GREE

[Gree Central Air conditioners]

2014

GMV5 DC INVERTER MULTI VRF UNITS

INSTALLATION • COMMISSIONING • MAINTENANCE MANUAL

PREFACE

This manual specifies safe operation requirements for GMV5 series VRF units from perspectives of engineering and installation, commissioning and maintenance, as well as basic principles and implementation methods. Professional operators must abide by relevant national (local) safety requirements and technical specifications set forth in this manual during operations; otherwise, the air conditioning system may fail or be damaged, and personnel safety accident may also occur.

Chapter 1 Introduction to Basic Features of Units

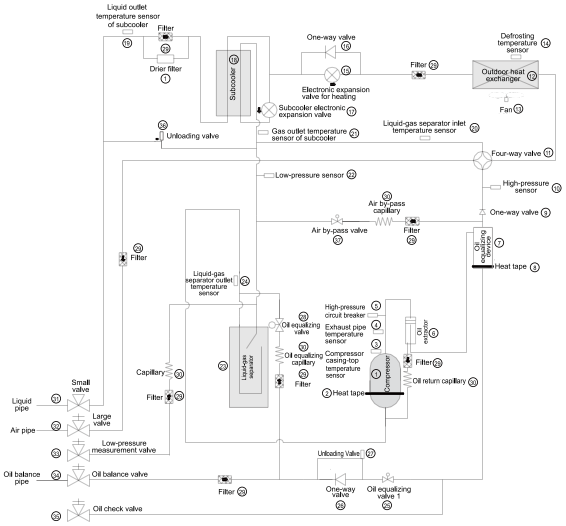
CONTENTS

I. Basic Operating Principle

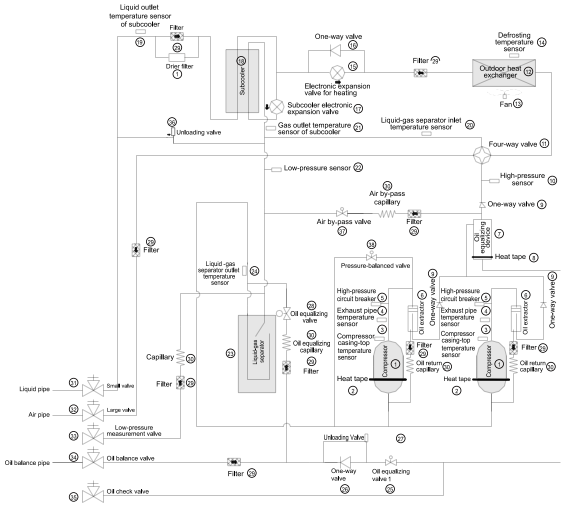
Outdoor units of GMV5 VRF air conditioner can be implemented by combining multiple modules in parallel. Similarly, indoor units (IDUs) consist of multiple units connecting in parallel. The operating principle is as follows: When an IDU is operating in cooling mode, the outdoor unit (ODU) can correspondingly enable the outdoor module based on the operating load requirement of the IDU. The outdoor heat exchanger serves as a system condenser, and the heat exchangers of cooling IDUs are connected in parallel to serve as a system evaporator. The circulation of air supply and air return of the IDU is performed to adjust the indoor temperature and humidity. When an IDU is operating in heating mode, all four-way valves in the ODU module are switched into energized status. The outdoor heat exchange serves as the system evaporator, and the heat exchanger of the IDU serves as the system condenser. The circulation of air supply and air return of the IDU is performed to adjust the indoor temperature and humidity.

II. Internal Piping Design of the Units

1. Piping Diagram of GMV-224WM/B-X, GMV-280WM/B-X, and GMV-335WM/B-X



2. Piping Diagram of GMV-400WM/B-X and GMV-450WM/B-X



3. Names and Main Functions of Components

No.	Name	Main Function
1	Compressor	Adjusts its own rotational speed based on the actual requirement of the system to implement capacity control.
2	Compressor heat tape	Maintains a proper oil temperature in the compressor when the compressor is in standby status, ensuring the reliability during compressor startup.
3	Compressor casing-top temperature sensor	Detects a compressor's exhaust gas temperature for compressor control and protection.
4	Exhaust pipe temperature sensor of compressor	Detects a compressor's exhaust gas temperature for compressor control and protection.
5	High-pressure circuit breaker	Protects a compressor by sending feedback signal to stop the system when the compressor's discharge temperature exceeds the operating value of high-pressure circuit breaker.
6	Oil extractor	Separates the gas and oil in the system to ensure compressor reliability.
7	Oil equalizing device	Equalizes the oil for all modules in the case of excess oil in the current module when multiple modules are arranged in parallel, thus ensuring the system reliability.
8	Heat tape of oil equalizing device	Maintains a proper oil temperature in the compressor when the compressor is in standby status, ensuring the reliability of compressor startup.
9	One-way valve	Prevents high-pressure gas from entering the compressor and fast balances the suction pressure and discharge pressure in a compressor.
10	High-pressure sensor	Detects the high pressure value in the system in real time mode for compressor protection and other control functions.
11	Four-way valve	Used for the switching between the cooling and heating functions of system IDU.
12	Heat exchanger	Used for outdoor heat exchange.
13	Fan	Strengthens heat exchanging.
14	Defrosting temperature sensor	Used for defrosting detection.
15	Electronic expansion valve for heating	Controls refrigerant adjustment in heating mode.
16	One-way valve	Controls refrigerant flow direction.
17	Subcooler electronic expansion valve	Controls the degree of subcooling of tube refrigerant when the system is running in cooling mode, and reduces the capacity loss on pipes.
18	Subcooler	Controls the degree of subcooling of tube.
19	Liquid outlet temperature sensor of subcooler	Detects tube temperature.
20	Inlet temperature sensor of gas-liquid separator	Detects the inlet temperature of gas-liquid separator to prevent the system from running when the refrigerant flows back to the compressor.

21	Gas outlet temperature sensor of subcooler	Detects gas temperature of subcooler.
22	Low-pressure sensor	Detects system low pressure to avoid extra-low operating pressure.
23	Gas-liquid separator	Separate gas and liquid to prevent the system from running when the refrigerant flows back to the compressor.
24	Outlet temperature sensor of gas-liquid separator	Detects internal status of gas-liquid separator to further control the compressor suction performance.
25	Oil equalizing valve 1	Used for oil equalizing control among modules.
26	One-way valve	Used for oil equalizing control among modules and avoid reverse flow of oil.
27	Unloading valve	Avoids over-high pressure caused by pipeline blind spot.
28	Oil equalizing valve 2	Used for oil equalizing control among modules.
29	Filter	Prevents impurities from entering components and parts.
30	Capillary tube	Supports flow regulating and pressure reduction.
31	Liquid valve	Stop valve, closed when the unit is delivered from the factory and will be opened after installation.
32	Air valve	Stop valve, closed when the unit is delivered from the factory and will be opened after installation.
33	Low-pressure measurement valve	Detects the low pressure value or charges refrigerant during system running.
34	Oil balance valve	Stop valve, closed when the unit is delivered from the factory and will be opened after installation.
35	Oil check valve	Checks the quality of refrigerating machine oil of compressor during maintenance.
36	Unloading valve	Avoid over-high pressure caused by pipeline blind spot.
37	Air by-pass valve	Avoids extra-high or low operating pressure.
38	Pressure-balanced valve	Ensures success startup of compressor.

III. Basic Parameters of Unit

1. Basic Parameters of ODU

Model			GMV-224WM/B-X	GMV-280WM/B-X	GMV-335WM/B-X	GMV-400WM/B-X	GMV-450WM/B-X	GMV-504WM/B-X	GMV-560WM/B-X	GMV-615WM/B-X
Refrigeration Capacity		HP	8	10	12	14	16	18	20	22
Combination Mode		—	—	—	—	—	—	GMV-224WM/B-X + GMV-280WM/B-X	GMV-280WM/B-X + GMV-280WM/B-X	GMV-280WM/B-X + GMV-335WM/B-X
Power Supply			380-415V 3N~ 50Hz/60Hz							
Rated Capacity	Cooling	kW	22.4	28	33.5	40	45	50.4	56	61.5
	Heating	kW	25	31.5	37.5	45	50	56.5	62.5	69
Dimensions (W x D x H)		mm	930 x 765 x 1605	930 x 765 x 1605	1340 x 765 x 1605	1340 x 765 x 1605	1340 x 765 x 1605	930 x 765 x 1605 + 930 x 765 x 1605	930 x 765 x 1605 + 930 x 765 x 1605	930 x 765 x 1605 + 1340 x 765 x 1605
Tubing Dimensions	Liquid Pipe	mm	Φ9.52	Φ9.52	Φ12.7	Φ12.7	Φ12.7	Φ15.9	Φ15.9	Φ15.9
	Gas Pipe	mm	Φ19.05	Φ22.2	Φ25.4	Φ25.4	Φ28.6	Φ28.6	Φ28.6	Φ28.6
	Balance pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Weight		kg	225	225	285	360	360	225+225	225+225	225+285
Refrigerant	Name		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
	Built-in Filling Volume	kg	5.9	6.7	8.2	9.8	10.3	5.9+6.7	6.7+6.7	6.7+8.2

Model			GMV-680WM/B-X	GMV-730WM/B-X	GMV-785WM/B-X	GMV-850WM/B-X	GMV-900WM/B-X	GMV-960WM/B-X	GMV-1010WM/B-X	GMV-1065WM/B-X
Refrigeration Capacity		HP	24	26	28	30	32	34	36	38
Combination Mode		—	GMV-280WM/B-X + GMV-400WM/B-X	GMV-280WM/B-X + GMV-450WM/B-X	GMV-335WM/B-X + GMV-450WM/B-X	GMV-400WM/B-X + GMV-450WM/B-X	GMV-450WM/B-X + GMV-450WM/B-X	GMV-280WM/B-X + GMV-280WM/B-X + GMV-400WM/B-X	GMV-280WM/B-X + GMV-280WM/B-X + GMV-450WM/B-X	GMV-280WM/B-X + GMV-335WM/B-X + GMV-450WM/B-X
Power Supply			380-415V 3N~ 50Hz/60Hz							
Rated Capacity	Cooling	kW	68	73	78.5	85	90	96	101	106.5
	Heating	kW	76.5	81.5	87.5	95	100	108	113	119
Dimensions (W x D x H)		mm	930 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 930 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 930 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605
Tubing Dimensions	Liquid Pipe	mm	Φ15.9	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05
	Air Pipe	mm	Φ28.6	Φ31.8	Φ31.8	Φ31.8	Φ31.8	Φ31.8	Φ38.1	Φ38.1
	Balance pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Weight		kg	225+360	225+360	285+360	360+360	360+360	225+225+360	225+225+360	225+285+360
Refrigerant	Name		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
	Built-in Filling Volume	kg	6.7+9.8	6.7+10.3	8.2+10.3	9.8+10.3	10.3+10.3	6.7+6.7+9.8	6.7+6.7+10.3	6.7+8.2+10.3

Model			GMV-1130WM/B-X	GMV-1180WM/B-X	GMV-1235WM/B-X	GMV-1300WM/B-X	GMV-1350WM/B-X	GMV-1410WM/B-X	GMV-1460WM/B-X
Refrigeration Capacity		HP	40	42	44	46	48	50	52
Combination Mode		—	GMV-280WM/B-X + GMV-400WM/B-X + GMV-450WM/B-X	GMV-280WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-335WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-400WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-450WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-280WM/B-X + GMV-280WM/B-X + GMV-400WM/B-X + GMV-450WM/B-X	GMV-280WM/B-X + GMV-280WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X
Power Supply			380-415V 3N~ 50Hz/60Hz						
Rated Capacity	Cooling	kW	113	118	123.5	130	135	141	146
	Heating	kW	126.5	131.5	137.5	145	150	158	163
Dimensions (W x D x H)		mm	930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605
Tubing Dimensions	Liquid Pipe	mm	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ19.05	Φ22.2	Φ22.2
	Air Pipe	mm	Φ38.1	Φ38.1	Φ38.1	Φ38.1	Φ38.1	Φ44.5	Φ44.5
	Balance pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Weight		kg	225+360+360	225+360+360	285+360+360	360+360+360	360+360+360	225+225+360+360	225+225+360+360
Refrigerant	Name		R410A	R410A	R410A	R410A	R410A	R410A	R410A
	Built-in Filling Volume	kg	6.7+9.8+10.3	6.7+10.3+10.3	8.2+10.3+10.3	9.8+10.3+10.3	10.3+10.3+10.3	6.7+6.7+9.8+10.3	6.7+6.7+10.3+10.3

Model			GMV-1515WM/B-X	GMV-1580WM/B-X	GMV-1630WM/B-X	GMV-1685WM/B-X	GMV-1750WM/B-X	GMV-1800WM/B-X
Refrigeration Capacity		HP	54	56	58	60	62	64
Combination Mode		—	GMV-280WM/B-X + GMV-335WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-280WM/B-X + GMV-400WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-280WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-335WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-400WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X	GMV-450WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X + GMV-450WM/B-X
Power Supply			380-415V 3N~ 50Hz/60Hz					
Rated Capacity	Cooling	kW	151.5	158	163	168.5	175	180
	Heating	kW	169	176.5	181.5	187.5	195	200
Dimensions (W x D x H)		mm	930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	930 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605	1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605 + 1340 x 765 x 1605
Tubing Dimensions	Liquid Pipe	mm	Φ22.2	Φ22.2	Φ22.2	Φ22.2	Φ22.2	Φ22.2
	Air Pipe	mm	Φ44.5	Φ44.5	Φ44.5	Φ44.5	Φ44.5	Φ44.5
	Balance pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Weight		kg	225+285+360+360	225+360+360+360	225+360+360+360	285+360+360+360	360+360+360+360	360+360+360+360
Refrigerant	Name		R410A	R410A	R410A	R410A	R410A	R410A
	Built-in Filling Volume	kg	6.7+8.2+10.3+10.3	6.7+9.8+10.3+10.3	6.7+10.3+10.3+10.3	8.2+10.3+10.3+10.3	9.8+10.3+10.3+10.3	10.3+10.3+10.3+10.3

2. Basic Parameters of IDU

2.1 High-efficiency Low-static-pressure Air-duct-type IDU

Model			GMV-ND22PLS/A-T	GMV-ND25PLS/A-T	GMV-ND28PLS/A-T	GMV-ND32PLS/A-T	GMV-ND36PLS/A-T	GMV-ND40PLS/A-T	GMV-ND45PLS/A-T	GMV-ND50PLS/A-T	GMV-ND56PLS/A-T
Refrigeration Capacity		HP	1	1	1	1.5	1.5	1.5	2	2	2
Cooling Capacity		kW	2.2	2.5	2.8	3.2	3.6	4.0	4.5	5.0	5.6
Heating Capacity		kW	2.5	2.8	3.2	3.6	4.0	4.5	5.0	5.6	6.3
Circulating Air Quantity		m^3/h	450	450	450	550	550	700	700	700	1000
Power Supply			220-240V~50Hz/208-230V~60Hz								
Connective Pipe	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ9.52
	Air Pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ12.7	Φ12.7	Φ12.7	Φ12.7	Φ12.7	Φ15.9
Drain Pipe	OD x Wall Thickness	mm	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5
Unit Dimensions	W x D x H	mm	700 x 615 x 200	700 x 615 x 200	700 x 615 x 200	700 x 615 x 200	700 x 615 x 200	900 x 615 x 200	900 x 615 x 200	900 x 615 x 200	1100 x 615 x 200
Net Weight		kg	22	22	22	22	22	27	27	27	31

Model			GMV-ND63PLS/A-T	GMV-ND71PLS/A-T	GMV-ND80PLS/A-T	GMV-ND90PLS/A-T	GMV-ND100PLS/A-T	GMV-ND112PLS/A-T	GMV-ND125PLS/A-T	GMV-ND140PLS/A-T
Refrigeration Capacity		HP	3	3	3	4	4	4	5	5
Cooling Capacity		kW	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0
Heating Capacity		kW	7.1	8.0	9.0	10.0	11.2	12.5	14.0	16.0
Circulating Air Quantity		m^3/h	1000	1000	1100	1500	1500	1700	2000	2000
Power Supply			220-240V~ 50Hz/208-230V~60Hz							
Connective Pipe	Liquid Pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
	Air Pipe	mm	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9
Drain Pipe	OD x Wall Thickness	mm	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5
Unit Dimensions	W x D x H	mm	1100 x 615 x 200	1100 x 615 x 200	1200 x 655 x 260	1340 x 655 x 260	1340 x 655 x 260	1340 x 655 x 260	1340 x 655 x 260	1340 x 655 x 260
Net Weight		kg	31	31	40	46	46	46	47	47

2.2 High-efficiency All-dimensional Ceiling Cassette Type IDU

Model			GMV-ND28T/A-T	GMV-ND36T/A-T	GMV-ND45T/A-T	GMV-ND50T/A-T	GMV-ND56T/A-T	GMV-ND63T/A-T	GMV-ND71T/A-T
Refrigeration Capacity		HP	1	1.5	2	2	2	3	3
Cooling Capacity		kW	2.8	3.6	4.5	5.0	5.6	6.3	7.1
Heating Capacity		kW	3.2	4.0	5.0	5.6	6.3	7.1	8.0
Circulating Air Quantity		m^3/h	750	750	750	830	1000	1000	1180
Power Supply			220-240V~50Hz/208-230V~60Hz						
Tubing Dimensions	Liquid Pipe	mm	Φ9.52	Φ12.7	Φ12.7	Φ12.7	Φ15.9	Φ15.9	Φ15.9
	Air Pipe	mm	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ9.52	Φ9.52	Φ9.52
Drain Pipe	OD x Wall Thickness	mm	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5
Main Part Dimensions	W x D x H	mm	840 x 840 x 190	840 x 840 x 190	840 x 840 x 190	840 x 840 x 190	840 x 840 x 240	840 x 840 x 240	840 x 840 x 240
Panel Dimensions	W x D x H	mm	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65
Net Weight	Main Part	kg	25	25	25	25	30	30	30
	Panel	kg	7	7	7	7	7	7	7

Model			GMV-ND80T/A-T	GMV-ND90T/A-T	GMV-ND100T/A-T	GMV-ND112T/A-T	GMV-ND125T/A-T	GMV-ND140T/A-T	GMV-ND160T/A-T
Refrigeration Capacity		HP	3	4	4	4	5	5	5
Cooling Capacity		kW	8.0	9.0	10.0	11.2	12.5	14.0	16.0
Heating Capacity		kW	9.0	10.0	11.2	12.5	14.0	16.0	17.5
Circulating Air Quantity		m^3/h	1180	1500	1500	1700	1860	1860	2100
Power Supply			220-240V~50Hz/208-230V~60Hz						
Tubing Dimensions	Liquid Pipe	mm	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9
	Air Pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
Drain Pipe	OD x Wall Thickness	mm	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5
Main Part Dimensions	W x D x H	mm	840 x 840 x 240	840 x 840 x 320	840 x 840 x 320	840 x 840 x 320	840 x 840 x 320	840 x 840 x 320	910 x 910 x 293
Panel Dimensions	W x D x H	mm	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	950 x 950 x 65	1040 x 1040 x 65
Net Weight	Main Part	kg	30	35	35	35	35	35	45
	Panel	kg	7	7	7	7	7	7	7.5

2.3 Single-side Air Outlet Ceiling Cassette Type IDU

Model			GMV-ND28TD/A-T	GMV-ND36TD/A-T	GMV-ND45TD/A-T	GMV-ND50TD/A-T
Refrigeration Capacity		HP	1	1.5	2	2
Cooling Capacity		kW	2.8	3.6	4.5	5.0
Heating Capacity		kW	3.2	4.0	5.0	5.6
Circulating Air Quantity		m^3/h	600	600	830	830
Power Supply			220-240V~50Hz/208-230V~60Hz			
Tubing Dimensions	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35	Φ6.35
	Air Pipe	mm	Φ9.52	Φ12.7	Φ12.7	Φ12.7
Drain Pipe	OD x Wall Thickness	mm	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5
Main Part Dimensions	W x D x H	mm	987 x 385 x 178	987 x 385 x 178	987 x 385 x 178	987 x 385 x 178
Panel Dimensions	W x D x H	mm	1200 x 460 x 55	1200 x 460 x 55	1200 x 460 x 55	1200 x 460 x 55
Net Weight	Main Part	kg	21	21	22	22
	Panel	kg	4.2	4.2	4.2	4.2

2.4 High-efficiency Ceiling Type IDU

Model			GMV-ND28ZD/A-T	GMV-ND36ZD/A-T	GMV-ND50ZD/A-T	GMV-ND63ZD/A-T	GMV-ND71ZD/A-T	GMV-ND90ZD/A-T	GMV-ND112ZD/A-T	GMV-ND125ZD/A-T	GMV-ND140ZD/A-T
Refrigeration Capacity		HP	1	1.5	2	3	3	4	4	5	5
Cooling Capacity		kW	2.8	3.6	5.0	6.3	7.1	9.0	11.2	12.5	14.0
Heating Capacity		kW	3.2	4.0	5.6	7.1	8.0	10.0	12.5	14.0	16.0
Circulating Air Quantity		m^3/h	650	650	950	1400	1400	1600	2000	2000	2000
Power Supply			220-240V~ 50Hz/208-230V~ 60Hz								
Connective Pipe	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
	Air Pipe	mm	Φ12.7	Φ12.7	Φ12.7	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9
Drain Pipe	OD x Wall Thickness	mm	Φ17 x 2.5	Φ17 x 2.5	Φ17 x 2.5	Φ17 x 2.5	Φ17 x 2.5	Φ17 x 2.5	Φ17 x 2.5	Φ17 x 2.5	Φ17 x 2.5
Unit Dimensions	W x D x H	mm	1220 x 700 x 225	1220 x 700 x 225	1220 x 700 x 225	1420 x 700 x 245	1420 x 700 x 245	1700 x 700 x 245	1700 x 700 x 245	1700 x 700 x 245	1700 x 700 x 245
Net Weight		kg	40	40	40	50	50	50	60	60	60

2.5 High-efficiency High-static-pressure Air-duct-type IDU

Model			GMV-ND56PHS/A-T	GMV-ND63PHS/A-T	GMV-ND71PHS/A-T	GMV-ND80PHS/A-T	GMV-ND90PHS/A-T	GMV-ND100PHS/A-T	GMV-ND112PHS/A-T	GMV-ND125PHS/A-T	GMV-ND140PHS/A-T
Refrigeration Capacity		HP	2	2	3	3	4	4	4	5	5
Cooling Capacity		kW	5.6	6.3	7.1	8.0	9.0	10.0	11.0	12.5	14.0
Heating Capacity		kW	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0	16.0
Circulating Air Quantity		m^3/h	1000	1000	1100	1100	1700	1700	1700	2000	2000
Power Supply			220-240V~ 50Hz/208-230V~ 60Hz								
Connective Pipe	Liquid Pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52
	Air Pipe	mm	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9
Drain Pipe	OD x Wall Thickness	mm	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5
Unit Dimensions	W x D x H	mm	1271 x 558 x 268	1271 x 558 x 268	1271 x 558 x 268	1271 x 558 x 268	1229 x 775 x 290	1229 x 775 x 290	1229 x 775 x 290	1229 x 775 x 290	1229 x 775 x 290
Net Weight		kg	35	35	35	35	47	47	47	47	47

