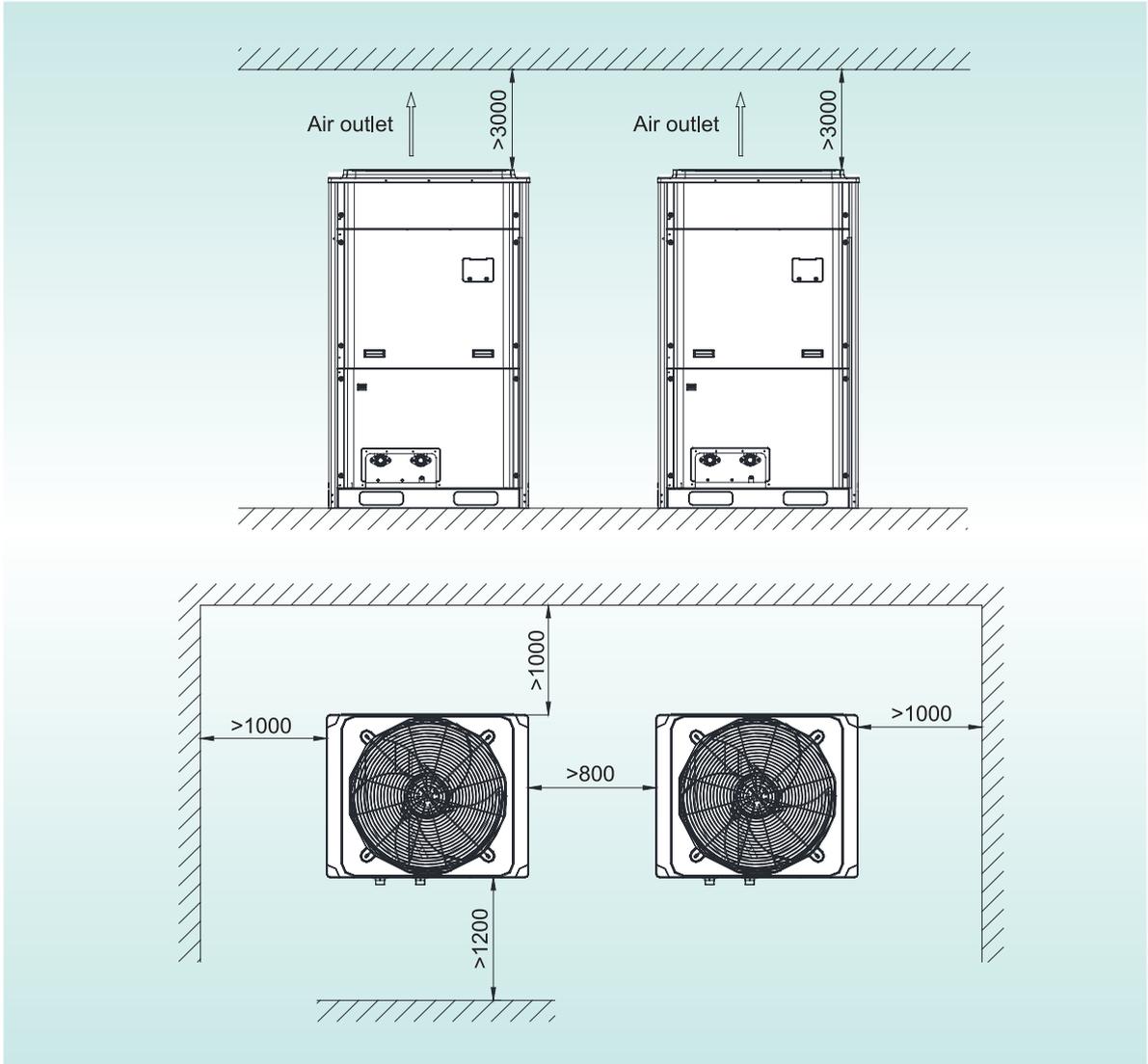
➔ 8.1 Installation space for a single unit of GRS-Cm28/NaA-M, GRS-Cm28/NaA1-M, GRS-Cm36/NaA-M, GRS-Cm36/NaA1-M, GRS-Cm53/NaA-M, GRS-Cm53/NaA1-M

