



# ***Technical Sales Guide***

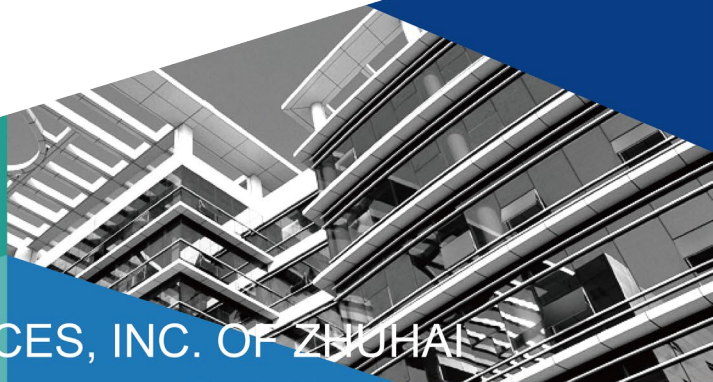
## **GMV MTAC MULTI VRF SYSTEM**

(GC201909-II)

TECHNICAL SALES GUIDE-60Hz

CAPACITY RANGE:3.52kW

SUPER HIGH AMBIENT OPERATION TO 48°C(118.4°F)



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## 1 OUTLINE OF MULTI VRF



### 1.1 Product List

Model	GMV-12WP/A-T(U)
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### 1.2 Product Features

#### 1.2.1 Summary of Features

GMV MTAC is a kind of concealed VRF unit, which adopts front side air discharge and air return. It's mainly developed for North American market, which is applicable for apartments, offices, hotels and other areas. The unit adopts deep subcooling technology for ensuring the quiet cooling operation. Moreover, the unique drainage control technology has solved the problem of water drainage of outdoor unit under low-temperature environment. Include GMV-12WP/A-T(U).

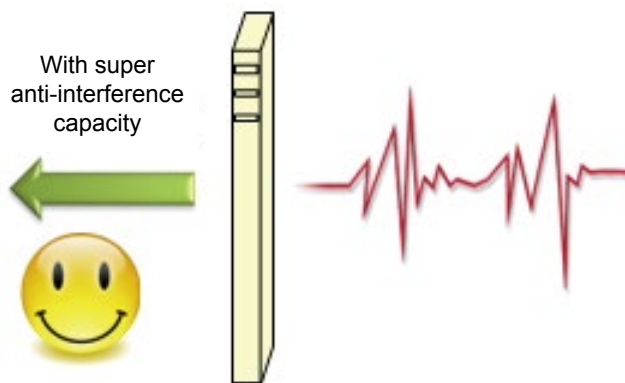
#### 1.2.2 Introduction of Features

##### (1) High Efficiency

The system adopts all DC motor, which greatly improves efficiency. The energy efficiency for Gree all DC unit is increased greatly. SEER of GMV-12WP/A-T(U) is up to 15.5; HSPF of GMV-12WP/A-T(U) is up to 9.5.

##### (2) Latest CAN Bus Communication

The latest communication way-CAN bus communication is adopted, which greatly improves anti-interference ability, precisely controls the indoor units and improves the reliability of system. Meanwhile, specialized shielded wire is not longer needed, while conventional communication wire can be used to increase the flexibility of project installation.



High anti-interference ability

##### (3) Long Connection Pipe and Big Height Difference

GMV-12WP/A-T(U):

The maximum length of connection pipe is 30m(98-3/8ft) (in total) and the farthest connection pipe between indoor and outdoor units can be 30(98-3/8ft)m's long, which has extended the installation condition and reduced the limit of installation distance.

The max allowable height difference between indoor unit and outdoor unit is 15m(49-2/8ft) and that between indoor unit and indoor unit is 10m(32-6/8ft).

##### (4) Wide Operation Range

The system can operate constantly and reliably in a wide temperature range (cooling: -5~48°C (23~118.4°F), heating: -20~27°C(-4~80.6°F)), which is not affected by atrocious environment.

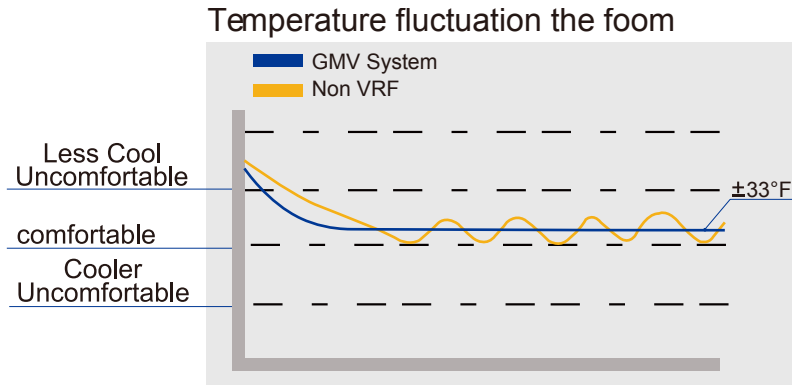
##### (5) Good Acoustic

A series of optimized measures are taken to solve the problem of indoor unit's throttling sound, indoor

unit's oil return noise, gas bypass noise during start-up, which improves the comfort of system.

(6) PID Intelligent Capacity Adjustment

The system applies the original technology of PID intelligent capacity adjustment, which quickly and precisely controls indoor ambient temperature according to set temperature, with small temperature fluctuation and great comfort.



(7) Self Diagnostics System

Comprehensive troubleshooting code allows for finely identification of problems arising.

(8) Intelligent Control

1) Intelligent Control

- a. High-efficient magnetic reluctance inverter compressor: High-efficient magnetic reluctance compressor is adopted to take advantage of the magnetic reluctance torque of compressor. Under the same output capacity, the efficiency can be improved by 5%.
- b. Advanced torque control technology: minimum current and maximum torque control technology adopts the most optimized control principle to realize maximum torque output with minimum current and reduce loss of motor winding and intelligent power module for higher energy efficiency.
- c. Advanced torque control technology: minimum current and maximum torque control technology adopts the most optimized control principle to realize maximum torque output with minimum current and reduce loss of motor winding and intelligent power module for higher energy efficiency.
- d. High-efficient numerical PFC control: High-efficient PFC control technology is applied to improve efficiency by approx. 1% compared with traditional PFC; for an air condition with rated power of 5kW, 50W can be saved per hour and 1.2kWh electricity can be saved per day.
- e. 180° sine wave DC variable speed technology: 180° current output waveform is smooth sine wave with small harmonic wave content, small torque pulsation, wide adjustable range and stable operation of motor, which can satisfy the temperature requirement in various occasion, save electricity greatly and ensure user's comfort in maximum.

2) Beautiful humanized controller design:

- a. 24h timer on or timer off can be preset (countdown timer and clock timer).
- b. Detect ambient temperature precisely; 7 kinds of fan speed can be set.
- c. Auto, cool, dry, fan or heat mode can be set.
- d. Master wired controller and sub-master wired controller can be set; several indoor units can be controlled simultaneously.
- e. Various functions can be set: sleep, ventilation, quiet (auto quiet), light, absence, energy-saving, clean, e-heater, x-fan, memory, etc..


3) High anti-interference ability

The latest communication way-CAN bus communication(non-polar communication) is adopted, which greatly improves anti-interference ability. Specialized shielded wire is not longer needed for communication wire between units, while conventional communication wire can be used to increase the flexibility of project installation.

- 4) Intelligent temperature control technology and intelligent defrosting mode are adopted
- 5) The system is with strong quick cooling/heating function, which can increase indoor temperature rapidly to set temperature and perform defrosting according to frosting situation.

## 2 SUMMARY OF SYSTEM EQUIPMENTS

### 2.1 Outdoor Unit

Model	Code	Cooling Capacity		Heating Capacity		Power Supply	Ref.	Appearance
		kW	Btu/h	kW	Btu/h			
GMV-12WP/A-T(U)	CN850W0930	3.52	12000	3.52	12000	208V/230V ~ 60Hz	R410A	

#### 2.1.1 Nomenclature

GMV	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	W	<input type="checkbox"/>	/	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2		3	4	5	6	7		8	9	10	

No.	Description	Options
1	Product code	GMV-Gree Multi VRF Units
2	Suitable climate	Blank-T1 condition; T2-low temperature climate; T3-high temperature climate
3	Unit type	DC Inverter (omit)
4	Function code	Q—Heat Recovery; S—Water Heater; W—Water-cooled Unit; X—Fresh Air Unit Leave blank if above functions are unavailable
5	Code of cooling capacity	Nominal capacity/1000(Btu/h)
6	Outdoor	W—Outdoor
7	Unit structure	M—Modular (top discharge); L—Non-modular (side discharge); blank—Non-modular (top discharge);P—PTAC
8	Refrigerant	R410A (omit)
9	Design No.	Named in order of A, B, C, or combined with 1, 2, 3...
10	Power supply	1 phase—omit; 3 phase—S

#### 2.1.2 Rated Conditions

	Indoor side inlet air status				Outdoor side inlet air status			
	Dry bulb temperature		Wet bulb temperature		Dry bulb temperature		Wet bulb temperature	
	°C	°F	°C	°F	°C	°F	°C	°F
Cooling	26.7	80.0	19.4	67.0	35.0	95.0	23.9	75.0
Heating	21.1	70.0	15.6	60.6	8.3	47	6.1	43

### 2.1.3 Branching joints

	Model name	Usage	Appearance
Y-shape branching joint	GMV-12WP/A-T(U)	FQ01A/A	

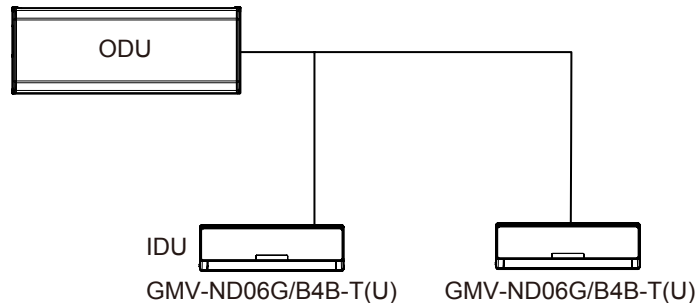
## 3 BASIC SYSTEM CONFIGURATION

### 3.1 System legend(ex.)

Model name of outdoor unit: GMV-12WP/A-T(U)

Allowed capacity code of indoor unit: Min:6000Btu/h, Max:16200Btu/h.

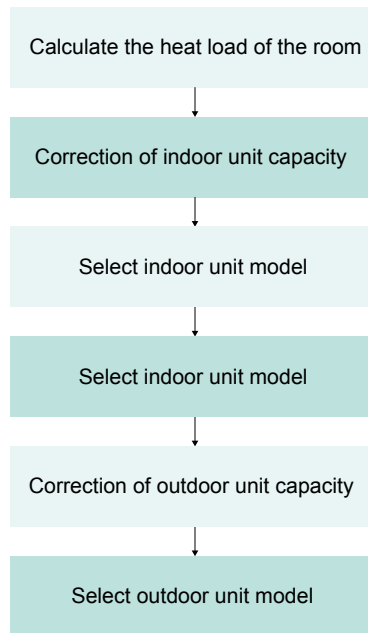
NOTE: The total capacity code of indoor units shall be within 50%~135% of the capacity code of selected outdoor unit.



Total capacity code of indoor units is  $6+6=12$ , so the selected outdoor unit is GMV-12WP/A-T(U).

## 4 EQUIPMENT SELECTION PROCEDURE

### 4.1 Selection flow chart



### 4.2 Combination conditions for indoor unit and outdoor unit

- (1) The capacity code of indoor units = total capacity code of outdoor unit × (50%~135%).
- (2) For outdoor unit, maximum No. of connectable indoor units and total capacity code of indoor units are decided.

Model name of outdoor unit	Capacity code of outdoor unit		Max. No. of indoor units
	kW	Btu/h	
GMV-12WP/A-T(U)	3.52	12000	2



### 4.3 Cooling/Heating capacity characteristics

(1) Cooling capacity calculation method.