Model			GMV-ND224PH/A-T	GMV-ND280PH/A-T
Refrigeration Capacity		HP	8	10
Cooling Capacity		kW	22.4	28.0
Heating Capacity		kW	25.0	31.0
Circulating Air Quantity		m^3/h	4000	4800
Power Supply			220-240V~50Hz/208-230V~60Hz	220-240V~50Hz/208-230V~60Hz
Connective Pipe	Liquid Pipe	mm	Φ9.52	Φ9.52
	Air Pipe	mm	Φ22.2	Φ22.2
Drain Pipe	OD x Wall Thickness	mm	Φ30 x 1.5	Φ30 x 1.5
Unit Dimensions	W x D x H	mm	1628 x 869 x 454	1628 x 869 x 454
Net Weight		kg	115	115

2.6 Wall mounted type IDU

Model			GMV-N22G/A3A-K	GMV-N28G/A3A-K	GMV-N36G/A3A-K	GMV-N45G/A3A-K	GMV-N50G/A3A-K	GMV-N56G/A3A-K	GMV-N63G/A3A-K	GMV-N71G/A3A-K
Refrigeration Capacity		HP	1	1	1.5	2	2	2	3	3
Cooling Capacity		kW	2.2	2.8	3.6	4.5	5.0	5.6	6.3	7.1
Heating Capacity		kW	2.5	3.2	4.0	5.0	5.8	6.3	7.0	8.0
Circulating Air Quantity		m^3/h	500	500	630	630	630	800	800	800
Power Supply			220-240V~50Hz	220-240V~50Hz	220-240V~50Hz	220-240V~50Hz	220-240V~50Hz	220-240V~50Hz	220-240V~50Hz	220-240V~ 50Hz
Connective Pipe	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ9.52	Φ9.52	Φ9.52
	Air Pipe	mm	Φ9.52	Φ9.52	Φ12.7	Φ12.7	Φ12.7	Φ15.9	Φ15.9	Φ15.9
Drain Pipe	OD x Wall Thickness	mm	Φ28 x 4.0	Φ28 x 4.0	Φ28 x 4.0	Φ28 x 4.0	Φ28 x 4.0	Φ28 x 4.0	Φ28 x 4.0	Φ28 x 4.0
Unit Dimensions	W x D x H	mm	843 x 180 x 275	843 x 180 x 275	940 x 200 x 298	940 x 200 x 298	940 x 200 x 298	1008 x 221 x 319	1008 x 221 x 319	1008 x 221 x 319
Net Weight		kg	9.5	9.5	11.0	11.0	11.0	13.0	13.0	13.0

2.7 Fresh Air Processing IDU

Model			GMV-NX140P/A(X1.2)-K	GMV-NX224P/A(X2.0)-M	GMV-NX280P/A(X2.5)-M	GMV-NX280P/A(X3.0)-M	GMV-NX450P/A(X4.0)-M
Refrigeration Capacity		HP	5	8	10	10	16
Cooling Capacity		kW	14	22.4	28	28	45
Heating Capacity		kW	10	16	20	20	32
Circulating Air Quantity		m^3/h	1200	2000	2500	3000	4000
Standard Static Pressure		Pa	150	200	200	200	200
Power Supply			220-240V~50Hz	380-415V 3N~50Hz	380-415V 3N~50Hz	380-415V 3N~50Hz	380-415V 3N~50Hz
Connective Pipe	Liquid Pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ12.7
	Air Pipe	mm	Φ15.9	Φ22.2	Φ22.2	Φ22.2	Φ28.6
Drain Pipe	OD x Wall Thickness	mm	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5	Φ25 x 2.5
Unit Dimensions	W x D x H	mm	1463 x 756 x 300	1500 x 1000 x 500	1500 x 1000 x 500	1500 x 1000 x 500	1700 x 1100 x 650
Net Weight		kg	63.5	130	134	134	190

2.8 High-efficiency Low-noise Duct Type Air Conditioner

Model			GMV-ND22PL/B-T	GMV-ND25PL/B-T	GMV-ND28PL/B-T	GMV-ND32PL/B-T	GMV-ND36PL/B-T	GMV-ND40PL/B-T
Cooling Capacity		kW	2.2	2.5	2.8	3.2	3.6	4.0
Heating Capacity		kW	2.5	2.8	3.2	3.6	4.0	4.5
Circulating Air Quantity		m^3/h	450	450	450	550	550	750
Noise (H)		dB(A)	30	30	30	31	31	33
Power Supply			220~240V-50Hz / 208~230V-60Hz					
Fan Motor	Input Power	kW	0.025	0.025	0.025	0.03	0.03	0.035
Connective Pipe	Air Pipe	mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ12.7	Φ12.7
	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ6.35	Φ6.35
	Connecting Mode		Through bellmouth					
Drain Pipe (OD x Wall Thickness)		mm	Φ26 x 2.5	Φ26 x 2.5	Φ26 x 2.5	Φ26 x 2.5	Φ26 x 2.5	Φ26 x 2.5
Dimensions (W x D x H)		mm	710 x 450 x 200	710 x 450 x 200	710 x 450 x 200	710 x 450 x 200	710 x 450 x 200	1010 x 450 x 200
Net Weight		kg	18.5	18.5	18.5	19.5	19.5	23.5
Recommended Power Cable		mm^2 x piece	1.0 x 3					

Model			GMV-ND45PL/B-T	GMV-ND50PL/B-T	GMV-ND56PL/B-T	GMV-ND63PL/B-T	GMV-ND72PL/B-T
Cooling Capacity		kW	4.5	5.0	5.6	6.3	7.2
Heating Capacity		kW	5.0	5.6	6.3	7.0	8.0
Circulating Air Quantity		m^3/h	750	750	850	850	1100
Unit External Static Pressure		dB(A)	33	33	35	35	37
Power Supply			220~240V-50Hz / 208~230V-60Hz				
Fan Motor	Input Power	kW	0.035	0.035	0.045	0.045	0.05
Connective Pipe	Air Pipe	mm	Φ12.7	Φ12.7	Φ15.9	Φ15.9	Φ15.9
	Liquid Pipe	mm	Φ6.35	Φ6.35	Φ9.52	Φ9.52	Φ9.52
	Connecting Mode		Through bellmouth				
Drain Pipe (OD x Wall Thickness)		mm	Φ26 x 2.5	Φ26 x 2.5	Φ26 x 2.5	Φ26 x 2.5	Φ26 x 2.5
Dimensions (W x D x H)		mm	1010 x 450 x 200	1010 x 450 x 200	1010 x 450 x 200	1010 x 450 x 200	1310 x 450 x 200
Net Weight		kg	23.5	23.5	24.5	24.5	30.5
Recommended Power Cable		mm^2 x piece	1.0 x 3				

IV. Electrical Parameters

1. Power Cable Wire Gauge and Circuit Breaker Selection

Model	Basic models	Air switch capacity (A)	Air switch capacity for combined units (A)	Wire size of power supply (mm^2)	Wire size of combined uni (mm^2)
GMV-224WM/B-X	GMV-224WM/B-X	20	20	2.5	2.5×5
GMV-280WM/B-X	GMV-280WM/B-X	25	25	2.5	2.5×5
GMV-335WM/B-X	GMV-335WM/B-X	32	32	4.0	4.0×5
GMV-400WM/B-X	GMV-400WM/B-X	40	40	6.0	6.0×5
GMV-450WM/B-X	GMV-450WM/B-X	40	40	6.0	6.0×5
GMV-504WM/B-X	224+280	40	20 + 25	2.5 + 2.5	2.5×5 + 2.5×5
GMV-560WM/B-X	280+280	50	25 + 25	2.5 + 2.5	2.5×5 + 2.5×5
GMV-615WM/B-X	280+335	50	25 + 32	2.5 + 4.0	2.5×5 + 4.0×5
GMV-680WM/B-X	280+400	63	25 + 40	2.5 + 6.0	2.5×5 + 6.0×5
GMV-730WM/B-X	280+450	63	25 + 40	2.5 + 6.0	2.5×5 + 6.0×5
GMV-785WM/B-X	400+400	80	40 + 40	6.0 + 6.0	6.0×5 + 6.0×5
GMV-850WM/B-X	400+450	80	40 + 40	6.0 + 6.0	6.0×5 + 6.0×5
GMV-900WM/B-X	450+450	80	40 + 40	6.0 + 6.0	6.0×5 + 6.0×5

Model	Basic models	Air switch capacity (A)	Air switch capacity for combined units (A)	Wire size of power supply (mm^2)	Wire size of combined uni (mm^2)
GMV-900WM/B-X	450+450	80	40 + 40	6.0 + 6.0	6.0×5 + 6.0×5
GMV-960WM/B-X	280+280+400	80	25 + 25 + 40	2.5 + 2.5 + 6.0	2.5×5 + 2.5×5 + 6.0×5
GMV-1010WM/B-X	280+280+450	80	25 + 25 + 40	2.5 + 2.5 + 6.0	2.5×5 + 2.5×5 + 6.0×5
GMV-1065WM/B-X	280+400+400	100	25 + 40 + 40	2.5 + 6.0 + 6.0	2.5×5 + 6.0×5 + 6.0×5
GMV-1130WM/B-X	280+400+450	100	25 + 40 + 40	2.5 + 6.0 + 6.0	2.5×5 + 6.0×5 + 6.0×5
GMV-1180WM/B-X	280+450+450	100	25 + 40 + 40	2.5 + 6.0 + 6.0	2.5×5 + 6.0×5 + 6.0×5
GMV-1235WM/B-X	400+400+450	125	40 + 40 + 40	6.0 + 6.0 + 6.0	6.0×5 + 6.0×5 + 6.0×5
GMV-1300WM/B-X	400+450+450	125	40 + 40 + 40	6.0 + 6.0 + 6.0	6.0×5 + 6.0×5 + 6.0×5
GMV-1350WM/B-X	450+450+450	125	40 + 40 + 40	6.0 + 6.0 + 6.0	6.0×5 + 6.0×5 + 6.0×5
GMV-1410WM/B-X	280+280+400+450	125	25 + 25 + 40 + 40	2.5 + 2.5 + 6.0 + 6.0	2.5×5 + 2.5×5 + 6.0×5 + 6.0×5

Model	Basic models	Air switch capacity (A)	Air switch capacity for combined units (A)	Wire size of power supply (mm^2)	Wire size of combined uni (mm^2)
GMV-1460WM/B-X	280+280+450+450	125	25 + 25 + 40 + 40	2.5 + 2.5 + 6.0 + 6.0	2.5×5 + 2.5×5 + 6.0×5 + 6.0×5
GMV-1515WM/B-X	280+335+450+450	125	25 + 32 + 40 + 40	2.5 + 4.0 + 6.0 + 6.0	2.5×5 + 4.0×5 + 6.0×5 + 6.0×5
GMV-1580WM/B-X	280+400+450+450	125	25 + 40 + 40 + 40	2.5 + 6.0 + 6.0 + 6.0	2.5×5 + 6.0×5 + 6.0×5 + 6.0×5
GMV-1630WM/B-X	280+450+450+450	160	25 + 40 + 40 + 40	2.5 + 6.0 + 6.0 + 6.0	2.5×5 + 6.0×5 + 6.0×5 + 6.0×5
GMV-1685WM/B-X	335+450+450+450	160	32 + 40 + 40 + 40	4.0 + 6.0 + 6.0 + 6.0	4.0×5 + 6.0×5 + 6.0×5 + 6.0×5
GMV-1750WM/B-X	400+450+450+450	160	40 + 40 + 40 + 40	6.0 + 6.0 + 6.0 + 6.0	6.0×5 + 6.0×5 + 6.0×5 + 6.0×5
GMV-1800WM/B-X	450+450+450+450	160	40 + 40 + 40 + 40	6.0 + 6.0 + 6.0 + 6.0	6.0×5 + 6.0×5 + 6.0×5 + 6.0×5

For information about the leakage circuit breaker for an indoor unit, refer to the following table. The circuit breaker capacities listed in the following table indicate the circuit breaker capacities when all indoor units in the same system are connecting connected to the main power.

Total capacity of indoor units	Capacity of circuit breaker (A)	Min. sectional area of power cord (mm^2)	Min. sectional area of grounding wire (mm^2)
<10A	10	1.0	1.0
16~10A	16	1.5	1.5
20~16A	20	2.5	2.5
32~20A	32	4.0	4.0
40~32A	40	6.0	6.0
50~40A	50	10.0	10.0
63~50A	63	16.0	16.0
80~63A	80	25.0	16.0
100~80A	100	35.0	16.0
125~100A	125	50.0	25.0

Table B: The breaker capacity and power cable specifications when a circuit breaker is installed on each indoor unit independently. Note that the circuit breaker of the indoor unit is used only for short-circuit protection and abnormal overload of the corresponding indoor unit. Usually, the circuit breaker is off. All circuit breaker terminals must be connected to one main power switch, which is used to cut off the power of all indoor units.

IDU	Breaker Capacity (A)	Minimum Sectional Area of Power Cable (mm^2)	Minimum Sectional Area of Grounding Cable (mm^2)
Low-static-pressure Air-duct-type Air Conditioner	6	1.0	1.0
All-dimensional Ceiling Cassette Type Air Conditioner	6	1.0	1.0
Single-side Air Outlet Ceiling Cassette Type Air Conditioner	6	1.0	1.0
Floor Ceiling Split Unit	6	1.0	1.0
High-static-pressure Air-duct-type Air Conditioner	6	1.0	1.0
Wall mounted type Air Conditioner	6	1.0	1.0
Static-pressure Air-duct-type Air Conditioner	6	1.0	1.0

⚠ Note:

① The circuit breaker and power cable specifications are selected based on the maximum power (maximum current) of the units.

② The power cable specifications are obtained under the conditions that the ambient temperature is 40°C, the working temperature of multi-core copper cable (for example, YJV cable) is 90°C, and the cable is exposed in cable troughs (GB/T 16895.15). In different applications, adjust the specifications based on national standards.

③ Only copper conductor cable can be used.

④ The sectional area of a wire is applicable for a distance range of up to 15 m. If the distance is greater than 15 m, increase the sectional area of the wire correspondingly to prevent the wire from being burned due to overload current and to avoid fire.

⑤ The circuit breaker specifications are obtained under the conditions that the ambient temperature is 40°C when the circuit breaker is working. In different applications, adjust the specifications based on the circuit breaker manual.

⑥ The circuit breaker must support magnetic release and thermal release at the same time to protect the system from short circuit and overload.

Electrical Parameters of Fresh Air Conditioning IDU

Model	Power Specification	Circuit Breaker Capacity (A)	Minimum Sectional Area of Grounding Cable(mm^2)	Minimum Area of Section of Power Cable(mm^2)
GMV-NX140P/A(X1.2)	220V~50Hz	6	1.0	1.0
GMV-NX224P/A(X2.0)	380V 3N~50Hz	6	1.0	1.0
GMV-NX280P/A(X2.5)	380V 3N~50Hz	6	1.0	1.0
GMV-NX280P/A(X3.0)	380V 3N~50Hz	6	1.0	1.0
GMV-NX450P/A(X4.0)	380V 3N~50Hz	6	1.0	1.0

Note:

① The circuit breaker and power cable specifications are selected based on the maximum power (maximum current) of the units.

② The power cable specifications are obtained under the conditions that the ambient temperature is 40°C, the working temperature of multi-core copper cable (for example, YJV cable) is 90°C, and the cable is exposed in cable troughs (GB/T 16895.15). In different applications, adjust the specifications based on national standards.

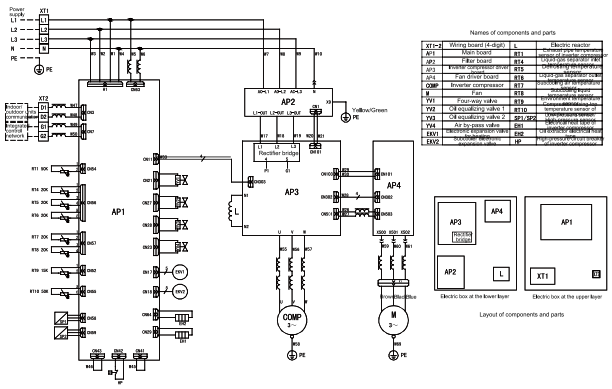
③ The circuit breaker specifications are obtained under the conditions that the ambient temperature is 40°C when the circuit breaker is working. In different applications, adjust the specifications based on the circuit breaker manual.

④ When breaker devices are installed near the unit, the minimum distance between different levels of breaker devices is 3 cm (required for both indoor and outdoor units).

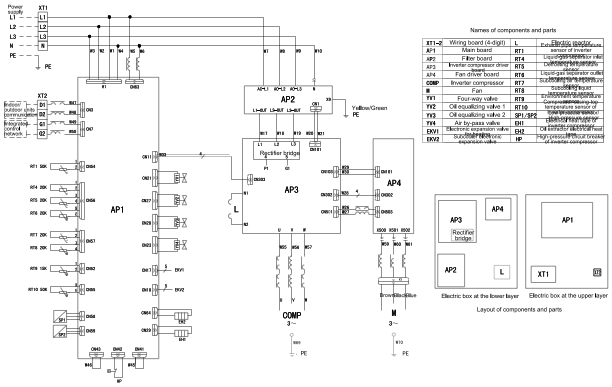
2. Circuit Diagram

2.1 Circuit Diagram of ODU

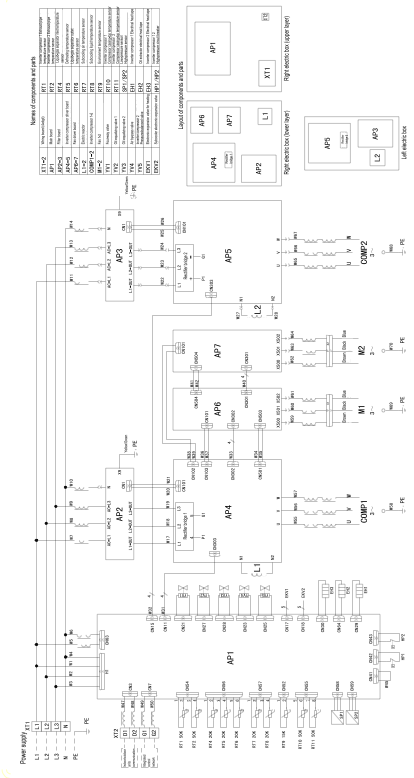
2.1.1 Circuit diagram of GMV-224WM/B-X and GMV-280WM/B-X



2.1.2 Circuit diagram of GMV-335WM/B-X



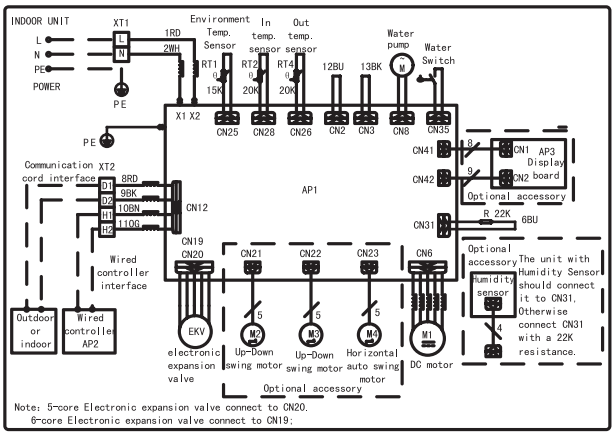
2.1.3 Circuit diagram of GMV-400WM/B-X and GMV-450WM/B-X



