PHOTOVOLTAIC MULTI VRF SYSTEM TECHNICAL SALES GUIDE

(GC201808)

BETTER CONDITIONERS GREE MAKING BETTER CONDITIONERS GREE MAKING BETTER CONDITIONERS GREE MAKING BETTER CONDITION

TECHNICAL SALES GUIDE-60Hz

CAPACITY RANGE:36~60kBtu/h

SUPER HIGH AMBIENT OPERATION TO 118 ˚F

TTER CONDITIONERS GREE MAKING BETTER CONDITIONERS GREE MAKING BETTER CONDITIONERS GREE MAKING BETTER CONDITIONE

R410A

GREE ELECTRIC APPLIANCES INC.OF ZHUHAI

CONTENTS

1 OUTLINE OF MULTI VRF

1.1 Product List

Model	GMV-Y36WL/A-T(U)
	GMV-Y48WL/A-T(U)
	GMV-Y60WL/A-T(U)

1.2 Product Features

GMV Solar Mini PV Inverter Multi VRF System is the new generation of DC inverter multi VRF system that Gree developed independently. It is a single refrigeration system that made up of one air cooled outdoor unit connected with several direct evaporative indoor units of identical or different series or capacity. It provides processed air directly to an area or several areas, which is mainly applicable for household or light commercial facilities. This product is endowed with the features of high efficiency, high anti-interference ability, long connection pipe, wide operation range, good acoustic, intelligent capacity adjustment, all-around protection.

Adopted the efficient direct-driven inverter compressor, Gree PV Direct-driven inverter multi VRF system is creating the new air conditioning era of energy conservation and comfort with the leading all DC inverter technology. Energy conservation effect is greatly enhanced, operation is more reliable, adjustment is more accurate and comfort effect is more obvious.

With the globally innovated communication technology for CAN network multi VRF system, its communication response speed is faster and more reliable; auto addressing, including for IDU and ODU (when several outdoor units are in parallel), can be completely realized. Free non-polarized wiring is available.

Gree PV Direct-driven inverter multi VRF system has the following unique technical characteristics:

(1) Five Core Technologies

1) PV Direct-driven technology

Connect the PV direct current to the direct current bus of the multi VRF system, utilization ration of PV direct-driven is over 97%, 5-7% of energy is saved when compared with other conventional methods.

2) Ternary conversion technology

Set up a ternary conversion model among PV sub-assy, multi VRF unit and public power grid to realize the two-way flow and multichannel mixture of electric energy in direct current side; dynamic switch time unit for power generation and consumption shall be millisecond; ensure the five real-time operation modes of PV multi VRF units.

3) Four-quadrant full control rectifier technology

Adopt the four-quadrant full control rectifier technology to ensure the two-way flow of energy and integrate the function of inverter in parallel and unit rectifier, the content of harmonic is as low as 3%, power factor is up to 99% or more.

4) Dynamic load tracking MPPT technology

Adopt the dynamic load tracking MPPT technology to respond the voltage instability of PV power generation. With MPPT control and AC/DC four-quadrant function, it eliminates the regular DC/DC voltage stabilization part and keeps tracking and controlling to make PV energy prioritized.

(2) Double zero function design

1) Fit the characteristics of PV energy, zero electric charge for power consumption;

The maximum PV power generation season is consistent with the highest unit power consumption season; meanwhile, the maximum daily power generation capacity is consistent with the maximum daily power consumption capacity. In the whole refrigeration year, electric energy absorbed from the electric supply is basically consistent with that is received.

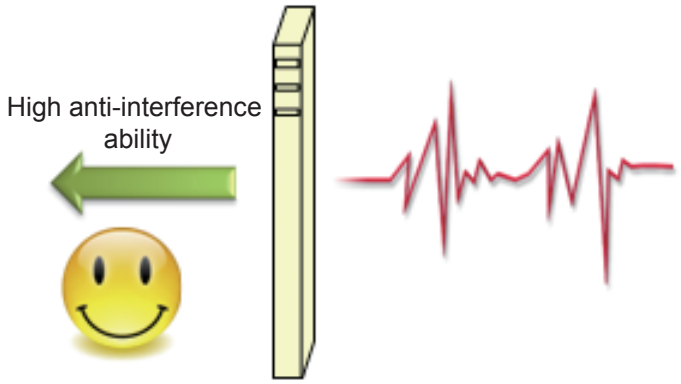
2) The residual power can be combined to the grid in real time, no wastage;

After satisfying the demand, if there's surplus output PV energy, they can be combined to the system grid in real time to realize complete utilization of output PV energy.

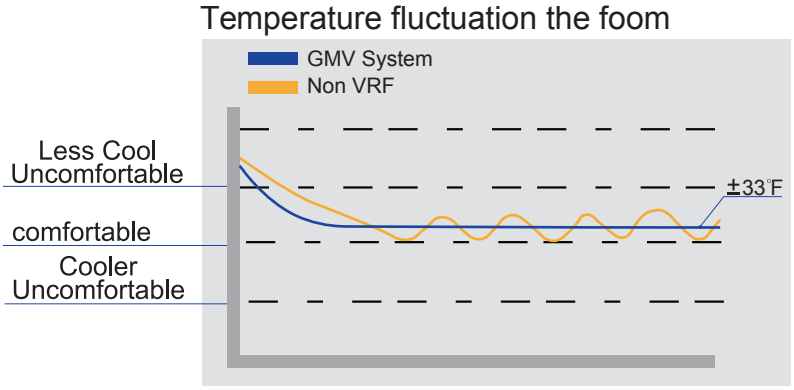
(3) Reliable Design
Low-voltage DC component, safer operation
Instead of traditional high-voltage AC component, it adopts the low-voltage DC component, which effectively ensures the safety and greatly decreases the hidden danger; the application of low-voltage DC component and the improvement of DC circuit topology have drastically reduced the hidden hazard of fire due to the aging of circuit and improved the EMC performance.

1.2.1 Introduction of Features

On the basis of unique technologies, PV direct-driven inverter multi VRF unit is inherited with the following advantages of GMV5 multi VRF units:
(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 is up to 16; HSPF is up to 9.
(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.



(3) Long Connection Pipe and Big Height Difference
The max length of connection reaches 300m(984ft)(total length). The connection pipe between indoor unit and outdoor unit can be as long as 120m(394ft). Project installation condition is wider while the limitation of installation distance is smaller. Branching joint and branching manifold can also be used.
The max allowable height difference between indoor unit and outdoor unit is 50m(164ft) and that between indoor unit and indoor unit is 15m(49ft).
(4) Wide Operation Range
The system can operate constantly and reliably in a wide temperature range(cooling: -5~48°C(23~118°F), heating: -20~27°C(-4~81°F)), which is not affected by atrocious environment.
(5) 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.



(6) Intelligent Control

1) Advanced DC inverter technology

① 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%.

② 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.

③ Closed-loop start-up technology of compressor: Self-innovative closed-loop start-up control is applied to enable output torque follow with load torque, whose start-up current is small and start-up is more reliable.

④ 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.

⑤ 180º sine wave DC variable speed technology: 180º 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

① 24h timer on or timer off can be preset (countdown timer and clock timer);Detect ambient emperature precisely; 7 kinds of fan speed can be set;

② Auto, cool, dry, fan or heat mode can be set;

③ Master wired controller and sub-master wired controller can be set; several indoor units can be controlled simultaneously;

④ 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

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.

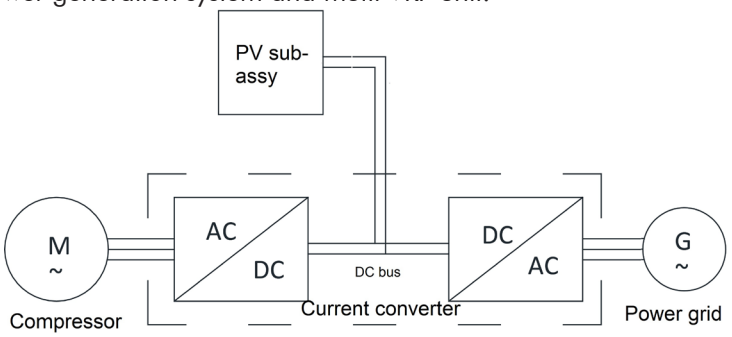
(7) Wide Control Application:

Independent remote control, wired control, zone control, centralized control, long-distance monitoring and weekly timer control of indoor units are available.

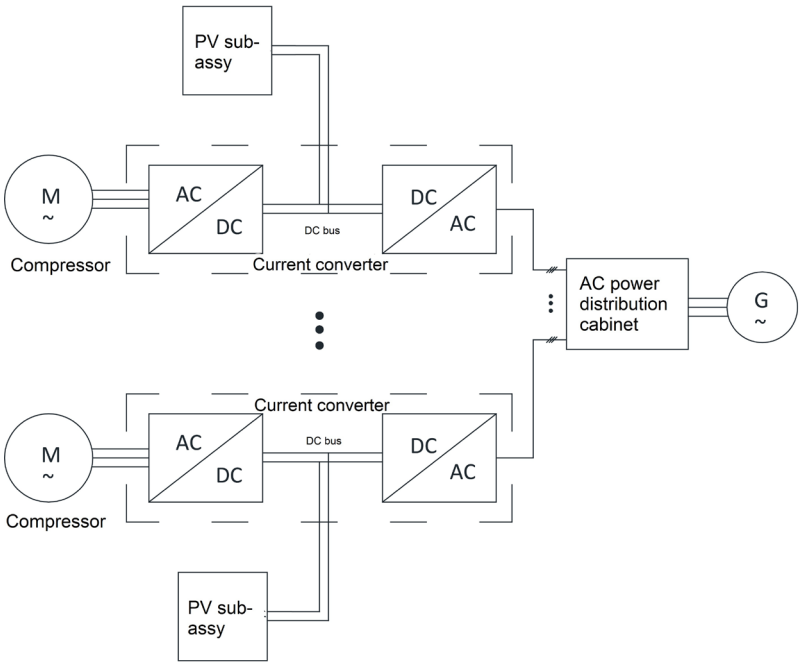
1.3 PV Direct-driven Inverter Multi VRF System

1.3.1 Working principle of PV Direct-driven Inverter Multi VRF System

PV power generation system is a power generation unit for PV direct-driven inverter multi VRF system and provides clean and renewable energies for PV direct-driven inverter multi VRF system. The left picture is the working principle chart of PV direct-driven inverter multi VRF system combined with one single multi VRF system and PV power generation system. As you can see, the sunlight irritates to the surface of the PV sub-assy, according to the photovoltaic effect, solar energy will be converted to DC electric power, then DC electric power shall be input to the DC bus of PV direct-driven inverter multi VRF system. When there's residual electric power or the compressor of multi VRF unit is not operating, DC will be converted to AC electric through current converter, meanwhile, conduct quality treatment to the electric energy, then combine the qualified AC to the power grid. In case several multi VRF systems are operating, an AC power distribution cabinet is needed to converge the AC, then combine them to the power grid, as is shown in the right picture. When PV power generation capacity is insufficient for the compressor of multi VRF system or PV is not generating power, the public power grid will supply electricity for the compressor of multi VRF system. The five working modes can be switched seamlessly according to actual operation situation of PV power generation system and multi VRF unit.



(single unit) Structure chart of PV direct-driven inverter VRF system



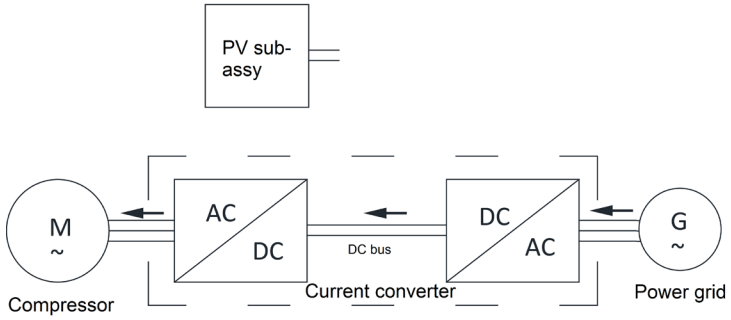
(multiple units) Structure chart of PV direct-driven inverter VRF system

1.3.2 Five working modes of PV Direct-driven Inverter Multi VRF System

Take a PV direct-driven inverter ODU as an example to introduce the 5 working modes of PV direct-driven inverter multi VRF unit.