➤ GMV-12WP/A-T(U)

TC—Total capacity of outdoor unit; PI—Power input of outdoor unit

Combination	Outdoor air temp(°C DB)	Indoor air temp													
		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
135%	-5	3.1	0.6	3.7	0.8	4.2	0.8	4.4	0.8	4.5	0.8	4.6	0.8	4.7	0.8
	0	3.1	0.6	3.7	0.8	4.2	0.8	4.4	0.8	4.5	0.8	4.6	0.8	4.7	0.8
	4	3.1	0.6	3.7	0.8	4.2	0.8	4.4	0.8	4.5	0.8	4.6	0.8	4.7	0.8
	7	3.1	0.6	3.7	0.8	4.2	0.8	4.4	0.8	4.5	0.8	4.6	0.8	4.7	0.8
	10	3.1	0.6	3.7	0.8	4.3	0.9	4.4	1.0	4.5	0.9	4.6	0.9	4.7	0.9
	12	3.1	0.7	3.7	0.8	4.3	1.0	4.4	1.0	4.4	0.9	4.5	0.9	4.6	0.9
	14	3.1	0.7	3.7	0.8	4.2	1.0	4.3	0.9	4.4	0.9	4.5	0.9	4.6	0.9
	16	3.1	0.7	3.7	0.8	4.2	1.0	4.2	1.0	4.3	1.0	4.4	1.0	4.5	1.0
	18	3.1	0.7	3.7	0.9	4.1	1.0	4.2	1.0	4.2	1.0	4.4	1.0	4.5	1.0
	20	3.1	0.7	3.7	0.9	4.1	1.0	4.1	1.1	4.2	1.1	4.3	1.1	4.4	1.1
	21	3.1	0.7	3.7	0.9	4.0	1.1	4.1	1.1	4.2	1.1	4.3	1.1	4.4	1.1
	23	3.1	0.8	3.7	1.0	4.0	1.1	4.0	1.1	4.1	1.1	4.2	1.1	4.3	1.2
	25	3.1	0.8	3.7	1.1	3.9	1.2	4.0	1.2	4.0	1.2	4.2	1.2	4.3	1.2
	27	3.1	0.9	3.7	1.2	3.9	1.0	3.9	1.2	4.0	1.2	4.1	1.2	4.2	1.3
	29	3.1	1.0	3.7	1.2	3.8	1.3	3.9	1.3	3.9	1.3	4.0	1.3	4.2	1.3
	31	3.1	1.0	3.7	1.3	3.8	1.3	3.8	1.3	3.9	1.3	4.0	1.3	4.1	1.4
	33	3.1	1.1	3.6	1.4	3.7	1.4	3.8	1.4	3.8	1.4	3.9	1.4	4.0	1.4
	35	3.1	1.2	3.5	1.4	3.6	1.4	3.7	1.4	3.8	1.4	3.9	1.5	4.0	1.5
	37	3.1	1.2	3.5	1.5	3.6	1.5	3.6	1.5	3.7	1.5	3.8	1.5	3.9	1.5
	39	3.1	1.3	3.4	1.5	3.5	1.5	3.6	1.5	3.6	1.5	3.8	1.6	3.9	1.6
41	2.9	1.5	3.3	1.8	3.5	1.8	3.5	1.7	3.6	1.7	3.7	1.7	3.8	1.7	
44	2.7	1.6	3.2	1.9	3.3	2.0	3.4	1.9	3.4	1.8	3.5	1.8	3.7	1.8	
47	2.6	2.1	3.1	2.6	3.2	2.1	3.2	1.9	3.3	1.9	3.4	1.9	3.5	1.9	
50	2.3	2.1	2.7	2.5	2.8	2.2	2.9	2.1	2.9	2.0	3.1	2.0	3.2	2.0	
52	1.8	1.7	2.0	2.1	2.1	1.9	2.2	1.9	2.3	1.8	2.4	1.8	2.6	1.8	



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		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
120%	-5	2.8	0.6	3.5	0.7	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8	4.6	0.8
	0	2.8	0.6	3.5	0.7	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8	4.6	0.8
	4	2.8	0.6	3.5	0.7	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8	4.6	0.8
	7	2.8	0.6	3.5	0.7	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8	4.6	0.8
	10	2.8	0.6	3.4	0.7	3.9	0.9	4.2	0.9	4.4	1.0	4.5	0.9	4.6	0.9
	12	2.8	0.6	3.4	0.7	3.9	0.9	4.2	0.9	4.3	1.0	4.4	0.9	4.5	0.9
	14	2.8	0.6	3.4	0.7	3.9	0.9	4.2	1.0	4.3	1.0	4.4	0.9	4.5	0.9
	16	2.8	0.6	3.4	0.8	3.9	0.9	4.2	1.0	4.2	1.0	4.3	1.0	4.4	1.0
	18	2.8	0.6	3.4	0.8	3.9	0.9	4.1	1.0	4.2	1.0	4.3	1.0	4.4	1.0
	20	2.8	0.6	3.4	0.8	3.9	1.0	4.1	1.0	4.1	1.1	4.2	1.1	4.3	1.1
	21	2.8	0.7	3.4	0.8	3.9	1.0	4.0	1.1	4.1	1.1	4.2	1.1	4.3	1.1
	23	2.8	0.7	3.4	0.9	3.9	1.1	4.0	1.1	4.0	1.1	4.1	1.1	4.2	1.1
	25	2.8	0.7	3.4	1.0	3.9	1.2	3.9	1.2	4.0	1.2	4.1	1.2	4.2	1.2
	27	2.8	0.8	3.4	1.0	3.8	1.2	3.9	1.2	3.9	1.2	4.0	1.2	4.1	1.2
	29	2.8	0.8	3.4	1.1	3.8	1.3	3.8	1.3	3.9	1.3	4.0	1.3	4.1	1.3
	31	2.8	0.9	3.4	1.2	3.7	1.3	3.8	1.3	3.8	1.3	3.9	1.3	4.0	1.4
	33	2.8	1.0	3.4	1.2	3.6	1.4	3.7	1.4	3.7	1.4	3.8	1.4	3.9	1.4
	35	2.8	1.0	3.4	1.3	3.6	1.4	3.6	1.4	3.7	1.4	3.8	1.4	3.9	1.5
	37	2.8	1.1	3.4	1.4	3.5	1.5	3.6	1.5	3.6	1.5	3.7	1.5	3.8	1.5
39	2.8	1.2	3.4	1.5	3.5	1.5	3.5	1.5	3.6	1.5	3.7	1.5	3.8	1.6	
41	2.7	1.3	3.2	1.7	3.4	1.8	3.4	1.6	3.5	1.7	3.6	1.7	3.7	1.7	
44	2.5	1.4	3.0	1.8	3.2	2.0	3.3	1.9	3.4	1.8	3.5	1.8	3.6	1.8	
47	2.4	1.9	2.9	2.4	3.1	2.1	3.2	1.9	3.2	1.9	3.4	1.9	3.5	1.9	
50	2.2	1.8	2.6	2.4	2.8	2.2	2.8	2.0	2.9	2.0	3.0	2.0	3.1	2.0	
52	1.6	1.5	2.0	2.0	2.1	1.9	2.1	1.9	2.2	1.8	2.4	1.8	2.5	1.7	

Combination	Outdoor air temp(°C DB)	Indoor air temp													
		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
110%	-5	2.6	0.5	3.2	0.6	4.1	0.8	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8
	0	2.6	0.5	3.2	0.6	4.1	0.8	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8
	4	2.6	0.5	3.2	0.6	4.1	0.8	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8
	7	2.6	0.5	3.2	0.6	4.1	0.8	4.2	0.8	4.3	0.8	4.4	0.8	4.5	0.8
	10	2.6	0.5	3.1	0.7	3.6	0.8	3.9	0.8	4.1	0.9	4.4	1.0	4.5	0.9
	12	2.6	0.5	3.1	0.7	3.6	0.8	3.9	0.9	4.1	0.9	4.4	1.0	4.5	0.9
	14	2.6	0.6	3.1	0.7	3.6	0.8	3.9	0.9	4.1	0.9	4.3	1.0	4.4	0.9
	16	2.6	0.6	3.1	0.7	3.6	0.8	3.9	0.9	4.1	1.0	4.3	1.0	4.3	1.0
	18	2.6	0.6	3.1	0.7	3.6	0.8	3.9	0.9	4.1	1.0	4.2	1.0	4.3	1.0
	20	2.6	0.6	3.1	0.7	3.6	0.9	3.9	1.0	4.0	1.0	4.1	1.1	4.2	1.1
	21	2.6	0.6	3.1	0.7	3.6	0.9	3.9	1.0	4.0	1.1	4.1	1.1	4.2	1.1
	23	2.6	0.6	3.1	0.8	3.6	1.0	3.9	1.1	4.0	1.1	4.1	1.1	4.1	1.1
	25	2.6	0.7	3.1	0.8	3.6	1.1	3.9	1.2	3.9	1.2	4.0	1.2	4.1	1.2
	27	2.6	0.7	3.1	0.9	3.6	1.1	3.8	1.2	3.8	1.2	3.9	1.2	4.0	1.2
	29	2.6	0.8	3.1	1.0	3.6	1.2	3.7	1.3	3.8	1.3	3.9	1.3	4.0	1.3
	31	2.6	0.8	3.1	1.0	3.6	1.3	3.7	1.3	3.7	1.3	3.8	1.3	3.9	1.3
	33	2.6	0.9	3.1	1.1	3.6	1.4	3.6	1.4	3.7	1.4	3.8	1.4	3.9	1.4
	35	2.6	0.9	3.1	1.2	3.5	1.4	3.6	1.4	3.6	1.4	3.7	1.4	3.8	1.4
	37	2.6	1.0	3.1	1.2	3.5	1.5	3.5	1.5	3.6	1.5	3.7	1.5	3.7	1.5
	39	2.6	1.0	3.1	1.3	3.4	1.5	3.5	1.5	3.5	1.5	3.6	1.5	3.7	1.5
41	2.5	1.1	2.9	1.5	3.3	1.8	3.4	1.6	3.4	1.6	3.5	1.7	3.6	1.7	
44	2.3	1.2	2.8	1.6	3.2	2.0	3.2	1.8	3.3	1.8	3.4	1.7	3.5	1.8	
47	2.2	1.7	2.7	2.1	3.1	2.1	3.1	1.9	3.2	1.9	3.3	1.9	3.4	1.9	
50	2.0	1.6	2.4	2.1	2.8	2.2	2.8	2.0	2.8	2.0	2.9	2.0	3.0	2.0	
52	1.5	1.4	1.8	1.8	2.1	1.9	2.1	1.8	2.2	1.8	2.3	1.8	2.5	1.7	

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		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
100%	-5	2.4	0.4	2.9	0.5	3.8	0.7	4.2	0.8	4.2	0.8	4.3	0.8	4.4	0.8
	0	2.4	0.4	2.9	0.5	3.8	0.7	4.2	0.8	4.2	0.8	4.3	0.8	4.4	0.8
	4	2.4	0.4	2.9	0.5	3.8	0.7	4.2	0.8	4.2	0.8	4.3	0.8	4.4	0.8
	7	2.4	0.4	2.9	0.6	3.8	0.7	4.2	0.8	4.2	0.8	4.3	0.8	4.4	0.8
	10	2.4	0.5	2.8	0.6	3.3	0.7	3.5	0.7	3.7	0.8	4.2	0.9	4.4	1.0
	12	2.4	0.5	2.8	0.6	3.3	0.7	3.5	0.8	3.7	0.8	4.2	0.9	4.4	0.9
	14	2.4	0.5	2.8	0.6	3.3	0.7	3.5	0.8	3.7	0.8	4.2	0.9	4.3	0.9
	16	2.4	0.5	2.8	0.6	3.3	0.7	3.5	0.8	3.7	0.9	4.2	1.0	4.2	1.0
	18	2.4	0.5	2.8	0.6	3.3	0.7	3.5	0.8	3.7	0.9	4.1	1.0	4.2	1.0
	20	2.4	0.5	2.8	0.6	3.3	0.8	3.5	0.8	3.7	0.9	4.0	1.0	4.1	1.1
	21	2.4	0.5	2.8	0.6	3.3	0.8	3.5	0.9	3.7	1.0	4.0	1.1	4.1	1.1
	23	2.4	0.5	2.8	0.7	3.3	0.9	3.5	0.9	3.7	1.0	4.0	1.1	4.0	1.1
	25	2.4	0.6	2.8	0.7	3.3	0.9	3.5	1.0	3.7	1.1	3.9	1.2	4.0	1.2
	27	2.4	0.6	2.8	0.8	3.3	1.0	3.5	1.1	3.7	1.2	3.9	1.2	3.9	1.2
	29	2.4	0.7	2.8	0.8	3.3	1.0	3.5	1.2	3.7	1.3	3.8	1.3	3.9	1.3
	31	2.4	0.7	2.8	0.9	3.3	1.1	3.5	1.2	3.7	1.3	3.7	1.3	3.8	1.3
	33	2.4	0.7	2.8	1.0	3.3	1.2	3.5	1.3	3.6	1.4	3.7	1.4	3.8	1.4
	35	2.4	0.8	2.8	1.0	3.3	1.3	3.5	1.4	3.5	1.4	3.6	1.4	3.7	1.4
37	2.4	0.8	2.8	1.1	3.3	1.3	3.4	1.5	3.5	1.5	3.6	1.5	3.7	1.5	
39	2.4	0.9	2.8	1.2	3.3	1.4	3.4	1.5	3.4	1.5	3.5	1.5	3.6	1.5	
41	2.2	1.0	2.7	1.3	3.1	1.6	3.3	1.6	3.4	1.6	3.4	1.6	3.5	1.7	
44	2.1	1.1	2.5	1.4	3.0	1.8	3.2	1.8	3.2	1.8	3.3	1.7	3.4	1.7	
47	2.0	1.4	2.4	1.9	2.9	1.9	3.1	1.9	3.1	1.9	3.2	1.9	3.3	1.9	
50	1.8	1.4	2.2	1.8	2.6	2.0	2.7	2.0	2.8	2.0	2.9	2.0	3.0	2.0	
52	1.4	1.2	1.6	1.5	1.9	1.7	2.1	1.8	2.1	1.8	2.3	1.8	2.4	1.7	