Unit: mm



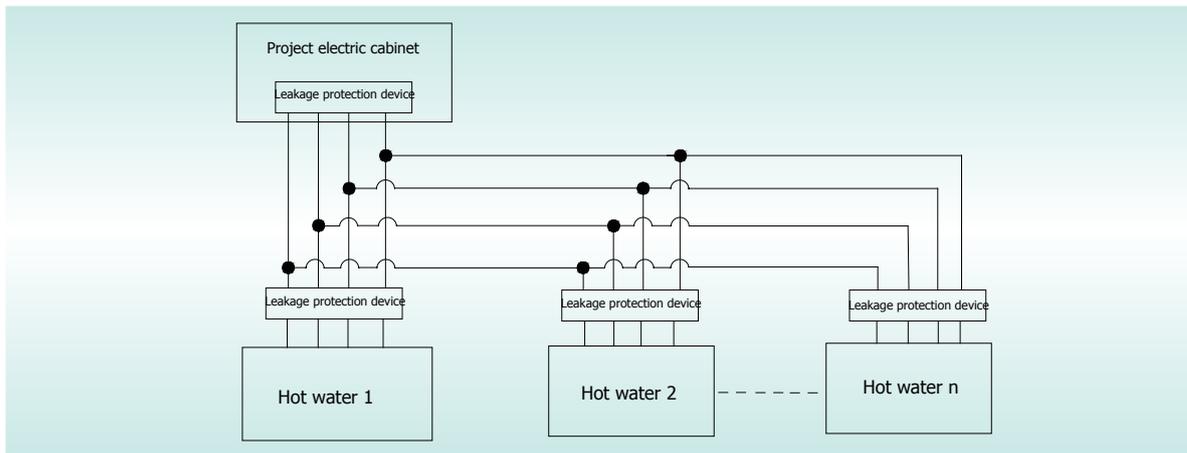
➔ 8.2 Installation space for modular units of GRS-Cm28/NaA-M, GRS-Cm28/NaA1-M, GRS-Cm36/NaA-M, GRS-Cm36/NaA1-M, GRS-Cm53/NaA-M, GRS-Cm53/NaA1-M

Unit: mm



9 Electric installation

- 1.All electric installation must be performed by professional person according to local law, regulation and instruction manual.
- 2.All installation must be check before putting through power.
- 3.Please adopt rated voltage and special power for the water heater.
- 4.Power cord should be fixed reliably.
- 5.When power cord and connection wire are damaged, please replace it with special electric cable.
- 6.For the consideration of safety, customer should install the leakage protection device at the power side. The detailed position is as below:



10 Selection of Air Switch and Power Cord

Unit model	Power type	Minimum sectional area of power cord(mm ²)			Capacity of air switch(A)
		Live wire	Neutral wire	Earthing wire	
GRS-Cm/28NaA-M GRS-Cm/28NaA1-M	380-415V 3N ~ 50Hz	2.5	2.5	2.5	25
GRS-Cm/36NaA-M GRS-Cm/36NaA1-M	380-415V 3N ~ 50Hz	4	4	4	32
GRS-Cm/53NaA-M GRS-Cm/53NaA1-M	380-415V 3N ~ 50Hz	6	6	6	40

- 1.Fuse and power cord are selected according to the maximum power (maximum current) of the unit.
- 2.If the length of power cord is more than 15m, please increase the sectional area of power cord properly to prevent accident.
- 3.Heat pump water heater belongs to type I electric appliances. Please adopt reliable grounding measures.
- 4.The yellow-green wire of the unit is the earthing wire. Please do connect the earthing wire to below places:
 - a. tap water pipe
 - b. gas pipe
 - c. blow-off pipe
 - d. other reliable places.