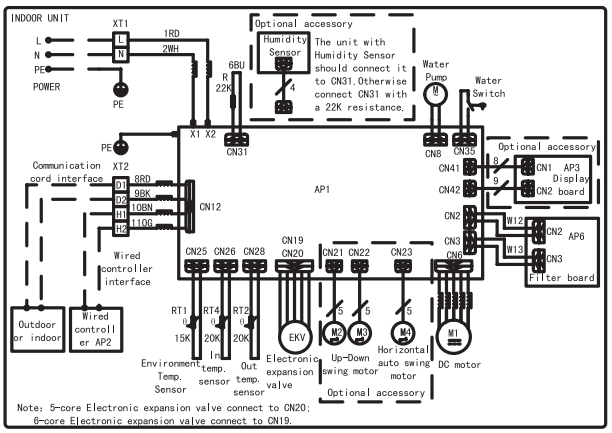
2.2 Circuit Diagram of IDU

2.2.1 GMV-ND**PLS/A-T series air-duct-type air conditioner

GMV-ND22PLS/A-T~GMV-ND80PLS/A-T

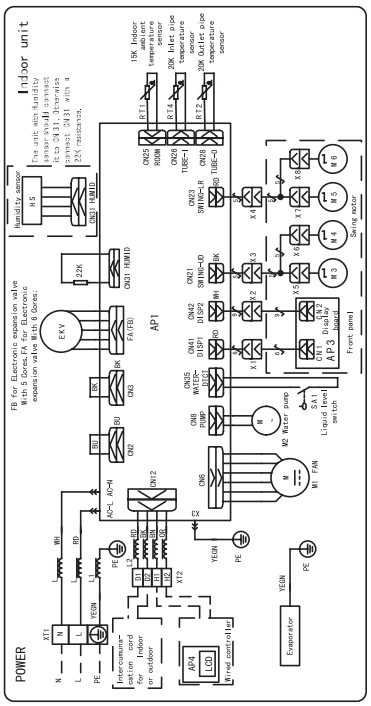


GMV-ND90PLS/A-T~GMV-ND140PLS/A-T

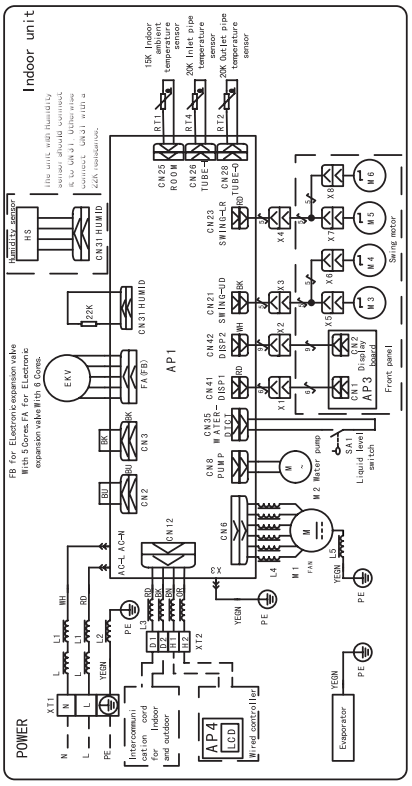


2.2.2 GMV-ND***T/A-T series ceiling cassette type air conditioner

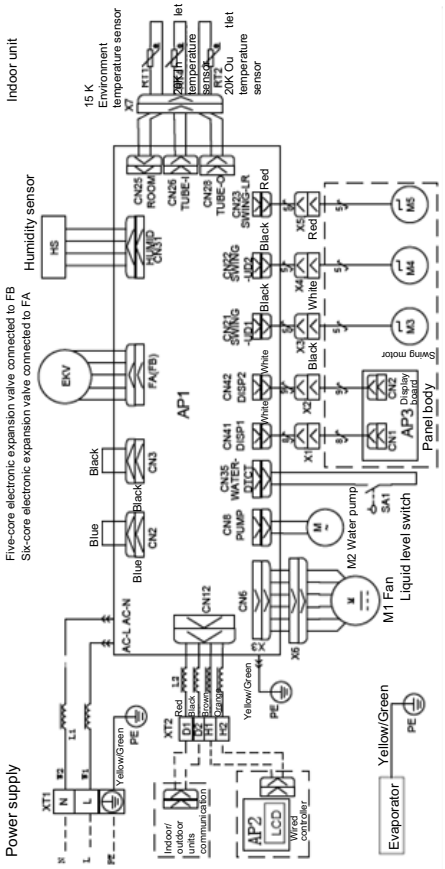
GMV-ND28T/A-T~GMV-ND80T/A-T



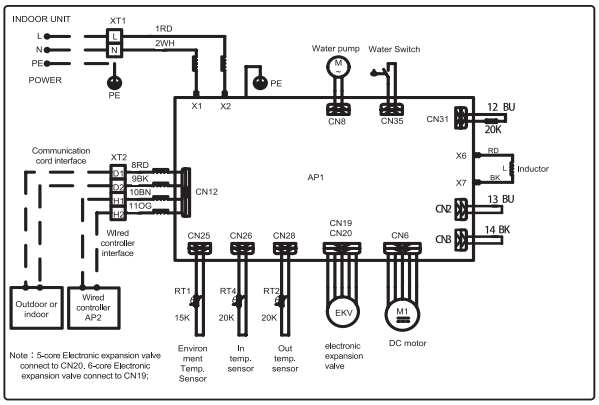
GMV-ND90T/A-T~GMV-ND140T/A-T



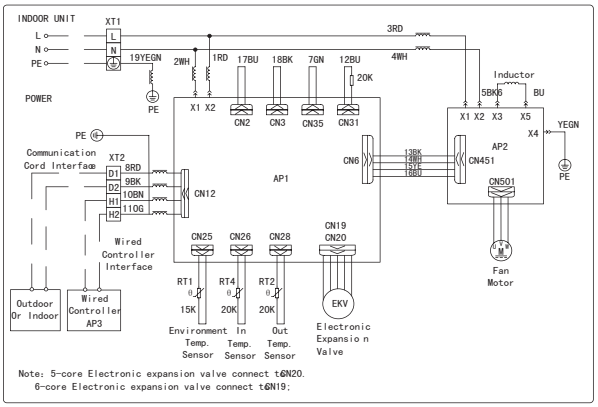
2.2.3 GMV-ND***TD/A-T series single-side air outlet ceiling cassette type air conditioner



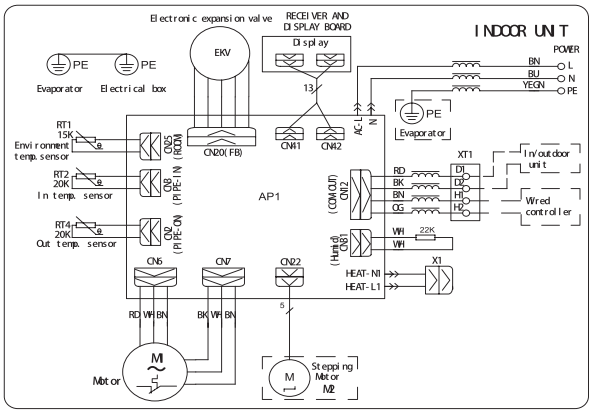
2.2.4 GMV-ND***PHS/A-T series high-static-pressure air-duct-type air conditioner



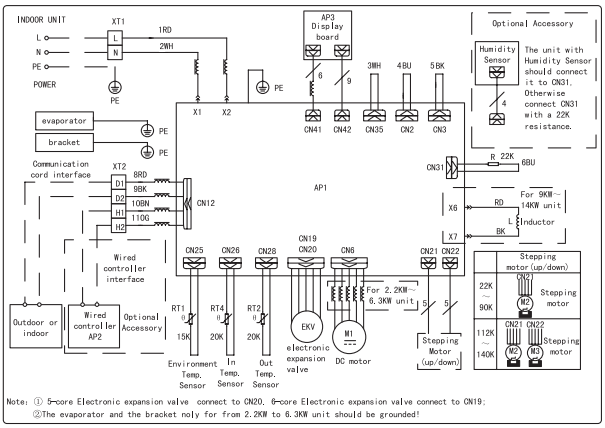
GMV-ND90PLS/A-T~GMV-ND140PLS/A-T



2.2.5 GMV-N**G/A3A-K eriesWall mounted type Air Conditioner

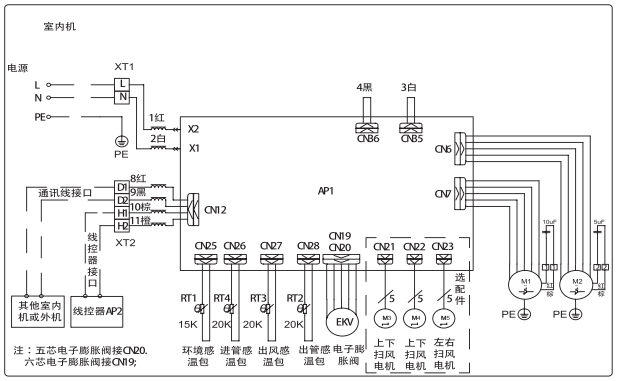


2.2.6 GMV-ND***ZD/A-T series floor ceiling split unit

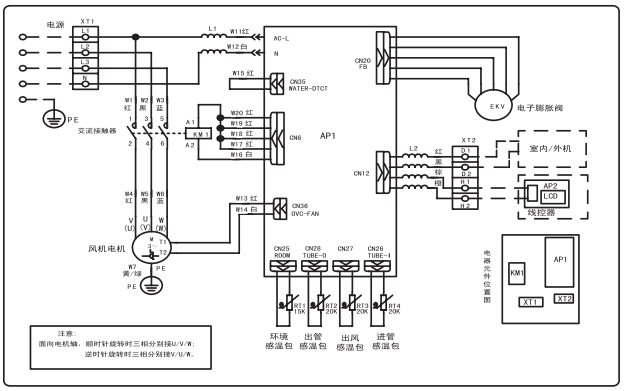


2.2.7 GMV-NX**P/A(X**)-* series fresh air processing unit

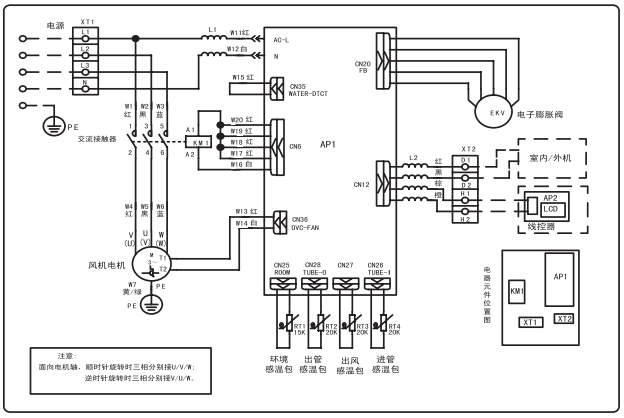
GMV-NX140P/A(X1.2)-K



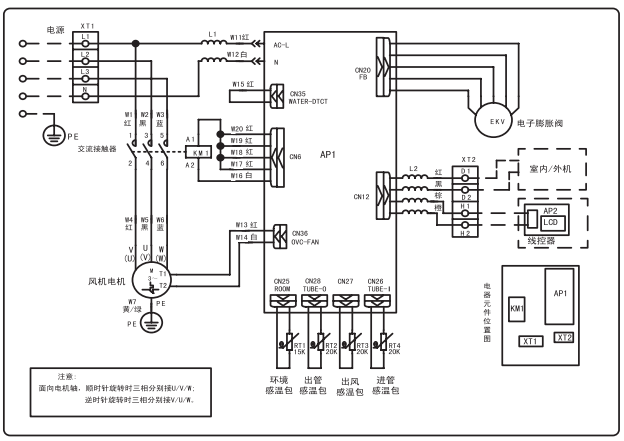
GMV-NX224P/A(X2.0)-K, GMV-NX280P/A(X2.5)-M, GMV-NX280P/A(X3.0)-M, GMV-NX450P/A(X4.0)-M,



2.2.8 GMV-ND***PL/B-T series low-noise duct type air conditioner



GMV-ND90T/A-T~GMV-ND140T/A-T



V. Optional Accessories

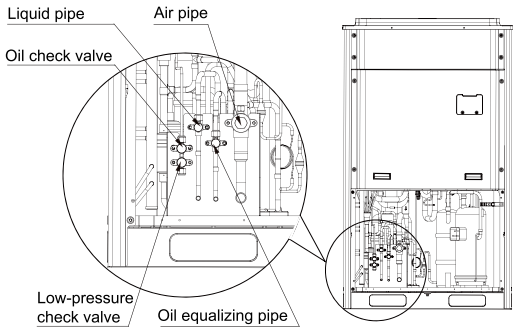
GMV5 series VRF units support the following optional accessories:

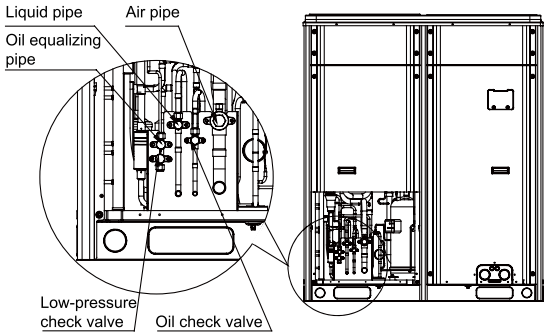
		Export Model	Remark
Manifold	ODU	ML01/A	For model selection, refer to Pipe Selection.
	IDU	FQ01A/A, FQ01B/A, FQ02/A, FQ03/A, and FQ04/A	
Remote-control Receiver Board		JS03	Applicable for air-duct-type IDUs.
Commissioning Remote Controller		YV1L1	Provides the commissioning functions for function settings of IDUs.
Commissioning Software		DE40-33/A(C)	Applicable for units that support CAN bus communication technology.
Remote Monitoring System	Software	FE31-00/AD(BM)	Applicable for units that support CAN bus communication technology.
	Optoelectronic Isolation Converter	GD02	
	MODbus Gateway	ME30-24/E4(M)	
	BACnet Gateway	MG30-24/D2(B)	

Note: Contact local sales company for optional accessories.

VI. Basic Requirement for Pipe Connection

1. Outdoor units adopt the modular combination design of individual cooling system, that is, units are connected by using pipes in parallel during installation. The tubing system used among modules includes air pipes, liquid pipes and oil equalizing pipes.





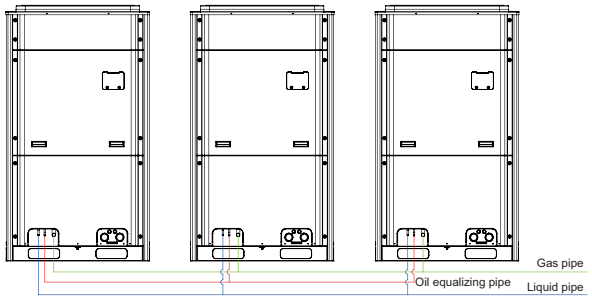
Note:

① Functions of oil check valve: During after-sale maintenance, the oil check valve can be used to extract lubricating

oil samples, which are further detected to analyze the oil quality in the system. The oil check valve can also serve as the inlet for lubricating oil charging. Stop the system for at least 12 hours before the extracting of lubricating oil from the system; otherwise, overheat oil may burn the operator.

② Functions of low-pressure check valve: It is mainly used for low pressure detection of the system and refrigerant charging during after-sale maintenance.

Pipe connection diagram of outdoor modules



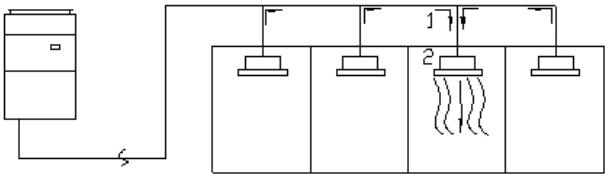
2. Each ODU system can be connected to multiple IDUs. Detailed information about the number of units to be connected and capacity ranges is shown in the following table:

Model	Maximum Number of Connected IDUs (Piece)	Capacity Range of Connected IDU (kW)	
		Minimum Capacity	Maximum Capacity
GMV-224WM/B-X	13	11.2	30.2
GMV-280WM/B-X	16	14.0	37.8
GMV-335WM/B-X	19	16.8	45.2
GMV-400WM/B-X	23	20.0	54.0
GMV-450WM/B-X	26	22.5	60.8
GMV-504WM/B-X	29	25.2	68.0
GMV-560WM/B-X	33	28.0	75.6
GMV-615WM/B-X	36	30.8	83.0
GMV-680WM/B-X	39	34.0	91.8
GMV-730WM/B-X	43	36.5	98.6
GMV-785WM/B-X	46	39.3	106.0
GMV-850WM/B-X	50	42.5	114.8
GMV-900WM/B-X	53	45.0	121.5
GMV-960WM/B-X	56	48.0	129.6
GMV-1010WM/B-X	59	50.5	136.4
GMV-1070WM/B-X	63	53.5	144.5
GMV-1130WM/B-X	64	56.5	152.6
GMV-1180WM/B-X	64	59.0	159.3
GMV-1250WM/B-X	64	62.5	168.8
GMV-1300WM/B-X	64	65.0	175.5
GMV-1350WM/B-X	64	67.5	182.3
GMV-1410WM/B-X	66	70.5	190.4
GMV-1460WM/B-X	69	73.0	197.1
GMV-1515WM/B-X	71	75.8	204.5
GMV-1580WM/B-X	74	79.0	213.3
GMV-1630WM/B-X	77	81.5	220.0
GMV-1700WM/B-X	80	85.0	229.5
GMV-1750WM/B-X	80	87.5	236.3
GMV-1800WM/B-X	80	90.0	243.0
——	——	——	——

VII. Precautions on Refrigerant Leakage

Personnel related to air conditioning engineering design and installation operators must abide by the safety requirement for preventing refrigerant leakage specified in local laws and regulations. If such safety requirement is unavailable in local documents, the design and operation must be implemented based on the following principles: GMV5 series VRF units adopt the R410A refrigerant, which is nonflammable and nontoxic. However, the space for refrigerant leakage must be sufficient to ensure that the refrigerant concentration does not exceed that specified in the safety requirement; otherwise, people involved can be stifled by the refrigerant.

The maximum refrigerant charge and maximum refrigerant concentration in the system are calculated directly based on the size of the air conditioning space. The unit of refrigerant concentration is 1 kg/m³.



(1) Flow direction of refrigerant leakage.

(2) Room for refrigerant leakage. Since the concentration of refrigerant is greater than that of air, pay attention to the spaces where the refrigerant may residue, for example, the basement.

Method for calculating the maximum concentration of refrigerant:

1) Calculate the refrigerant charge quantity of each system.

Charge quantity of an ODU upon delivery (for the system consisting of multiple modules in parallel, the accumulative charge quantity of modules upon delivery is used) + Onsite charge quantity = Total refrigerant charge quantity in the system (kg)

2) Calculate the volume of maximum air conditioning space (m³).

Volume of air conditioning space (m³) = Length x Width x Height

Note: The length, width and height here refer to the effective length, width and height of the indoor space.

3) Calculate the maximum refrigerant concentration of the refrigeration system.

Total refrigerant quantity of the system

----------≤ Maximum supported concentration (kg/m³)

Minimum volume of air conditioning space

Note: If the maximum supported refrigerant concentration is not available in relevant local standard, use 0.3kg /m³ as the maximum supported refrigerant concentration.

4) If the maximum refrigerant concentration exceeds the allowed threshold, the refrigeration system must be redesigned. In this case, separate the refrigeration system into multiple small-capacity refrigeration systems, or adopt other ventilation measures, or contact local Gree sales company.

VIII. Unit Operating Temperature

Cooling	-5°C~50°C
Heating	-20°C~24°C

In the case of a full fresh air conditioning IDU, the unit operating temperature is as follows:

Cooling	16°C~45°C
Heating	-7°C~16°C

IX. Configuration of Full Fresh Air Conditioning IDU

Multi-connected fresh-air air-conditioning unit brings in air from outdoor and provides processed air for indoor users. Based on the model of indoor unit, multi-connected fresh-air air-conditioning unit supports two connection methods:

(1) The indoor units in the following table can be connected to one set of outdoor unit system together with ordinary multi-connected air-conditioning indoor units.

Indoor unit model	Outdoor unit model
GMV-NX140P/A(X1.2)-K	Can be connected to GMV-***WM/B-X series modular outdoor units. Connection requirements: ①. The total capacity of all connected fresh-air indoor units and ordinary indoor units must be 50% to 100% of the capacity of the outdoor unit.Among which,the capacity of the outdoor unit. ②. The fresh-air indoor unit can be used independently.The total capacity of connected fresh-air indoor units must be 50% to 100% of the capacity of the outdoor unit.
GMV-NX224P/A(X2.0)-M	
GMV-NX280P/A(X2.5)-M	

Note: When a multi-connected fresh-air indoor unit is connected with a common multi-connected indoor unit, the capacity requirement must be strictly followed. The capacity of the fresh-air indoor unit cannot exceed 30% of that of the outdoor unit. The sum of capacities of indoor units should be 50% to 100% of the capacity of the outdoor unit. Otherwise, the refrigeration performance will be affected and the unit may be damaged.

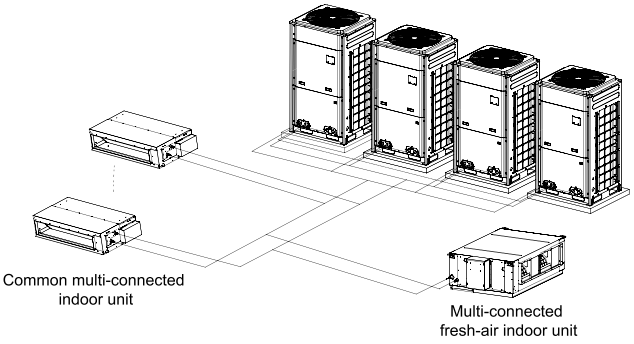
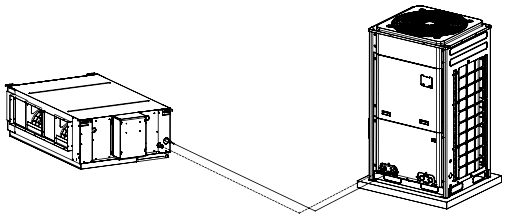


Diagram of connecting a fresh-air indoor unit to a common multi-connected indoor unit

(2) The indoor units listed in the following table can be connected only in fixed mode.

Indoor unit model	Outdoor unit model
GMV-NX280P/A(X3.0)-M	GMV-280WM/B-X
GMV-NX450P/A(X4.0)-M	GMV-450WM/B-X



Conenction diagram

Chapter 2 Installation

CONTENTS

CONTENTS continue

Part 1 Engineering Installation Preparation

I. Installation Safety

Personnel and property safety are highly concerned during the entire installation process. Installation implementation must abide by relevant national safety regulations to ensure personnel and property safety.

All personnel involved in the installation must attend safety education courses and pass corresponding safety examinations before installation. Only qualified personnel can attend the installation. Relevant personnel must be held responsible for any violation of the regulation.

II. Importance of Installation Engineering

VRF air conditioning systems use refrigerant, instead of other agent, to directly evaporate to carry out the system heat. High level of pipe cleanness and dryness is required in the system. Since various pipes need to be prepared and laid out onsite, carelessness or maloperation during installation may leave impurities, water, or dust inside refrigerant pipes. If the design fails to meet the requirement, various problems may occur in the system or even lead to system breakdown.

Problems that usually occur during installation are as follows:

No.	Installation Problem	Possible Consequence
1	Dust or impurities enter into the refrigeration system.	Pipes are more likely to be blocked; air conditioning performance is reduced; compressor wear is increased or even hinder the normal operation of the system and burn the compressor.
2	Nitrogen is not filled into the refrigerant pipe or insufficient Nitrogen is filled before welding.	Pipes are more likely to be blocked; air conditioning performance is reduced; compressor wear is increased or even hinder the normal operation of the system and burn the compressor.
3	The vacuum degree in the refrigerant pipe is insufficient.	The refrigeration performance is reduced. The system fails to keep normal operation due to frequent protection measures. When the problem getting serious, compressor and other major components can be damaged.
4	Water enters into the refrigeration system.	Copper plating may appear on the compressor and reduce the compressor efficiency with abnormal noise generated; failures may occur in the system due to ice plug.
5	The refrigerant pipe specifications do not meet the configuration requirements.	Smaller configuration specifications can increase the system pipe resistance and affect the cooling performance; larger configuration specifications are waste of materials and can also reduce the cooling performance.
6	Refrigerant pipe is blocked.	The cooling performance is reduced; in certain cases, it may cause long-term compressor operating under overheat conditions; the lubricating effect can be affected and the compressor may be burnt if impurities were mixed with the lubricating oil.
7	Refrigerant pipe exceeds the limit.	The loss in pipe is considerable and the unit energy efficiency decreases, which are harmful for long-term running of the system.
8	Incorrect amount of refrigerant is filled.	The system cannot correctly control the flow allocation; the compressor may be operating under over-heating environment or running when the refrigerant flows back to the compressor..
9	The refrigerant pipe leaks.	Insufficient refrigerant circulating in the system decreases the cooling performance of the air conditioner. Long-term operation under such circumstance may cause an overheating compressor or even damage the compressor.
10	Water drainage from the condensate water pipe is not smooth.	Residual water in IDUs can affect the normal operation of the system. The possible water leakage can damage the IDU's decoration.
11	The ratio of slop for condensate water pipe is insufficient or the condensate water pipe is incorrectly connected.	Reverse slop or inconsistent connection of condensate water pipe can hinder the smooth drainage and cause leakage of the IDU.
12	The air channel is improperly fixed.	The air channel will deform; vibration and noise occur during unit operating.
13	The guide vane of air channel is not reasonably manufactured.	Uneven air quantity allocation reduces the overall performance of the air conditioner.
14	The refrigerant pipe or condensate water pipe does not meet the insulation requirement.	Water can easily condensate and drip to damage the indoor decoration, or even trigger the protection mode of system due to overheating operation.
15	The installation space for IDU is insufficient.	Since there is a lack of space for maintenance and checking, indoor decoration might need to be damaged during such operation.
16	The IDU or the location of the air outlet or return air inlet is not designed reasonably.	The air outlet or return air inlet may be short-circuited, thus affecting the air conditioning performance.
17	The ODU is improperly installed.	The ODU is difficult to be maintained; unit exhaust is not smooth, which reduces the heat exchanging performance or even prevent the system from normal operation; in addition, the cold and hot air for heat exchange and the noise may annoy people in surrounding areas.
18	Power cables are incorrectly provided.	Unit components may be damaged and potential safety hazard may occur.
19	Control communication cables are incorrectly provided or improperly connected.	The normal communication in the system fails or the control over IDUs and ODUs turn in a mess.
20	Control communication cables are not properly protected.	The communication cables are short-circuited or disconnected, and the unit cannot be started up due to communication failure.