1.3.2.1 Pure air conditioner working mode

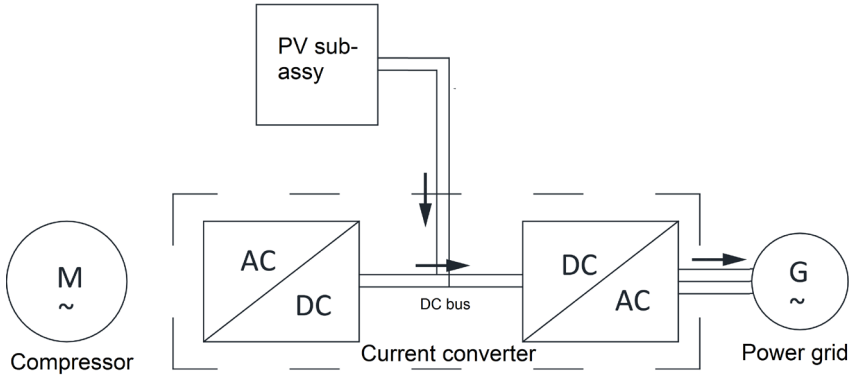
Pure air conditioner working mode means that, when PV power generation system is not generating power, national power grid will supply electricity to the main unit, as is shown in the following picture, at this time, the system equals to a regular high-efficiency permanent magnet synchronous inverter multi VRF unit.



Pure air conditioner working mode

1.3.2.2 Pure PV power generation working mode

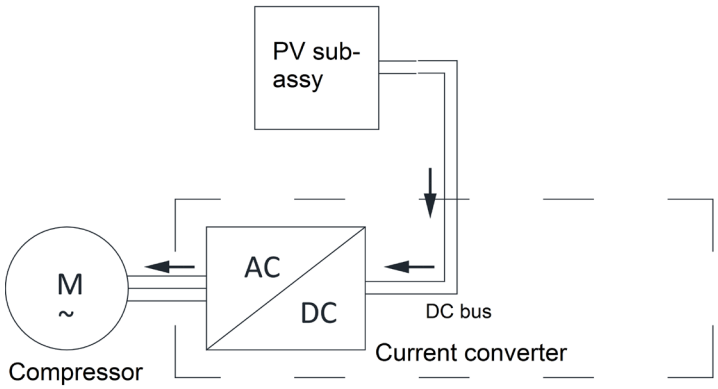
Pure PV power generation working mode means that, when the multi VRF system is not working, the electric power distributed by the PV power generation system will be supplied to the national power grid, as is shown in the following picture, at this time, the multi VRF will provide the PV inverter function and the system equals to a regular PV power station.



Pure PV power generation working mode

1.3.2.3 PV air conditioner working mode

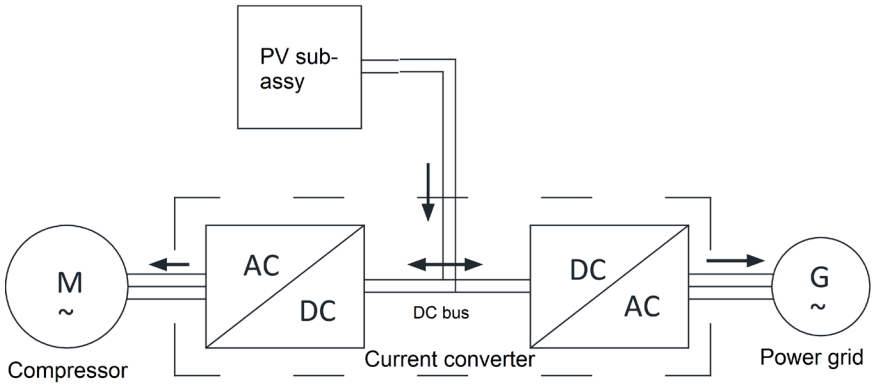
PV air conditioner working mode means that, when the power of PV power generation equals to power consumption of multi VRF system, the distributed electric energy of PV system will be applied to the operating working mode of multi VRF unit, as is shown in the following picture, at this time, the PV power generation system can realize self-sufficiency of electric power and “zero electricity consumption”.



PV air conditioner working mode

1.3.2.4 PV air conditioner and system power generation working mode

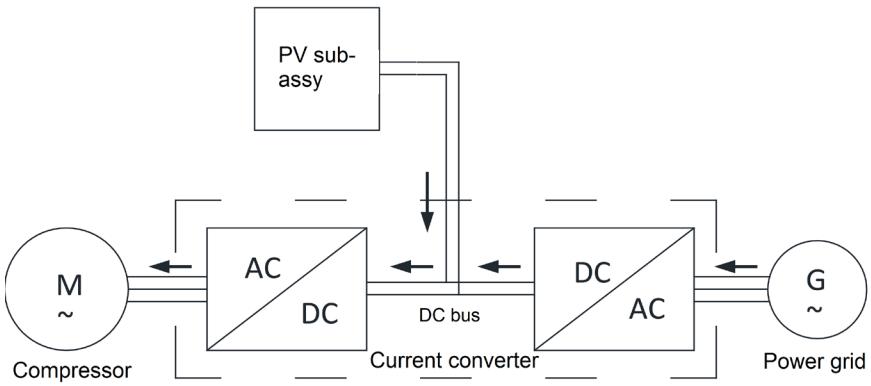
PV air conditioner and system power generation working mode means that, when the power of PV power generation is higher than the power consumption of multi VRF system, the distributed electric energy of PV system will satisfy the operation of multi VRF system preferentially, the surplus electric charge will be supplied to national power grid, as is shown in the following picture:



PV air conditioner and system power generation working mode

1.3.2.5 PV air conditioner and system power consumption working mode

PV air conditioner and system power consumption working mode means that, when the power of PV power generation is lower than the power consumption of multi VRF system, the distributed electric energy of PV system is insufficient to drive the normal operation of multi VRF system, the national power grid shall supplement the electric charge, as is shown in the following picture.



PV air conditioner and system power consumption working mode

1.3.3 PV system components

In PV direct-driven inverter multi VRF system, major PV system components include PV sub-assy and more. Through cable connection, distribution and transportation of electric energy is completed.

1.3.3.1 PV sub-assy

PV sub-assy is the core part of PV power generation system. By utilizing the photovoltaic effect, the radiation of sunlight is converted to electric energy. These electric energies can be used directly, combined to national power grid, or stored in storage battery. In current market, the major PV sub-assy include monocrystaline silicon sub-assy, polycrystalline silicon sub-assy and Thin film sub-assy. The following picture is the appearance of these three sub-assys.

Monocrystaline silicon sub-assy

Polycrystalline silicon sub-assy

Thin film sub-assy

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-Y36WL/A-T(U)	CN870W0210	11	37500	12.3	42000	208V/240V 60Hz	R410A	
GMV-Y48WL/A-T(U)	CN870W0200	14.1	48000	15.8	54000			
GMV-Y60WL/A-T(U)	CN870W0190	15.8	54000	17.6	60000			

2.1.1 Nomenclature

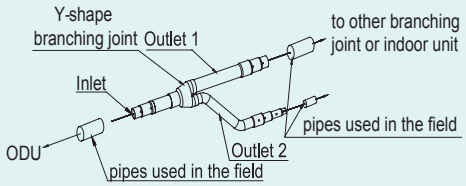
GMV	□	-	□	□	□	□	W	□	/	□	□	□
1	2		3	4	5		6	7		8	9	10

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 Y- PV air conditioner Leave blank if above functions are unavailable.
5	Code of cooling capacity	Nominal capacity/1000(Btu/h)
6	Unit structure	M—Modular (top discharge); L—Non-modular (side discharge); blank—Non-modular (top discharge)
7	Refrigerant	R410A (omit)
8	Design No.	Named in order of A, B, C, or combined with 1, 2, 3...
9	Power supply	1 phase—omit; 3 phase—S

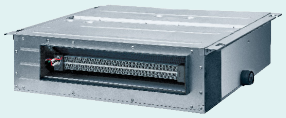
2.1.2 Rated Conditions

	Indoor side inlet air status				Outdoor side inlet air status			
	Dry bulb temperature		Wet bulb temperature		Dry bulb temperature		Wet bulb temperaturea	
	℃	℉	℃	℉	℃	℉	℃	℉
Cooling	26.7	80.0	19.4	67.0	35.0	95.0	23.9	75.0
Heating	21.1	70.0	15.6	60.0	8.3	47	6.1	43

2.1.3 Branching joints

	Model name	Usage	Appearance
Y-shape branching joint	GMV-Y36WL/A-T(U)	FQ01A/A	
	GMV-Y48WL/A-T(U)		
	GMV-Y60WL/A-T(U)		

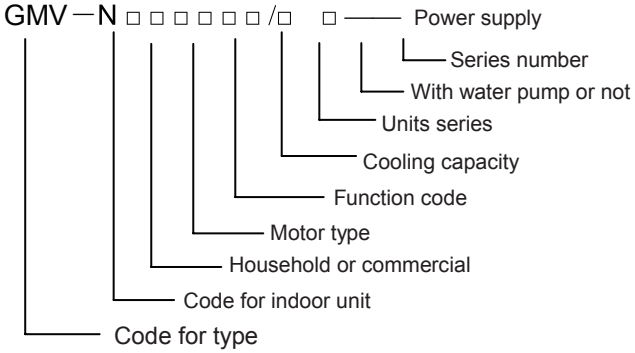
2.2 Indoor Unit

Type	Appearance	Model Name	Cooling Capacity		Heating Capacity	
			kW	Btu/h	kW	Btu/h
Duct type indoor unit		GMV-ND07PLS/A-T(U)	2.2	7500	2.5	8500
		GMV-ND09PLS/A-T(U)	2.8	9500	3.1	10500
		GMV-ND12PLS/A-T(U)	3.5	12000	4.0	13500
		GMV-ND14PLS/A-T(U)	4.0	13800	4.5	15500
		GMV-ND18PLS/A-T(U)	5.3	18000	5.9	20000
		GMV-ND22PLS/A-T(U)	6.3	22000	7.1	24000

Type	Appearance	Model Name	Cooling Capacity		Heating Capacity	
			kW	Btu/h	kW	Btu/h
Four-way Cassette		GMV-ND07T/A-T(U)	2.2	7500	2.5	8500
		GMV-ND09T/A-T(U)	2.8	9500	3.1	10500
		GMV-ND12T/A-T(U)	3.5	12000	4.0	13500
		GMV-ND15T/A-T(U)	4.4	15000	5	17000
		GMV-ND18T/A-T(U)	5.3	18000	5.9	20000
		GMV-ND24T/A-T(U)	7.0	24000	7.9	27000
		GMV-ND30T/A-T(U)	8.8	30000	10	34000
		GMV-ND36T/A-T(U)	10.6	36000	11.7	40000
		GMV-ND42T/A-T(U)	12.3	42000	13.8	47000
		GMV-ND48T/A-T(U)	14.1	48000	15.8	54000

Type	Appearance	Model Name	Cooling Capacity		Heating Capacity	
			kW	Btu/h	kW	Btu/h
Wall Mounted Type		GMV-N07G/A3A-D(U)	2.2	7500	2.5	8500
		GMV-N09G/A3A-D(U)	2.8	9500	3.2	11000
		GMV-N12G/A3A-D(U)	3.5	12000	4.0	13500
		GMV-N18G/A3A-D(U)	5.2	18000	5.8	20000
		GMV-N24G/A3A-D(U)	7.0	24000	7.5	25500

2.2.1 Nomenclature

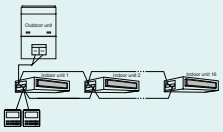
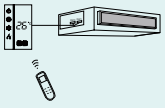
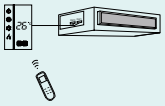


Code for multi VRF	—	Code for indoor unit	Motor type	Function code	Cooling capacity
GMV	—	N	D-DC motor Default-AC motor	R-heat pump L-cooling only X-fresh air W-dual heat sources Q-heat recovery Default-electric heating	Nominal cooling capacity/1000(Btu/h)

Classification	With water pump or not	Series number	Power supply
PL-Low static pressure duct type indoor unit; P-Standard static pressure duct type indoor; PH-High static pressure duct type indoor unit; PB-Thin duct type indoor unit; T-Four-way cassette; TD-Single-way cassette; TS-Two-way cassette; C-Floor mounting unit; ZD-Floor ceiling unit; G-Wall-mounted unit	With water pump-S(All cassette indoor units are with water pump, S is not presented in the model same)	A, B, C... or 1, 2, 3...	Select power supply code according to power supply specification