Annex Model Selection and Installation for the Commercial Water Heater in Project Design

➔ 1 Model selection of water heater

Hot water project

Calculate the hot water volume according to actual requirement.

According to local lowest average temperature and the water inlet temperature of water heater in the coldest season, view table or curve to get the actual water generation capacity of water heater. Meanwhile, other factors should be considered. Calculate the hot water generation volume under the condition that water heater works for 10-14 hours a day. The hot water requirement for the building should be satisfied even in the bad working condition.

Decide the unit mode and quantity according to the size of installation position, weight bearing factor, and so on.

➔ 2 Model selection of water pump

Selection of flow volume of hot water circulating water pump and delivery lift

Flow volume requirement should satisfy the rated flow volume of hot water. When the unit and the water tank is installed at the same floor, the rated delivery lift of water pump should be 15m above.

Selection of the hot water supply pressure pump at user side

In general, the water supply pressure pump will adopt normal pressure pump, self-feeding automatic start-stop pump or electric contact pressure switch+circulating pump. For large scale project, the inverter water pump will be adopted for the comfort of water generation.

The detailed model selection can't be regulated clearly, which should be decided by actual product. Delivery list H is 1.1~1.2 times of the sum of height difference between hot water outlet of water tank and terminal pipeline, resistance loss along the pipeline and part resistance loss. Resistance loss along the pipeline and part resistance loss should be calculated by the water power. When calculating the delivery lift, take 50.5kPa water column for the part resistance loss, and 5m every 100m pipe for the resistance loss along the pipeline. If the pipeline is L, the delivery lift should be calculated by below formula:

$$H=(5+Z+0.05L)\times 1.1 \text{ or } 1.2$$

The flow volume of water pump is the 1.3 times of the flow volume of system at the peak time of water consumption.

Note

The lift calculated by above formula is lift of water pump used for overcoming the water resistance. If it needs to add pressure, the lift should add 15m~25m.

GRS-Cm28/NaA-M、GRS-Cm/28NaA1-M			
Quantity of unit	Main water inlet pipe	Main water outlet pipe	Circulating water pump (rated value)
1 set	DN40	DN40	$Q > 4.8\text{m}^3/\text{h}$; H is calculated by the formula
2 sets	DN50	DN50	$Q > 9.6\text{m}^3/\text{h}$; H is calculated by the formula
3 sets	DN65	DN65	$Q > 14.4\text{m}^3/\text{h}$; H is calculated by the formula
4 sets	DN65	DN65	$Q > 19.2\text{m}^3/\text{h}$; H is calculated by the formula

GRS-Cm36/NaA-M、GRS-Cm/36NaA1-M			
Quantity of unit	Main water inlet pipe	Main water outlet pipe	Circulating water pump (rated value)
1 set	DN50	DN50	$Q > 6.2\text{m}^3/\text{h}$; H is calculated by the formula
2 sets	DN65	DN65	$Q > 12.4\text{m}^3/\text{h}$; H is calculated by the formula
3 sets	DN80	DN80	$Q > 18.6\text{m}^3/\text{h}$; H is calculated by the formula
4 sets	DN100	DN100	$Q > 24.8\text{m}^3/\text{h}$; H is calculated by the formula

GRS-Cm53/NaA-M、GRS-Cm/53NaA1-M			
Quantity of unit	Main water inlet pipe	Main water outlet pipe	Circulating water pump (rated value)
1 set	DN65	DN65	$Q > 9.2\text{m}^3/\text{h}$; H is calculated by the formula
2 sets	DN80	DN80	$Q > 18.4\text{m}^3/\text{h}$; H is calculated by the formula
3 sets	DN100	DN100	$Q > 27.6\text{m}^3/\text{h}$; H is calculated by the formula
4 sets	DN125	DN125	$Q > 36.8\text{m}^3/\text{h}$; H is calculated by the formula

Note

The “circulating water pump” in above table indicated hot water circulating water pump.