Understand the special requirement (if any) for unit installation before implementation to ensure installation quality. Relevant installers must have corresponding engineering construction qualifications.

Special type operators involved in the engineering

implementation, such as welders, electricians, and refrigeration mechanics must have relevant operating licenses and are accredited with vocational qualification certification.

III. Cooperation Between Different Professions

A quality installation of air conditioning engineering depends on careful organization and close cooperation between different professions such as architecture, structure, electric, water supply and drainage, fire-fighting, and decoration. Pipes must be laid in places away from any automatic spray head for fire-fighting, and must be reasonably arranged to ensure that the pipes fit the electric, luminaries, and decoration.

(1). Requirements for cooperation with civil engineering:

1). The riser should be installed in the air conditioning tube well, and the horizontal pipe should be placed in the ceiling, if possible.

2). A place should be reserved for the ODU base to prevent the waterproof layer or insulating layer on the roof from being damaged in later phase of installation.

3). At places on walls or floors where pipes need to go through, holes or casing should be preserved. If the pipe needs to go through a bearing beam, a steel casing must be prepared.

(2). Requirements for cooperation with decoration engineering:

The air conditioning installation should not damage the bearing structure or the decorative style. Air conditioning pipes should be laid out along the bottom of the beam as possible. If pipes meet one another at the same elevation, process based on the following principles:

1). Drain pipes enjoy the highest priority. Air ducts and pressure pipes should leave places for gravity pipes.

2). Air ducts and small pipes should leave places for major pipes.

(3). Requirements for cooperation with electric:

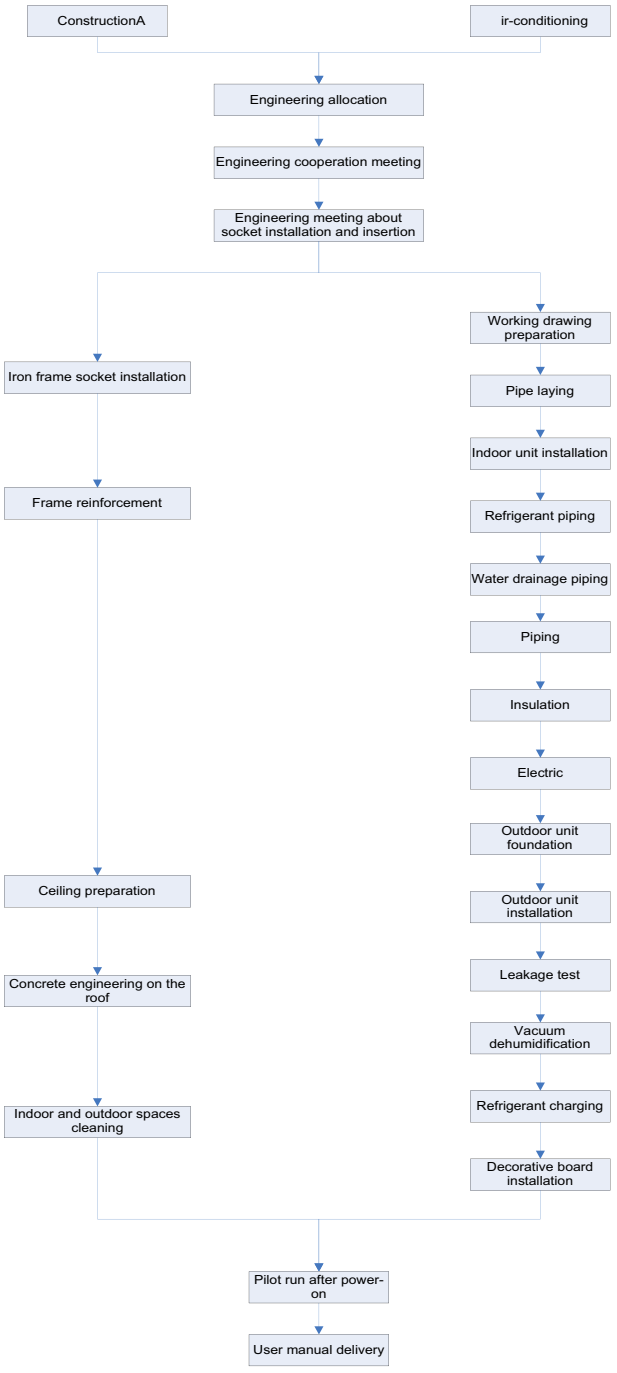
After the capacity of air conditioning unit is determined, check the following aspects with relevant electric design personnel:

1). Whether the electrical load is designed based on the requirement of the air conditioning unit;

2). Whether the power cable and circuit breaker meet the unit requirement and abide by relevant national safety regulations;

3). Whether the regional power supply quality (including voltage fluctuation and interference noise) meet the international requirement.

Any nonconformity must be resolved through coordination.



IV. Onsite Review of Design Drawing

Installation personnel must carefully read and understand the design scheme and drawings provided by engineering designers, and prepare detailed and feasible construction organization design after reviewing the onsite status.

The following aspects of working drawing must be reviewed:

(1). The loads of indoor and ODUs must match. The gross rated capacity of the IDU should be set to a value that is 50% to 135% of the rated capacity of the ODU. In actual conditions, if the capacity of concurrently operating IDUs exceeds 100% of the rated capacity of the ODU, the air conditioning system fails to meet the requirement. Note: Configuration in excess of the capacity of the IDUs can affect the comfort for users. The more the excess is, the lower the adjustment capacity of an air

conditioning unit will be. When the capacity exceeds 135% of the configured value, the system reliability can be affected. Therefore, relevant regulations on capacity limit must be strictly followed.

(2). The difference of level between an ODU and an IDU, and that between IDUs must be set within the designed range.

(3). Pipe bend for trapped oil is required for air pipe riser in the unit to ensure normal circulation in the unit lubricating system.

(4). The pipe diameter and manifold type in the cooling system must meet relevant technical specifications.

(5). The drainage method of unit condensate water must be reasonable; the pipeline slope must follow the design requirement of unit.

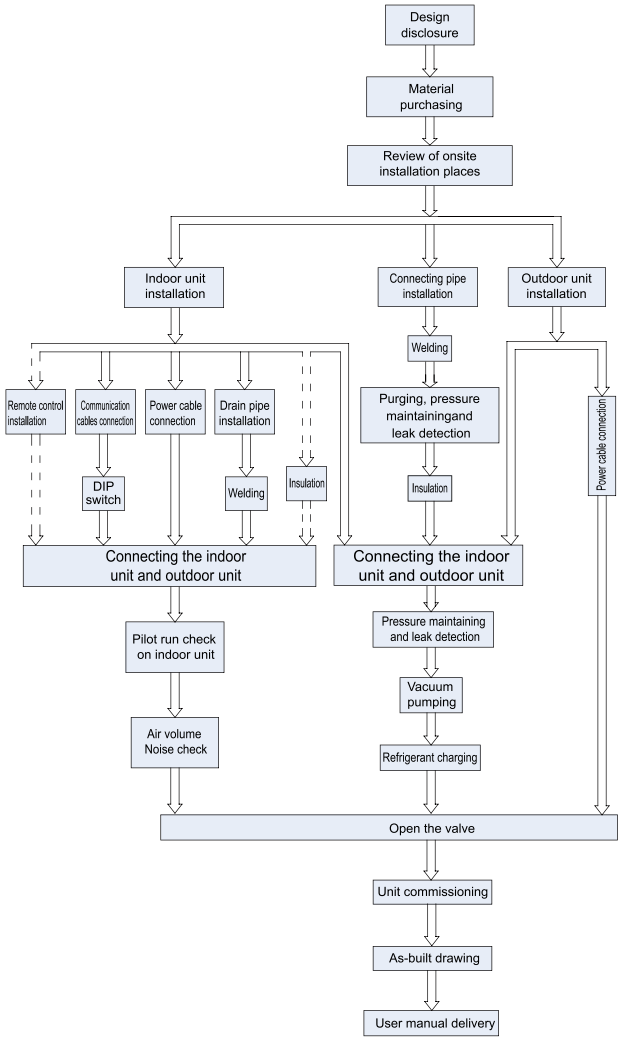
(6). The air duct direction and air flow are reasonably organized.

(7). The configuration specifications, type, and control method of power cables should meet the design requirement of unit.

(8). The arrangement, total length, and control method of control line should meet the design requirement of unit.

Note: Engineering construction personnel must strictly abide by the design drawings. If any design cannot be implemented during construction and needs to be modified, contact the designer first for approval and prepare a written document, that is, the design modification record.

V. Construction Organization Process



Part 2 Material Selection

I. Requirement for Selecting Construction Materials

The materials, equipment and instruments used during air conditioning engineering construction must have certifications and test reports.

Products with fireproof requirements must be provided with fireproof inspection certificates and must meet national and relevant compulsory standards.

If environmentally-friendly materials are to be used as required by customers, all such materials must meet national environmental protection requirement and be provided with relevant certificates.

II. Requirement for Selecting Major Materials

(1). Copper pipe

1). Material requirement: Dephosphorization drawing copper pipe for air conditioners

2). Appearance requirement: The inner and outer surface of pipe should be smooth without pinhole, crack, peeling, blister, inclusion, copper powder, carbon deposition, rust, dirt or severe oxide film, and without obvious scratch, pit, spot and other defects.

3). Test report: Certifications and quality test reports must be provided.

4). The tensile strength must be at least 240 kgf/mm².

5). Specifications requirement

R410A Refrigerant System		
OD (mm/inch)	Wall Thickness (mm)	Model
Φ6.35(1/4)	≥0.8	0
Φ9.52(3/8)	≥0.8	0
Φ12.70(1/2)	≥0.8	0
Φ15.9(5/8)	≥1.0	0
Φ19.05(3/4)	≥1.0	0
Φ22.2(7/8)	≥1.2	1/2H
Φ25.40(1/1)	≥1.2	1/2H
Φ28.60(9/8)	≥1.2	1/2H
Φ31.80(5/4)	≥1.3	1/2H
Φ34.90(11/8)	≥1.3	1/2H
Φ38.10(12/8)	≥1.5	1/2H
Φ41.30(13/8)	≥1.5	1/2H
Φ44.5(7/4)	≥1.5	1/2H
Φ51.4(7/4)	≥1.5	1/2H
Φ54.1(17/8)	≥1.5	1/2H

6). After the inner part of the copper pipe is cleaned and dried, the inlet and outlet must be sealed tightly by using pipe caps, plugs or adhesive tapes.

(2). Condensate water pipe

1). Pipes that can be used for air conditioner drainage include: water supplying UPVC pipe, PP-R pipe, PP-C pipe, and HDG steel pipe.

2). All relevant certificates and quality test reports are provided.

3). Requirements for specifications and wall thickness

Water supplying UPVC pipe: Φ32mm×2mm, Φ40mm×2mm, Φ50mm×2.5mm;

HDG steel pipe: Φ25mm×3.25mm, Φ32mm×3.25mm, Φ40mm×3.5mm, Φ50mm×3.5mm.

(3). Insulation material

1). Rubber foam insulation material;

2). Flame retardancy level: B1 or higher;

3). Refractoriness: at least 120°C;

4). The insulation thickness of condensate water pipe: at least 10 mm;

5). When the diameter of copper pipe is equal to or greater than Φ15.9 mm, the thickness of insulation material should be at least 20 mm; when the diameter of copper pipe is less than 15.9 mm, the thickness of insulation material should be at least 15 mm.

(4). Communication cable and control cable

Note: For air conditioning units installed in places with strong electromagnetic interference, shielded wire must be used as the communication cables of the IDU and wired controller, and shielded twisted pairs must be used as the communication cables between IDUs and between the IDU and ODU.

Communication cable selection for outdoor and IDUs

Wire Type	Total Length of Communication Cables Between IDU and Indoor (Outdoor) Unit L(m)	Number of Wire Pieces x Wire Diameter (mm^2)	Wire Standard	Remark
Common sheath twisted pair copper core (RVV)	L≤1000	≥2×0.75	IEC 60227	If the wire diameter is enlarged to 2×1mm^2, the overall communication length can reach 1500 m.

Communication cable selection for IDU and wired controller

Wire Type	Total Length of Communication Cables of the IDU and Wired Controller L(m)	Number of Wire Pieces x Wire Diameter (mm^2)	Wire Standard	Remark
Common sheath twisted pair copper core (RVV)	L≤250	≥2×0.75	IEC 60227	The overall communication length cannot exceed 250 m.

(5). Power cable

Only copper conductors can be used as power cables. The copper conductors must meet relevant national standard and satisfy the carrying capacity of unit.

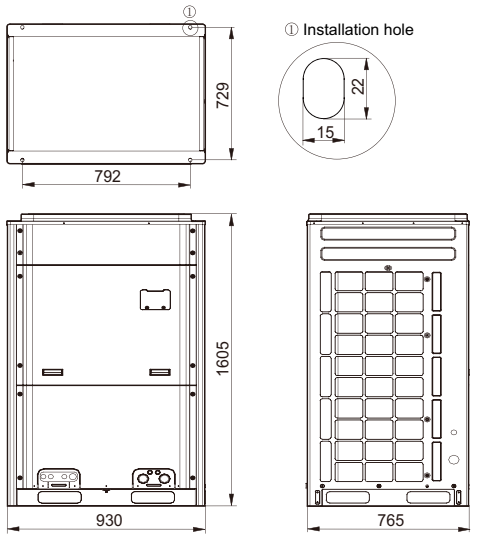
Part 3 Installation Space Requirement

I. Place Selection for Installing ODU

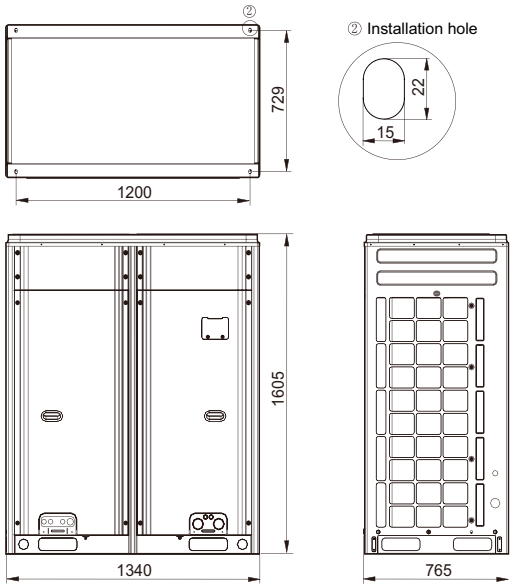
The widely-used VRF units are applicable for various scenarios. In residential areas, especially in rooms where elderly and infants live, a higher refrigerating performance and noise control is required. Therefore, the ODU with excellent capacity and low noise is preferred; in addition, ODU should be installed in outdoor spaces instead of in bedrooms, studies or meeting rooms. In commercial areas, ODU should be installed far away from offices.

II. ODU Dimensions and Installation Hole Size

Outline and physical dimention of GMV-224WM/B-X and GMV-280WM/B-X unit.



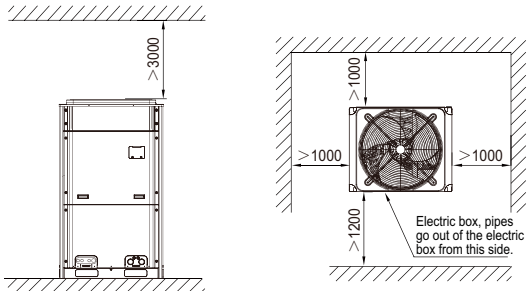
Outline and Physical Dimention of GMV-335WM/B-X, GMV-400WM/B-X and GMV-450WM/B-X unit.



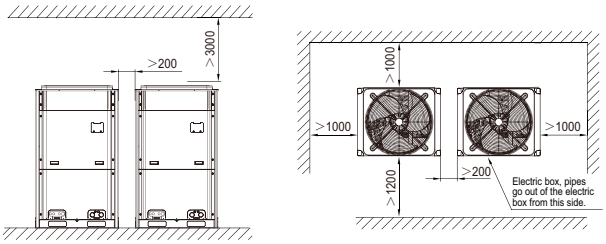
III. Installation Space Requirement for ODU

(1). If all sides of the ODU (including the top) are surrounded by walls, process according to the following requirements for installation space:

Installation space requirement for single-module unit



Installation space requirement for dual-module unit



Installation space requirement for triple-module unit

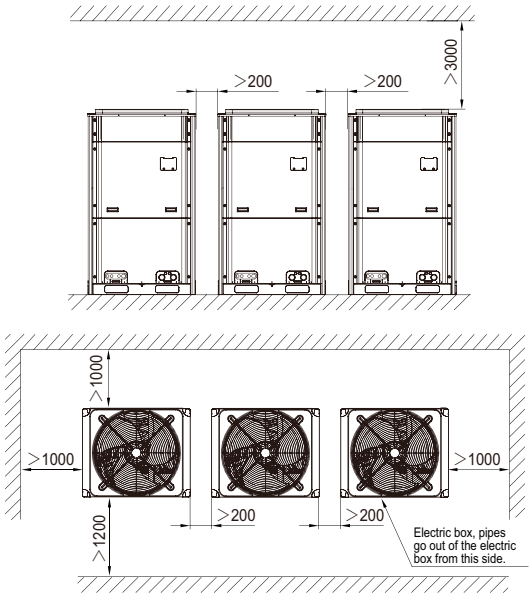


Figure 5

Installation space requirement for quad-module unit

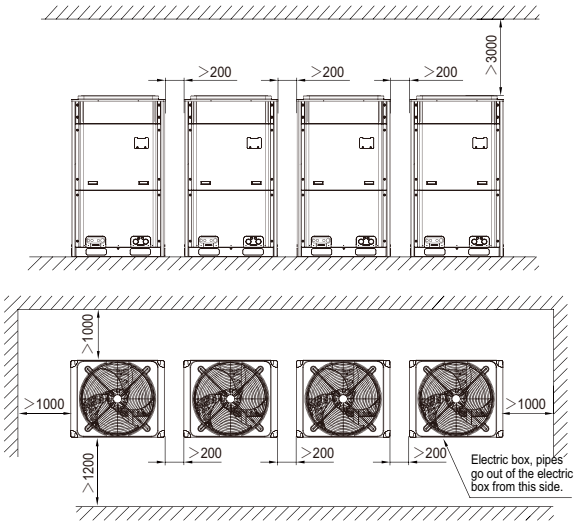


Figure 6

(2). In principle, if a crown wall (obstacles for keeping out the wind) exists over the machine, a distance of at least 3000 mm should be left between the top of the machine and the crown wall. If the front, rear, left and right sides of the machine are open spaces, the distance between the top of the machine and the crown wall should be at least 1500 mm, as shown in Figure 7. If the requirement for the minimum 1500 mm cannot be met, or the spaces around the machine are not open, an air return pipe needs to be connected to maintain smooth ventilation, as shown in Figure 8.

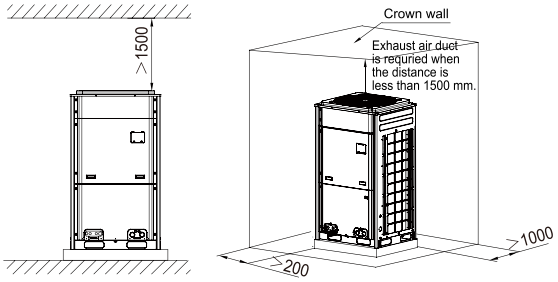
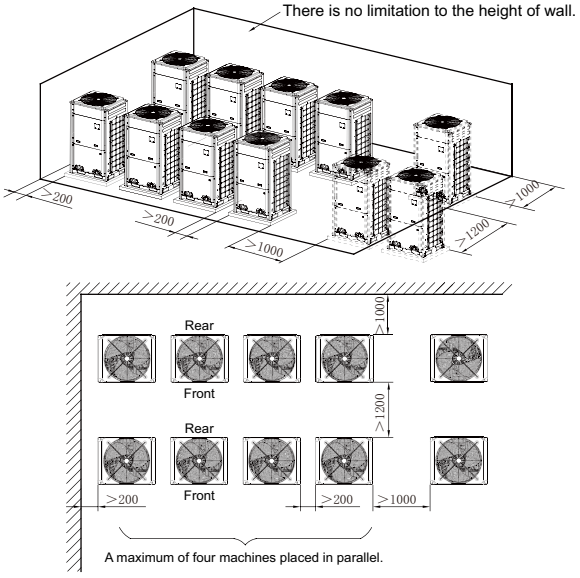


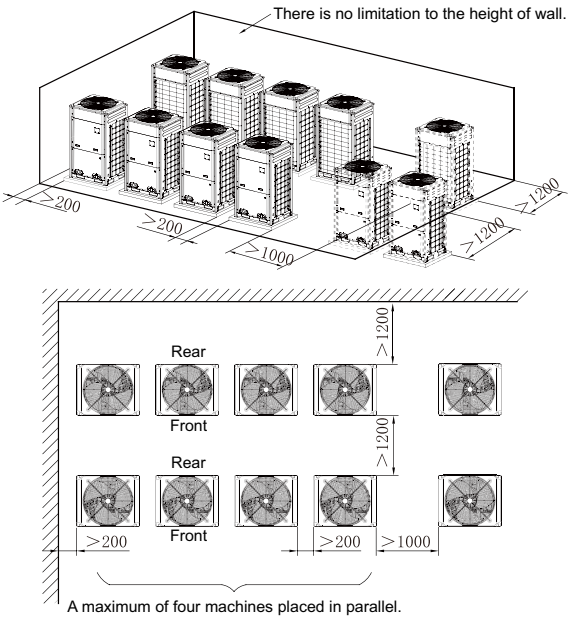
Figure 7 Figure 8

Installation space requirement for multiple ODUs

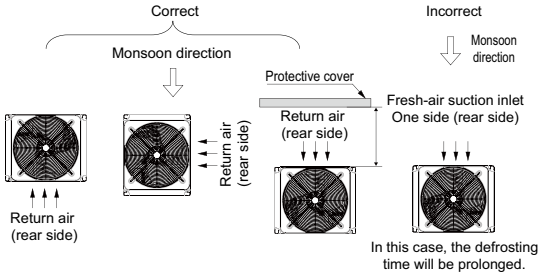
To ensure smooth ventilation, the top of the unit must be open spaces without obstacles.