Power supply specification	Code
220V ~ ,60Hz; 208-230V ~ ,60Hz; 220-240V ~ ,60HZ; 208/230V ~, 60Hz	D
220V ~ ,50Hz; 230V ~ ,50Hz; 220-230V ~ ,50Hz	E
240V ~ ,50HZ	J
220-240V ~ ,50Hz; 230-240V ~ ,50Hz	K
208-230V ~ ,60Hz and 220-240V ~ ,50Hz General	T

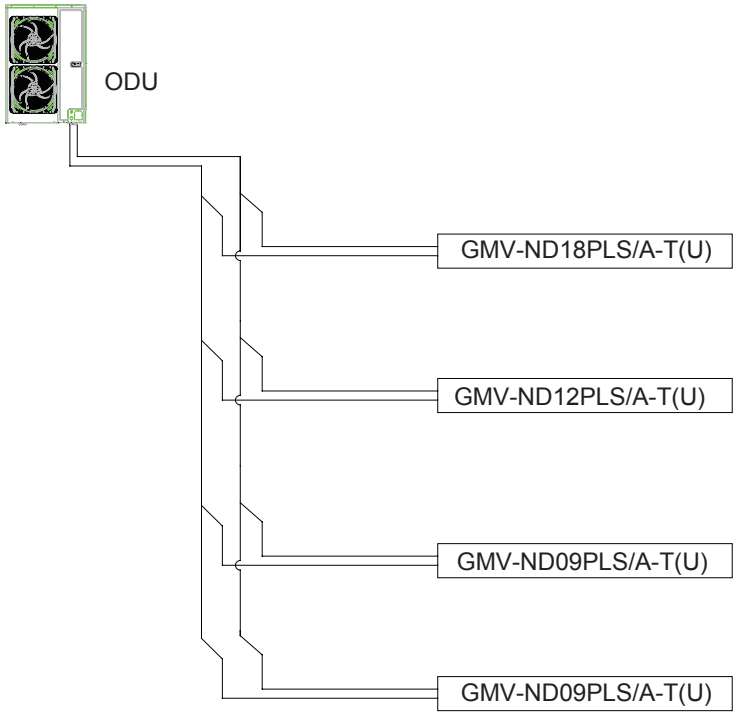
2.3 CONTROLLER

Name	Model name	Appearance	Application	Function
Wired controller	XK46			1）Elegant appearance and adopts big LCD screen with back light; 2） Ten touch buttons to avoid complicated combination buttons, which is convenient for operation; 3） Optional modes: Auto, cool, dry, fan, heat mode or floor heating, 3D heat supply(heating + floor heating) mode; 4）7 kinds of fan speed; 5） Clock can be displayed and set; 24h preset ON or OFF is available (countdown, clock timer function); 6） Dual wired controllers can be equipped. The two wired controllers can control the same indoor unit simultaneously. Or one wired controller can control several indoor units simultaneously; 7）Settable functions: sleep, air, quiet(auto quiet), light, energy saving, E-heater, X-fan, memory, low ambient temperature drying, heating in absence, controllable drying and E-heater, filter cleaning reminding; 8）With project parameter viewing and setting functions, which is convenient for project installation and debugging; 9）Adopts dual wire power carrier communication technology, which means power supply and communication share the same two-core wire. Users can purchase the wire by themselves, flexible for project installation and wiring.
Remote controller	YAP1F			Besides the common functions, the following functions are also available: up&down swing, timer on, timer off, I-feel, sleep and 8℃ heating operation, etc.
	YV1L1			Besides the common functions, the following functions are also available: up&down swing, left&right swing, quiet, timer on, timer off, sleep, I-feel, low ambient temperature drying and 8℃ heating operation, etc.

3 BASIC SYSTEM CONFIGURATION

3.1 System legend(ex.)

Model name of outdoor unit:GMV-Y48WL/A-T(U)
Allowed capacity code of indoor unit:Min:24000Btu/h Max: 64800Btu/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 18+12+9+9=48, so the selected outdoor unit is GMV-Y48WL/A-T(U).

3.2 PV system components

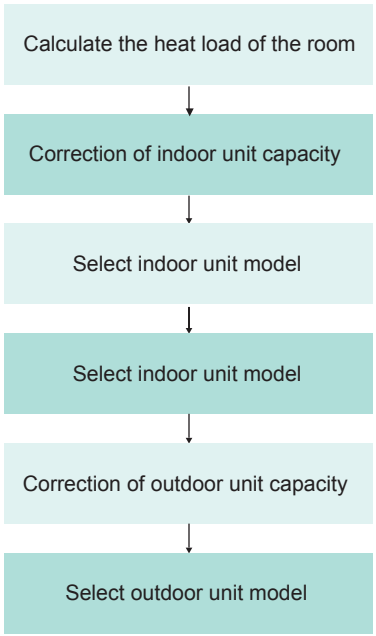
3.2.1 PV sub-assy

Type of battery	156*156 monocrystaline silicon sub-assy	156*156 polycrystalline silicon sub-assy	156*156 membrane sub-assy
Quantity of battery	60	60	60
Peak power (Wp)	250	255	260
Peak voltage (V)	29.8	30.0	30.3
Peak current (A)	8.39	8.49	8.59
Open circuit voltage (V)	37.6	37.7	37.7
Short circuit current (A)	8.92	9.01	9.09
Sub-assy efficiency (%)	15.4	15.7	16
Peak power temperature coefficient (%/℃)	-0.42		
Open circuit voltage temperature coefficient (%/℃)	-0.32		
Short circuit current temperature coefficient (%/℃)	0.05		

Type of battery	156*156 monocrystaline silicon sub-assy	156*156 polycrystalline silicon sub-assy	156*156 membrane sub-assy
Peak power and voltage temperature coefficient (%/℃)	-0.42		
Size (mm)	1640*990*35		
Weight (kg)	18.5		

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 = 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-Y36WL/A-T(U)	11.0	37500	7
GMV-Y48WL/A-T(U)	14.1	48000	8
GMV-Y60WL/A-T(U)	15.8	54000	9

4.3 Cooling/Heating capacity characteristics

(1) Cooling capacity calculation method.

(2) Heating capacity calculation method.

Cooling or heating capacity calculation method:

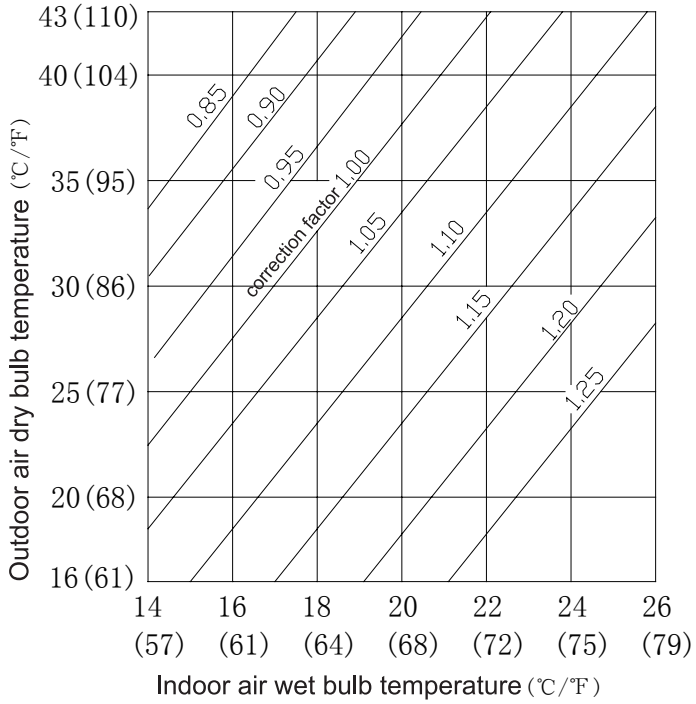
R410A outdoor unit capacity = outdoor unit capacity in rated condition × correction factor of indoor and outdoor temperature condition × connection pipe distance, correction factor of height difference between indoor unit and outdoor unit.

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;

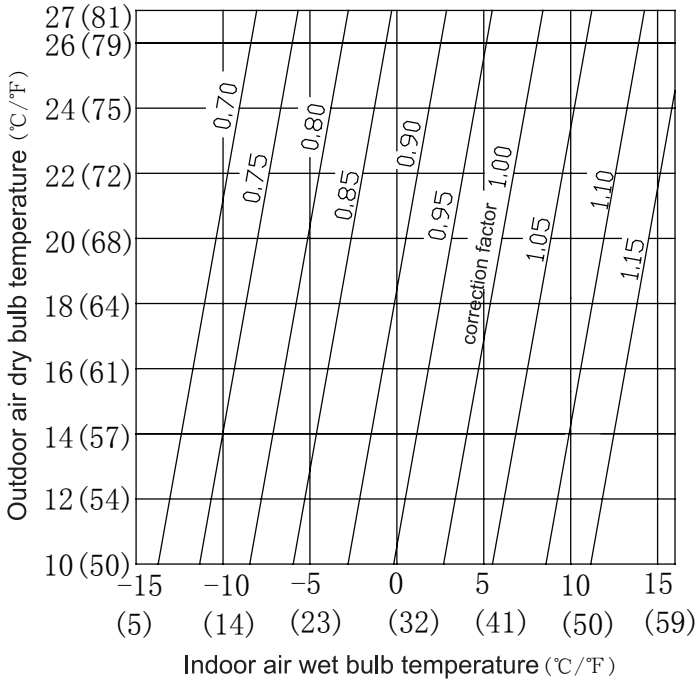
② If the total capacity code of indoor units is bigger than the capacity code of outdoor unit, the capacity of outdoor unit in rated condition equals to its rated cooling capacity;

③ Correction factor of indoor and outdoor temperature condition.

1) Correction factor of cooling capacity



2) Correction factor of heating capacity



④ Correction factor of connection pipe distance and height difference

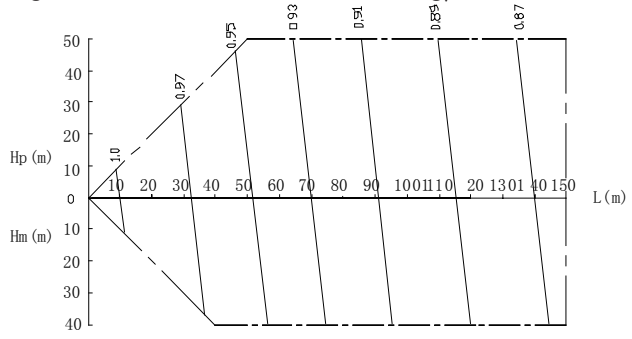
◆ Symbol instruction:

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

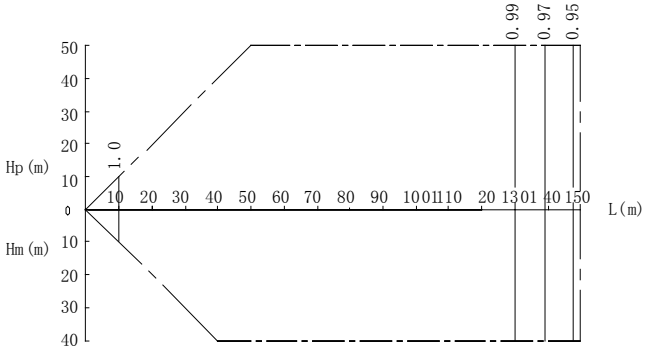
Hm: Height difference (m) between indoor unit and outdoor unit when indoor unit is higher than outdoor unit;

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℃ (61℉) in cooling and set in 30℃ (86℉) in heating).



Change rate of cooling capacity



Change rate of heating capacity

Note:

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

(3) Capacity of each indoor unit=Capacity of outdoor unit × Total capacity of indoor units/Total capacity of synchronously operating indoor units.

(4) Operating temperature rang.

	Temperature range	
	℃	℉
Cooling	-5~48	23~118
Heating	-20~27	-4~81

4.4 Example of equipment selection

(1) Overview of building model

a. Temperature condition

b. Outdoor temperature: 35℃ (95 ℉) DB; Indoor temperature: 17℃ (81 ℉) WB.

c. Load in cooling

		Room A	Room B	Room C	Room D
Load	kW	2.4	3.2	2.4	4.7
	Btu/h	8200	10900	8200	16000

(2) Selection Criteria for each floor

Pipe length: 55m; Height difference between indoor unit and outdoor unit: 25m (indoor unit is higher

than outdoor unit).