Combination	Outdoor air temp(°C DB)	Indoor air temp													
		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-5	2.3	0.4	2.8	0.5	3.6	0.6	3.9	0.6	4.2	0.7	4.4	0.8	4.5	0.8
	0	2.3	0.4	2.8	0.5	3.6	0.6	3.9	0.6	4.2	0.7	4.4	0.8	4.5	0.8
	4	2.3	0.4	2.8	0.5	3.6	0.6	3.9	0.6	4.2	0.7	4.4	0.8	4.5	0.8
	7	2.3	0.4	2.8	0.5	3.6	0.6	3.9	0.7	4.2	0.7	4.4	0.8	4.4	0.8
	10	2.3	0.4	2.7	0.5	3.1	0.6	3.3	0.7	3.5	0.7	3.9	0.8	4.3	0.9
	12	2.3	0.4	2.7	0.5	3.1	0.6	3.3	0.7	3.5	0.7	3.9	0.8	4.3	0.9
	14	2.3	0.4	2.7	0.5	3.1	0.6	3.3	0.7	3.5	0.7	3.9	0.8	4.3	1.0
	16	2.3	0.4	2.7	0.5	3.1	0.6	3.3	0.7	3.5	0.8	3.9	0.9	4.3	1.0
	18	2.3	0.5	2.7	0.5	3.1	0.6	3.3	0.7	3.5	0.8	3.9	0.9	4.3	1.0
	20	2.3	0.5	2.7	0.6	3.1	0.7	3.3	0.7	3.5	0.8	3.9	0.9	4.2	1.0
	21	2.3	0.5	2.7	0.6	3.1	0.7	3.3	0.8	3.5	0.8	3.9	1.0	4.2	1.1
	23	2.3	0.5	2.7	0.6	3.1	0.7	3.3	0.8	3.5	0.9	3.9	1.1	4.1	1.1
	25	2.3	0.5	2.7	0.6	3.1	0.8	3.3	0.9	3.5	0.9	3.9	1.1	4.1	1.2
	27	2.3	0.5	2.7	0.7	3.1	0.8	3.3	0.9	3.5	1.0	3.9	1.2	4.0	1.2
	29	2.3	0.6	2.7	0.7	3.1	0.9	3.3	1.0	3.5	1.1	3.9	1.3	4.0	1.3
	31	2.3	0.6	2.7	0.8	3.1	1.0	3.3	1.1	3.5	1.2	3.8	1.3	3.9	1.3
	33	2.3	0.7	2.7	0.8	3.1	1.0	3.3	1.1	3.5	1.2	3.8	1.4	3.9	1.4
	35	2.3	0.7	2.7	0.9	3.1	1.1	3.3	1.2	3.5	1.3	3.7	1.4	3.8	1.4
	37	2.3	0.7	2.7	0.9	3.1	1.2	3.3	1.2	3.5	1.4	3.7	1.5	3.8	1.5
	39	2.3	0.8	2.7	1.0	3.1	1.2	3.2	1.3	3.5	1.5	3.6	1.5	3.7	1.5
41	2.2	0.9	2.6	1.1	3.0	1.4	3.2	1.4	3.4	1.5	3.6	1.6	3.6	1.6	
44	2.0	0.9	2.5	1.2	2.8	1.5	3.0	1.6	3.2	1.6	3.4	1.7	3.5	1.7	
47	1.9	1.3	2.4	1.6	2.8	1.6	2.9	1.6	3.1	1.7	3.3	1.8	3.4	1.9	
50	1.8	1.2	2.1	1.6	2.5	1.7	2.6	1.7	2.8	1.9	3.0	2.0	3.1	1.9	
52	1.4	1.0	1.6	1.3	1.9	1.4	2.0	1.6	2.2	1.7	2.4	1.8	2.5	1.7	

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Combination	Outdoor air temp(°C DB)	Indoor air temp													
		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
80%	-5	2.1	0.3	2.5	0.4	3.2	0.5	3.5	0.5	3.7	0.6	4.2	0.7	4.4	0.8
	0	2.1	0.3	2.5	0.4	3.2	0.5	3.5	0.5	3.7	0.6	4.2	0.7	4.4	0.8
	4	2.1	0.3	2.5	0.4	3.2	0.5	3.5	0.5	3.7	0.6	4.2	0.7	4.4	0.8
	7	2.1	0.3	2.5	0.4	3.2	0.5	3.5	0.6	3.7	0.6	4.1	0.7	4.3	0.8
	10	2.1	0.4	2.4	0.5	2.8	0.5	3.0	0.6	3.2	0.6	3.5	0.7	3.9	0.8
	12	2.1	0.4	2.4	0.5	2.8	0.5	3.0	0.6	3.2	0.6	3.5	0.7	3.9	0.8
	14	2.1	0.4	2.4	0.5	2.8	0.6	3.0	0.6	3.2	0.6	3.5	0.7	3.9	0.8
	16	2.1	0.4	2.4	0.5	2.8	0.6	3.0	0.6	3.2	0.7	3.5	0.8	3.9	0.9
	18	2.1	0.4	2.4	0.5	2.8	0.6	3.0	0.6	3.2	0.7	3.5	0.8	3.9	0.9
	20	2.1	0.4	2.4	0.5	2.8	0.6	3.0	0.6	3.2	0.7	3.5	0.8	3.9	1.0
	21	2.1	0.4	2.4	0.5	2.8	0.6	3.0	0.6	3.2	0.7	3.5	0.8	3.9	1.0
	23	2.1	0.4	2.4	0.5	2.8	0.6	3.0	0.7	3.2	0.7	3.5	0.9	3.9	1.1
	25	2.1	0.4	2.4	0.5	2.8	0.7	3.0	0.7	3.2	0.8	3.5	0.9	3.9	1.2
	27	2.1	0.5	2.4	0.6	2.8	0.7	3.0	0.8	3.2	0.9	3.5	1.0	3.9	1.2
	29	2.1	0.5	2.4	0.6	2.8	0.8	3.0	0.8	3.1	0.9	3.5	1.1	3.9	1.3
	31	2.1	0.5	2.4	0.7	2.8	0.8	3.0	0.9	3.1	1.0	3.5	1.1	3.8	1.3
	33	2.1	0.6	2.4	0.7	2.8	0.9	3.0	0.9	3.1	1.0	3.5	1.2	3.8	1.4
	35	2.1	0.6	2.4	0.7	2.8	0.9	3.0	1.0	3.1	1.1	3.5	1.3	3.7	1.4
37	2.1	0.6	2.4	0.8	2.8	1.0	2.9	1.1	3.1	1.2	3.5	1.4	3.7	1.5	
39	2.1	0.7	2.4	0.8	2.8	1.0	2.9	1.1	3.1	1.3	3.5	1.5	3.6	1.5	
41	2.0	0.8	2.3	0.9	2.7	1.2	2.8	1.2	3.0	1.3	3.4	1.5	3.5	1.6	
44	1.8	0.8	2.2	1.0	2.5	1.3	2.7	1.3	2.9	1.4	3.2	1.6	3.4	1.7	
47	1.7	1.1	2.1	1.3	2.5	1.3	2.6	1.3	2.8	1.5	3.1	1.7	3.3	1.8	
50	1.6	1.1	1.9	1.3	2.2	1.4	2.4	1.5	2.5	1.6	2.8	1.8	3.0	1.9	
52	1.3	0.9	1.5	1.1	1.7	1.2	1.8	1.3	2.0	1.4	2.3	1.6	2.5	1.7	

Combination	Outdoor air temp(°C DB)	Indoor air temp													
		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-5	1.8	0.3	2.2	0.3	2.9	0.4	3.1	0.4	3.3	0.5	3.7	0.6	4.1	0.7
	0	1.8	0.3	2.2	0.3	2.9	0.4	3.1	0.5	3.3	0.5	3.7	0.6	4.1	0.7
	4	1.8	0.3	2.2	0.3	2.9	0.4	3.1	0.5	3.3	0.5	3.7	0.6	4.1	0.7
	7	1.8	0.3	2.2	0.3	2.9	0.4	3.1	0.5	3.3	0.5	3.6	0.6	4.0	0.7
	10	1.8	0.3	2.1	0.4	2.5	0.5	2.6	0.5	2.8	0.5	3.1	0.6	3.4	0.7
	12	1.8	0.3	2.1	0.4	2.5	0.5	2.6	0.5	2.8	0.5	3.1	0.6	3.4	0.7
	14	1.8	0.3	2.1	0.4	2.5	0.5	2.6	0.5	2.8	0.6	3.1	0.6	3.4	0.7
	16	1.8	0.4	2.1	0.4	2.5	0.5	2.6	0.5	2.8	0.6	3.1	0.6	3.4	0.7
	18	1.8	0.4	2.1	0.4	2.5	0.5	2.6	0.5	2.8	0.6	3.1	0.7	3.4	0.7
	20	1.8	0.4	2.1	0.4	2.5	0.5	2.6	0.5	2.8	0.6	3.1	0.7	3.4	0.8
	21	1.8	0.4	2.1	0.4	2.5	0.5	2.6	0.6	2.8	0.6	3.1	0.7	3.4	0.8
	23	1.8	0.4	2.1	0.4	2.5	0.5	2.6	0.6	2.8	0.6	3.1	0.7	3.4	0.8
	25	1.8	0.4	2.1	0.5	2.5	0.6	2.6	0.6	2.8	0.7	3.1	0.8	3.4	0.9
	27	1.8	0.4	2.1	0.5	2.5	0.6	2.6	0.7	2.8	0.7	3.1	0.8	3.4	1.0
	29	1.8	0.4	2.1	0.5	2.5	0.6	2.6	0.7	2.8	0.8	3.1	0.9	3.4	1.0
	31	1.8	0.5	2.1	0.6	2.5	0.7	2.6	0.7	2.8	0.8	3.1	0.9	3.4	1.1
	33	1.8	0.5	2.1	0.6	2.5	0.7	2.6	0.8	2.8	0.9	3.1	1.0	3.4	1.2
	35	1.8	0.5	2.1	0.6	2.5	0.8	2.6	0.8	2.8	0.9	3.1	1.1	3.4	1.3
	37	1.8	0.5	2.1	0.7	2.5	0.8	2.6	0.9	2.8	1.0	3.1	1.1	3.4	1.3
	39	1.8	0.6	2.1	0.7	2.5	0.9	2.5	0.9	2.8	1.0	3.1	1.2	3.4	1.4
41	1.7	0.6	2.0	0.8	2.4	1.0	2.5	1.0	2.7	1.1	3.0	1.2	3.3	1.5	
44	1.6	0.7	1.9	0.9	2.2	1.1	2.4	1.1	2.6	1.1	2.9	1.3	3.2	1.5	
47	1.5	0.9	1.9	1.1	2.2	1.1	2.3	1.1	2.5	1.2	2.8	1.4	3.1	1.6	
50	1.4	0.9	1.7	1.1	2.0	1.2	2.1	1.2	2.2	1.3	2.5	1.5	2.8	1.7	
52	1.1	0.8	1.3	1.0	1.5	1.0	1.6	1.1	1.7	1.2	2.0	1.3	2.3	1.5	

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Combination	Outdoor air temp(°C DB)	Indoor air temp													
		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
60%	-5	1.6	0.2	1.9	0.3	2.5	0.3	2.7	0.4	2.9	0.4	3.2	0.5	3.5	0.5
	0	1.6	0.2	1.9	0.3	2.5	0.3	2.7	0.4	2.9	0.4	3.2	0.5	3.5	0.5
	4	1.6	0.2	1.9	0.3	2.5	0.3	2.7	0.4	2.9	0.4	3.2	0.5	3.5	0.5
	7	1.6	0.2	1.9	0.3	2.5	0.3	2.7	0.4	2.9	0.4	3.1	0.5	3.5	0.6
	10	1.6	0.3	1.9	0.3	2.1	0.4	2.3	0.4	2.4	0.5	2.7	0.5	3.0	0.6
	12	1.6	0.3	1.9	0.3	2.1	0.4	2.3	0.4	2.4	0.5	2.7	0.5	3.0	0.6
	14	1.6	0.3	1.9	0.4	2.1	0.4	2.3	0.4	2.4	0.5	2.7	0.5	3.0	0.6
	16	1.6	0.3	1.9	0.4	2.1	0.4	2.3	0.4	2.4	0.5	2.7	0.5	3.0	0.6
	18	1.6	0.3	1.9	0.4	2.1	0.4	2.3	0.5	2.4	0.5	2.7	0.6	3.0	0.6
	20	1.6	0.3	1.9	0.4	2.1	0.4	2.3	0.5	2.4	0.5	2.7	0.6	3.0	0.6
	21	1.6	0.3	1.9	0.4	2.1	0.4	2.3	0.5	2.4	0.5	2.7	0.6	3.0	0.6
	23	1.6	0.3	1.9	0.4	2.1	0.4	2.3	0.5	2.4	0.5	2.7	0.6	3.0	0.7
	25	1.6	0.3	1.9	0.4	2.1	0.5	2.3	0.5	2.4	0.5	2.7	0.6	3.0	0.7
	27	1.6	0.3	1.9	0.4	2.1	0.5	2.3	0.5	2.4	0.6	2.7	0.7	3.0	0.8
	29	1.6	0.4	1.9	0.4	2.1	0.5	2.3	0.6	2.4	0.6	2.7	0.7	3.0	0.8
	31	1.6	0.4	1.9	0.5	2.1	0.6	2.3	0.6	2.4	0.7	2.7	0.8	3.0	0.9
	33	1.6	0.4	1.9	0.5	2.1	0.6	2.3	0.6	2.4	0.7	2.7	0.8	3.0	0.9
	35	1.6	0.4	1.9	0.5	2.1	0.6	2.3	0.7	2.4	0.7	2.7	0.9	3.0	1.0
	37	1.6	0.5	1.9	0.6	2.1	0.7	2.2	0.7	2.4	0.8	2.7	0.9	3.0	1.1
39	1.6	0.5	1.9	0.6	2.1	0.7	2.2	0.8	2.4	0.8	2.7	1.0	3.0	1.1	
41	1.5	0.5	1.8	0.7	2.0	0.8	2.2	0.8	2.3	0.9	2.6	1.0	2.8	1.2	
44	1.4	0.6	1.7	0.7	2.0	0.9	2.1	0.9	2.2	0.9	2.5	1.1	2.7	1.2	
47	1.4	0.8	1.6	1.0	1.9	0.9	2.0	0.9	2.1	1.0	2.4	1.1	2.7	1.3	
50	1.3	0.8	1.5	0.9	1.7	1.0	1.8	1.0	1.9	1.1	2.2	1.2	2.4	1.4	
52	1.0	0.6	1.2	0.8	1.3	0.8	1.4	0.9	1.5	0.9	1.8	1.1	2.0	1.2	