If the front and left (or right) sides of the ODU are open spaces, the units should be installed along the same or reverse direction.

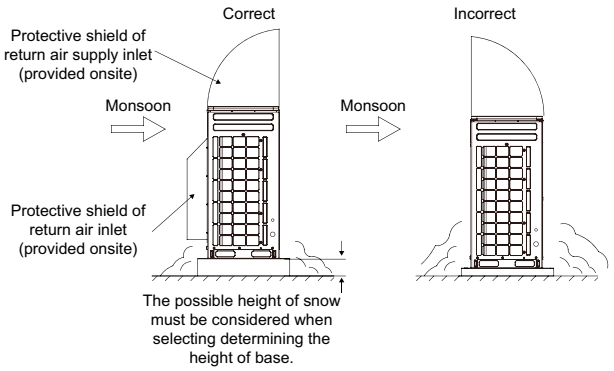




(3). Monsoons must be considered during ODU installation.



(4). Snow must be considered during ODU installation.



(5). During the installation of the ODU, induced and exhaust pipes must be connected. In addition, the aperture opening rate of shutters must be at least 80%, and the angle between the shutters and the horizontal plane should be less than 20°. Requirements for installing exhaust air duct are as follows:

1). Basic requirement for connecting an ODU to static pressure ventilating duct

When an ODU needs to be connected to the static pressure ventilating duct, the ventilating duct must be reasonably designed. The pressure loss caused by the ventilating duct must be calculated. In addition, a proper type of ventilating duct is necessary. To connect he static pressure ventilating duct to the ODU, three basic parts are required:

① . ODU;

② . canvas; and

③ . steel-plate ventilating duct.

The ODU must be interconnected with the ventilating duct through canvas to prevent abnormal vibration and noise generated by the steel-plate ventilating duct. The joint part must be tightly sealed with tin foil to avoid air leakage.

2). Preparations for connecting an ODU to static pressure ventilating duct

a. The ODU is installed properly based on the unit installation requirement.

b. The steel-plate ventilating duct is designed based on the unit and engineering requirement, and is installed properly according to the engineering standards.

c. Based on the unit dimensions and the size of steel-plate ventilating duct, prepare materials such as canvas casing, tin foil, steel bar and tapping screw, as well as tools such as hand-operated electric drill, air screw driver and screwdriver.

3). Basic operation of connecting an ODU to static pressure ventilating duct

Two methods are available to connect an ODU to static pressure ventilating duct.

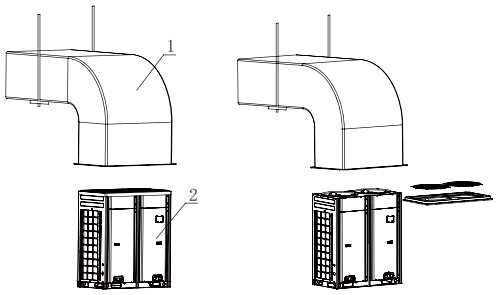
Method 1: Reserve the unit top case. Detailed operations are as follows:

a. Install the ODU (2) and steel-plate ventilating duct (1). Use an air screw driver or screwdriver to unfasten the tapping screws that fixing the top case component (3), and then remove the top case component. Take out the grille from the top of the top case component and leave the top case.

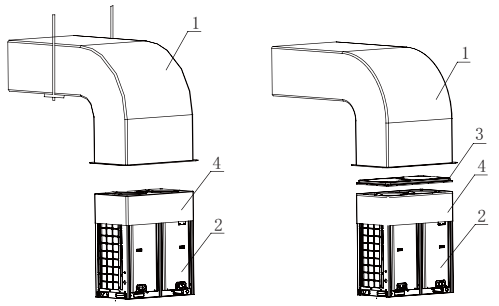
b. Put the canvas casing inside out (4). Cover one end of the canvas casing over the unit downward until the canvas end face is aligned with the unit or a bit higher than the top of the unit. Then, put the top case back (3) and tightly press the canvas casing (4). Use tapping screws to fix the top case onto the unit (3).

c. Pull up the canvas casing reversely (4) and use the steel bar (5) to press the canvas casing tightly onto the counter flange of the steel-plate ventilating duct (1). Use a hand-operated electric drill to drill holes and fasten the parts by using tapping screws.

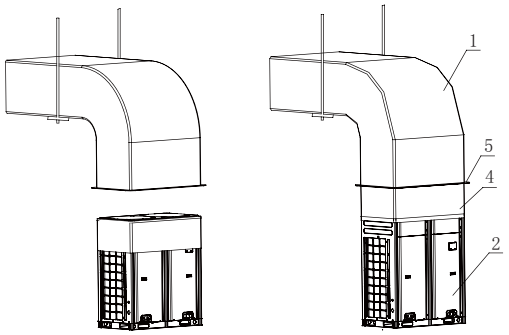
d. Use the tin foil to seal the joints and check the joints' reliability.



Step 1 Step 2



Step 3 Step 4



Step 5 Step 6

Method 2: Remove the unit top case. Detailed operations are as follows:

a. Install the ODU (2) and steel-plate ventilating duct (1). Take out the grille from the top of the top case component. Use the prepared canvas casing inside out (4) to cover the surroundings over the top of the unit.

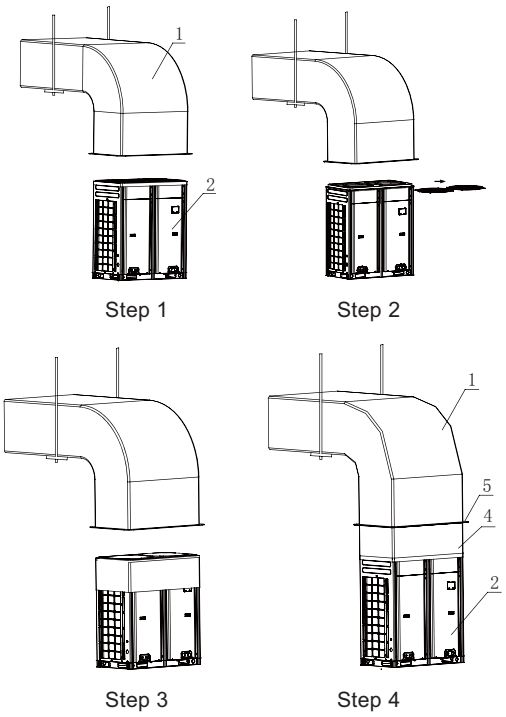
Keep the top of canvas casing (4) 30 to 50 mm higher over the top of the unit.

b. Use a steel bar to press tightly the canvas casing (4) around the top case of the unit. Use a hand-operated electric drill to drill holes and fasten the canvas casing onto the unit through steel bar by using tapping screws.

c. Pull up the canvas casing reversely and use the steel bar to press the canvas casing tightly onto the counter flange of the steel-plate ventilating duct. Use a hand-operated electric drill to drill holes and fasten the parts by using tapping screws.

d. Use the tin foil to seal the joints and check the joints' reliability.

Note: Remove the grille on the top case when connecting an ODU to static pressure ventilating duct; otherwise, the air volume, especially the unit operating performance will be affected. For method 2, since drills are required on the top case, the powder coated protective layer on the top case will be damaged. As a result, the anti-corrosion performance of the unit top case will be reduced.



(6). When the effective area of air intake is less than 70% of the total air intake area of all ODUs, an induced draft fan is also required. The total air input of induced draft fan should be no less than 80% of the total supply air rate.

IV. Installation Space Requirement for IDU

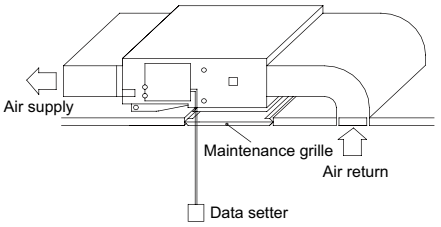
(1). Precautions on the IDU design

Pay attention to the following issues when selecting places for IDUs:

1). Ensure the optimum air flow organization of air conditioning in the practice and the most even distribution of temperature;

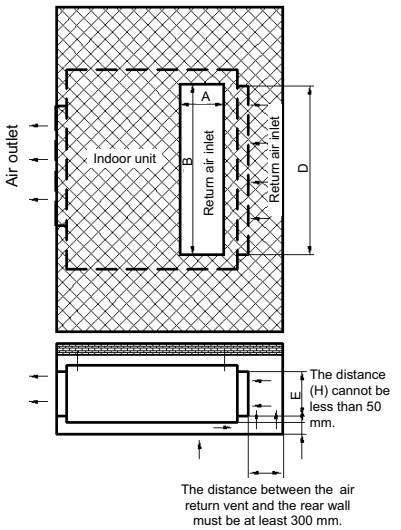
2). Avoid air interaction among different air conditioning areas;

3). Adopt the air back return method when air-duct-type all-blast IDU is used. This can further reduce the unit noise generated due to air return.



4). Ensure that the air return of the unit is not affected when selecting places. In particular, for air-duct-type all-blast IDU, the air return vent of the unit must be at least 300 mm away from the rear wall or other obstacles (in air back return mode).

5). If the unit adopts the air back return method and the ceiling requires air return under the unit, ensure that the distance between the unit bottom and the ceiling is at least 50 mm, and ensure that the effective circulation area between the unit bottom and the ceiling is not less than the air return vent area of the unit. For example,



Unit air return area S1: = D x E

Perimeter of ceiling return air inlet: L = 2 x (A + B)

Effective air return area on the ceiling: S2 = L x H

S2 should not be less than S1; the distance between the ceiling and unit (H) should not be less than 50 mm.

6). Ensure that no obstacle is placed near the air intake or air outlet of the IDU to block ventilation. Install the IDU at places 2.3 m higher than the floor.

7). For IDUs of which the rated cooling capacity is greater than 5.6 kW, air pipe also needs to be installed. Air duct and air inlet can reduce the noise.

8). Reserve sufficient space for future maintenance.

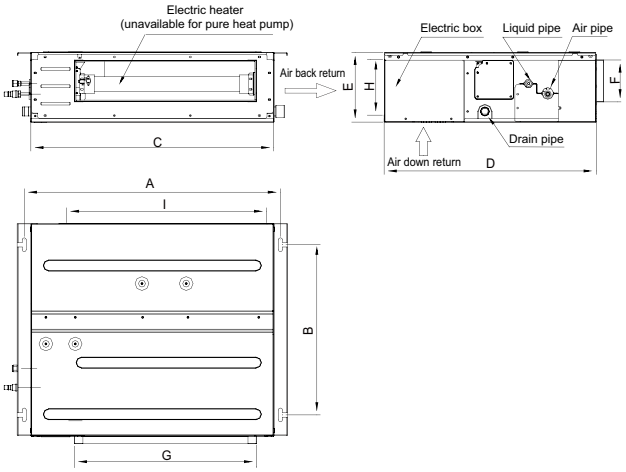
(2). Different installation space requirements for various IDUs

1. Air-duct-type unit series

1.1 Dimensions

1.1.1 Low-static-pressure air-duct-type series

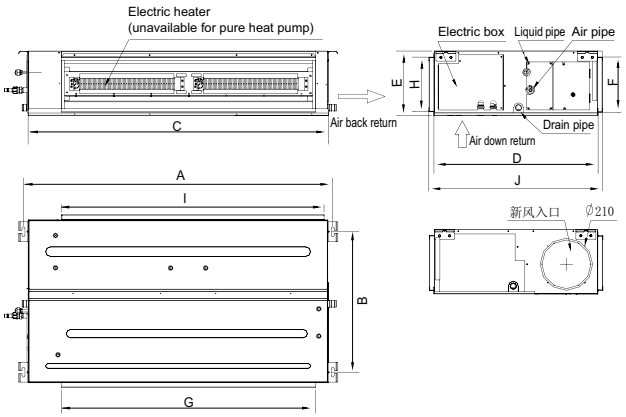
The following diagram is applicable for units with the cooling capacity ranging from 2.2 to 6.3 kW.



The following table lists the detailed dimensions.

Item / Model	A	B	C	D	E	F	G	H	I
GMV-ND22PLS/A-T GMV-ND25PLS/A-T GMV-ND28PLS/A-T GMV-ND32PLS/A-T GMV-ND36PLS/A-T	742	491	700	615	200	121	528	161	580
GMV-ND40PLS/A-T GMV-ND45PLS/A-T GMV-ND50PLS/A-T	942	491	900	615	200	121	728	161	780
GMV-ND56PLS/A-T GMV-ND63PLS/A-T	1142	491	1100	615	200	121	928	161	980

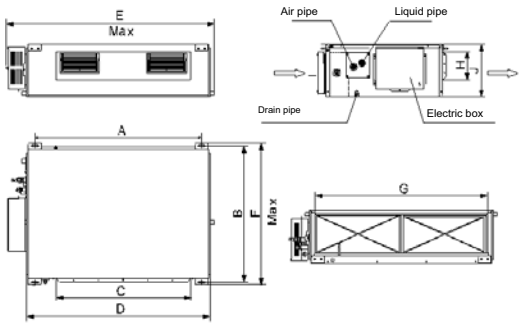
The following diagram is applicable for units with the cooling capacity ranging from 7.1 to 14.0 kW.



The following table lists the detailed dimensions.

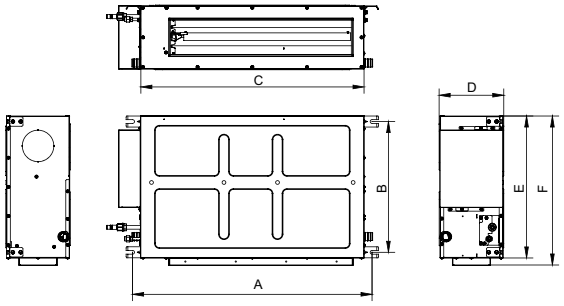
Item / Model	A	B	C	D	E	F	G	H	I	J
GMV-ND71PLS/A-T GMV-ND80PLS/A-T	1236	565	1200	655	260	222	1016	220	1050	695
GMV-ND90PLS/A-T GMV-ND100PLS/A-T GMV-ND112PLS/A-T	1379	565	1340	655	260	207	1153	220	1188	716
GMV-ND125PLS/A-T GMV-ND140PLS/A-T	1379	565	1340	655	260	207	1153	220	1188	716

1.1.2 High-static-pressure air-duct-type series



Model	A	B	C	D	E	F	G	H	I	J
GMV-ND56PHS/A-T	1101	517	820	1159	1271	558	1002	160	235	268
GMV-ND63PHS/A-T	1101	517	820	1159	1271	558	1002	160	235	268
GMV-ND71PHS/A-T	1101	517	820	1159	1271	558	1002	160	235	268
GMV-ND80PHS/A-T	1101	517	820	1159	1271	558	1002	160	235	268
GMV-ND90PHS/A-T	1011	748	820	1115	1229	775	979	160	231	290
GMV-ND100PHS/A-T	1011	748	820	1115	1229	775	979	160	231	290
GMV-ND112PHS/A-T	1011	748	820	1115	1229	775	979	160	231	290
GMV-ND125PHS/A-T	1011	748	820	1115	1229	775	979	160	231	290
GMV-ND140PHS/A-T	1011	748	820	1115	1229	775	979	160	231	290

1.1.3 Low-noise duct type series

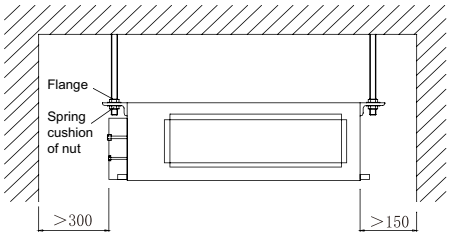


Item / Model	A	B	C	D	E	F
GMV-ND22~36PL/B-T	760	415	710	200	450	475
GMV-ND40~63PL/B-T	1060	415	1010	200	450	475
GMV-ND72PL/B-T	1360	415	1310	200	450	475

1.2 Installation and maintenance space for air duct type unit

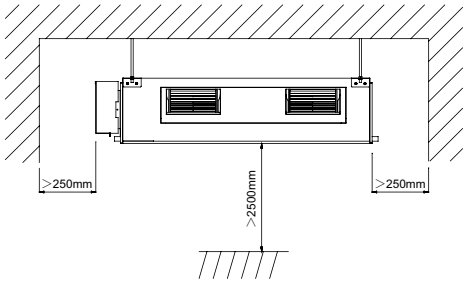
1.2.1 Low-static-pressure air-duct-type

GMV-ND**PLS/A-T series and Low-noise duct type GMV-ND**PL/B-T series



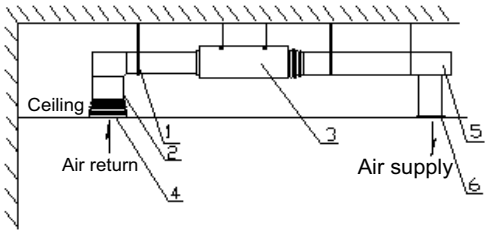
1.2.2 High-static-pressure air-duct-type

GMV-ND—PHS/A-T series



1.3 Air pipe installation

(1). Rectangular air duct installation



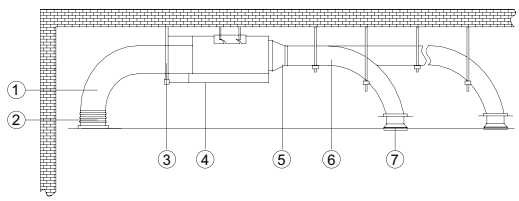
No.	1	2	3	4	5	6
Name	Hanger rod	Air return pipe	Air-duct-type IDU	Return air inlet	Air duct	Air outlet

The proceeding figure shows the installation of back return air inlet. In practice, the down return mode can also be implemented. The installation method is similar to that of back return mode. The air pipe is rectangular air duct, connecting to the air inlet of the IDU. At least one air outlet must keep opening.

Air outlet and return air inlet are connected with canvas (insulation type canvas). If static pressure and low noise are required, a plenum chamber should be connected between the air outlet and air pipe. The dimensions of air inlet of the plenum chamber are consistent with that of the air outlet. The plenum chamber and air outlet are connected with canvas.

The air back return method is adopted. Spaces should be reserved within the ceiling air-duct-type IDU for installing the air return pipe. Larger dimensions of a return air inlet with a slower wind speed are better.

(2). Round air duct installation



No.	1	2	3	4	5	6	7
Name	Air return pipe	Return air inlet	Hanger rod	Air-duct-type IDU	Transient air pipe	Air duct	Air outlet

Note:

①. The maximum length of air pipe refers to the sum of the total length of the air duct at the farthest air outlet and the total length of the air return pipe at the farthest return air inlet.

②. For the unit with auxiliary electric heating, if the round air duct is to be connected, the linear length of the transient air pipe should be at least 200 mm.

◆ Installation procedure of round air duct:

1). Preset the round air outlet on the transient air pipe and fix the round air outlet with tapping screws.

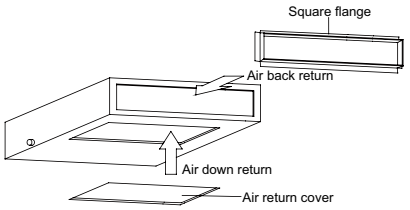
2). Cover the transient air pipe on the air outlet of unit, and connecting them with rivets.

3). Cover the air duct on the round air outlet and fasten the connection. Until now, the round air duct is successfully connected to the unit. Other steps are not described here.

1.4 Installation of air return pipe

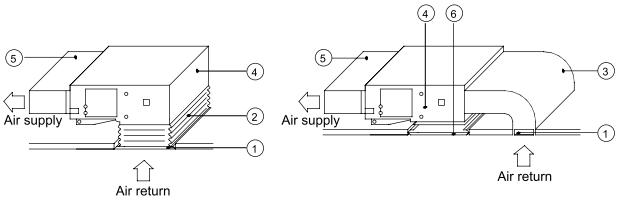
◆ A unit adopts the air back return method before it is delivered from the factory. The air return cover is located at the unit bottom, as shown in the following figure.

◆ To implement air back return, switch positions of the square flange and the air return cover.



◆ Connect the air return pipe to the return air inlet of the IDU by using rivets. The other side of the air return pipe is connected to the return air inlet. Prepare a section of canvas air duct for flexible adjustment of height. Use 8# iron wire to strengthen the canvas air duct and make the air duct folded.

Use the air back return method or air down return method based on the installation and maintenance spaces. The installation of air return pipe is shown in the following figure.



No.	Name	No.	Name
1	Return air inlet (with filter screen)	4	Indoor unit
2	Canvas air duct	5	Air duct
3	Air return pipe	6	Maintenance grille

Note:

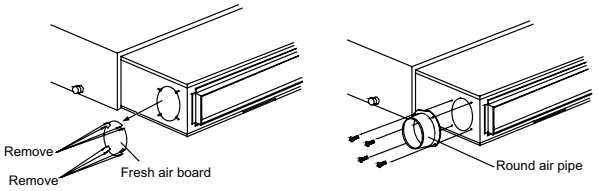
①. Since the air down return method will generate larger noise than the air back return method, the air down return method is usually not recommended.

②. The air down return method is typically applicable for small installation places.

③. High static pressure series units do not support the air down return method.

1.5 Installation of fresh air pipe

- ◆ To connect the fresh air pipe, remove a part of the fresh air board, as shown in the following figure (left). If the fresh air pipe is not required, use sponge to block the gap on the fresh air board.
- ◆ Install the round flange to which the fresh air pipe will be connected, as shown in the following figure (right).
- ◆ The air pipe and round flange must be tightly sealed and can provide well insulation functions.
- ◆ Fresh air refers to the filtered air.



Note:

① . Insulation layers must be wrapped over the air duct and air return pipe to prevent heat leakage or condensation.