(3) Procedure and result of equipment selection

a. Procedure of equipment selection

Introduce the equipment selection procedure step by step.

b. Equipment selection and capacity check

① 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℃（95 ℉）DB and indoor temperature of 17℃（81 ℉）WB, the corrected ratio of cooling capacity is 0.94.

Selection result is as below:

		Room A	Room B	Room C	Room D
Corrected load of capacity	kW	2.55	3.40	2.55	5.0
	Btu/h	8720	11600	8720	17020
Unit size		09	12	09	18

② Selection of outdoor unit

The total capacity code of indoor units is 48. 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.

In the example, capacity of outdoor unit=48/(0.94×0.95)=54.

Select the outdoor unit with capacity code of 160 and nominal cooling capacity of 14.1Kw(48000Btu/h).

The capacity code ratio between indoor unit and outdoor unit is 48/48×100%=100%, which is within 50%~135% and accords with the equipment selection standard.

③ Correction of outdoor unit capacity

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

Outdoor unit: GMV-Y48WL/A-T(U)

Indoor unit: GMV-ND09PLS/A-T(U)×2, GMV-ND12PLS/A-T(U)×1, GMV-ND18PLS/A-T(U)×1

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 14.1Kw(48000Btu/h).

④ Referring to the corrected ratio chart of cooling capacity related to temperature condition, under outdoor temperature of 35 ℃（95 ℉）DB and indoor temperature of 17 ℃（81 ℉）WB, the corrected ratio of cooling capacity is 0.94.

⑤ Referring to the corrected ratio of connection pipe of 55m（180ft）long and height difference between indoor unit and outdoor unit of 25m（82ft）（outdoor unit is lower than indoor unit）, the corrected ratio is 0.95.

Capacity of outdoor unit=48×0.94×0.95=12.59Kw（42.86Btu/h）

⑥ 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-ND09PLS/A-T(U): 48×9/48=9kBtu/h

GMV-ND12PLS/A-T(U): 48×12/48=12kBtu/h

GMV-ND09PLS/A-T(U): 48×18/48=18kBtu/h

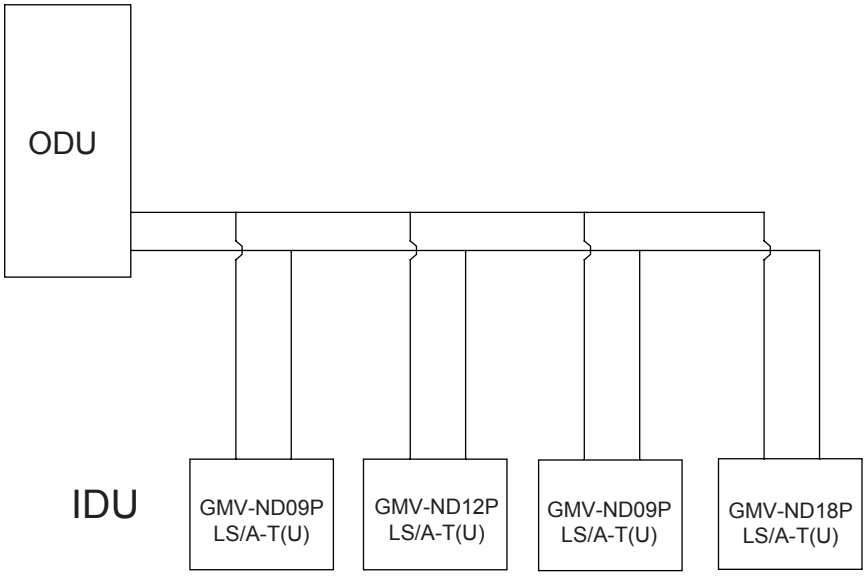
The result is as below:

Air conditioning load			Equipment selection			
Floor	RoomNo	Indoor air conditioning load	Indoor unit		Outdoor unit	
		Cooling (Btu/h)	Model	Capacity (Btu/h)	Model	Capacity(Btu/h)
				Cooling		Cooling
1	A	8200	GMV-ND09PLS/A-T(U)	9500	GMV-Y48WL/A-T(U)	48000
	B	10900	GMV-ND12PLS/A-T(U)	12000		
	C	8200	GMV-ND09PLS/A-T(U)	9500		
	D	16000	GMV-ND18PLS/A-T(U)	18000		

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	85	280	25（ODU is lower than IDU）	82m(ODU is lower than IDU)	12.56	42860	2.55	8720	The selection should accord with the standard
	B							3.40	11600	
	C							2.55	8720	
	D							5.00	17020	

c.Schematic diagram

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



4.5 Correction of PV sub-assy parameter

In general, the string number S of PV sub-assy is calculated according to the following formula:

$$S \approx U_{DC} / V_{mpp}$$

among them:
UDC——The best working voltage of converting unit
Vmpp——Series connection voltage of PV sub-assy
Related parameter of the sub-assy is mainly affected by temperature, therefore, correction is needed according to local climate condition when designing.
Low temperature （S×Vmpp× [(1+ β ×(Tmin-25)]≤UDC mppmax
High temperature （S×Vmpp× [(1+ β × （Tmax-25)]≥UDC mppmin
among them:
β ——Open circuit voltage temperature coefficient of PV sub-assy
Tmin——Installation location of PV system, the lowest temperature when PV sub-assy is working
Tmax——Installation location of PV system, the highest temperature of sub-assy rear panel when PV sub-assy is working
UDC mppmax——Max. MPPT voltage of converting unit
UDC mppmin——Min. MPPT voltage of converting unit
So the string number S of PV sub-assy shall meet the following requirement:

$$\frac{U_{DCmpp\min}}{V_{mpp}\times[1+\beta\times(T_{\max}-25)} \le S \le \frac{U_{DCmpp\max}}{V_{mpp}\times[1+\beta\times(T_{\min}-25)}$$

Notes:
① Low temperature means the lowest temperature of the installation location of PV system.
② High temperature means the temperature of sub-assy rear plate when PV sub-assy is operating in its installation location. The higher the ambient temperature is, the higher the temperature of the sub-assy rear plate is. The highest temperature can be 25°C higher than the ambient temperature; however, when the sub-assy is not generating power or the sunlight is weak, the sub-assy rear plate temperature will be lower than the ambient temperature sometimes.

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;

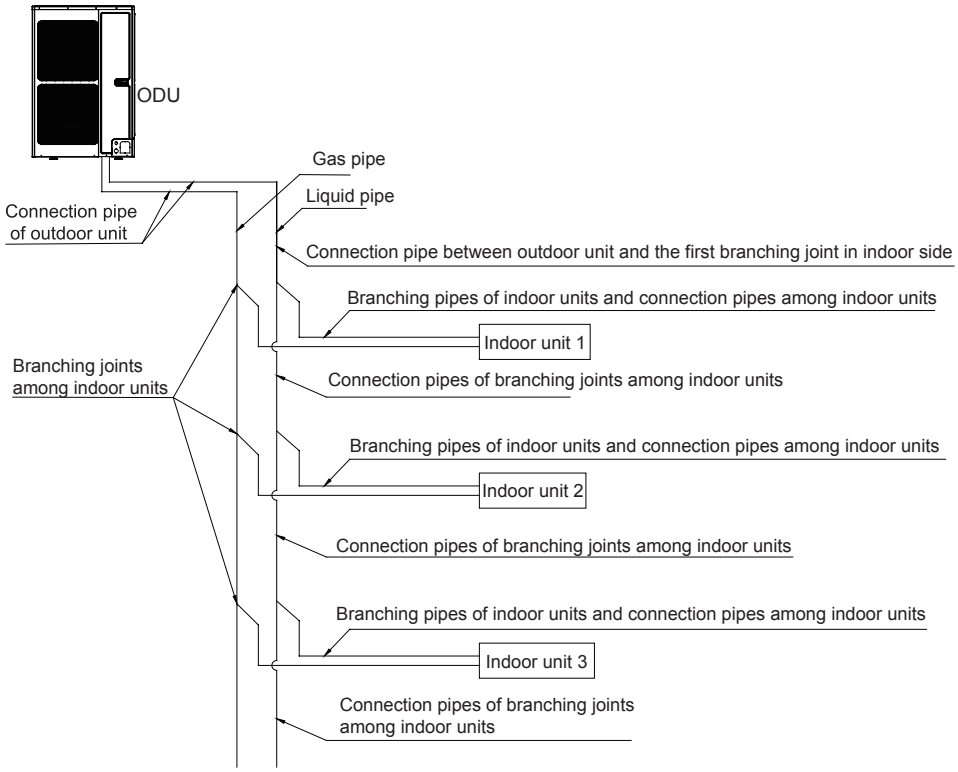
Step two: Slowly increase pressure to 1.5MPa and maintain pressure for 5min. Small leakage may be found during airproof test;

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.

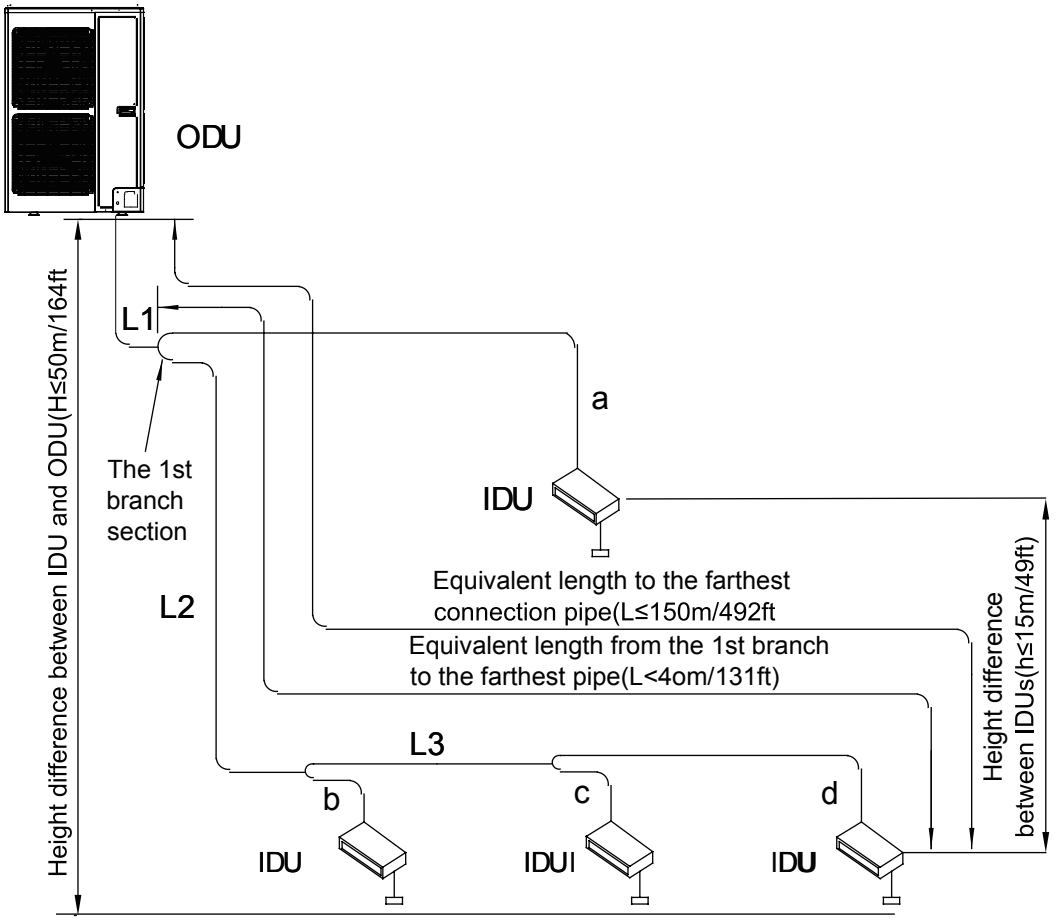
(2) Introduction of handling method of leakage

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



5.3 Allowable length/height difference of refrigerant piping



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

NOTICE! The equivalent length of one Y shape branching joint is 0.5m(1-5/8ft).