Combination	Outdoor air temp(°C DB)	Indoor air temp													
		14.0°C WB		16.0°C WB		18.0°C WB		19.0°C WB		20.0°C WB		22.0°C WB		24.0°C WB	
		20.0°C DB		23.0°C DB		26.0°C DB		27.0°C DB		28.0°C DB		30.0°C DB		32.0°C DB	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-5	1.4	0.2	1.6	0.2	2.1	0.3	2.3	0.3	2.4	0.3	2.7	0.4	3.0	0.4
	0	1.4	0.2	1.6	0.2	2.1	0.3	2.3	0.3	2.4	0.3	2.7	0.4	3.0	0.4
	4	1.4	0.2	1.6	0.2	2.1	0.3	2.3	0.3	2.4	0.3	2.7	0.4	3.0	0.4
	7	1.4	0.2	1.6	0.2	2.1	0.3	2.3	0.3	2.4	0.3	2.7	0.4	2.9	0.4
	10	1.4	0.3	1.6	0.3	1.8	0.3	1.9	0.4	2.0	0.4	2.3	0.4	2.5	0.5
	12	1.4	0.3	1.6	0.3	1.8	0.3	1.9	0.4	2.0	0.4	2.3	0.4	2.5	0.5
	14	1.4	0.3	1.6	0.3	1.8	0.3	1.9	0.4	2.0	0.4	2.3	0.4	2.5	0.5
	16	1.4	0.3	1.6	0.3	1.8	0.3	1.9	0.4	2.0	0.4	2.3	0.4	2.5	0.5
	18	1.4	0.3	1.6	0.3	1.8	0.4	1.9	0.4	2.0	0.4	2.3	0.5	2.5	0.5
	20	1.4	0.3	1.6	0.3	1.8	0.4	1.9	0.4	2.0	0.4	2.3	0.5	2.5	0.5
	21	1.4	0.3	1.6	0.3	1.8	0.4	1.9	0.4	2.0	0.4	2.3	0.5	2.5	0.5
	23	1.4	0.3	1.6	0.3	1.8	0.4	1.9	0.4	2.0	0.4	2.3	0.5	2.5	0.5
	25	1.4	0.3	1.6	0.3	1.8	0.4	1.9	0.4	2.0	0.4	2.3	0.5	2.5	0.6
	27	1.4	0.3	1.6	0.3	1.8	0.4	1.9	0.4	2.0	0.5	2.3	0.5	2.5	0.6
	29	1.4	0.3	1.6	0.4	1.8	0.4	1.9	0.5	2.0	0.5	2.3	0.6	2.5	0.6
	31	1.4	0.3	1.6	0.4	1.8	0.5	1.9	0.5	2.0	0.5	2.3	0.6	2.5	0.7
	33	1.4	0.3	1.6	0.4	1.8	0.5	1.9	0.5	2.0	0.6	2.3	0.6	2.5	0.7
	35	1.4	0.4	1.6	0.4	1.8	0.5	1.9	0.5	2.0	0.6	2.3	0.7	2.5	0.8
	37	1.4	0.4	1.6	0.4	1.8	0.5	1.9	0.6	2.0	0.6	2.3	0.7	2.5	0.8
	39	1.4	0.4	1.6	0.5	1.8	0.6	1.9	0.6	2.0	0.7	2.3	0.8	2.5	0.9
41	1.3	0.4	1.5	0.5	1.7	0.6	1.8	0.6	1.9	0.7	2.2	0.8	2.4	0.9	
44	1.2	0.5	1.4	0.6	1.7	0.7	1.8	0.7	1.9	0.7	2.1	0.8	2.3	0.9	
47	1.2	0.6	1.4	0.8	1.6	0.7	1.7	0.7	1.8	0.8	2.0	0.9	2.2	1.0	
50	1.1	0.6	1.3	0.8	1.5	0.8	1.5	0.8	1.6	0.8	1.8	1.0	2.0	1.1	
52	0.9	0.5	1.0	0.6	1.1	0.7	1.2	0.7	1.3	0.8	1.5	0.8	1.7	0.9	



(2) Heating capacity calculation method.

➤ GMV-12WP/A-T(U)

TC—Total capacity of outdoor unit; PI—Power input of outdoor unit

Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
135%	-19.8	-20.0	2.3	0.8	2.3	0.8	2.2	0.9	2.2	0.9	2.2	0.9	2.2	1.0
	-18.8	-19.0	2.3	0.8	2.3	0.8	2.3	0.9	2.3	0.9	2.3	1.0	2.3	1.0
	-16.7	-17.0	2.4	0.8	2.4	0.9	2.4	0.9	2.4	1.0	2.4	1.0	2.4	1.0
	-13.7	-15.0	2.5	0.9	2.5	0.9	2.5	1.0	2.5	1.0	2.5	1.0	2.5	1.1
	-11.8	-13.0	2.6	0.9	2.6	1.0	2.6	1.0	2.6	1.0	2.6	1.1	2.6	1.1
	-9.8	-11.0	2.7	0.9	2.7	1.0	2.7	1.0	2.7	1.1	2.7	1.1	2.7	1.1
	-9.5	-10.0	2.8	1.0	2.8	1.0	2.8	1.1	2.8	1.1	2.7	1.1	2.7	1.1
	-8.5	-9.1	2.8	1.0	2.8	1.0	2.8	1.1	2.8	1.1	2.8	1.1	2.8	1.2
	-7.0	-7.6	2.9	1.0	2.9	1.1	2.9	1.1	2.9	1.1	2.9	1.1	2.9	1.2
	-5.0	-5.6	3.1	1.1	3.1	1.1	3.1	1.1	3.1	1.2	3.1	1.2	3.1	1.2
	-3.0	-3.7	3.2	1.1	3.2	1.1	3.2	1.2	3.2	1.2	3.2	1.2	3.2	1.2
	0.0	-0.7	3.5	1.1	3.5	1.2	3.5	1.2	3.5	1.2	3.5	1.2	3.5	1.3
	3.0	2.2	3.8	1.2	3.8	1.2	3.7	1.3	3.7	1.3	3.7	1.3	3.7	1.3
	5.0	4.1	4.0	1.2	3.9	1.2	3.9	1.3	3.9	1.3	3.9	1.3	3.9	1.3
	7.0	6.0	4.2	1.2	4.1	1.3	4.1	1.3	4.1	1.2	4.1	1.3	4.0	1.3
	9.0	7.9	4.4	1.3	4.4	1.3	4.4	1.3	4.3	1.3	4.3	1.3	4.0	1.2
	11.0	9.8	4.6	1.3	4.6	1.3	4.6	1.3	4.4	1.3	4.3	1.2	4.0	1.1
	13.0	11.8	4.8	1.3	4.8	1.3	4.6	1.3	4.4	1.2	4.3	1.2	4.0	1.1
	15.0	13.7	5.1	1.3	4.8	1.3	4.6	1.2	4.4	1.1	4.3	1.1	4.0	1.0
18.0	16.8	5.1	1.3	4.8	1.2	4.6	1.1	4.4	1.1	4.3	1.0	4.0	1.0	
20.0	18.5	5.1	1.2	4.8	1.2	4.6	1.1	4.4	1.0	4.3	1.0	4.0	0.9	
24.0	20.5	5.1	1.2	4.8	1.1	4.6	1.0	4.4	1.0	4.3	0.9	4.0	0.9	

Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
120%	-19.8	-20.0	2.3	0.9	2.2	0.9	2.2	1.0	2.2	1.0	2.2	1.0	2.2	1.1
	-18.8	-19.0	2.3	0.9	2.3	0.9	2.3	1.0	2.3	1.0	2.3	1.0	2.3	1.1
	-16.7	-17.0	2.4	0.9	2.4	1.0	2.4	1.0	2.4	1.0	2.4	1.0	2.3	1.1
	-13.7	-15.0	2.5	0.9	2.5	1.0	2.5	1.0	2.5	1.1	2.5	1.1	2.4	1.1
	-11.8	-13.0	2.6	1.0	2.6	1.0	2.6	1.1	2.6	1.1	2.6	1.1	2.6	1.2
	-9.8	-11.0	2.7	1.0	2.7	1.1	2.7	1.1	2.7	1.1	2.7	1.1	2.7	1.2
	-9.5	-10.0	2.8	1.0	2.8	1.1	2.7	1.1	2.7	1.1	2.7	1.1	2.7	1.2
	-8.5	-9.1	2.8	1.0	2.8	1.1	2.8	1.1	2.8	1.1	2.8	1.2	2.8	1.2
	-7.0	-7.6	2.9	1.1	2.9	1.1	2.9	1.1	2.9	1.2	2.9	1.2	2.9	1.2
	-5.0	-5.6	3.1	1.1	3.1	1.1	3.1	1.2	3.1	1.2	3.1	1.2	3.0	1.3
	-3.0	-3.7	3.2	1.1	3.2	1.2	3.2	1.2	3.2	1.2	3.2	1.2	3.2	1.3
	0.0	-0.7	3.5	1.2	3.5	1.2	3.5	1.3	3.5	1.3	3.5	1.3	3.5	1.3
	3.0	2.2	3.8	1.2	3.7	1.3	3.7	1.3	3.7	1.3	3.7	1.3	3.7	1.3
	5.0	4.1	3.9	1.3	3.9	1.3	3.9	1.3	3.9	1.3	3.9	1.3	3.7	1.2
	7.0	6.0	4.1	1.3	4.1	1.3	4.1	1.3	4.1	1.3	3.9	1.3	3.7	1.2
	9.0	7.9	4.4	1.3	4.3	1.3	4.2	1.3	4.1	1.2	3.9	1.2	3.7	1.1
	11.0	9.8	4.6	1.3	4.5	1.3	4.2	1.2	4.1	1.2	3.9	1.1	3.7	1.0
	13.0	11.8	4.7	1.3	4.5	1.2	4.2	1.1	4.1	1.1	3.9	1.1	3.7	1.0
	15.0	13.7	4.7	1.2	4.5	1.2	4.2	1.1	4.1	1.0	3.9	1.0	3.7	0.9
	18.0	16.8	4.7	1.2	4.5	1.1	4.2	1.0	4.1	1.0	3.9	0.9	3.7	0.9
20.0	18.5	4.7	1.1	4.5	1.0	4.2	1.0	4.1	0.9	3.9	0.9	3.7	0.8	
24.0	20.5	4.7	1.1	4.5	1.0	4.2	0.9	4.1	0.9	3.9	0.9	3.7	0.8	

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Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
110%	-19.8	-20.0	2.2	0.9	2.2	1.0	2.2	1.0	2.2	1.0	2.2	1.1	2.2	1.1
	-18.8	-19.0	2.3	0.9	2.3	1.0	24.5	1.0	2.3	1.1	2.3	1.1	2.3	1.1
	-16.7	-17.0	2.4	1.0	2.4	1.0	2.4	1.1	2.3	1.1	2.3	1.1	2.3	1.1
	-13.7	-15.0	2.5	1.0	2.5	1.0	2.4	1.1	2.4	1.1	2.4	1.1	2.4	1.2
	-11.8	-13.0	2.6	1.0	2.6	1.1	2.6	1.1	2.6	1.1	2.5	1.2	2.5	1.2
	-9.8	-11.0	2.7	1.1	2.7	1.1	2.7	1.1	2.7	1.2	2.7	1.2	2.7	1.2
	-9.5	-10.0	2.8	1.1	2.7	1.1	2.7	1.2	2.7	1.2	2.7	1.2	2.7	1.2
	-8.5	-9.1	2.8	1.1	2.8	1.1	2.8	1.2	2.8	1.2	2.8	1.2	2.8	1.3
	-7.0	-7.6	2.9	1.1	2.9	1.2	2.9	1.2	2.9	1.2	2.9	1.2	2.9	1.3
	-5.0	-5.6	3.1	1.2	3.1	1.2	3.0	1.2	3.0	1.2	3.2	1.3	3.0	1.3
	-3.0	-3.7	3.2	1.2	3.2	1.2	3.2	1.3	3.2	1.3	3.5	1.3	3.2	1.3
	0.0	-0.7	3.5	1.2	3.5	1.3	3.5	1.3	3.5	1.3	3.6	1.3	3.4	1.3
	3.0	2.2	3.7	1.3	3.7	1.3	3.7	1.3	3.7	1.3	3.6	1.3	3.4	1.2
	5.0	4.1	3.9	1.3	3.9	1.3	3.9	1.3	3.7	1.3	3.6	1.2	3.4	1.1
	7.0	6.0	4.1	1.3	4.1	1.3	3.9	1.2	3.7	1.2	3.6	1.1	3.4	1.0
	9.0	7.9	4.3	1.3	4.1	1.3	3.9	1.2	3.7	1.1	3.6	1.1	3.4	1.0
	11.0	9.8	4.3	1.3	4.1	1.2	3.9	1.1	3.7	1.1	3.6	1.0	3.4	0.9
	13.0	11.8	4.3	1.2	4.1	1.1	3.9	1.0	3.7	1.0	3.6	1.0	3.4	0.9
	15.0	13.7	4.3	1.1	4.1	1.0	3.9	1.0	3.7	0.9	3.6	0.9	3.4	0.8
	18.0	16.8	4.3	1.1	4.1	1.0	3.9	0.9	3.7	0.9	3.6	0.9	3.4	0.8
20.0	18.5	4.3	1.0	4.1	0.9	3.9	0.8	3.7	0.8	3.6	0.8	3.4	0.8	
24.0	20.5	4.3	1.0	4.1	0.9	3.9	0.8	3.7	0.8	3.6	0.8	3.4	0.7	

Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
100%	-19.8	-20.0	2.2	1.0	2.2	1.0	2.2	1.1	2.2	1.1	2.2	1.1	2.2	1.2
	-18.8	-19.0	2.3	1.0	2.3	1.1	2.3	1.1	2.3	1.1	2.2	1.1	2.2	1.2
	-16.7	-17.0	2.4	1.0	2.3	1.1	2.3	1.1	2.3	1.1	2.3	1.2	2.3	1.2
	-13.7	-15.0	2.5	1.1	2.4	1.1	2.4	1.1	2.4	1.2	2.4	1.2	2.4	1.2
	-11.8	-13.0	2.6	1.1	2.6	1.1	2.5	1.2	2.5	1.2	2.5	1.2	2.5	1.3
	-9.8	-11.0	2.7	1.1	2.7	1.2	2.7	1.2	2.7	1.2	2.7	1.2	2.7	1.3
	-9.5	-10.0	2.7	1.1	2.7	1.2	2.7	1.2	2.7	1.2	2.7	1.3	2.7	1.3
	-8.5	-9.1	2.8	1.2	2.8	1.2	2.8	1.2	2.8	1.2	2.8	1.3	2.8	1.3
	-7.0	-7.6	2.9	1.2	2.9	1.2	2.9	1.2	2.9	1.3	2.9	1.3	2.9	1.3
	-5.0	-5.6	3.1	1.2	3.0	1.2	3.0	1.3	3.0	1.3	3.0	1.3	3.0	1.3
	-3.0	-3.7	3.2	1.2	3.2	1.3	3.2	1.3	3.2	1.3	3.2	1.3	3.1	1.3
	0.0	-0.7	3.5	1.3	3.5	1.3	3.4	1.3	3.4	1.3	3.3	1.3	3.1	1.2
	3.0	2.2	3.7	1.3	3.7	1.3	3.5	1.2	3.4	1.2	3.3	1.1	3.1	1.1
	5.0	4.1	3.9	1.3	3.7	1.3	3.5	1.2	3.4	1.1	3.3	1.1	3.1	1.0
	7.0	6.0	3.9	1.3	3.7	1.2	3.5	1.1	3.4	1.1	3.3	1.0	3.1	0.9
	9.0	7.9	3.9	1.2	3.7	1.1	3.5	1.0	3.4	1.0	3.3	1.0	3.1	0.9
	11.0	9.8	3.9	1.1	3.7	1.1	3.5	1.0	3.4	0.9	3.3	0.9	3.1	0.8
	13.0	11.8	3.9	1.1	3.7	1.0	3.5	0.9	3.4	0.9	3.3	0.9	3.1	0.8
	15.0	13.7	3.9	1.0	3.7	0.9	3.5	0.9	3.4	0.8	3.3	0.8	3.1	0.7
	18.0	16.8	3.9	0.9	3.7	0.9	3.5	0.8	3.4	0.8	3.3	0.8	3.1	0.7
20.0	18.5	3.9	0.9	3.7	0.9	3.5	0.8	3.4	0.8	3.3	0.7	3.1	0.7	
24.0	20.5	3.9	0.8	3.7	0.8	3.5	0.8	3.4	0.7	3.3	0.7	3.1	0.7	

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Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-19.8	-20.0	2.4	1.1	2.4	1.1	2.4	1.2	2.4	1.2	2.4	1.2	2.4	1.2
	-18.8	-19.0	2.4	1.1	2.4	1.1	2.4	1.2	2.4	1.2	2.4	1.2	2.4	1.2
	-16.7	-17.0	2.5	1.1	2.5	1.1	2.5	1.2	2.5	1.2	2.5	1.2	2.5	1.3
	-13.7	-15.0	2.6	1.1	2.6	1.2	2.6	1.2	2.6	1.2	2.6	1.2	2.6	1.3
	-11.8	-13.0	2.7	1.2	2.7	1.2	2.7	1.2	2.7	1.3	2.7	1.3	2.7	1.3
	-9.8	-11.0	2.8	1.2	2.8	1.2	2.8	1.3	2.8	1.3	2.8	1.3	2.8	1.3
	-9.5	-10.0	2.9	1.2	2.9	1.2	2.9	1.3	2.9	1.3	2.9	1.3	2.9	1.3
	-8.5	-9.1	3.0	1.2	3.0	1.3	3.0	1.3	3.0	1.3	3.0	1.3	2.9	1.3
	-7.0	-7.6	3.1	1.2	3.1	1.3	3.1	1.3	3.1	1.3	3.1	1.3	2.9	1.3
	-5.0	-5.6	3.2	1.3	3.2	1.3	3.2	1.3	3.2	1.3	3.1	1.3	2.9	1.2
	-3.0	-3.7	3.4	1.3	3.4	1.2	3.3	1.3	3.2	1.3	3.1	1.2	2.9	1.1
	0.0	-0.7	3.6	1.3	3.5	1.2	3.3	1.2	3.2	1.2	3.1	1.1	2.9	1.0
	3.0	2.2	3.7	1.3	3.5	1.2	3.3	1.1	3.2	1.1	3.1	1.0	2.9	0.9
	5.0	4.1	3.7	1.2	3.5	1.1	3.3	1.0	3.2	1.0	3.1	1.0	2.9	0.9
	7.0	6.0	3.7	1.1	3.5	1.0	3.3	1.0	3.2	0.9	3.1	0.9	2.9	0.8
	9.0	7.9	3.7	1.1	3.5	1.0	3.3	0.9	3.2	0.9	3.1	0.9	2.9	0.8
	11.0	9.8	3.7	1.0	3.5	0.9	3.3	0.9	3.2	0.8	3.1	0.8	2.9	0.7
	13.0	11.8	3.7	0.9	3.5	0.9	3.3	0.8	3.2	0.8	3.1	0.8	2.9	0.7
	15.0	13.7	3.7	0.9	3.5	0.8	3.3	0.8	3.2	0.7	3.1	0.7	2.9	0.7
	18.0	16.8	3.7	0.8	3.5	0.8	3.3	0.7	3.2	0.7	3.1	0.7	2.9	0.6
20.0	18.5	3.7	0.8	3.5	0.7	3.3	0.7	3.2	0.7	3.1	0.6	2.9	0.6	
24.0	20.5	3.7	0.7	3.5	0.7	3.3	0.7	3.2	0.6	3.1	0.6	2.9	0.6	

Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
80%	-19.8	-20.0	2.4	1.1	2.4	1.2	2.4	1.2	2.4	1.2	2.4	1.3	2.4	1.3
	-18.8	-19.0	2.4	1.2	2.4	1.2	2.4	1.2	2.4	1.2	2.4	1.3	2.4	1.3
	-16.7	-17.0	2.5	1.2	2.5	1.2	2.5	1.2	2.5	1.3	2.5	1.3	2.5	1.3
	-13.7	-15.0	2.6	1.2	2.6	1.2	2.6	1.3	2.6	1.3	2.6	1.3	2.6	1.3
	-11.8	-13.0	2.7	1.2	2.7	1.3	2.7	1.3	2.7	1.3	2.7	1.3	2.6	1.3
	-9.8	-11.0	2.8	1.3	2.8	1.3	2.8	1.3	2.8	1.3	2.8	1.3	2.6	1.2
	-9.5	-10.0	2.9	1.3	2.9	1.3	2.9	1.3	2.9	1.3	2.8	1.3	2.6	1.2
	-8.5	-9.1	3.0	1.3	3.0	1.3	2.9	1.3	2.9	1.3	2.8	1.3	2.6	1.1
	-7.0	-7.6	3.1	1.3	3.1	1.3	3.0	1.3	2.9	1.2	2.8	1.2	2.6	1.1
	-5.0	-5.6	3.2	1.2	3.2	1.3	3.0	1.2	2.9	1.2	2.8	1.1	2.6	1.0
	-3.0	-3.7	3.3	1.2	3.2	1.2	3.0	1.1	2.9	1.1	2.8	1.1	2.6	1.0
	0.0	-0.7	3.3	1.2	3.2	1.1	3.0	1.0	2.9	1.0	2.8	1.0	2.6	0.9
	3.0	2.2	3.3	1.1	3.2	1.0	3.0	1.0	2.9	0.9	2.8	0.9	2.6	0.8
	5.0	4.1	3.3	1.0	3.2	1.0	3.0	0.9	2.9	0.9	2.8	0.8	2.6	0.8
	7.0	6.0	3.3	1.0	3.2	0.9	3.0	0.8	2.9	0.8	2.8	0.8	2.6	0.7
	9.0	7.9	3.3	0.9	3.2	0.9	3.0	0.8	2.9	0.8	2.8	0.7	2.6	0.7
	11.0	9.8	3.3	0.9	3.2	0.8	3.0	0.8	2.9	0.7	2.8	0.7	2.6	0.7
	13.0	11.8	3.3	0.8	3.2	0.8	3.0	0.7	2.9	0.7	2.8	0.7	2.6	0.6
	15.0	13.7	3.3	0.8	3.2	0.7	3.0	0.7	2.9	0.7	2.8	0.6	2.6	0.6
	18.0	16.8	3.3	0.7	3.2	0.7	3.0	0.6	2.9	0.6	2.8	0.6	2.6	0.6
20.0	18.5	3.3	0.7	3.2	0.7	3.0	0.6	2.9	0.6	2.8	0.6	2.6	0.5	
24.0	20.5	3.3	0.7	3.2	0.6	3.0	0.6	2.9	0.6	2.8	0.5	2.6	0.5	

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Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-19.8	-20.0	2.4	1.2	2.4	1.3	2.4	1.3	2.4	1.3	2.4	1.3	2.3	1.3
	-18.8	-19.0	2.4	1.2	2.4	1.3	2.4	1.3	2.4	1.3	2.4	1.3	2.3	1.3
	-16.7	-17.0	2.5	1.3	2.5	1.3	2.5	1.3	2.5	1.3	2.5	1.3	2.3	1.2
	-13.7	-15.0	2.6	1.3	2.6	1.3	2.6	1.3	2.5	1.3	2.5	1.3	2.3	1.2
	-11.8	-13.0	2.7	1.3	2.7	1.3	2.6	1.3	2.5	1.2	2.5	1.2	2.3	1.1
	-9.8	-11.0	2.8	1.3	2.8	1.3	2.6	1.2	2.5	1.2	2.5	1.1	2.3	1.0
	-9.5	-10.0	2.9	1.3	2.8	1.3	2.6	1.2	2.5	1.1	2.5	1.1	2.3	1.0
	-8.5	-9.1	2.9	1.3	2.8	1.2	2.6	1.2	2.5	1.1	2.5	1.1	2.3	1.0
	-7.0	-7.6	2.9	1.3	2.8	1.2	2.6	1.1	2.5	1.1	2.5	1.0	2.3	0.9
	-5.0	-5.6	2.9	1.2	2.8	1.1	2.6	1.0	2.5	1.0	2.5	1.0	2.3	0.9
	-3.0	-3.7	2.9	1.1	2.8	1.1	2.6	1.0	2.5	0.9	2.5	0.9	2.3	0.8
	0.0	-0.7	2.9	1.0	2.8	1.0	2.6	0.9	2.5	0.9	2.5	0.8	2.3	0.8
	3.0	2.2	2.9	0.9	2.8	0.0	2.6	0.8	2.5	0.8	2.5	0.8	2.3	0.7
	5.0	4.1	2.9	0.9	2.8	0.8	2.6	0.8	2.5	0.7	2.5	0.7	2.3	0.7
	7.0	6.0	2.9	0.8	2.8	0.8	2.6	0.7	2.5	0.7	2.5	0.7	2.3	0.6
	9.0	7.9	2.9	0.8	2.8	0.7	2.6	0.7	2.5	0.7	2.5	0.6	2.3	0.6
	11.0	9.8	2.9	0.7	2.8	0.7	2.6	0.7	2.5	0.6	2.5	0.6	2.3	0.6
	13.0	11.8	2.9	0.7	2.8	0.7	2.6	0.6	2.5	0.6	2.5	0.6	2.3	0.5
	15.0	13.7	2.9	0.7	2.8	0.6	2.6	0.6	2.5	0.6	2.5	0.6	2.3	0.5
	18.0	16.8	2.9	0.6	2.8	0.6	2.6	0.6	2.5	0.5	2.5	0.5	2.3	0.5
20.0	18.5	2.9	0.6	2.8	0.6	2.6	0.5	2.5	0.5	2.5	0.5	2.3	0.5	
24.0	20.5	2.9	0.6	2.8	0.5	2.6	0.5	2.5	0.5	2.5	0.5	2.3	0.5	

Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
60%	-19.8	-20.0	2.4	1.3	2.4	1.3	2.3	1.3	2.2	1.2	2.1	1.2	2.0	1.1
	-18.8	-19.0	2.4	1.3	2.4	1.3	2.3	1.2	2.2	1.2	2.1	1.1	2.0	1.1
	-16.7	-17.0	2.5	1.3	2.4	1.3	2.3	1.2	2.2	1.1	2.1	1.1	2.0	1.0
	-13.7	-15.0	2.5	1.3	2.4	1.2	2.3	1.1	2.2	1.1	2.1	1.0	2.0	1.0
	-11.8	-13.0	2.5	1.2	2.4	1.2	2.3	1.1	2.2	1.0	2.1	1.0	2.0	0.9
	-9.8	-11.0	2.5	1.2	2.4	1.1	2.3	1.0	2.2	1.0	2.1	0.9	2.0	0.9
	-9.5	-10.0	2.5	1.1	2.4	1.1	2.3	1.0	2.2	0.9	2.1	0.9	2.0	0.8
	-8.5	-9.1	2.5	1.1	2.4	1.0	2.3	1.0	2.2	0.9	2.1	0.9	2.0	0.8
	-7.0	-7.6	2.5	1.1	2.4	1.0	2.3	0.9	2.2	0.9	2.1	0.9	2.0	0.8
	-5.0	-5.6	2.5	1.0	2.4	0.9	2.3	0.9	2.2	0.8	2.1	0.8	2.0	0.7
	-3.0	-3.7	2.5	0.9	2.4	0.9	2.3	0.8	2.2	0.8	2.1	0.8	2.0	0.7
	0.0	-0.7	2.5	0.9	2.4	0.8	2.3	0.8	2.2	0.7	2.1	0.7	2.0	0.6
	3.0	2.2	2.5	0.8	2.4	0.7	2.3	0.7	2.2	0.7	2.1	0.6	2.0	0.0
	5.0	4.1	2.5	0.7	2.4	0.7	2.3	0.7	2.2	0.6	2.1	0.6	2.0	0.6
	7.0	6.0	2.5	0.7	2.4	0.7	2.3	0.6	2.2	0.6	2.1	0.6	2.0	0.5
	9.0	7.9	2.5	0.7	2.4	0.6	2.3	0.6	2.2	0.6	2.1	0.6	2.0	0.5
	11.0	9.8	2.5	0.6	2.4	0.6	2.3	0.6	2.2	0.5	2.1	0.5	2.0	0.5
	13.0	11.8	2.5	0.6	2.4	0.6	2.3	0.5	2.2	0.5	2.1	0.5	2.0	0.5
	15.0	13.7	2.5	0.6	2.4	0.5	2.3	0.5	2.2	0.5	2.1	0.5	2.0	0.4
	18.0	16.8	2.5	0.5	2.4	0.5	2.3	0.5	2.2	0.5	2.1	0.5	2.0	0.4
20.0	18.5	2.5	0.5	2.4	0.5	2.3	0.5	2.2	0.5	2.1	0.4	2.0	0.4	
24.0	20.5	2.5	0.5	2.4	0.5	2.3	0.4	2.2	0.4	2.1	0.4	2.0	0.4	



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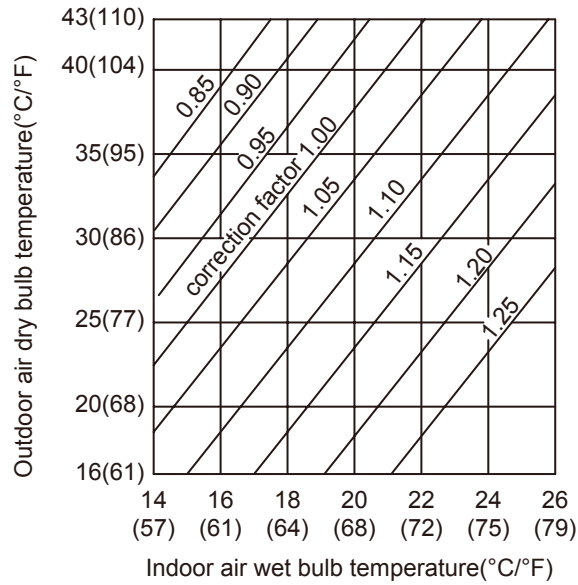
Combination	Outdoor air temp		Indoor air temp°C DB											
			16		18		20		21		22		24	
	DB	WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-19.8	-20.0	2.2	1.2	2.0	1.1	1.9	1.0	1.9	1.0	1.8	0.9	1.7	0.9
	-18.8	-19.0	2.2	1.2	2.0	1.1	1.9	1.0	1.9	1.0	1.8	0.9	1.7	0.9
	-16.7	-17.0	2.2	1.1	2.0	1.0	1.9	1.0	1.9	0.9	1.8	0.9	1.7	0.8
	-13.7	-15.0	2.2	1.0	2.0	1.0	1.9	0.9	1.9	0.9	1.8	0.8	1.7	0.8
	-11.8	-13.0	2.2	1.0	2.0	0.9	1.9	0.9	1.9	0.8	1.8	0.8	1.7	0.7
	-9.8	-11.0	2.2	0.9	2.0	0.9	1.9	0.8	1.9	0.8	1.8	0.8	1.7	0.7
	-9.5	-10.0	2.2	0.9	2.0	0.9	1.9	0.8	1.9	0.8	1.8	0.7	1.7	0.7
	-8.5	-9.1	2.2	0.9	2.0	0.8	1.9	0.8	1.9	0.8	1.8	0.7	1.7	0.7
	-7.0	-7.6	2.2	0.9	2.0	0.8	1.9	0.7	1.9	0.7	1.8	0.7	1.7	0.6
	-5.0	-5.6	2.2	0.8	2.0	0.8	1.9	0.7	1.9	0.7	1.8	0.7	1.7	0.6
	-3.0	-3.7	2.2	0.8	2.0	0.7	1.9	0.7	1.9	0.6	1.8	0.6	1.7	0.6
	0.0	-0.7	2.2	0.7	2.0	0.7	1.9	0.6	1.9	0.6	1.8	0.6	1.7	0.5
	3.0	2.2	2.2	0.6	2.0	0.6	1.9	0.6	1.9	0.6	1.8	0.5	1.7	0.5
	5.0	4.1	2.2	0.6	2.0	0.6	1.9	0.5	1.9	0.5	1.8	0.5	1.7	0.5
	7.0	6.0	2.2	0.6	2.0	0.5	1.9	0.5	1.9	0.5	1.8	0.5	1.7	0.5
	9.0	7.9	2.2	0.6	2.0	0.5	1.9	0.5	1.9	0.5	1.8	0.5	1.7	0.4
	11.0	9.8	2.2	0.5	2.0	0.5	1.9	0.5	1.9	0.5	1.8	0.4	1.7	0.4
	13.0	11.8	2.2	0.5	2.0	0.5	1.9	0.4	1.9	0.4	1.8	0.4	1.7	0.4
	15.0	13.7	2.2	0.5	2.0	0.5	1.9	0.4	1.9	0.4	1.8	0.4	1.7	0.4
	18.0	16.8	2.2	0.5	2.0	0.4	1.9	0.4	1.9	0.4	1.8	0.4	1.7	0.4
20.0	18.5	2.2	0.4	2.0	0.4	1.9	0.4	1.9	0.4	1.8	0.4	1.7	0.3	
24.0	20.5	2.2	0.4	2.0	0.4	1.9	0.4	1.9	0.4	1.8	0.4	1.7	0.3	

Cooling or heating capacity calculation method:

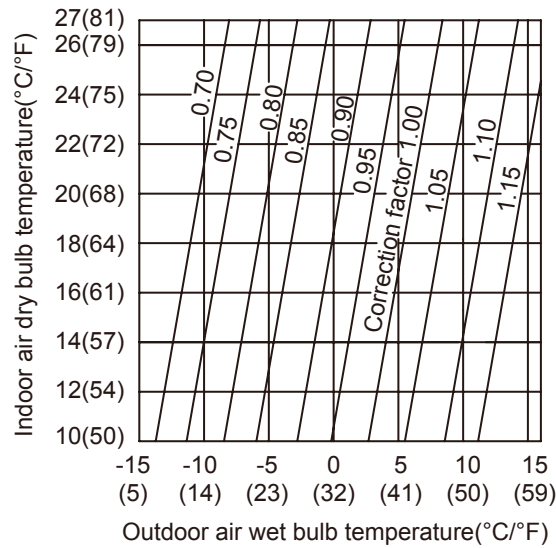
R410A outdoor unit capacity = outdoor unit capacity in rated condition × correction factor of indoor and outdoor temperature condition × connection pipe distance, correction factor of height difference between indoor unit and outdoor unit.

- 1) If the total capacity code of indoor units is smaller than the capacity code of outdoor unit, the capacity of outdoor unit in rated condition equals to the total capacity code of indoor units.
- 2) If the total capacity code of indoor units is bigger than the capacity code of outdoor unit, the capacity of outdoor unit in rated condition equals to its rated cooling capacity.
- 3) Correction factor of indoor and outdoor temperature condition.

a. Correction factor of cooling capacity



b. Correction factor of heating capacity



4) Correction factor of connection pipe distance and height difference.

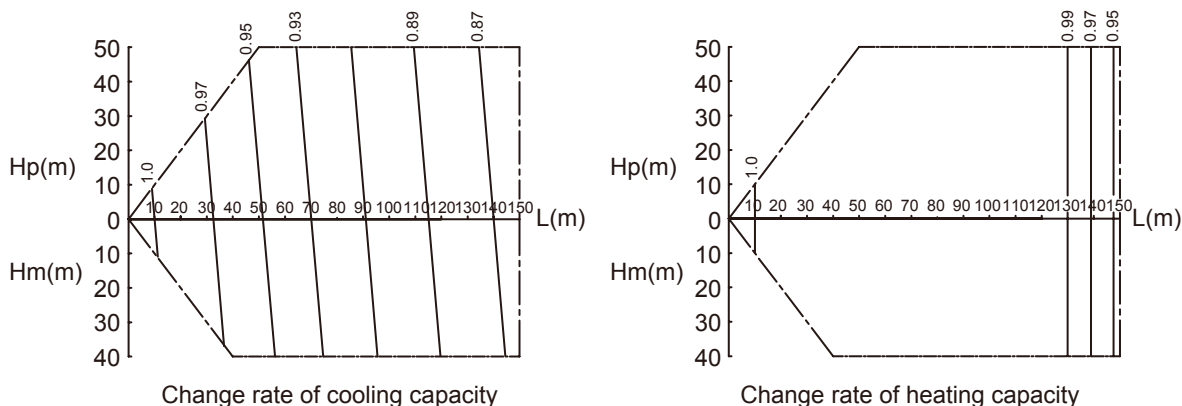
◆ Symbol instruction:

Hp: Height difference (m) between indoor unit and outdoor unit when indoor unit is lower than outdoor unit.

Hm: Height difference (m) between indoor unit and outdoor unit when indoor unit is higher than outdoor unit.

L: Single-pass equivalent connection pipe length L.

◆ The following chart is the capacity change rate in 100% load under standard condition (thermostat is set in 16°C(61°F) in cooling and set in 30°C(86°F) in heating).



NOTE:

m	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
feet	0	33	66	98	131	164	197	230	262	295	328	361	394	427	459	492

- c. Capacity calculation for each indoor unit  
Capacity of each indoor unit=Capacity of outdoor unit × Total capacity of indoor units/Total capacity of synchronously operating indoor units
- d. Operating temperature range

	Temperature range	
	°C	°F
Cooling	-5~48	23~118.4
Heating	-20~27	-4~80.6



## 4.4 Example of equipment selection

- (1) Overview of building model
  - 1) Temperature condition
  - 2) Outdoor temperature: 35°C(95°F) DB; Indoor temperature: 17°C(62.6°F) WB
  - 3) Load in cooling

Load		Room A	Room B
		kW	1.6
	Btu/h	5460	5800

- (2) Selection Criteria for each floor  
Pipe length: 15m(49.2ft); Height difference between indoor unit and outdoor unit: 5m(16.4ft) (indoor unit is higher than outdoor unit)
- (3) Procedure and result of equipment selection
  - 1) Procedure of equipment selection  
Introduce the equipment selection procedure step by step
  - 2) Equipment selection and capacity check
    - a. Selection of indoor unit  
Select suitable indoor unit according to the corrected load of indoor unit capacity  
Corrected load of indoor unit capacity=Load/Corrected ratio of cooling capacity related to temperature condition  
Referring to the corrected ratio chart of cooling capacity related to temperature condition,

under outdoor temperature of 35°C(95°F) DB and indoor temperature of 17°C (62.6°F)WB, the corrected ratio of cooling capacity is 0.94.  
Selection result is as below:

		Room A	Room B
Corrected load of capacity	kW	1.7	1.81
	Btu/h	5800	6170
Unit size		06	06

b. Selection of outdoor unit

The total capacity code of indoor units is 12. Please select suitable outdoor unit according to the total capacity of indoor units and corrected situation.