② . The air duct and air return pipe must be supported by iron supports and fixed onto the precast slab. Air duct joints must be tightly sealed with glue to prevent air leakage.

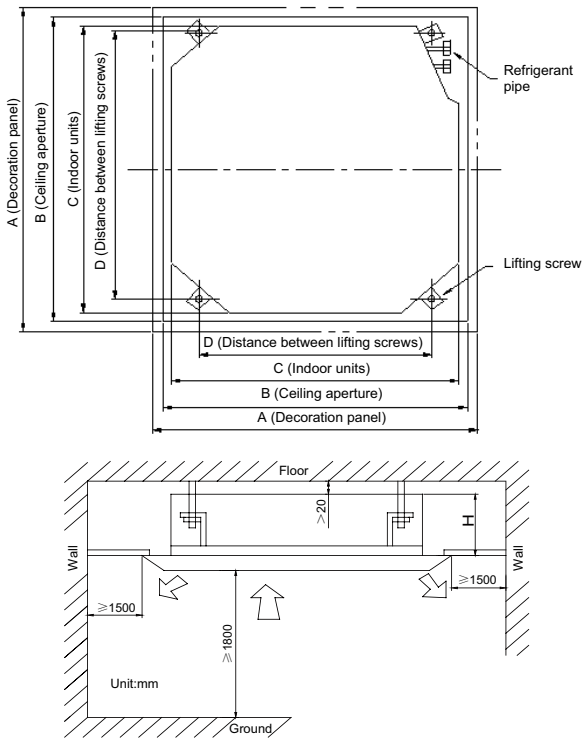
③ . The design and construction of air pipe must abide by relevant national engineering standards.

④ . The edge of air return pipe must be at least 150 mm away from the wall. A filter must be installed on the return air inlet.

⑤ . Noise reduction and shock absorber must be considered during air pipe design and construction.

2. All-dimensional ceiling cassette type IDU

Dimensions and requirement for installation and maintenance spaces

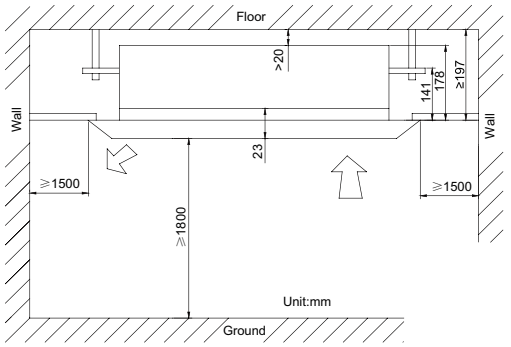


Model	A	B	C	D	E	G	H
GMV-ND28T/A-T GMV-ND36T/A-T GMV-ND45T/A-T GMV-ND50T/A-T	950	890	840	680	780	65	210
GMV-ND56T/A-T GMV-ND63T/A-T GMV-ND71T/A-T GMV-ND80T/A-T	950	890	840	680	780	65	260
GMV-ND90T/A-T GMV-ND100T/A-T GMV-ND112T/A-T GMV-ND125T/A-T GMV-ND140T/A-T	950	890	840	680	780	65	340
GMV-ND160T/A-T	1040	975	910	787	840	65	315

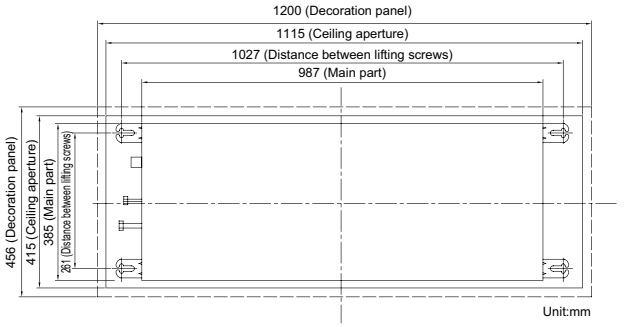
3. Single-side air outlet ceiling cassette type IDU

Dimensions and requirement for installation and maintenance spaces

◆ Spare space

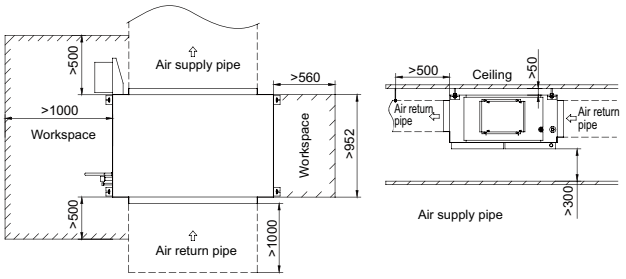


◆ Distance between screws



4. Fresh air conditioning IDU

◆ Spare space



◆ Distance between screws

GMV-NX140P/A(X1.2)-K

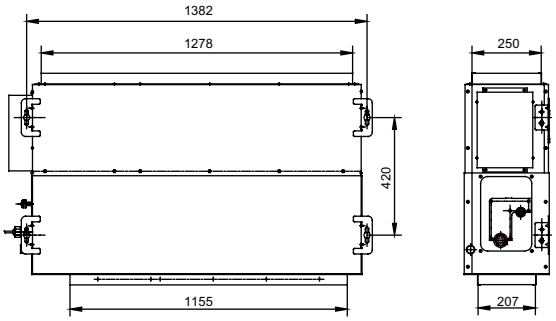


Figure 4.1.1

GMV-NX224P/A(X2.0)-M, GMV-NX280P/A(X2.5)-M, GMV-NX450P/A(X4.0)-M, GMV-NX280P/A(X3.0)-M

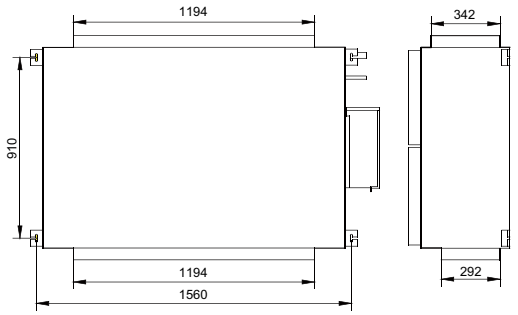


Figure 4.1.2

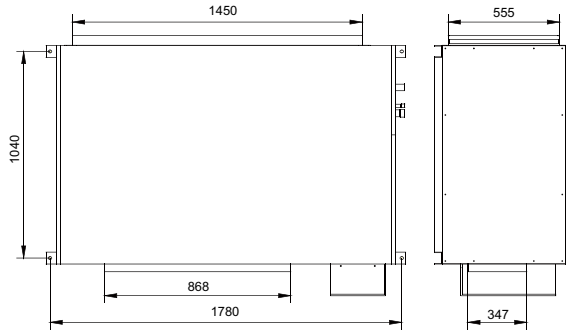
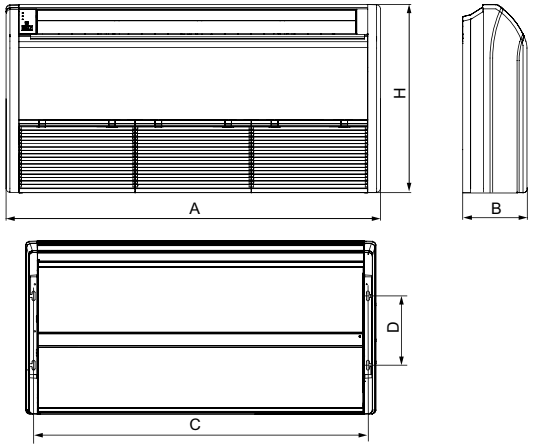


Figure 4.1.3

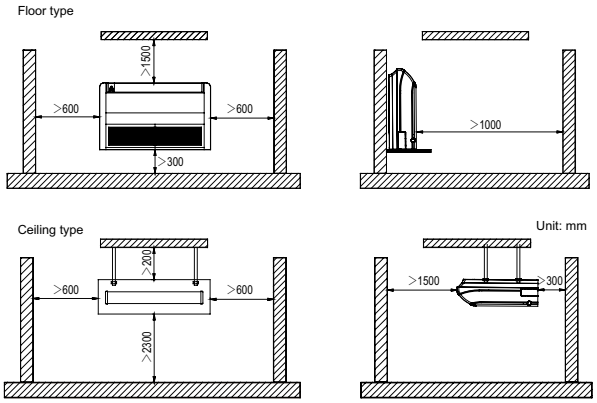
5. Floor Ceiling Split Unit

5.1 Dimensions



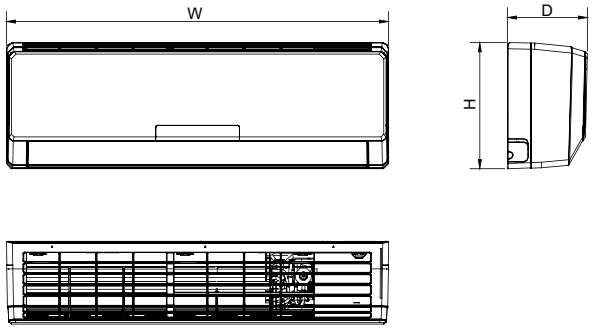
Model	A	B	C	D	H
GMV-ND28ZD/A-T GMV-ND36ZD/A-T GMV-ND50ZD/A-T	1220	225	1158	280	700
GMV-ND71ZD/A-T GMV-ND90ZD/A-T	1420	245	1354	280	700
GMV-ND112ZD/A-T GMV-ND125ZD/A-T GMV-ND140ZD/A-T	1700	245	1634	280	700

5.2 Installation and maintenance spaces



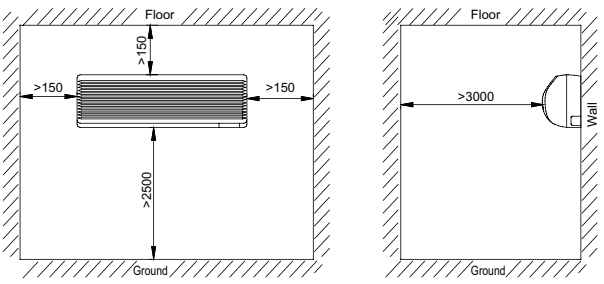
6. Wall mounted type air conditioning IDU

6.1 Dimension



Model	W	H	D
GMV-N22G/A3A-K GMV-N)28G/A3A-K	843	275	180
GMV-N36G/A3A-K GMV-N45G/A3A-K GMV-N50G/A3A-K	940	298	200
GMV-N56G/A3A-K GMV-N63G/A3A-K GMV-N71G/A3A-K	1008	221	319

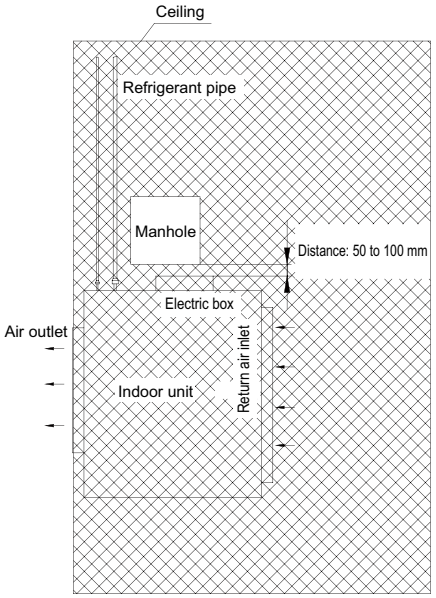
6.2 Installation and maintenance spaces



V. Position Selection for Manhole and Return Air Inlet

During the place selection for unit, the locating of manhole is also important except for the reserve of sufficient spaces for maintenance. Improper position selection of manhole can bring about difficulties for future maintenance.

The manhole should take in the shoulders of an adult, with the size not less than 450 mm x 450 mm. For air-duct-type all-blast IDU, the manhole is usually located at the side of the unit electric box, and the distance between the manhole and the electric box ranges from 50 mm to 100 mm. The place of the manhole should also be convenient for the maintenance of pipes. For ceiling cassette type IDU, the place for pipe maintenance is the primary consideration. Therefore, keep the distance between one side of the manhole to the connecting tube between 200 and 250 mm. The diagram is as follows.



For air-duct-type all-blast IDU, the place of return air inlet also needs to be considered. The return air inlet is mainly used for the air return of unit, as well as the maintenance of fan motor and filter screen of the IDU. Therefore, except for the proceeding air return design requirements, the place of return air inlet must support convenient replacing of motor and filter screen.

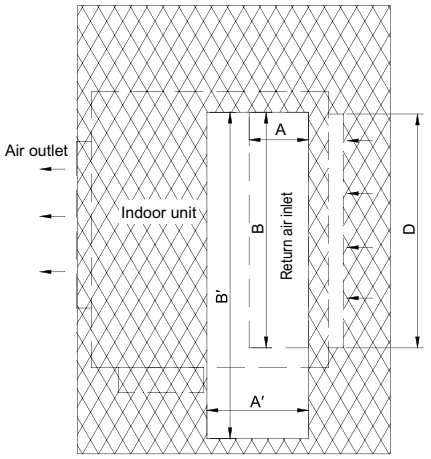
(1). The return air inlet of unit should be far away from a door, bathroom, or kitchen; otherwise, condensation and smell may generate.

(2). The length of return air inlet must be equal to or larger than 2/3 of the unit's return air inlet.

(3). If the return air inlet is located at the right rear of the unit, the distance between the return air inlet and the unit cannot be larger than 300 mm.

The width of return air inlet cannot be less than 200 mm.

(4). In the case when the return air inlet serves also as the manhole for electric box, a maintenance place should also be reserved on the side of the electric box based on the proceeding principles. Meanwhile, ensure that the location of the return air inlet supports convenient replacing of fan motor and filter screen. On the premise that the return air inlet meets the air quantity design requirement, enlarge the circulation area to 1.5 to 2 times of the original based on actual status. The diagram is as follows.



Original area of return air inlet: S = A x B

Currently required area of return air inlet: S' = A' x B'

S' ≥ (1.5 ~ 2.0) S

Part 4 Requirements on Foundation Installation

I. ODU Foundation

The concrete foundation of the ODU must be strong enough. Ensure that the drainage is smooth and that the ground drainage or floor drainage is not affected.

Requirements on the concrete foundation are as follows:

(1). The concrete foundation must be flat and have enough rigidity and strength to undertake the unit's weight during running. The height of the foundation is 200 mm to 300 mm, which is determined based on the size of the unit.

(2). The proportion of the cement, sand, and stone for the concrete is 1:2:4. Place 10 reinforced steel bars (φ10 mm) with a space between of 30 mm.

(3). Use the mortar to flatten the surface of the foundation. Sharp edges must be chamfered.

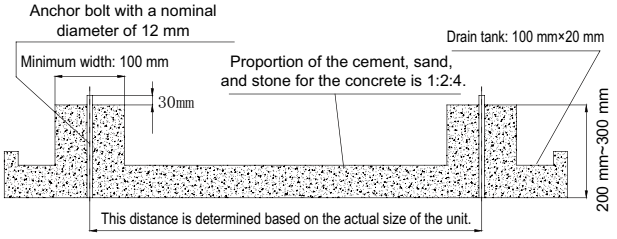
(4). When the foundation is built on a concrete floor, crushed stones are not required. But the foundation surface must be roughened.

(5). Clear the oil stains, crushed stones, dirt, and water in the reserved bolt hole of the foundation and install a temporary cover before installing bolts.

(6). Build a drainage ditch around the foundation to discharge the condensate water.

(7). If the air conditioner is installed on the roof, check the intensity of the building and take waterproof measures.

(8). If a u-steel foundation is adopted, the structure must be designed with sufficient rigidity and strength.



Cement foundation diagram

Height difference between outdoor unit and indoor unit	Outdoor unit at upper	⩽50	——
	Outdoor unit at lower	⩽90	——
Height difference between indoor units (m)		⩽30	——
Maximum length of Main pipe(2)		⩽90	L1
From IDU to its nearest branch (3)		⩽10	a,b,c,d,e,f,g,h,i,j

Notices:

① . Normally, the pipe length from the first branch of IDU to the farthest IDU is 40m. Under the following conditions, the length can reach 90m.

a. Actual length of pipe in total: L1+L2x2+L3x2+L4x2+…+L9x2+a+b+…+i+j≤1000m;

b. Length between each IDU and its nearest branch a, b, c, d, e, f, g, h, i, j≤40m;

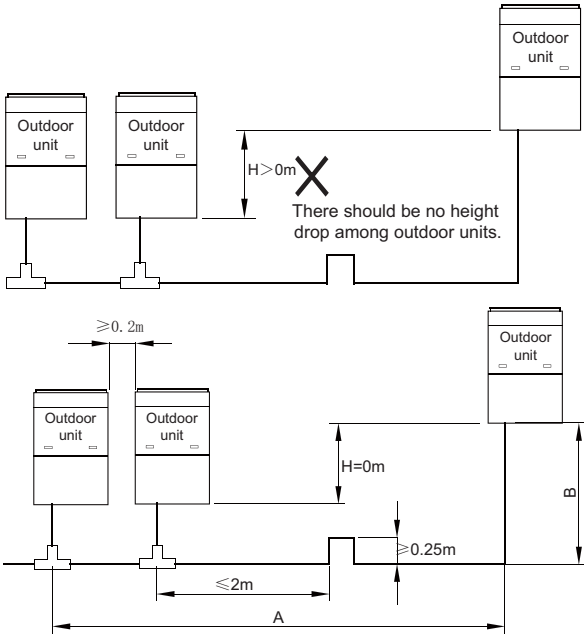
c. Difference between the pipe length from the first branch of IDU to the farthest IDU and the pipe length from the first branch of IDU to the nearest IDU: L10-L11≤40m.

② . When the maximum length of the main pipe from ODU to the first branch of IDU is≥90m, then adjust the pipe size of the gas pipe and liquid pipe of main pipe according to the following table.

Outdoor Model	Gas pipe size(mm)	Liquid pipe size(mm)
GMV-224WM/B-X	No need to enlarge pipe size	No need to enlarge pipe size
GMV-280WM/B-X	No need to enlarge pipe size	Φ12.7
GMV-335WM/B-X	Φ28.6	Φ15.9
GMV-400WM/B-X	Φ31.8	Φ15.9
GMV-450WM/B-X	Φ31.8	Φ15.9
GMV-504WM/B-X	Φ34.9	Φ19.05
GMV-560WM/B-X	Φ34.9	Φ19.05
GMV-615WM/B-X	Φ34.9	Φ19.05
GMV-680WM/B-X	No need to enlarge pipe size	Φ19.05
GMV-730WM/B-X	Φ38.1	Φ22.2
GMV-785WM/B-X	Φ38.1	Φ22.2
GMV-850WM/B-X	Φ38.1	Φ22.2
GMV-900WM/B-X	Φ38.1	Φ22.2
GMV-960WM/B-X	Φ41.3	Φ22.2
GMV-1010WM/B-X	Φ44.5	Φ22.2
GMV-1065WM/B-X	Φ44.5	Φ22.2
GMV-1130WM/B-X	Φ44.5	Φ22.2
GMV-1180WM/B-X	Φ44.5	Φ22.2
GMV-1235WM/B-X	Φ44.5	Φ22.2
GMV-1300WM/B-X	Φ44.5	Φ22.2
GMV-1350WM/B-X	Φ44.5	Φ22.2
GMV-1410WM/B-X	No need to enlarge pipe size	Φ25.4
GMV-1460WM/B-X	No need to enlarge pipe size	Φ25.4
GMV-1515WM/B-X	No need to enlarge pipe size	Φ25.4
GMV-1580WM/B-X	No need to enlarge pipe size	Φ25.4
GMV-1630WM/B-X	No need to enlarge pipe size	Φ25.4
GMV-1685WM/B-X	No need to enlarge pipe size	Φ25.4
GMV-1750WM/B-X	No need to enlarge pipe size	Φ25.4
GMV-1800WM/B-X	No need to enlarge pipe size	Φ25.4

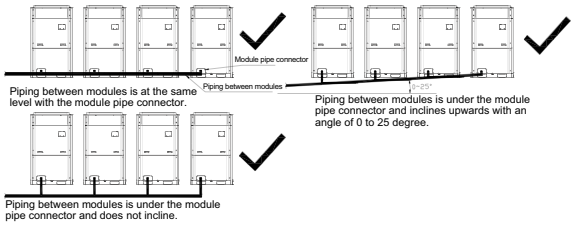
③ . If the length between an IDU and its nearest branch is above 10m, then double the size of the liquid pipe of IDU (only for the pipe size that is≤6.35mm).

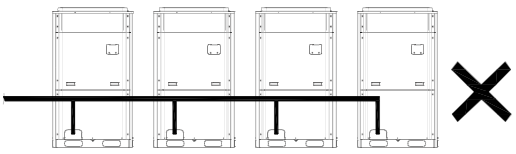
IV. Connection Pipe among Outdoor Modules



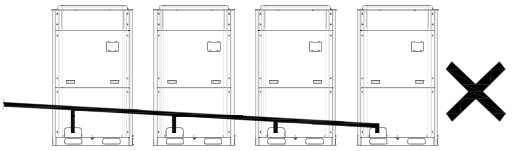
Note: When the distance between outdoor units exceeds 2m, U-type oil trap should be added at low-pressure gas pipe. A+B⩽10m.

Pipe connection among ODUs must meet the following requirements:





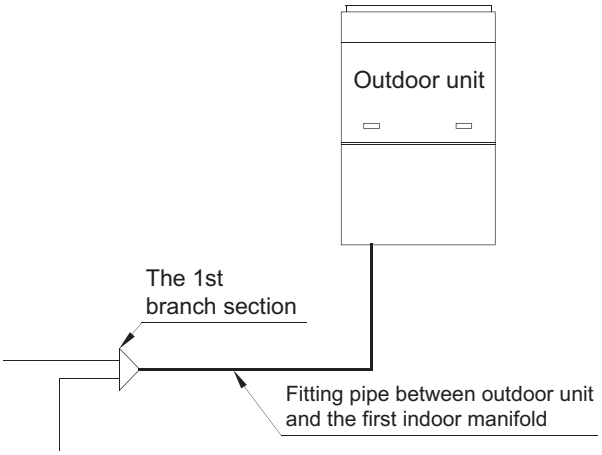
Piping between modules is above the module pipe connector.



Piping between modules is above the module pipe connector.

V. Fitting pipe between Outdoor Unit and the First Manifold

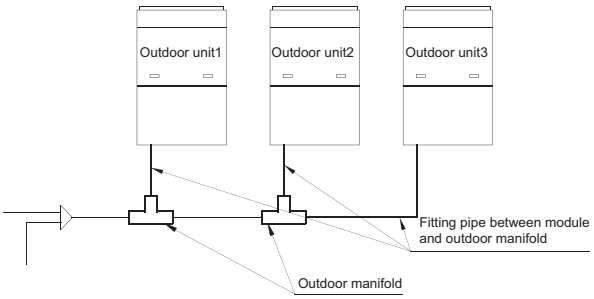
(1). For single module system, pipe size (between outdoor unit and the first manifold)is determined by that of outdoor unit.