➔ 3 Selection of water pipe

Formula: $V=Q/S$

V—Water flow speed ;

Q—Rated flow volume of unit;

S—Sectional area for the water connection pipe;

Hot water supply pipe, hot water circulating pipe, water makeup pipe and drainage pipe should adopt PPR pipe, compound pipe, galvanized steel pipe and copper pipe.

For consideration of the problem of extension and clean of pipeline, PPR pipe is suggested for the installation. PPR is with good heat resistant performance (applicable temperature range -20 ~ 120°C).

The suggested specification for the PPR pipe is in below table:

Model selection of inlet/outlet/water pipe for GRS-Cm28/NaA-M、GRS-Cm28/NaA1-M		
Quantity of unit	Mian water inlet pipe	Main water outlet pipe
1 set	DN40	DN40
2 sets connection in parallel	DN50	DN50
3 sets connection in parallel	DN65	DN65
4 ~ 5 sets connection in parallel	DN80	DN80
6 ~ 8 sets connection in parallel	DN80	DN80
9 ~ 14 sets connection in parallel	DN100	DN100
15 ~ 16 sets connection in parallel	DN100	DN100

Model selection of inlet/outlet/water pipe for GRS-Cm36/NaA-M、GRS-Cm36/NaA1-M		
Quantity of unit	Mian water inlet pipe	Main water outlet pipe
1 set	DN50	DN50
2 sets connection in parallel	DN65	DN65
3 sets connection in parallel	DN80	DN80
4 ~ 5 sets connection in parallel	DN100	DN100
6 ~ 8 sets connection in parallel	DN100	DN100
9 ~ 14 sets connection in parallel	DN125	DN125
15 ~ 16 sets connection in parallel	DN125	DN125

Model selection of inlet/outlet/water pipe for GRS-Cm53/NaA-M、GRS-Cm53/NaA1-M		
Quantity of unit	Mian water inlet pipe	Main water outlet pipe
1 set	DN65	DN65
2 sets connection in parallel	DN80	DN80
3 sets connection in parallel	DN100	DN100
4 ~ 5 sets connection in parallel	DN125	DN125
6 ~ 8 sets connection in parallel	DN150	DN150
9 ~ 14 sets connection in parallel	DN150	DN150
15 ~ 16 sets connection in parallel	DN200	DN200

Note

1.As for multiple units' connection in parallel for operation, after selecting the main water pipe, the water power must be calculated. If the pipeline resistance at water side is more than the delivery list of selected water pump, it needs to select the bigger water pump again, or increase the water pipe.

2.If adopt steel pipe, copper pipe and other metal pipes for the pipeline, the unit must connect PPR connection pipe, and then connect metal pipes through connection pipe sub-assy.

3.The water pipe should be installed uprightly and the layout the pipelines should be reasonable for reducing elbows as much as possible.

4.Strainer should be installed at the water inlet of unit for preventing blockage of water side heat exchanger.

5.In general, service valve should be installed in front of the solenoid valve for future maintenance. For the clean of system, drainage valve should be installed at the lowest position of the system, and discharge valve should be installed at the highest position of the system.

6.When the pipeline is installed well, leakage test must be performed according to related regulation. The pipeline should be clean for preventing damage to heat exchanger and water pump.

7.After that, water inlet pipe, water outlet pipe and water makeup pipe should be thermal insulated to preventing heat loss and breakage of pipeline in winter. All valves should also be thermal insulated.

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With the installation of Gree commercial air conditioners in important projects at home and abroad like Media Village for 2008 Beijing Olympic Games, Stadiums for 2010 World Cup in South Africa, as well as India Telecom base station, Gree commercial air conditioners are ready to develop steadily to every corner in the world, to present a more comfortable and harmonious working environment and family atmosphere.



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