Capacity of outdoor unit=Total capacity of indoor units/(Corrected ratio of cooling capacity related to temperature condition × Correction of connection pipe length and height difference)  
After calculating the capacity of outdoor unit, select suitable outdoor unit according to 50%~135% of the capacity of outdoor unit.

Select the outdoor unit with capacity code of 12 and nominal cooling capacity of 3.52kW(12000Btu/h).

The capacity code ratio between indoor unit and outdoor unit is  $12/12 \times 100\% = 100\%$ , which is within 50%~135% and accords with the equipment selection standard.

c. Correction of outdoor unit capacity

Suppose the combination situation between indoor unit and outdoor unit is as below

Outdoor unit: GMV-12WP/A-T(U)

Indoor unit: GMV-ND06G/B4B-T(U)×2

If the total capacity code of indoor units is bigger than the capacity code of outdoor unit, the capacity of outdoor unit in rated condition equals to its rated cooling capacity. So the capacity of outdoor unit under rated condition is 3.52kW(12000Btu/h).

d. Referring to the corrected ratio chart of cooling capacity related to temperature condition, under outdoor temperature of 35°C(95°F) DB and indoor temperature of 17°C(62.6°F) WB, the corrected ratio of cooling capacity is 0.94.

e. Referring to the corrected ratio of connection pipe of 15m(49.2ft) long and height difference between indoor unit and outdoor unit of 5m(16.4ft) (outdoor unit is lower than indoor unit), the corrected ratio is 0.99.

Capacity of outdoor unit= $12 \times 0.94 \times 0.99 = 3.27\text{kW}(11.17\text{kBtu/h})$

f. Correction of indoor unit capacity

Capacity of each indoor unit=Capacity of outdoor unit × Total capacity of indoor units/Total capacity of synchronously operating indoor units

GMV-ND06G/B4B-T(U):  $12 \times 6 / 12 = 6\text{kBtu/h}$

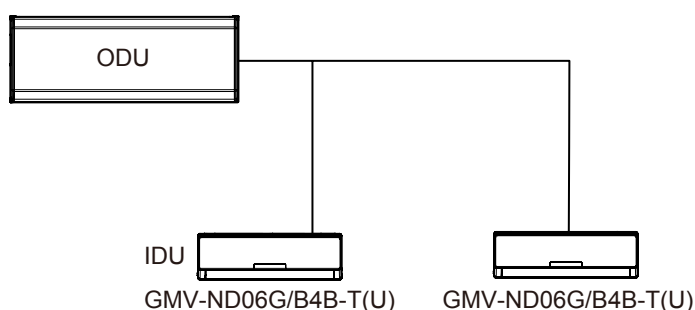
The result is as below:

Air conditioning load			Equipment selection			
Floor	Room No.	Indoor air conditioning load	Indoor unit		Outdoor unit	
		Cooling(Btu/h)	Model	Capacity (Btu/h)	Model	Capacity(Btu/h)
				Cooling		Cooling
1	A	5800	GMV-ND06G/B4B-T(U)	6000	GMV-12WP/A-T(U)	12000
	B	6170	GMV-ND06G/B4B-T(U)	6000		

Piping distance						Capacity correction		Capacity check after correction		
Floor	Room No.	Equivalent length		Height difference		Pipe correction × temp. correction		Capacity		Judgment
		m	Ft	m	Ft	kW	Btu/h	kW	Btu/h	
1	A	15	49.2	5( ODU is lower than IDU )	16.4 (ODU is lower than IDU)	3.27	11170	1.7	5800	The selection should accord with the standard
	B							1.81	6170	

### 3) Schematic diagram

Explain the location of units in each room and connection way of indoor unit and outdoor unit with single-line chart.



## 5 REFRIGERANT PIPING DESIGN

### 5.1 Warning on refrigerant leakage

#### (1) Introduction of leakage detection method

Procedures of leakage detection

Before ex-factory, the cut-off valves of gap pipe and liquid pipe of outdoor unit are closed. Please confirm it before installation.

Before testing, apply some suitable lubricant on the joint of cap and pipe. Use two wrenches when fixing the cap.

Connecting outdoor pipeline for testing is not allowed during leakage detection.

The testing pressure of R410A system is 4.15MPa (for R22 system, it is 3.0Mpa). The medium of airproof test must be dry nitrogen. Increase the pressure slowly in three steps:

Step one: Slowly increase pressure to 0.5MPa and maintain pressure for 5min. Big leakage may be found during leakage detection;

Step two: Slowly increase pressure to 1.5MPa and maintain pressure for 5min. Small leakage may be found during airproof test;

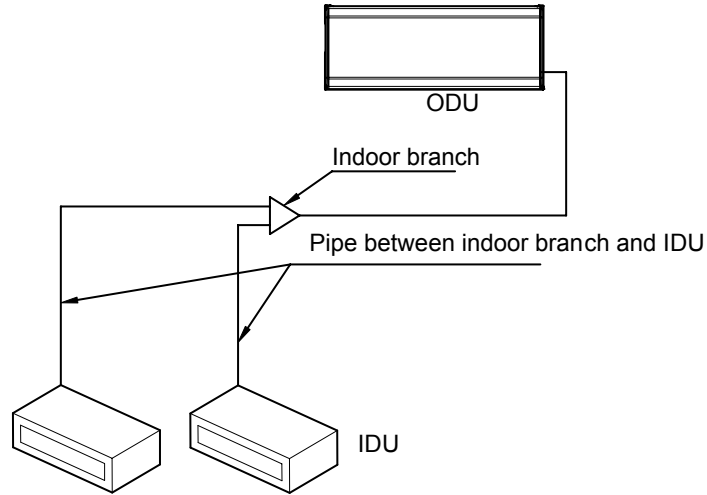
Step three: For R410A system, slowly increase pressure to 4.15MPa(for R22 system, it is 3.0Mpa) and maintain pressure for 5min. Tiny leakage may be found during strength test. Increase pressure to testing pressure and maintain pressure for 24h. Check if the pressure decreases. The test is passed if pressure doesn't decrease.

#### (2) Introduction of handling method of leakage

Firstly, discharge the refrigerant and then charge nitrogen for leakage welding. The nitrogen charging way is the same as that in airproof test. Blow away the impurities and clean the pipeline after finishing welding. Finally, rearrange airproof test for leakage detection until there is no leakage.

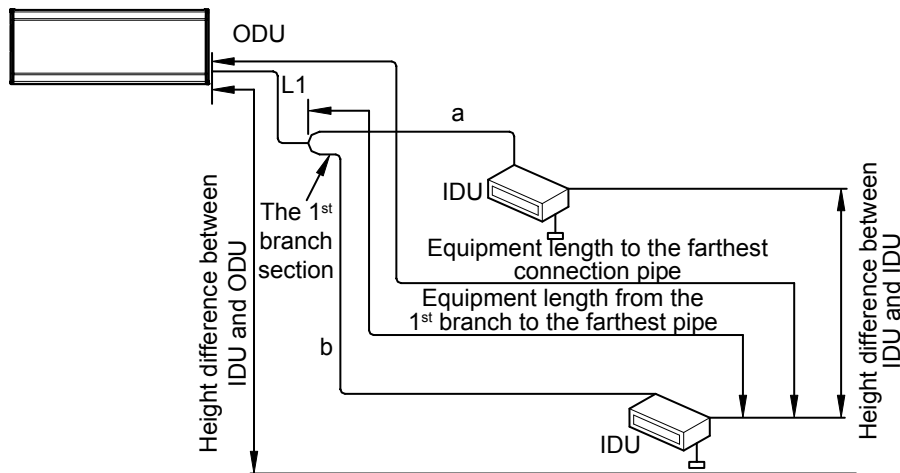
## 5.2 Free branching system

GMV-12WP/A-T(U):



## 5.3 Allowable length/height difference of refrigerant piping

GMV-12WP/A-T(U):



Each Y-type branch equals to 0.5m(1-5/8feet) and each branch header equals to 1.0m(3-1/4feet).

NOTE: The equivalent length of one Y shape branching joint is 0.5m(1-5/8feet).

Piping parameters of GMV-12WP/A-T(U):

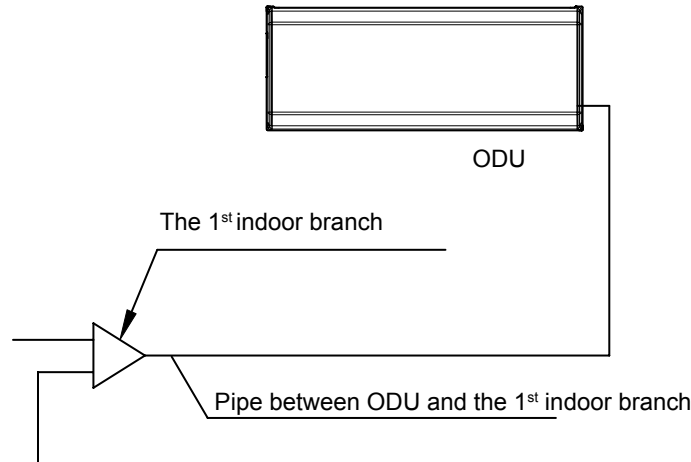
—	Allowable value		Piping section
	M	Feet	
Total length (actual length) of fitting pipe	30	98-3/8	L1+a+b
Length of farthest fitting pipe (m)	Actual length	30	L1+b
	Equivalent length	30.5	
From the 1 <sup>st</sup> branch to the farthest indoor pipe	15	49-2/8	b
Height difference between ODU and IDU	ODU at upper side	15	—
	ODU at lower side	15	—
Height difference between IDUs	10	32-6/8	—

## ➔ 5.5 Allowable length/height difference of refrigerant piping

(1) Size of main pipe

Dimension of pipe from ODU to the 1<sup>st</sup> indoor branch will be determined by the dimension of outdoor connection pipe.

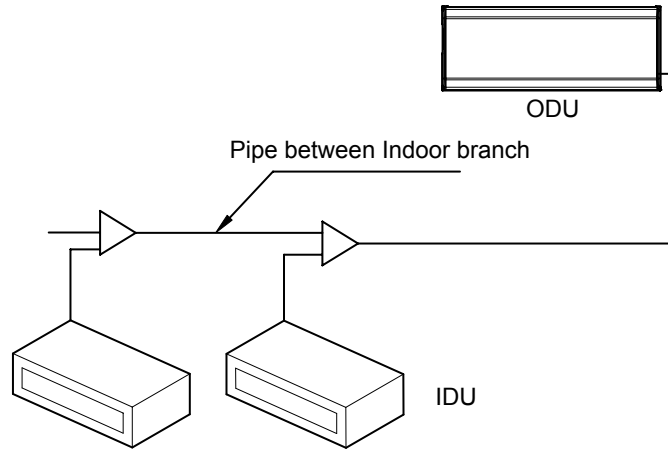
GMV-12WP/A-T(U):



(2) Pipe size between branching joints

Select indoor branches according to the total capacity of downstream indoor units. if the capacity exceeds that of the outdoor unit, capacity of outdoor unit prevails.

GMV-12WP/A-T(U):

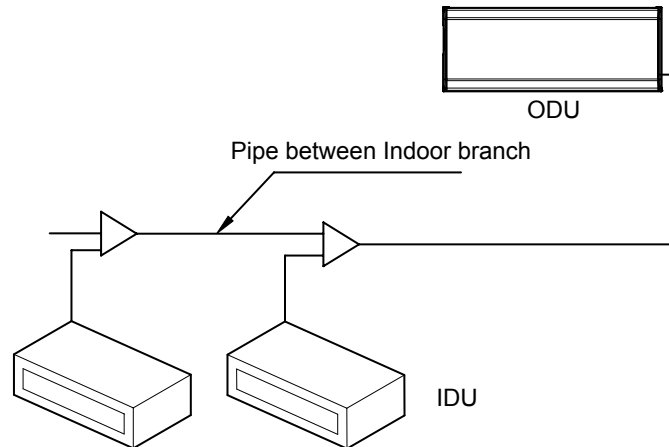


Total capacity of downstream indoor units C (Btu/h)	Gas pipe		Liquid pipe	
	mm	inch	mm	inch
$C \leq 19000$	Φ12.7	Φ1/2	Φ6.35	Φ1/4
$19000 < C \leq 48500$	Φ15.9	Φ5/8	Φ9.52	Φ3/8
$48500 < C \leq 76400$	Φ19.05	Φ3/4	Φ9.52	Φ3/8

(3) Piping of indoor unit

Dimension of pipe between indoor branch and IDU should be consistent with the dimension of indoor pipe.