Pipe size of basic outdoor module is shown as follows:

Basic Module	Pipe between ODU and the first branch of IDU	
	Gas Pipe(mm)	Liquid Pipe(mm)
GMV-224WM/B-X	Φ19.05	Φ9.52
GMV-280WM/B-X	Φ22.2	Φ9.52
GMV-335WM/B-X	Φ25.4	Φ12.7
GMV-400WM/B-X	Φ25.4	Φ12.7
GMV-450WM/B-X	Φ28.6	Φ12.7

(2). For multi-module unit, select appropriate manifold connected to oudoor module as per the pipe size of basic module. Pipe size of basic outdoor module is shown as follows:



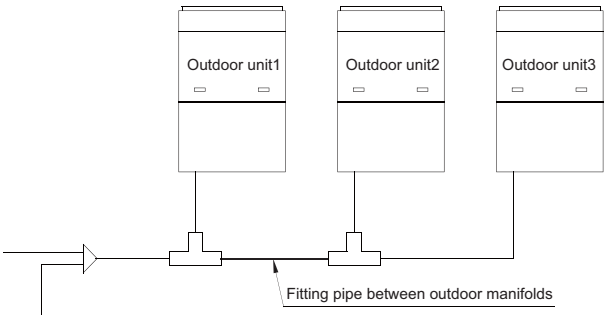
Basic Module	Pipe between module and branch of ODU	
	Gas Pipe(mm)	Liquid Pipe(mm)
GMV-224WM/B-X	Φ19.05	Φ9.52
GMV-280WM/B-X	Φ22.2	Φ9.52
GMV-335WM/B-X	Φ25.4	Φ12.7
GMV-400WM/B-X	Φ25.4	Φ12.7
GMV-450WM/B-X	Φ28.6	Φ12.7

Select the branch of outdoor module

	Module's capacity (C)	Model
Select the branch of outdoor module	504≤C	ML01/A

(3). Fitting pipe between two manifolds from basic modules

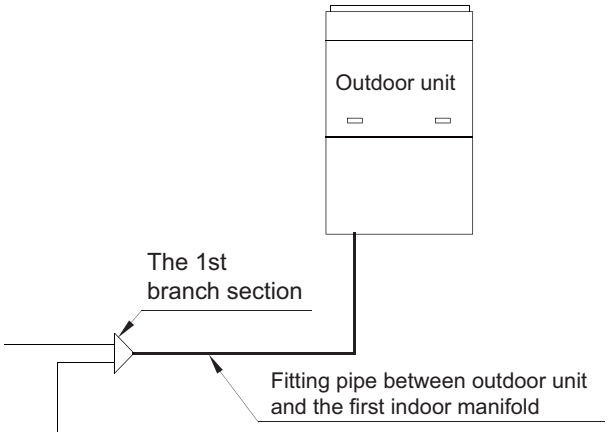
Pipe size (between two manifolds from basic modules)is based on the total capacity of upstream modules.



Total capacity of upstream modules Q(kW)	Pipe size between manifolds	
	Gas Pipe(mm)	Liquid Pipe(mm)
22.4 ≥ Q	Φ19.05	Φ9.52
28.0 ≥ Q > 22.4	Φ22.2	Φ9.52
40.0 ≥ Q > 28.0	Φ25.4	Φ12.7
45.0 ≥ Q >40.0	Φ28.6	Φ12.7
68.0 ≥ Q > 45.0	Φ28.6	Φ15.9
96.0 ≥ Q > 68.0	Φ31.8	Φ19.05
135.0 ≥ Q > 96.0	Φ38.1	Φ19.05
Q > 135.0	Φ44.5	Φ22.2

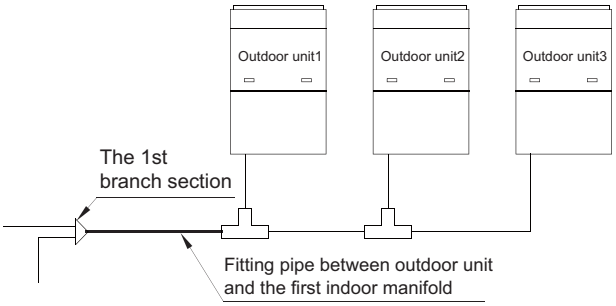
(4). Fitting pipe between the first manifold from indoor unit and the end manifold from outdoor unit

Single module unit



Basic Module(single module)	Pipe between ODU and the first branch of IDU	
	Gas Pipe(mm)	Liquid Pipe(mm)
GMV-224WM/B-X	Φ19.05	Φ9.52
GMV-280WM/B-X	Φ22.2	Φ9.52
GMV-335WM/B-X	Φ25.4	Φ12.7
GMV-400WM/B-X	Φ25.4	Φ12.7
GMV-450WM/B-X	Φ28.6	Φ12.7

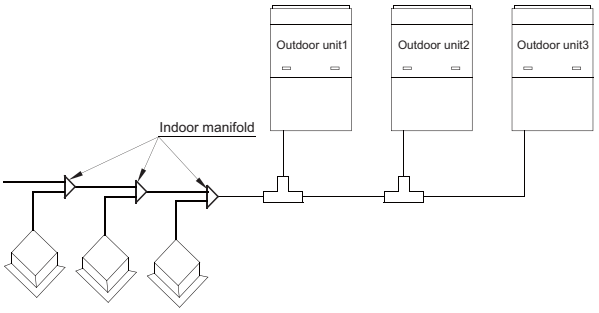
For multiple modules, the piping from ODU to the first branch of IDU is based on the total rated capacity of outdoor modules.



Total rated capacity of outdoor modules (multi-modular system)	Pipe between ODU and the first branch of IDU	
	Gas Pipe(mm)	Liquid Pipe(mm)
GMV-504WM/B-X	Φ28.6	Φ15.9
GMV-560WM/B-X	Φ28.6	Φ15.9
GMV-615WM/B-X	Φ28.6	Φ15.9
GMV-680WM/B-X	Φ28.6	Φ15.9
GMV-730WM/B-X	Φ31.8	Φ19.05
GMV-785WM/B-X	Φ31.8	Φ19.05
GMV-850WM/B-X	Φ31.8	Φ19.05
GMV-900WM/B-X	Φ31.8	Φ19.05
GMV-960WM/B-X	Φ31.8	Φ19.05
GMV-1010WM/B-X	Φ38.1	Φ19.05
GMV-1065WM/B-X	Φ38.1	Φ19.05
GMV-1130WM/B-X	Φ38.1	Φ19.05
GMV-1180WM/B-X	Φ38.1	Φ19.05
GMV-1235WM/B-X	Φ38.1	Φ19.05
GMV-1300WM/B-X	Φ38.1	Φ19.05
GMV-1350WM/B-X	Φ38.1	Φ19.05
GMV-1410WM/B-X	Φ44.5	Φ22.2
GMV-1460WM/B-X	Φ44.5	Φ22.2
GMV-1515WM/B-X	Φ44.5	Φ22.2
GMV-1580WM/B-X	Φ44.5	Φ22.2
GMV-1630WM/B-X	Φ44.5	Φ22.2
GMV-1685WM/B-X	Φ44.5	Φ22.2
GMV-1750WM/B-X	Φ44.5	Φ22.2
GMV-1800WM/B-X	Φ44.5	Φ22.2

(5). Manifold at indoor unit side

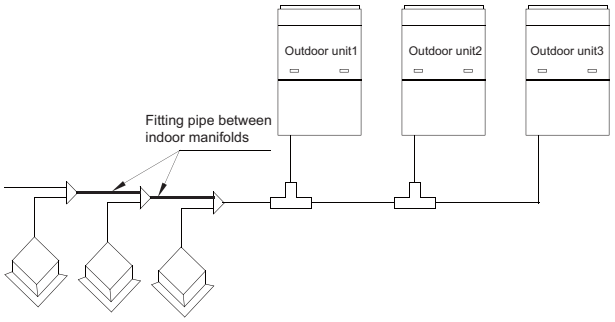
Manifold at indoor unit side can be selected as per total capacity of downstream indoor unit(s). Refer to the following table.



R410A Refrigerant System	Total capacity of downstream indoor unit(s) C (kW)	Model
Y-type Manifold	C ≤ 20.0	FQ01A/A
	20.0 < C ≤ 30.0	FQ01B/A
	30.0 < C ≤ 70.0	FQ02/A
	70.0 < C ≤ 135.0	FQ03/A
	135.0 < C	FQ04/A

(6). Fitting pipe between manifolds

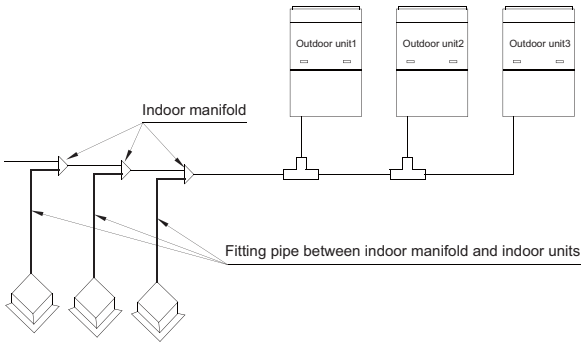
Pipe size (between two manifolds at indoor unit side) is based on the total capacity of upstream indoor unit(s).



Total Rated Capacity X of Downstream Indoor units (kW)	Size of Pipes between Manifolds at IDU Side	
	Gas Pipe (mm)	Liquid Pipe (mm)
X ≤ 5.6	Φ12.7	Φ6.35
5.6 < X ≤ 14.2	Φ15.9	Φ9.52
14.2 < X ≤ 22.4	Φ19.05	Φ9.52
22.4 < X ≤ 28.0	Φ22.2	Φ9.52
28.0 < X ≤ 40.0	Φ25.4	Φ12.7
40.0 < X ≤ 45.0	Φ28.6	Φ12.7
45.0 < X ≤ 68.0	Φ28.6	Φ15.9
68.0 < X ≤ 96.0	Φ31.8	Φ19.05
96.0 < X ≤ 135.0	Φ38.1	Φ19.05
135.0 < X	Φ44.5	Φ22.2

(7). Fitting pipe between indoor unit and manifold

Manifold should be matched with fitting pipe of indoor unit.



Rated capacity of indoor unit C(kW)	Pipe between indoor branch and IDU	
	Gas Pipe(mm)	Liquid Pipe(mm)
C ≤ 2.8	Φ9.52	Φ6.35
2.8 < C ≤ 5.0	Φ12.7	Φ6.35
5.0 < C ≤ 14.0	Φ15.9	Φ9.52
14.0 < C ≤ 16.0	Φ19.05	Φ9.52
16.0 < C ≤ 28.0	Φ22.2	Φ9.52

Part 6 Pipe Installation and Insulation

I. Pipe Installation for the Cooling System

1. Precautions on Pipe Direction Design

Refrigerant pipe layout must be designed in accordance with the following principles:

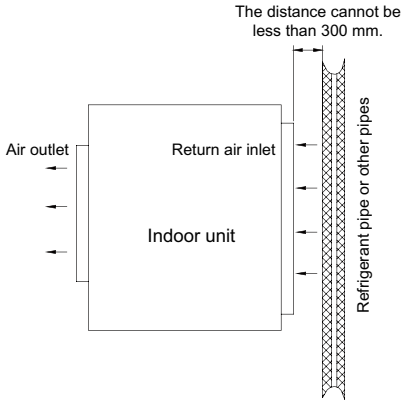
(1). The air conditioning installation should not damage the bearing structure or the decorative style. Air conditioning pipes should be laid out along the bottom of beam as possible. If pipes meet one another at the same elevation, process based on the following principles:

Drain pipes enjoy the highest priority. Air ducts and pressure pipes should leave places for gravity pipes.

Air ducts and small pipes should leave places for major pipes.

(2). The refrigerant pipe layout must be optimal in actual engineering with minimum pipe length and bends. In this way, the performance of the unit can be maximized.

(3). The refrigerant pipe cannot affect air discharge and return of internal units. The minimum distance between the refrigerant pipe with an insulation layer and the air return box is 300 mm. If the air return or manhole is at the right lower part of the unit, the minimum distance is 150 mm. When the refrigerant pipe needs to be laid at the air outlet side, avoid laying the pipe at the front of the air outlet. The refrigerant pipe cannot connect to any part of the unit except the joint points. If the preceding principles are not followed, performance of the unit will be affected and running noises will be increased.



(4). The refrigerant pipe must be laid away from the manhole of the unit so that sufficient space can be reserved for maintenance.

(5). The riser should be installed in the air conditioning tube well, and the horizontal pipe should be placed in the ceiling, if possible.

2. Processing to Refrigerant Pipes

2.1 Cut-off and Burring

Use a special-purpose pipe cutter to cut copper pipes instead of using a hacksaw.

Cut the pipes gently to ensure that the copper pipe does not deform.

After cutting the pipes, use a slicker to grater bur the pipes with the pipe opening inclining downward so that the copper scales do not fall into the pipe.

Allowable deviation: Skewness of the cross section cannot

exceed 1% of the copper pipe caliber.

If the copper pipe is not used immediately after cut-off, cover it with a sealing cap or adhesive tape.

2.2 Pipe Cleaning

Cleaning with a piece of silk cloth: Wrap a thin steel wire with a piece of clean silk cloth. Crumple the cloth into a lump with diameter larger than the pipe calibre. Apply several drops of chlorylene to the cloth. Push the cloth in from one end of the pipe and pull out from the other end. Every time the cloth is pulled out, remove the dust and sundries with chlorylene. Wash repeatedly until the pipe is clean. This method applies to straight pipes.

Cleaning with nitrogen: Blow off all dust and sundries in the pipe with nitrogen. This method applies to coils.

After cleaning, cover the both ends of the pipe with a sealing cap or adhesive tape.

2.3 Pipe Bending

◆ Processing methods:

Manual bending: applies to thin copper pipes (Φ6.35 mm to Φ12.7 mm)

Mechanical bending: applicable range (Φ6.35mm to Φ54.1mm)

◆ Requirements:

The radius of the bending pipe must exceed 3.5D. The ratio of the short diameter after bending to the original diameter must exceed 2/3.

◆ Precautions:

During bending, there must be no corrugation or deformation inside the pipe.

The welding point of the pipe should not be at the bending part. The distance between the nozzle welding joint and the bending part should be less than 100 mm.

2.4 Pipe Expanding

Pipe expanding is used to provide a welding point for pipe connection. Requirements on pipe expanding are as follows:

(1). All burrs and sundries inside the pipe must be cleared after cut-off.

(2). Before pipe expanding, apply appropriate amount of lubricant on the surface of the pipe. (The lubricant must meet the refrigerant system's requirements.)

(3). Pipe expanding length must be in accordance with the insertion depth of the caliber.

(4). To avoid leakage due to straight lines at the expanding point, turn round the copper pipe and then make corrections.

(5). Apply appropriate force during pipe expanding to avoid crack.

2.5 Flaring

Another mode of pipe connection is flare opening connection, which requires pipe flaring before connection. Before pipe flaring, apply appropriate amount of lubricant on the surface of the opening to ensure smooth pass of flaring nuts and avoid pipe distortion. (The lubricant must meet the refrigerant system's requirements.) The concentricity must be ensured after pipe flaring. The sealing face must be intact without any burr, crack, or wrinkle.

◆ Requirements on pipe flaring are as follows:

(1). End faces of the copper pipe are smooth.

(2). Burrs and turnups inside the pipe opening must be cleared.

(3). Install flaring nuts in the pipe before pipe flaring.

(4). The flared opening must be concentric with the main pipe. No eccentricity is allowed.

(5). Put the pipe into the root of the pipe expander.

(6). Longitudinal cracks cannot be generated.

3. Installation of Refrigerant Pipes

3.1 Operation Sequence

The sequence for installing the refrigerant pipe is as follows:

Preparing and installing the support, hanger, and bracket – Piping according to the drawing – Cleaning the pipe – Processing the pipe – Adding an insulation sleeve – Connecting the pipe – Fixing the pipe – Blowing contaminants in the pipe system – Performing a air-tightness test – Performing insulation

3.2 Construction of Built-in Metal Fittings

(1). Construction of supports, hangers, and brackets for pipes: These parts must be fixed securely in reasonable type and style without any tilt. The surface is clean without any dirt. The parts embedded into the wall or floor cannot be painted or coated and must be free from grease stains.

(2). Construction of fixing bolts for devices: Ensure sufficient rigidity for the devices. Take anticorrosive measures for exposed part of built-in fittings. If the foundation must be waterproof, takes waterproof measures.

(3). Construction of steel casings: Equip a steel casing for all pipes which are led through the wall or floor. Pipe welding joints cannot be placed inside the sleeve. The steel casing must be parallel with the bottom of the wall or floor but be 20 mm or more above the bottom. The diameter of the steel casing must be determined based on the thickness of the insulation layer and the inclination degree of the condensate water pipe. Fill the gap between the pipe and the sleeve with flexible and non-flammable materials. The sleeve cannot be used as a support point of the pipe.

(4). Operation Sequence

If possible, make ink lines on the ground and project them to the top of the building.

(5). Installing Built-in Metal Fittings

Select built-in metal fittings in accordance with local regulations.

(6). Installing Expansion Bolts

Use expansion bolts when built-in metal fittings are unavailable due to design change.

(7). Installing Expansion Bolts

If the foot pedal is 2 m or more from the ground, there must be three points of support.

The foot pedal must be tightened securely with the ladder.

Do not perform operations on the top of the ladder.

3.3 Shaping and Fixing of Pipes

When installing refrigerant pipes, ensure that the directions and branches are correct with minimum length. Use minimum number of braze welding junctions and elbows. Alignment and insulation after installation cannot affect the pipe location and elevation. There shall not be flat bending or corrugation on the

pipe after piping.

Use angle steel support, bracket, round steel hanger, U-type pipe clip, or flat steel to fix pipes outside the insulation layer. It is better that the insulation materials be not compressed to ensure good insulation.

The style and workmanship of supports, hangers, and brackets must follow the standard T616 HVAC Systems Design Handbook.

The minimum distance between supports, hangers, and brackets is listed in the table below:

External Diameter of the Pipe (mm)	ф≤16	40>ф≥19.05	ф≥40
Distance between Horizontal Pipes (mm)	1000	1500	2000
Distance between Vertical Pipes (mm)	1500	2000	2500

The pipe led through a wall or beam must be fixed by a support, hanger, or bracket on both ends at the position 300 mm away from the hole.

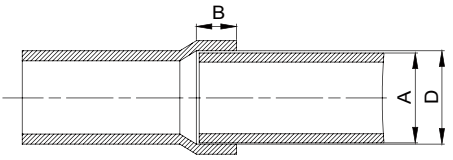
3.4 Pipe Connection

3.4.1 Flaring Connection

The refrigerant pipes and IDUs are connected by using the flare opening. Therefore, the quality of flaring connection must be ensured. The flaring depth of the bell mouth cannot be smaller than the caliber. The flaring direction must face towards the direction of medium flow. Use two torque wrenches to fasten the connection.

3.4.2 Socket Welding

The gap between socket components should be proper to ensure that the connection will not loose from the friction surface. The flaring direction of the socket component must face towards the direction of medium flow .During pipe connect, protect the braze welding part according the length specified below:



A: External Diameter of the Pipe (mm)	B: Minimum Insertion Depth (mm)	D-A: Gap between Pipes (mm)
ф6.35	6	0.05-0.21
ф9.52 ф12.7	7	
ф15.8	8	0.05-0.27
ф19.05 ф22.2 ф25.4	10	
ф28.6, ф31.8	12	0.05-0.30
ф38.1 ф44.5	19	0.15-0.35
ф54.1	24	0.15-0.35

3.4.3 Bell Socket Welding

The bell socket welding is another form of socket welding. It uses the sleeve or pipe in a larger size for welding. The insertion depth cannot be smaller than that required by socket welding.

3.4.4 Flange Connection

The pipes with large caliber and the devices are always connected by using a flange, which must be clean and intact. Before installation, apply lubricant on the surface of the flange. Two flanges must be symmetrical. Fasten with screws at the diagonal direction to avoid inclination.

3.5 Welding Protection

Aerate with nitrogen before and during welding and keep aerating for 30 s after the welding is finished.

Equip a pressure regulator valve to the nitrogen cylinder.

The nitrogen flow is above 4-6 L/min (pressure of 0.02 to 0.05 Mpa) and must be regulated based on the pipe caliber.

3.6 Requirements on Manifold Installation

Manifolds are used to divert refrigerant. Requirements on manifold installation are as follows:

A. Ensure that the manifold is close to the IDU to reduce impact on refrigerant assignment by IDU branches.

B. The manifold must be that specified by the manufacture and match with the devices.

C. Ensure that the manifold model is correct.

D. Manifolds can be laid in the following ways:

D1. Horizontal installation: The three ports must be on the same level. The shaping size and assembly angle cannot be changed.

D2. Vertical installation: The direction can be upwards or downwards. Three ports must be on the same elevation without inclination.

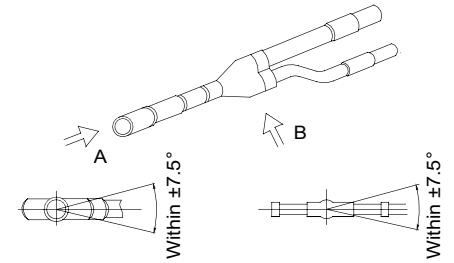
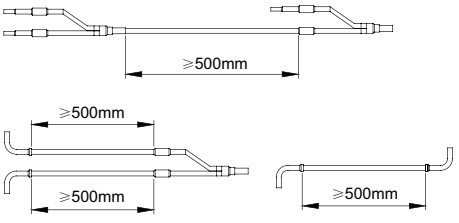


Diagram for direction A Diagram for direction B

D3. The length of a straight pipe between two manifolds cannot be less than 500 mm.

D4. The length of a straight pipe before the main pipe port of the manifold cannot be less than 500 mm.

D5. The length of a straight pipe between the branch of the manifold and the IDU cannot be less than 500 mm.



E. Fixing of manifolds.

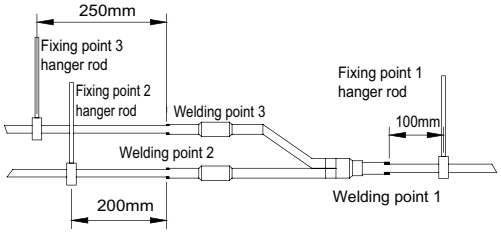
There must be three fixing point for both horizontal and vertical installation of the Y-type manifold.