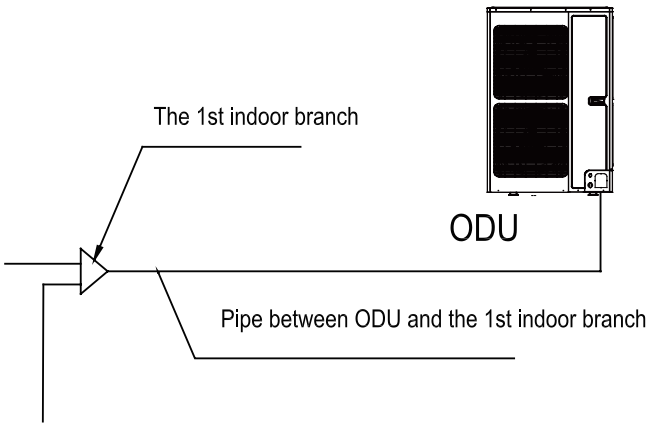
GMV-Y36WL/A-T(U) 、GMV-Y48WL/A-T(U)、GMV-Y60WL/A-T(U):

			Allowable value		Piping section
			M	Ft	
Pipe length	Total extension of pipe (Liquid pipe, real length)		250	820	L1+L2+L3+a+b+c+d
	Farthest piping length	Real length	100	328	L1+L2+L3+d
		Equivalent length	120	394	
	Equivalent length of farthest piping from 1st branching		40	131	L2+L3+d
Height difference	Height between indoor and outdoor units	Upper outdoor unit	30	98	——
		Lower outdoor unit	30	98	——
	Height between indoor units	Upper outdoor unit	10	33	——
		Lower outdoor unit	10	33	——

5.4 Selection of refrigerant piping

(1) Size of main pipe

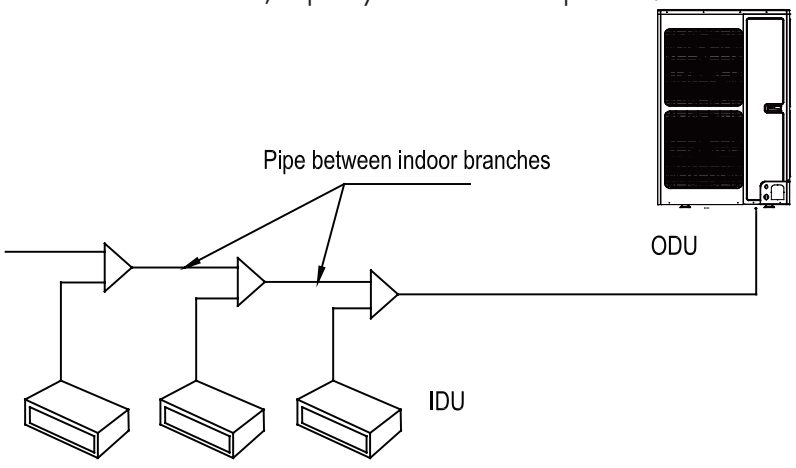
Dimension of pipe from ODU to the 1st indoor branch will be determined by the dimension of outdoor connection pipe.



Model	Pipe dimension			
	Gas pipe		Liquid pipe	
	mm	inch	mm	inch
GMV-Y36WL/A-T(U)	Ø15.9	5/8	Ø9.52	3/8
GMV-Y48WL/A-T(U)	Ø15.9	5/8	Ø9.52	3/8
GMV-Y60WL/A-T(U)	Ø19.05	3/4	Ø9.52	3/8

(2) Pipe size between branching joints

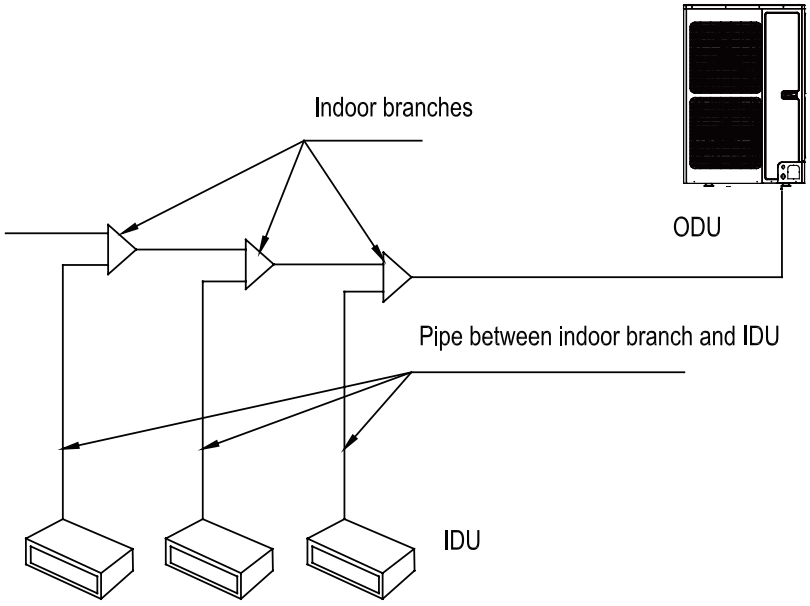
Select pipe between indoor branches according to the capacity of downstream indoor units; if the capacity exceeds that of the outdoor unit, capacity of outdoor unit prevails.



Total capacity of downstream indoor units C (Btu/h)	Gas pipe		Liquid pipe	
	mm	inch	mm	inch
C ⩽ 19000	Ø12.7	1/2	Ø6.35	1/4
19000 < C ⩽ 48500	Ø15.9	5/8	Ø9.52	3/8

(3) Piping of indoor unit

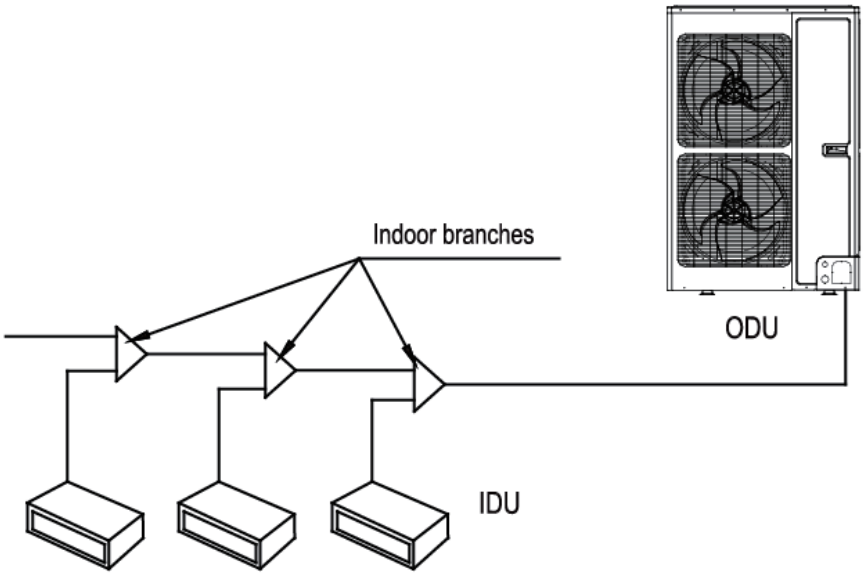
Dimension of pipe between indoor branch and IDU should be consistent with the dimension of indoor pipe.



Rated capacity of IDU C (Btu/h)	Gas pipe		Liquid pipe	
	mm	inch	mm	inch
C ⩽ 9600	Ø9.52	3/8	Ø6.35	1/4
9600 < C ⩽ 17000	Ø12.7	1/2	Ø6.35	1/4
17000 < C ⩽ 48000	Ø15.9	5/8	Ø9.52	3/8
48000 < C ⩽ 55000	Ø19.05	3/4	Ø9.52	3/8
55000 < C ⩽ 96000	Ø22.2	7/8	9.52	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.



R410A Refrigerant system	Total capacity of downstream indoor units C (Btu/h)	Model
Y type branch	C ⩽ 68200	FQ01A/A
	68200 ⩽ C ⩽ 102400	FQ01B/A
	102400 ⩽ C ⩽ 238800	FQ02/A
	238800 ⩽ C ⩽ 460600	FQ03/A
	460600 ⩽ C	FQ04/A

5.5 Charging requirement with additional refrigerant

5.5.1 Refrigerant Adding

(1) Refrigerant quantity of outdoor unit before delivery:

Model	GMV-Y36WL/A-T(U)	GMV-Y48WL/A-T(U)	GMV-Y60WL/A-T(U)
Refrigerant Qty (kg)	3.3(116)	3.3(116)	3.3(116)

Note:

① The refrigerant amount charged before delivery doesn't include the amount that needs to be added to indoor units and the connection pipeline.
② Length of connection pipe is decided on site. Therefore the amount of additional refrigerant shall be decided on site according to the dimension and length of field-installed liquid pipe.
③ Record the amount of additional refrigerant for convenience of after-sales service.

(2) Calculation of the amount of additional refrigerant

When the ODU is GMV-Y***WL/A-T(U), adding refrigerant method includes 3 steps as follow:

1) Amount of additional refrigerant depending on the pipe size(X)
2) Amount of additional refrigerant depending on Quantity of IDU(Y)
3) Amount of additional refrigerant depending on certain model of IDU(Z)

Total charging amount =X+Y+Z

Detail calculation is as follow:

1) X= ∑(Liquid pipe length×amount of additional refrigerant of each 1m)

Diameter of liquid pipe (mm/inch)	Φ19.05 (Φ3/4)	Φ15.9 (Φ5/8)	Φ12.7 (Φ1/2)	Φ9.52 (Φ3/8)	Φ6.35 (Φ1/4)
kg/m	0.25	0.17	0.11	0.054	0.022
oz/inch	0.224	0.152	0.099	0.048	0.020

2) Y=(Quantity of IDU-2)x0.3 kg(10.58oz)

3) List of certain model of IDU require amount of additional refrigerant Z is as follow

(Unit: kg/oz)

Capacity (K) / Model	09	12	15
Big Duct Type GMV-ND**PHS/B-T(U)	0.20 (7.05)	0.30 (10.58)	0.30 (10.58)
Big Cassette Type GMV-ND**T/A-T(U)	0.30 (10.58)	0.30 (10.58)	0.30 (10.58)

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) Connect wire according to the wiring diagram stuck on the unit.

6.2 Electrical wiring design

(1) Wiring drawing

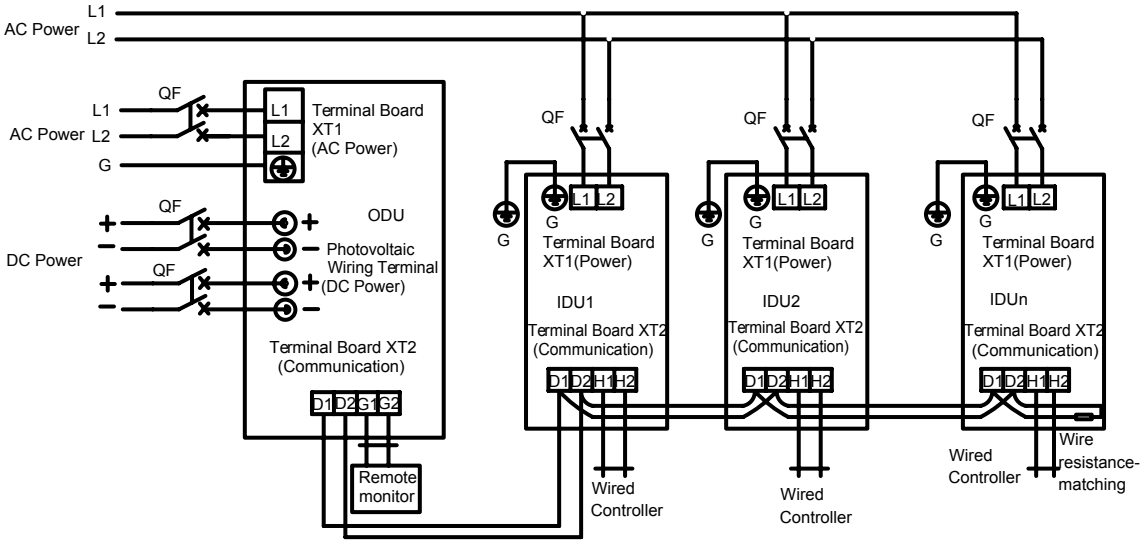
(2) Selection of power supply cord and fuse of units