GMV-12WP/A-T(U):

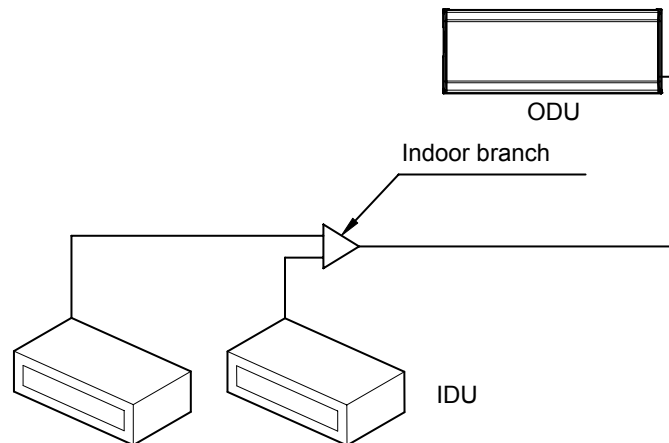


Rated capacity of IDU C (Btu/h)	Gas pipe		Liquid pipe	
	mm	inch	mm	inch
$C \leq 9600$	$\Phi 9.52$	$\Phi 3/8$	$\Phi 6.35$	$\Phi 1/4$
$9600 < C \leq 17000$	$\Phi 12.7$	$\Phi 1/2$	$\Phi 6.35$	$\Phi 1/4$
$17000 < C \leq 48000$	$\Phi 15.9$	$\Phi 5/8$	$\Phi 9.52$	$\Phi 3/8$
$48000 < C \leq 55000$	$\Phi 19.05$	$\Phi 3/4$	$\Phi 9.52$	$\Phi 3/8$
$55000 < C \leq 96000$	$\Phi 22.2$	$\Phi 7/8$	$\Phi 9.52$	$\Phi 3/8$

(4) Selection for branching section

Select indoor branches according to the total capacity of downstream indoor units. If the capacity exceeds that of the outdoor unit, capacity of outdoor unit prevails.

GMV-12WP/A-T(U):



Refrigerant system	Total capacity of downstream indoor units C (Btu/h)	Model
Y type branch	$C < 68200$	FQ01A/A
	$68200 \leq C \leq 102400$	FQ01B/A
	$102400 < C \leq 238800$	FQ02/A
	$238800 < C \leq 460600$	FQ03/A
	$460600 < C$	FQ04/A



## ➔ 5.5 Charging requirement with additional refrigerant

(1) Refrigerant in the system when shipped from the factory

Model		GMV-12WP/A-T(U)
Refrigerant Qty	kg	0.8
	oz	28.2

(2) Calculation method of the quantity of additional refrigerant (based on liquid pipe)

Quantity of additional refrigerant = Quantity of additional refrigerant for each set of indoor unit: 0.2kg (7oz) +  $\sum$ length of liquid pipe  $\times$  quantity of additional refrigerant per meter

Diameter of liquid pipe(mm/inch)	$\Phi$ 22.2( $\Phi$ 7/8)	$\Phi$ 19.05( $\Phi$ 3/4)	$\Phi$ 15.9( $\Phi$ 5/8)	$\Phi$ 12.7( $\Phi$ 1/2)	$\Phi$ 9.52( $\Phi$ 3/8)	$\Phi$ 6.35( $\Phi$ 1/4)
kg/m	0.35	0.25	0.17	0.11	0.054	0.022
oz/inch	0.314	0.224	0.152	0.099	0.048	0.020

NOTE:

- ① The refrigerant amount inside the system before ex-factory doesn't include the required additional refrigerant charge amount inside the pipeline system of indoor units and the pipeline system connecting indoor unit and outdoor unit.
- ② For the length of connection pipe in field, the required additional refrigerant charge amount shall be confirmed according to liquid pipe size in field and its length.
- ③ Record additional refrigerant charge amount for future reference.

NOTE:

When the compressor is not working after ensuring there is no leakage, charge the required additional refrigerant amount to the unit from the valve of liquid pipe of outdoor unit. When the pipe pressure increases and the additional refrigerant can't be charged to the required amount quickly, please set the unit in cooling operation status and charge refrigerant from the low pressure maintenance port of outdoor unit.

## 6 WIRING DESIGN

### ➔ 6.1 General wiring principle

- (1) All electrical work shall be done by professionals according to national and local laws and regulations.
- (2) The unit must be grounded reliably according to the related requirement of GB 50169.
- (3) Connect wire according to the wiring diagram stuck on the unit.

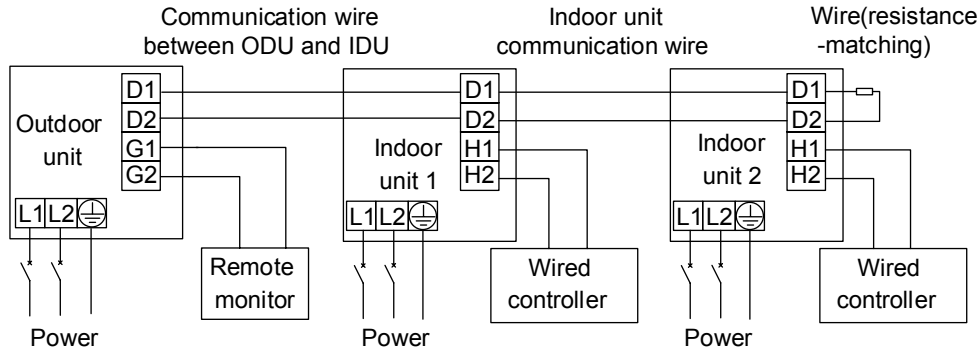
### ➔ 6.2 Electrical wiring design

- (1) Wiring drawing.
- (2) Selection of power supply cord and fuse of units.

Model	Power supply	Max Fuse Size/ Fusible Max.(A)	Max Ckt, Bkr Size/ Disjoncteur Max.(A)	Min. Circuit Ampacity
GMV-12WP/A-T(U)	208V/230V~ 60Hz	15	15	13.5

### 6.3 Wiring diagram of units

GMV-12WP/A-T(U):



### 6.4 Parameters

Model		GMV-12WP/A-T(U)
MCA	A	13.5
MOP	A	15

## 7 ACCESSORIES

Outdoor unit

Model name	Standard	Option	Provide for oneself
GMV-12WP/A-T(U)	√		
FQ01A/A Y shape branching joint		√	
Condensate pipe			√
Power cord			√
Filter		√	
Signal wires among units			√

## 8 TECHNICAL SPECIFICATIONS

Outdoor unit

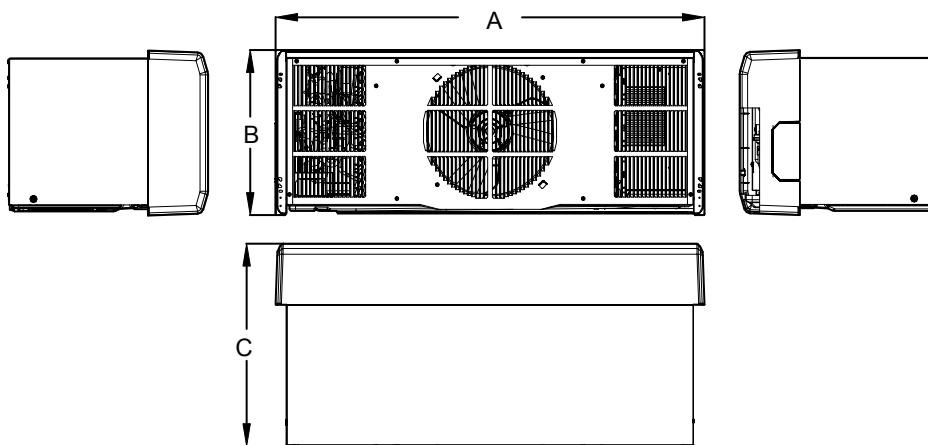
Model		GMV-12WP/A-T(U)
Cooling capacity	kW	3.52
	Btu/h	12000
Heating capacity	kW	3.52
	Btu/h	12000
Circulating air volume	m <sup>3</sup> /h	850
	CFM	500
Noise	dB(A)	Indoor46/Outdoor57
Refrigerant charge volume	Kg	0.8
	oz	28.2

Model			GMV-12WP/A-T(U)
Power supply			208V/230V~ 60Hz
Rated power input	Cooling	kW	1.4
	Heating	kW	1.1
Unit Dimensions (W×D×H)		mm	1069×500×406
		inch	42-1/16×19-11/16×16
Dimensions (W×D×H)		mm	1164×601×470
		inch	45-13/16×23-11/16×18-8/16
Compressor			SNB150FGAMC
Water-proof level			IPX4
Suitable climate			T1
Connection pipe	Gas	mm	Φ12.7
		inch	Φ1/2
	Liquid	mm	Φ6.35
		inch	Φ1/4
	Connection Method		Flare Connection
Net weight		kg	55
		oz	121

## 9 DIMENSIONAL DRAWINGS

### (1) Outdoor unit

Include the required dimension of installation space of main unit and single unit.

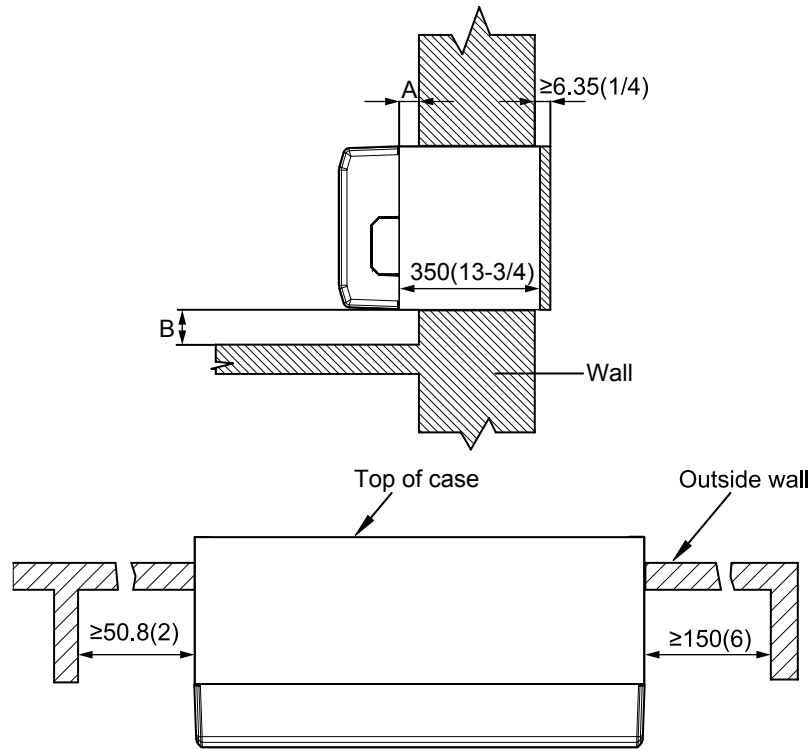


Unit: mm (inch)

Model	A	B	C
GMV-12WP/A-T(U)	1069(42-1/16)	406(16)	500(19-11/16)

Installation dimension:  
GMV-12WP/A-T(U):

Unit: mm (inch)



Dimension	A	B	
	Allow for wall finishing Min.(mm/inch)	Allow for floor finishing Min.(mm/inch)      Max.(mm/inch)	
No Accessories	6.35(1/4)	6.35(1/4)	—
With Subbase	45(1-3/4)	89(3-1/2)	127(5)
With Lateral Duct	19(3/4)	6.35(1/4)	—

NOTE:

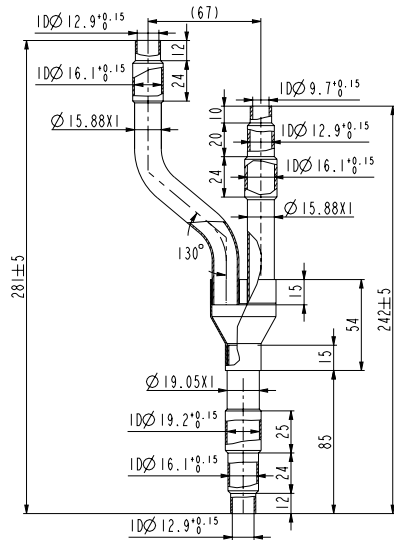
- ① If more than one accessory is to be used, use the maximum dimension. If the wall thickness is more than 350mm(13-3/4in.) - (A + 6.35mm(1/4in.)), a sleeve extension must be used.
- ② See the manual for detailed installation instructions.

# GMV MTAC Multi VRF System Technical Sales Guide

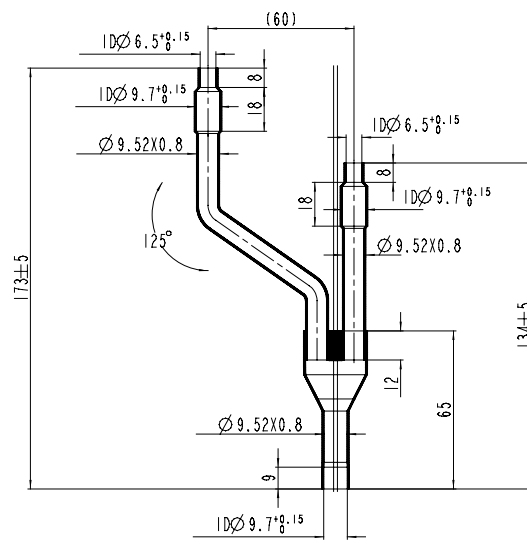
## (2) Branching joint

Length of each kind of Y-shape branching joint and the dimension of connection pipe port.

Y-shape branching joint: FQ01A/A



Gas pipe



Liquid pipe



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