Model	Power supply	Max Fuse Size/ Fusible Max. (A)	Max Ckt, Bkr Size/ Disjoncteur Max. (A)	Min. Circuit Ampacity
GMV-Y36WL/A-T(U)	208/240V~ 60Hz	35	35	32
GMV-Y48WL/A- T(U)	208/240V~ 60Hz	45	45	35
GMV-Y60WL/A- T(U)	208/240V~ 60Hz	50	50	38

For photovoltaic DC power supply, selection of power cord diameter and air switch are as below:

Model	Power Supply	Capacity of Circuit Breaker (A)	QTY of Power Cord*minimum Sectional Area (mm^2)
GMV-Y36WL/A-T(U)	120-440Vdc	20A	4*2.5
GMV-Y48WL/A-T(U)	120-440Vdc	20A	4*2.5
GMV-Y60WL/A-T(U)	120-440Vdc	20A	4*2.5

6.3 Wiring diagram of units



6.4 Parameters

Model		GMV-Y36WL/A-T(U)	GMV-Y48WL/A-T(U)	GMV-Y60WL/A-T(U)
MCA	A	32	35	38
MOP	A	35	45	50

7 ACCESSORIES

(1) Outdoor unit

Model name	Standard	Option	Provide for oneself
GMV-Y36WL/A-T(U)	√		
GMV-Y48WL/A-T(U)	√		
GMV-Y60WL/A-T(U)	√		
FQ01A/A Y shape branching joint		√	
Condensate pipe			√
Power cord			√
Filter		√	
Signal wires among units	√		

(2) Indoor unit

Model name	Standard	Option	Provide for oneself
XK46 Wired Controller	√		
YV1L1 remote controller		√	
YAD1F remote controller		√	
Screw M4X25 (Cross recessed small pan head screw)	√		
Drain Hose Assembly	√		
Union Nut Assembly	√		
Nut with Washer	√		
Nut M10 (Type 1 Hex Nut)	√		
Nut 10 (Type 1 Hex Nut)	√		
Heating Jacket of Header	√		
Heating Jacket of Liquid-in Pipe	√		
Sponge of Drain Pipe	√		
Cable Tie	√		

(3) Controller

Model name	Standard	Option	Provide for oneself
Wired controller XK62	√		
Central controller CE53-24/F(C)		√	

(1) Indoor unit

◆ Low Static Pressure Duct Type IDU

Model			GMV-ND07PLS/A-T(U)	GMV-ND09PLS/A-T(U)	GMV-ND12PLS/A-T(U)	GMV-ND14PLS/A-T(U)	GMV-ND18PLS/A-T(U)	GMV-ND22PLS/A-T(U)
Product Code			CM810N0080	CM810N0090	CM810N0100	CM810N0120	CM810N0070	CM810N0110
Cooling Capacity		Btu/h	7500	9500	12000	14000	18000	22000
		kW	2.2	2.8	3.5	4.0	5.3	6.3
Heating Capacity		Btu/h	8500	10500	13500	15000	20000	24000
		kW	2.5	3.1	4.0	4.5	5.9	7.1
Casing finish			Galvanized Steel plate					
Dimensions (W×D×H)	outline	mm	700×615×200	700×615×200	700×615×200	900×615×200	1100×615×200	1100×615×200
		inch	27-1/2×24-1/4×7-7/8	27-1/2×24-1/4×7-7/8	27-1/2×24-1/4×7-7/8	35-3/8×24-1/4×7-7/8	43-1/4×24-1/4×7-7/8	43-1/4×24-1/4×7-7/8
	Packaging	mm	893×743×305	893×743×305	893×743×305	1123×743×305	1323×743×305	1323×743×305
		inch	35-1/8×29-1/4×12	35-1/8×29-1/4×12	35-1/8×29-1/4×12	44-1/2×29-1/4×12	52×29-1/4×12	52×29-1/4×12
Net Weight		lbs.	51	51	51	60	69	69
		kg	23	23	23	27	31	31
Gross Weight		lbs.	64	64	64	73	86	86
		kg	29	29	29	33	39	39
Pipe Connection	Liquid Side	mm	Ø6.35	Ø6.35	Ø6.35	Ø6.35	Ø9.52	Ø9.52
		inch	Ø1/4	Ø1/4	Ø1/4	Ø1/4	Ø3/8	Ø3/8
	Gas Side	mm	Ø9.52	Ø12.7	Ø12.7	Ø12.7	Ø15.9	Ø15.9
		inch	Ø3/8	Ø1/2	Ø1/2	Ø1/2	Ø5/8	Ø5/8
	Drain Pipe	mm	Ø25					
		inch	Ø1					
Power supply			1-phase 208/230V~60Hz					
Sound Pressure Level(H/M/L)		dB(A)	31/29/25	31/29/25	32/30/27	33/31/28	35/33/30	35/33/30
Heat Exchanger			Fenestrate plain film --hydrophilic film					
Air Filter			PP					
Refrigeration Control Device			EXV					
Protection Device			Fuse					

8 TECHNICAL SPECIFICATIONS

◆ 4-way Cassette Type IDU

Model			GMV-ND07T/A-T(U)	GMV-ND09T/A-T(U)	GMV-ND12T/A-T(U)	GMV-ND15T/A-T(U)	GMV-ND18T/A-T(U)
Product Code			CM500N0520	CM500N0530	CM500N0540	CM810N0130	CM500N0510
Cooling Capacity		Btu/h	7500	9500	12000	15000	18000
		kW	2.2	2.8	3.5	4.4	5.3
Heating Capacity		Btu/h	8500	10500	13500	17000	20000
		kW	2.5	3.1	4.0	5	5.9
Casing finish			Galvanized Steel plate				
Dimensions (W×D×H)	Body outline	mm	840×840×190	840×840×240	840×840×240	840×840×240	840×840×240
		inch	33×33×7 1/2	33×33×9-1/2	33×33×9-1/2	33×33×9-1/2	33×33×9-1/2
	Body Packaging	mm	960×960×257	960×960×310	960×960×310	960×960×310	960×960×310
		inch	37-3/4×37-3/4×10-1/8	37-3/4×37-3/4×12-1/4	37-3/4×37-3/4×12-1/4	37-3/4×37-3/4×12-1/4	37-3/4×37-3/4×12-1/4
	Panel outline	mm	950×950×65	950×950×65	950×950×65	950×950×65	950×950×65
		inch	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2
	Panel Packaging	mm	1030×1035×118	1030×1035×118	1030×1035×118	1030×1035×118	1030×1035×118
		inch	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8
Net Weigh	Main Body	lbs.	50	58	58	58	58
		kg	22.5	26.5	26.5	26.5	26.5
	Panel	lbs.	15-3/8	15-3/8	15-3/8	15-3/8	15-3/8
		kg	7.0	7.0	7.0	7.0	7.0
Gross Weigh	Main Body	lbs.	64	75	75	75	75
		kg	29	34	34	34	34
	Panel	lbs.	24-1/4	24-1/4	24-1/4	24-1/4	24-1/4
		kg	11.0	11.0	11.0	11.0	11.0
Pipe Connections	Liquid Side	mm	Ø6.35	Ø6.35	Ø6.35	Ø6.35	Ø9.52
		inch	Ø1/4	Ø1/4	Ø1/4	Ø1/4	Ø3/8
	Gas Side	mm	Ø9.52	Ø12.7	Ø12.7	Ø12.7	Ø15.9
		inch	Ø3/8	Ø1/2	Ø1/2	Ø1/2	Ø5/8
	Drain Pipe	mm	Ø25				
		inch	Ø1				
Power supply			1-phase 208/230V~60Hz				
Sound Pressure Level (H/M/L)		dB(A)	36/34/31	37/35/32	37/35/32	37/35/32	37/35/32
Heat Exchanger			Fenestrate plain film --hydrophilic film				
Air Filter			PP	PP	PP	PP	PP
Insulation Material			Foamed polystyrene				
Refrigeration Control Device			EXV	EXV	EXV	EXV	EXV
Protection Device			Fuse	Fuse	Fuse	Fuse	Fuse
Panel name			TC01	TC01	TC01	TC01	TC01

Model			GMV-ND24T/A-T(U)	GMV-ND30T/A-T(U)	GMV-ND36T/A-T(U)	GMV-ND42T/A-T(U)	GMV-ND48T/A-T(U)
Product code			CM500N0550	CM500N0560	CM500N0570	CM500N0580	CM500N0590
Cooling Capacity		Btu/h	24000	30000	36000	42000	48000
		kW	7	8.8	10.6	12.3	14.1
Heating Capacity		Btu/h	27000	34000	40000	47000	54000
		kW	7.9	10	11.7	13.8	15.8
Casing finish			Galvanized Steel plate				
Dimensions (W×D×H)	Body outline	mm	840×840×240	840×840×320	840×840×320	840×840×320	840×840×320
		inch	33×33×9-1/2	33×33×12-5/8	33×33×12-5/8	33×33×12-5/8	33×33×12-5/8
	Body Packaging	mm	960×960×310	960×960×394	960×960×394	960×960×394	960×960×394
		inch	37-3/4×37-3/4×12-1/4	37-3/4×37-3/4×15-1/2	37-3/4×37-3/4×15-1/2	37-3/4×37-3/4×15-1/2	37-3/4×37-3/4×15-1/2
	Panel outline	mm	950×950×65	950×950×65	950×950×65	950×950×65	950×950×65
		inch	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2	37-3/8×37-3/8×2-1/2
	Panel Packaging	mm	1030×1035×118	1030×1035×118	1030×1035×118	1030×1035×118	1030×1035×118
		inch	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8	40-1/2×40-1/2×4-5/8
Net Weight	Main Body	lbs.	58	72	72	72	72
		kg	26.5	32.5	32.5	32.5	32.5
	Panel	lbs.	15-3/8	15-3/8	15-3/8	15-3/8	15-3/8
		kg	7.0	7.0	7.0	7.0	7.0
Gross Weight	Main Body	lbs.	75	88	88	88	88
		kg	34	40	40	40	40
	Panel	lbs.	24-1/4	24-1/4	24-1/4	24-1/4	24-1/4
		kg	11.0	11.0	11.0	11.0	11.0
Pipe Connections	Liquid Side	mm	Ø9.52	Ø9.52	Ø9.52	Ø9.52	Ø9.52
		inch	Ø3/8	Ø3/8	Ø3/8	Ø3/8	Ø3/8
	Gas Side	mm	Ø15.9	Ø15.9	Ø15.9	Ø15.9	Ø15.9
		inch	Ø5/8	Ø5/8	Ø5/8	Ø5/8	Ø5/8
	Drain Pipe	mm	Ø25				
		inch	Ø1				
Power supply			1-phase 208/230V~60Hz				
Sound Pressure Level(H/M/L)		dB(A)	38/36/33	40/38/35	41/38/36	43/41/38	43/41/38
Heat Exchanger			Fenestrate plain film --hydrophilic film				
Air Filter			PP	PP	PP	PP	PP
Insulation Material			Foamed polystyrene				
Refrigeration Control Device			EXV	EXV	EXV	EXV	EXV
Protection Device			Fuse	Fuse	Fuse	Fuse	Fuse
Panel name			TC01	TC01	TC01	TC01	TC01

◆ Features of Wall Mounted

Model			GMV-N07G/A3A-D(U)	GMV-N09G/A3A-D(U)	GMV-N12G/A3A-D(U)	GMV-N18G/A3A-D(U)	GMV-N24G/A3A-D(U)
Product code			CM100N1480	CM100N1490	CM100N1500	CM100N1510	CM100N1520
Cooling Capacity		Btu/h	7500	9500	12000	18000	24000
		kW	2.2	2.8	3.5	5.2	7
Heating Capacity		Btu/h	8500	11000	13500	20000	25500
		kW	2.5	3.2	4	5.8	7.5
Casing finish			Galvanized Steel plate				
Dimensions (W×D×H)	outline	mm	843×180×275	843×180×275	940×200×298	940×200×298	1008×221×319
		inch	33 1/5×7×10 5/6	33 1/5×7×10 5/6	37×7 7/8×11 3/4	37×7 7/8×11 3/4	39 2/3×8 5/7×12 5/9
	Packaging	mm	973×258×370	973×258×370	1068×288×395	1068×288×395	1131×398×328
		inch	38 1/3×10 1/6×14 4/7	38 1/3×10 1/6×14 4/7	42×11 1/3×15 5/9	42×11 1/3×15 5/9	44 1/2×15 2/3×13
Net Weight		lbs.	22	22	27.6	27.6	33.1
		kg	10	10	12.5	12.5	15
Gross Weight		lbs.	27.6	27.6	33.1	33.1	40.8
		kg	12.5	12.5	15	15	18.5
Pipe Connections	Liquid Side	mm	Ø6.35	Ø6.35	Ø6.35	Ø9.52	Ø9.52
		inch	Ø1/4	Ø1/4	Ø1/4	Ø3/8	Ø3/8
	Gas Side	mm	Ø9.52	Ø9.52	Ø12.7	Ø15.9	Ø15.9
		inch	Ø3/8	Ø3/8	Ø1/2	Ø5/8	Ø5/8
	Drain Pipe	mm	Ø17	Ø17	Ø17	Ø17	Ø17
		inch	Ø2/3	Ø2/3	Ø2/3	Ø2/3	Ø2/3
Power supply			1-phase 208/230V~60Hz				
Sound Pressure Level(H/M/L)		dB(A)	38/34/30	38/34/30	44/41/38	44/41/38	44/41/38
Heat Exchanger			Fenestrate plain film -- hydrophilic film				
Air Filter			PP+10%BCM+FP03				
Insulation Material			Foamed polystyrene				
Refrigeration Control Device			EXV				
Protection Device			Fuse				

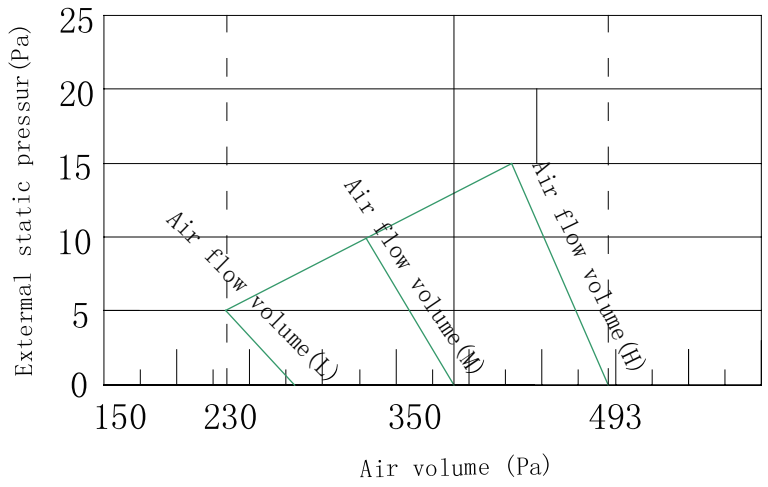
(2) Outdoor unit

Model			GMV-Y36WL/A-T(U)	GMV-Y48WL/A-T(U)	GMV-Y60WL/A-T(U)
Cooling capacity		kW	11	14.1	15.8
		Btu/h	37500	48000	54000
Heating capacity		kW	12.3	15.8	17.6
		Btu/h	42000	54000	60000
Circulating air volume		m3/h	6000	6300	6600
		CFM	3531	3708	3884
Noise		dB(A)	62	62	62
Refrigerant charge volume		Kg	3.3	3.3	3.3
		oz	116	116	116
Power supply			208/240V~60Hz	208/240V~60Hz	208/240V~60Hz
Rated power input	Cooling	kW	2.8	3.8	4.6
	Heating	kW	3.1	4.0	4.7
Unit Dimensions (WxDxH)		mm	900×340×1345		
		inch	35_7/16×13_3/8×53		
Dimensions (WxDxH)		mm	998×458×1500		
		inch	39_5/16×18×59		
Compressor			QXAS-F428zX050E	QXAS-F428zX050E	QXAS-F428zX050E
Water-proof level			IPX4	IPX4	IPX4
Suitable climite			T1	T1	T1
Pipe Connection	Gas Side	mm	Ø15.9	Ø15.9	Ø19.05
		inch	Ø5/8	Ø5/8	Ø3/4
	Liquid Side	mm	Ø9.52	Ø9.52	Ø9.52
		inch	Ø3/8	Ø3/8	Ø3/8
	Connection Method		Bell mouth connection	Bell mouth connection	Bell mouth connection
Net weight		Kg	123	123	123
		oz	4339	4339	4339
PV Input Voltage Range			120V~440V		
Isc PV			15A/15A		
Max.continuous input current			12.5A/12.5A		
Max.PV input Power			6kW		
MPPT voltage range			100V~380V		
Rated AC Voltage			208Vac/240Vac		
Operating Voltage Range			177~229Vac/204~265Vac		
Operating Frequency Range			57~63Hz		
Rated AC Power Output/Input			5kW/7kW		

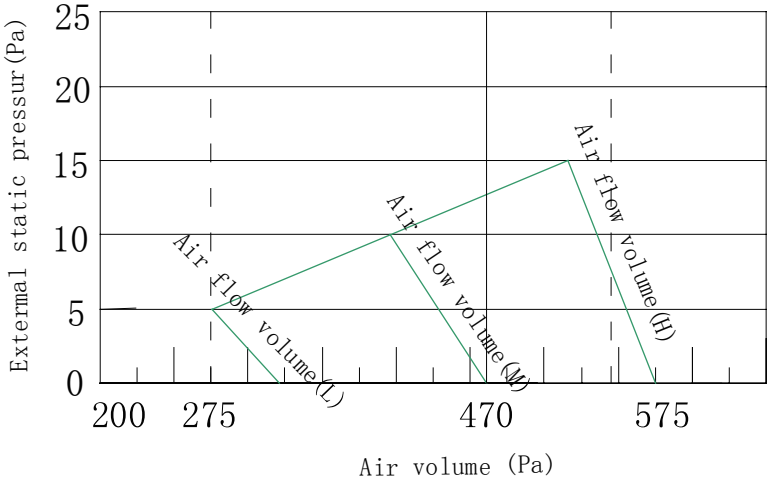
Model	GMV-Y36WL/A-T(U)	GMV-Y48WL/A-T(U)	GMV-Y60WL/A-T(U)
Maximum continuous AC Current	35A		
Power factor(full load)	0.99		
Max.THD(full load)	<3%		
Cooling method	Air-cooled		
Certifications	UL1741, IEEE1547.1		

9 FAN CHARACTERISTICS

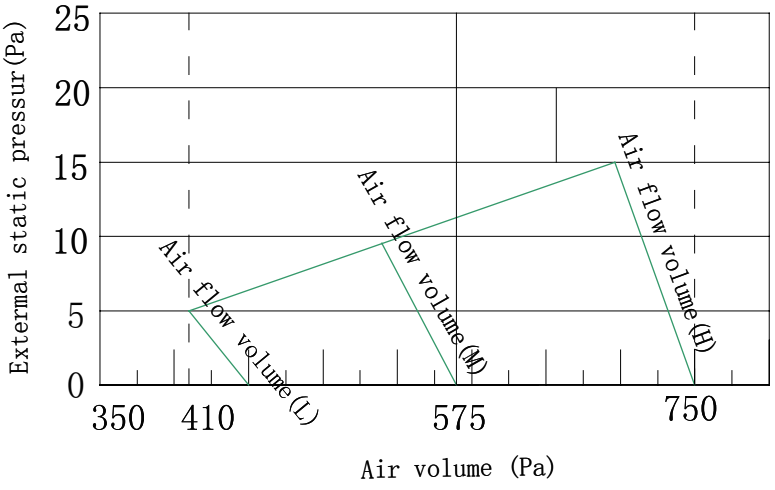
GMV-ND07PLS/A-T(U)



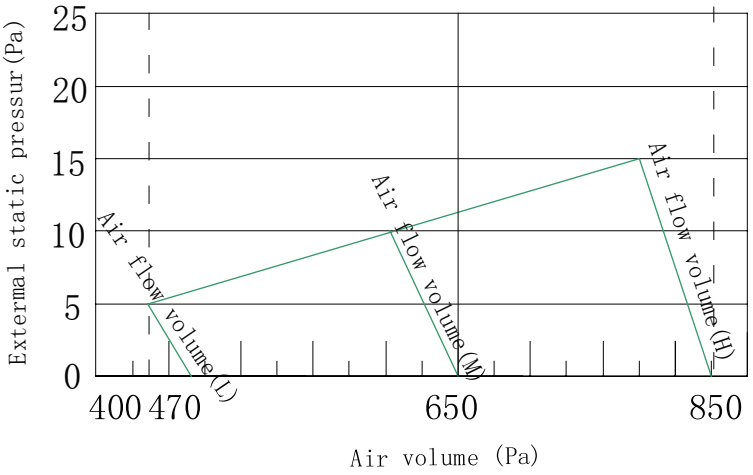
GMV-ND09PLS/A-T(U)



GMV-ND12PLS/A-T(U)\GMV-ND14PLS/A-T(U)



GMV-ND18PLS/A-T(U)、GMV-ND22PLS/A-T(U)

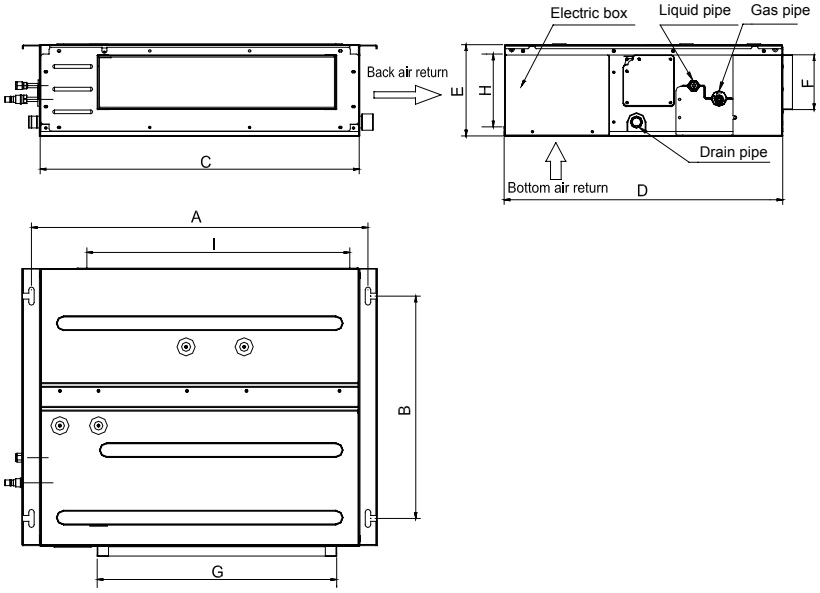


10 DIMENSIONAL DRAWINGS

(1) Indoor unit

◆ Duct Type (include the dimension of main unit, air return case and suspension hole)

Unit outline and installation dimension

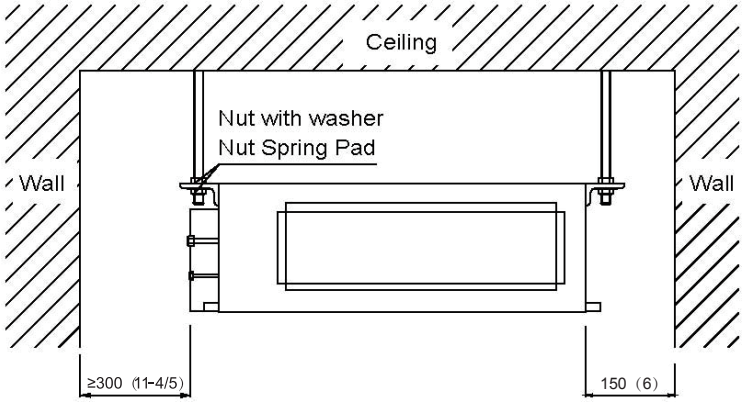


The following table lists the detailed dimensions.

Unit: mm(inch)

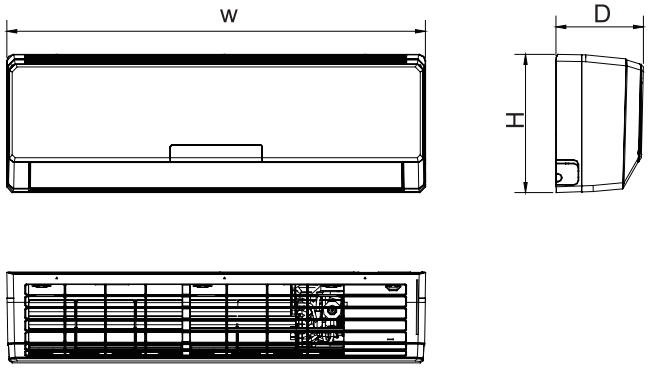
Item / Model	A	B	C	D	E	F	G	H	I
GMV-ND07PLS/A-T(U) GMV-ND09PLS/A-T(U) GMV-ND12PLS/A-T(U)	742 (29-3/16)	491 (19-5/16)	700 (27-1/2)	615 (24-1/4)	200 (7-7/8)	121 (4-3/4)	528 (20-13/16)	161 (6-5/16)	580 (22 13/16)
GMV-ND14PLS/A-T(U)	942 (37-1/16)	491 (19-5/16)	900 (35-3/8)	615 (24-1/4)	200 (7-7/8)	121 (4-3/4)	728 (28-11/16)	161 (6-5/16)	780 (30-11/16)
GMV-ND18PLS/A-T(U) GMV-ND22PLS/A-T(U)	1142 (44-5/16)	491 (19-5/16)	1100 (43-1/4)	615 (24-1/4)	200 (7-7/8)	121 (4-3/4)	928 (36-9/16)	161 (6-5/16)	980 (38-9/16)

Installation space:



◆ Wall Mounted Type

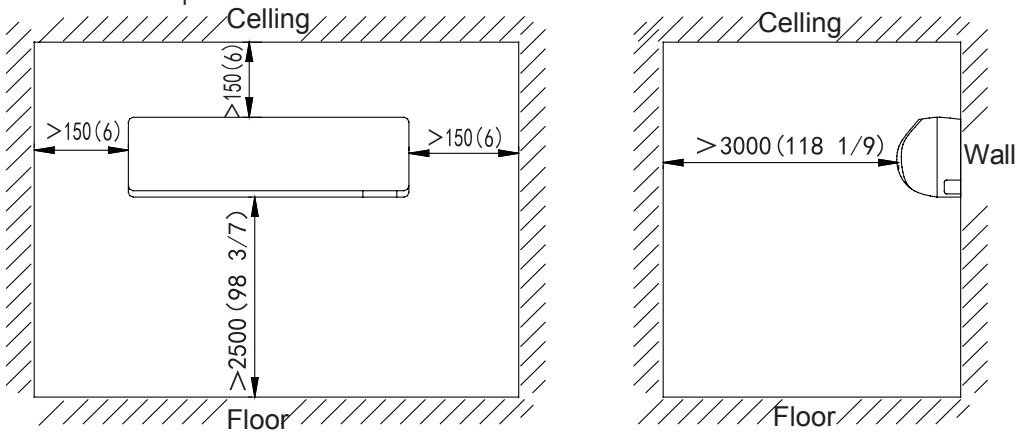
1) Unit outline and installation dimension



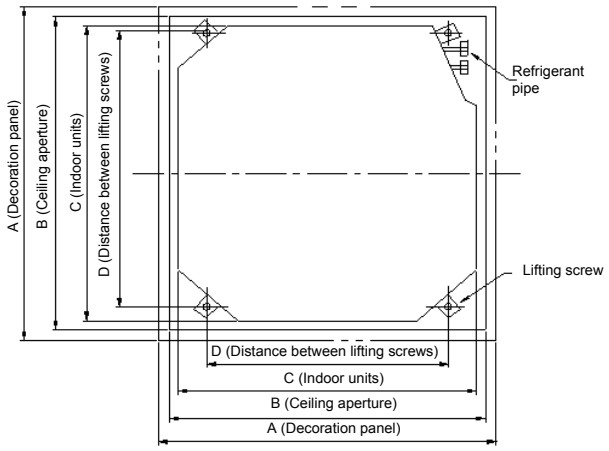
Unit:mm(inch)

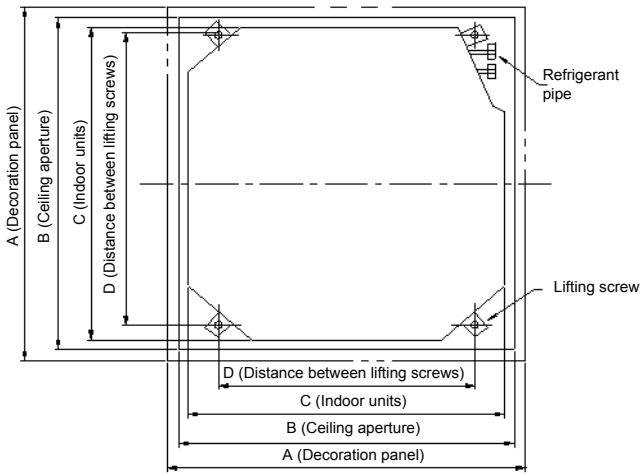
Model	W	H	D
GMV-N07G/A3A-D(U) GMV-N09G/A3A-D(U)	843 (33-1/5)	275 (10-5/6)	180 (7)
GMV-N12G/A3A-D(U) GMV-N18G/A3A-D(U)	940 (37)	298 (11-3/4)	200 (7-7/8)
GMV-N24G/A3A-D(U)	1008 (39-2/3)	221 (8-5/7)	319 (12-5/9)

2) Unit installation space



◆ Four-way Cassette Indoor Unit

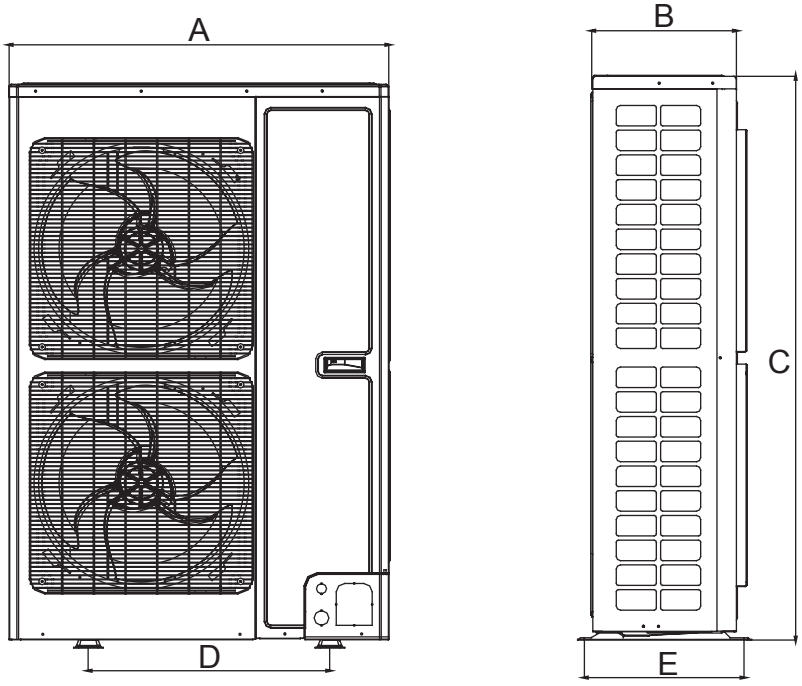




Unit: mm(inch)

Model	A	B	C	D	E	G	H
GMV-ND07T/A-T(U)	950 (37-2/5)	890 (35)	840 (33)	680 (26-7/9)	780 (30-5/7)	65 (2-5/9)	210 (8-1/4)
GMV-ND09T/A-T(U) GMV-ND12T/A-T(U) GMV-ND18T/A-T(U) GMV-ND24T/A-T(U)	950 (37-2/5)	890 (35)	840 (33)	680 (26-7/9)	780 (30-5/7)	65 (2-5/9)	260 (10-1/4)
GMV-ND30T/A-T(U) GMV-ND36T/A-T(U) GMV-ND42T/A-T(U) GMV-ND48T/A-T(U)	950 (37-2/5)	890 (35)	840 (33)	680 (26-7/9)	780 (30-5/7)	65 (2-5/9)	340 (13-2/5)

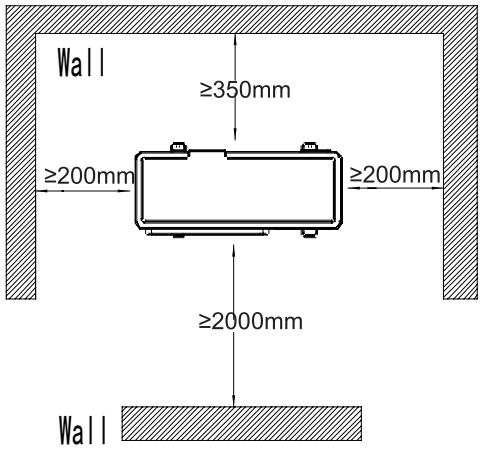
(2) Outdoor unit

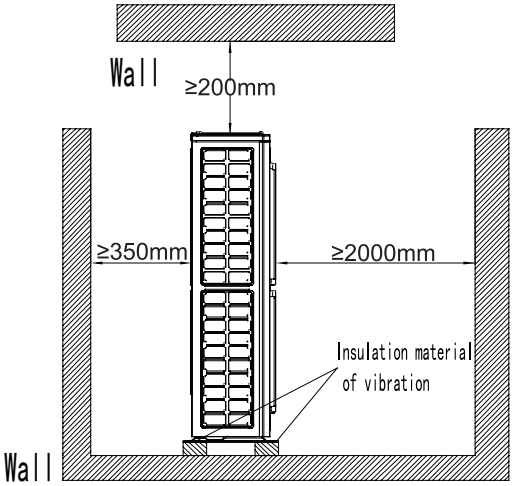


Unit:mm

Model	A	B	C	D	E
GMV-Y36WL/A-T(U) GMV-Y48WL/A-T(U) GMV-Y48WL/A-T(U)	900 (35-3/8)	340 (13-3/8)	1345 (53)	572 (22-1/2)	378 (15)

(1) Installation dimension:

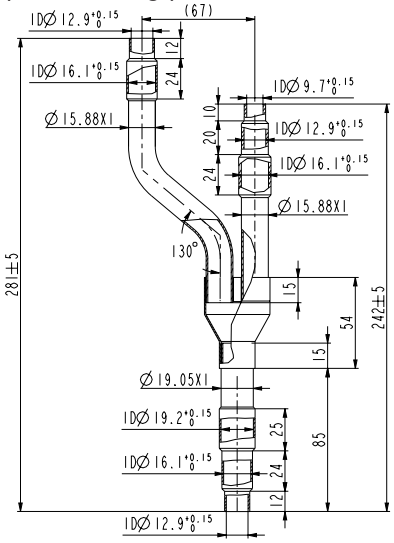




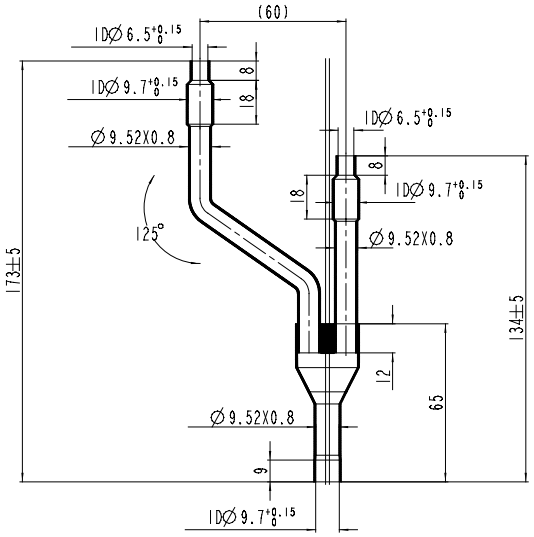
(3) ranching join

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

Gree Electric Appliances, Inc. of Zhuhai, founded in 1991, is the world's largest air conditioner enterprise integrating R&D, manufacturing, marketing and services.

Technology Innovation and quality are always our priority. With efforts of thousands of Gree's engineers, we own more than 3500 patents for our products.

Nowadays, we have 7 production bases in Zhuhai, Chongqing, Hefei and Zhengzhou(China), as well as Brazil, Pakistan and Vietnam, with annual production capacity of 30 million sets of residential air conditioners and 4 million sets of commercial air conditioners.

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.

GREE MAKING BETTER AIR CONDITIONERS GREE MAKING BETTER AIR CONDITIONERS GREE MAKING BETTER AIR CONDITIONER GREE MAKIN BETTER

GREE

Add: West Jinji Rd,Qianshan Zhuhai,Guangdong,China519070
Tel: (+86-756)8614883 Fax: (+86-756)8614998
Http://www.gree.com Email: gree@gree.com.cn

SJ00505031