Fixing point 1: 100 mm on the main inlet manifold from the welding point

Fixing point 2: 200 mm on the main branched pipe from the

welding point

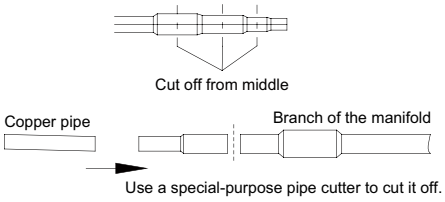
Fixing point 3: 250 mm on the branched pipe from the welding point



Branches of a manifold must be laid parallel and cannot be wrapped in superimposed mode.

F. The liquid pipe and gas pipe must have the same length and be laid in the same route.

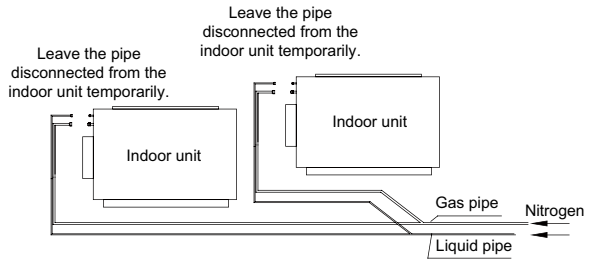
G. The Y-type manifold has an attached pipe used to adjust the diameter of different pipes. If the pipe size on site does not match the size of the manifold junction, use the pipe cutter to cut at the middle of the pipe and remove burrs. Then insert the copper pipe to proper depth. A concave bag for positioning is available to the manifold purchased from Gree.



H. Because the manifold structure is complex, perform with care to ensure tight insulation.

3.7 Pipe Cleaning by Nitrogen

Before connecting the flare opening of the pipe to the IDU, connect the pressure regulator valve on the nitrogen cylinder to the liquid pipe in the outdoor pipe system. Regulate the nitrogen pressure to about 5 kgf/cm² and blow nitrogen into the pipe for 1 minute. Repeat this operation for three times till the dirt and water are discharged. After cleaning the liquid pipe, perform the same operation to clean the gas pipe.

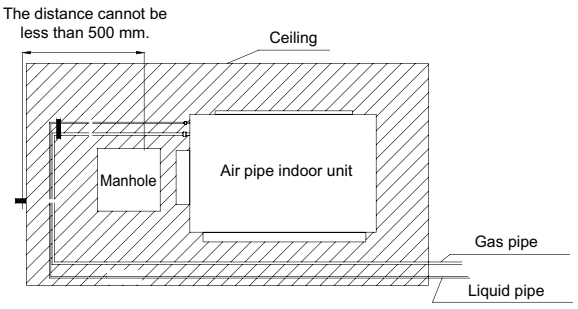


Perform an air-tightness test and a vacuum test to the entire refrigerant pipe system after the construction is finished.

There must be a secure distance between pipes. Pipes in different types must be fixed separately.

3.8 Regard for Refrigerant Pipe Installation

During refrigerant pipe installation, ensure a distance above 500 mm between the pipe and the electric box of the unit for maintenance. In a case when the space is not enough, the final piping way must be determined by the technical personnel.



3.9 Filter and Drier Installation for the ODU

As the piping for the VRF system is complex, it is recommended that a filter is installed for the gas pipe and a drier is installed for the liquid pipe during construction. This ensures aridity and cleanness of the piping system and further improves the operation stability of the system.

The procedure is as follows:

First, weld a stop valve with the corresponding caliber to the gas pipe and liquid pipe at the position relatively close to the ODU and easy for operation.

Second, install a filter (100 mesh/ft^2) between the added stop valve outside the gas pipe and the stop valve of the ODU. Then install a drier filter between the added stop valve outside the liquid pipe and the stop valve of the ODU.

Lastly, after the test run is complete,

To remove the filter from the gas pipe after starting all IDUs and keeping them running cooling mode for 24 hours:

(1). Power off all units.

(2). Turn off the two stop valves of the gas pipe.

(3). Remove the filter.

(4). Short connect with a copper pipe with the same caliber and vacuumize the pipe.

(5). Open the two stop valves and keep normal running.

To remove the drier filter from the liquid pipe after starting all IDUs and keeping them running in heating mode for 24 hours:

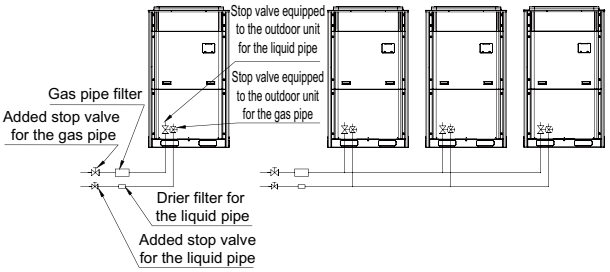
(1). Power off all units.

(2). Turn off the two stop valves of the liquid pipe.

(3). Remove the drier filter.

(4). Short connect with a copper pipe with the same caliber and vacuumize the pipe.

(5). Turn on the two stop valves and keep normal running.



II. Pipe Installation for the Condensate Water System

1. Pipes

Generally, U-PVC water supply pipes bonded with special glue are adopted as condensate water pipes. PP-R, PP-C, and hot galvanized steel pipes can also be adopted. Aluminium plastic compound pipes cannot be used.

2. Requirements on Installation

(1). Determine the direction and elevation of a condensate water pipe before installing it. Avoid overlapping it with other pipes to ensure straight inclination. The clamp of the pipe hanger is fixed outside the insulation layer. The height of the clamp can be adjusted.

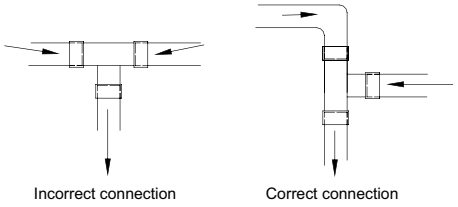
(2). Distance between Hangers

External Diameter of the Pipe (mm)	Φ≤25	32>Φ≥25	Φ≥32
Distance between Horizontal Pipes (mm)	800	1000	1500
Distance between Vertical Pipes (mm)	1500		2000

There are at least two hangers for each vertical pipe.

(3). The inclination degree of the condensate water pipe must be above 1% and that of the main pipe cannot be lower than 0.3%. Adverse slopes are not allowed.

(4). When connecting three-way pipes, the two-way straight pipes must be laid on the same slope, as shown in the following figures.



(5). The condensate water pipe cannot be tied with the refrigerant pipe.

(6). A ventilation hole must be provided on the top of the drain pipe to ensure smoother discharge of condensate water.

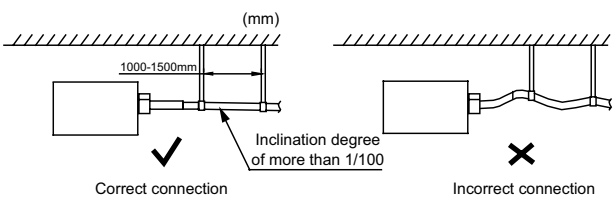
(7). After pipes are connected, perform a test with some water and another test with full water in the pipe to check whether drainage is smooth and whether water leakage exists in the pipe system.

(8). Equip a steel casing for all pipes which are led through the wall or floor. Pipe bonding joints cannot be placed inside the sleeve. The steel casing must be parallel with the bottom of the floor or wall. There must be a height drop of 20 mm from the ground when the pipe is lead through the floor. The sleeve cannot affect the inclination degree of the pipe. Fill the gap between the pipe and the sleeve with flexible and non-flammable materials. The sleeve cannot be used as a support point of the pipe.

(9). Bond the insulation material joints with special glue and then wrap them with plastic adhesive tape. The width of the adhesive tape must be 5 cm or more to prevent dewing.

3. Other Requirements

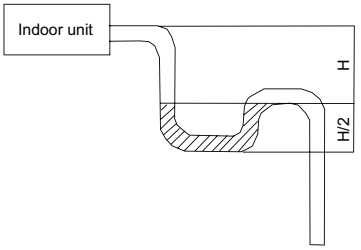
(1). Ensure an inclination degree of more than 1% when connecting the drain pipe to the IDU.



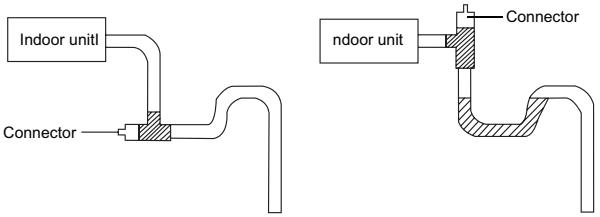
(2). When connecting the drain pipe to that of the IDU, fix the pipes with the bands provided upon delivery instead of using the glue to facilitate further maintenance.

(3). When connecting the drain pipe branches to the main pipe, lead through from the above part of the main pipe.

(4). If the air volume of the IDUs is high and outdoor air resorption may be caused by negative suction pressure, provide a u-type drain trap at the water outlet side of each IDU, as shown in the following figure.



- Install drain trap connectors as shown in the following figure.
- Install a drain trap connector for each unit.
- The drain trap connector shall be installed in a way that facilitates trap cleaning.



(5). During condensate water pipe installation, ensure a distance above 500 mm between the pipe and the electric box of the unit for maintenance. In a case when the space is not enough, the final piping way must be determined by the technical personnel.

4. Requirements on Installation of Drain Pipes for Different Types of IDUs

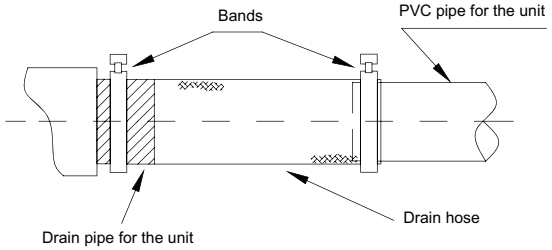
4.1 Drain Pipe Installation for Hidden Air-duct-type IDU for Air Supply

(1). Ensure an inclination degree of greater than 1% when connecting the drain pipe to the IDU.

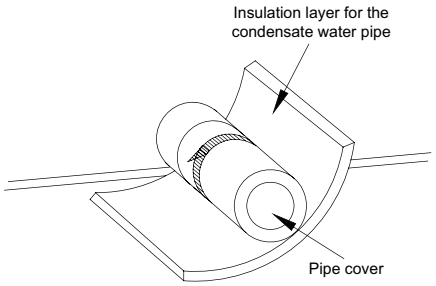
(2). When connecting the drain pipe to that of the IDU, fix the pipes with the bands instead of using the glue to facilitate further maintenance.

(3). There is a condensate water outlet on both sides of the IDU. After one condensate water outlet is determined, use the rubber stopper to block the other outlet. Tie it with threads and strap with insulation materials to prevent leakage.

(4). The connection between the drain pipe and that of the IDU is shown in the following figure.



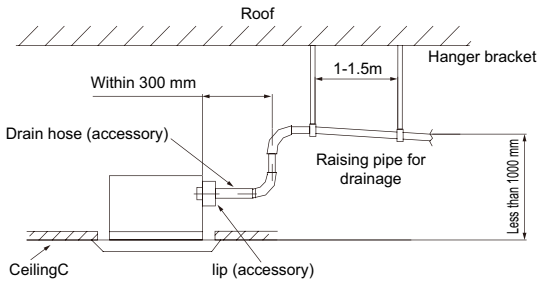
(5). Apply insulation materials to the condensate water pipe joints to prevent dewing. d. Insulation for connection between the drain pipe and that of the IDU is shown in the following figure.



4.2 Drain Pipe Installation for IDU

(1). Use pipe clips instead of applying glue to connect the hoses provided upon delivery and plastic pipes on the device. Connect the other end of the joint to the elbow. The height from the suction inlet of the discharge pump is about 200 to 500 mm. Ensure a proper inclination degree while connecting to the main drain pipe.

(2). The lifting pipe for drainage must be provided as shown in the following figure.



(3). The drain pump shall be fixed securely. Otherwise, abnormal noises will be generated.

5. Requirements on Independent Drainage for Each IDU

Requirements on independent drainage design for each IDU are as follows:

(1). There must be a proper inclination for the drain pipe.

(2). The drain pipe must be installed to facilitate drainage to the largest extent and be as short as possible.

(3). If the water is discharged to the outdoor side, it cannot drop to the outdoor ground directly.

6. Requirements on Centralized Drainage for IDUs

(1). When there are multiple IDUs in the same building, centralized drainage is adopted.

(2). When a header pipe is used, the drain pipe of each IDU must be higher than the header pipe.

(3). The diameter of the header pipe must be determined on the number and capacity of IDUs.

(4). When installing pipe, start from the highest point of the pipe and follow the specified inclination to smoothly discharge condensate water.

(5). Connect branches to the main pipe from the upper part or side instead of lower part of the main pipe.

(6). Insulate all condensate water pipes, especially for joints at elbows.

III. Insulation System

1. Insulation for the Refrigerant Pipe System

1.1 Insulation Materials

Use closed-cell foam insulation materials with flame retardant grade of B1.

The heat conductivity is not greater than 0.035 w/(m·k) when the average temperature is 0°C.

1.2 Thickness of the Insulation Layer

External Diameter of the Pipe (mm)	≤ 12.7	≥ 15.88
Thickness of the Insulation Layer (mm)	≥ 15	≥ 20

Use sunblock, anti-weathering, and non-cracking insulation materials for outdoor pipes.

1.3 Procedure of Insulation

(1). Select insulation materials based on design requirements.

(2). Wear the insulation sleeve before connecting refrigerant pipes. Users cannot cut the insulation material apart and then wrap up with ties after connecting the pipes by welding.

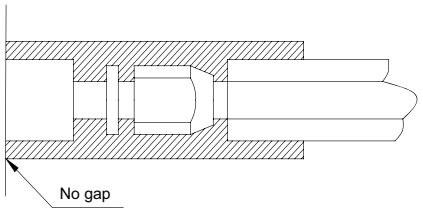
(3). Specifications of the insulation sleeve must match with that of the refrigerant pipes.

(4). Reserve a distance of about 200 mm near the welding point to protect the insulation sleeve during welding. After performing the air-tightness test, perform insulation to the welding point separately to ensure continuity of the insulation sleeve.

(5). The insulation layer cannot crack during construction. Bond the insulation material joints with special glue and then wrap them with electrical adhesive tape. The width of the adhesive tape must be 50 mm or more to ensure secure connection.

(6). Use glue to bond the insulation material at the water outlet to the unit to prevent dewing.

(7). Wrap joints of indoor/outdoor units with insulation materials. There must be no gap between the joint and the wall of the indoor/outdoor unit, as shown in the following figure.



2. Insulation for the Condensate Water Pipe System

(1). Insulation Materials

Use closed-cell foam insulation materials with retardant grade of B1.

The heat conductivity is not greater than 0.035 w/(m·k) when the average temperature is 0°C.

(2). Thickness of the Insulation Layer

Thickness of the insulation layer for the condensate water pipe must be greater than 10 mm.

(3). Bond the insulation material joints with special glue and then wrap them with plastic adhesive. The width of the adhesive must be greater than 5 cm to prevent dewing.

(4). Insulation is not required for the outdoor part of

condensate water pipes.

3. Insulation for Air Ducts

(1). Insulation for air duct components and devices must be performed after the air leakage test is performed or after quality check.

(2). Use centrifugal glass wool or rubber and plastic materials for insulation or use novel insulation air ducts.

(3). The insulation layer should be flat and tight without any crack or gap.

(4). Thickness of the Insulation Layer

For the air supply and return air pipe laid in a room without an air conditioner, thickness of the rubber and plastic insulation layer is 35 mm.

For the air supply and return air pipe laid in an air conditioning room, thickness of the rubber and plastic insulation layer is 20 mm.

(5). Supports, hangers, and brackets of the air duct must be installed outside the insulation layer. A chock must be provided between the support, hanger, or brackets and the air duct.

Part 7 Electric and Controller Installation

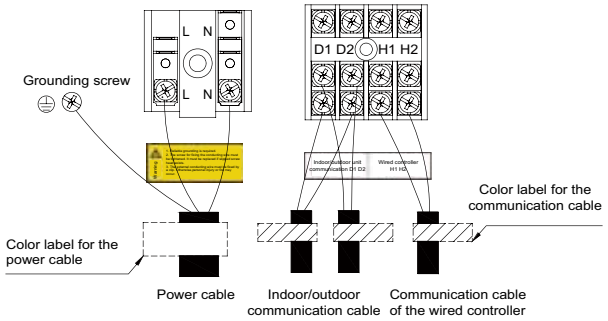
I. Precautions

Both the power cable and communication cable must be connected properly. If the power cable is connected to the communication port, the main board will be burnt.

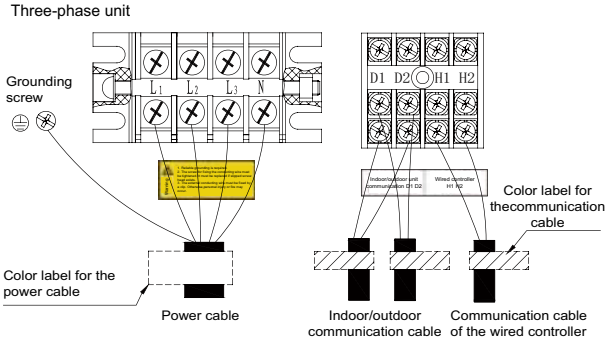
The power cable and communication cable can be identified in the following ways:

Method 1: Use sheaths in different colours.

Single-phase unit



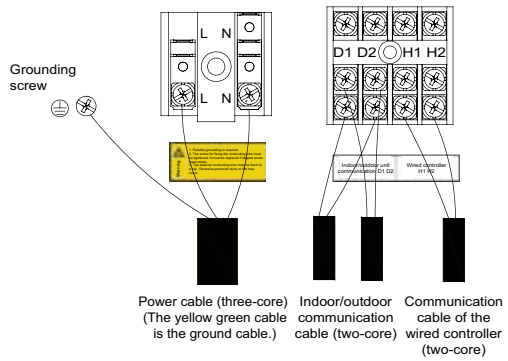
Three-phase unit



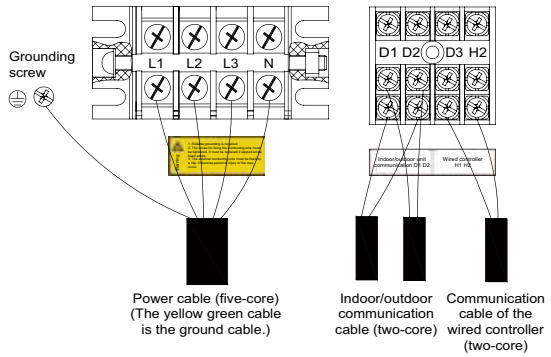
Method 2: Use different types of cables.

The diameter of the power cable is larger than that of the communication cable. Alternatively, adopt three cores or more for the power cable and two cores for the communication cable.

Single-phase unit



Three-phase unit



Elaborate the method with the installation personnel on site no matter which method is adopted.

II. Installation of the Power Cable

1. Precautions

(1). The air conditioning unit is category 1 electrical appliance which requires reliable grounding.

(2). The grounding resistance must meet the requirement of GB 50169.

(3). The yellow green cable inside the air conditioning unit is a grounding cable. It cannot be used for other purposes or be cut off. Do not fix it with tapping screws. Otherwise, an electric shock may be caused.

(4). A reliable ground terminal must be provided for the power. Do not connect the grounding cable to any of the following:

1). Water pipes

2). Gas pipes

3). Drainage pipe

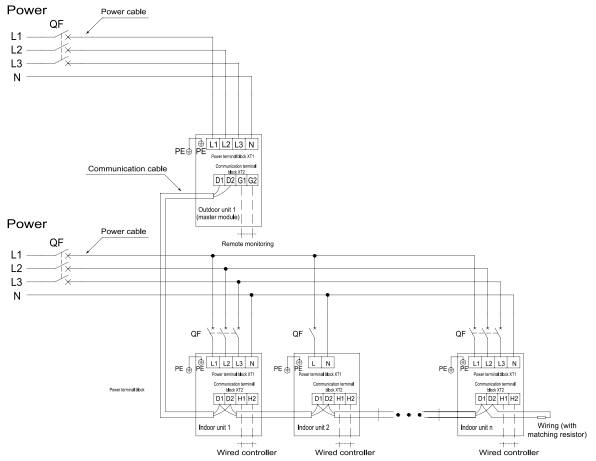
4). Other places deemed as unreliable

(5). The power cable and the communication cable must be laid separately with a distance of greater than 20 cm. Otherwise, the communication of the unit will be affection.

2. Requirements on Power Cable Configuration

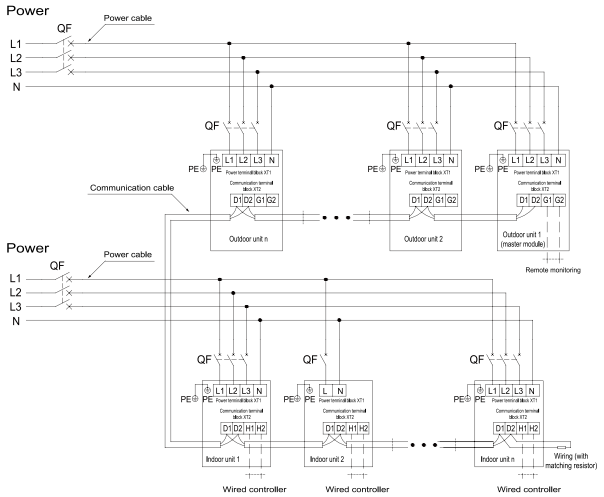
Configure a circuit breaker to each unit for short circuit and overload protection. In addition, configure a general circuit breaker to both the indoor and ODUs to switch on or switch off the general power of the IDU or ODU.

(1). External Connection for Individual Units



Note:The maximum number of connected IDUs (n) is determined based on the capacity of the ODU. For details, see the description on unit capacity configuration.

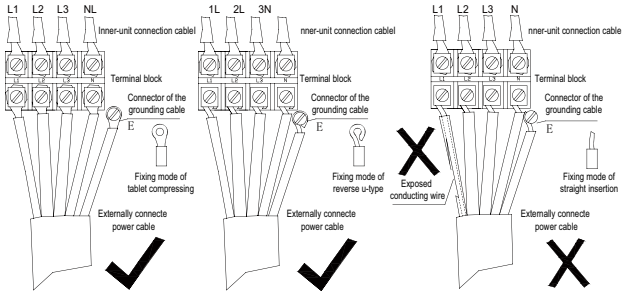
(2). External Connection for Modularly Connected Units



Note:The maximum number of connected ODUs (N) and that of connected IDUs (n) are determined based on the combination form of ODUs. For details, see the description on unit capacity configuration.

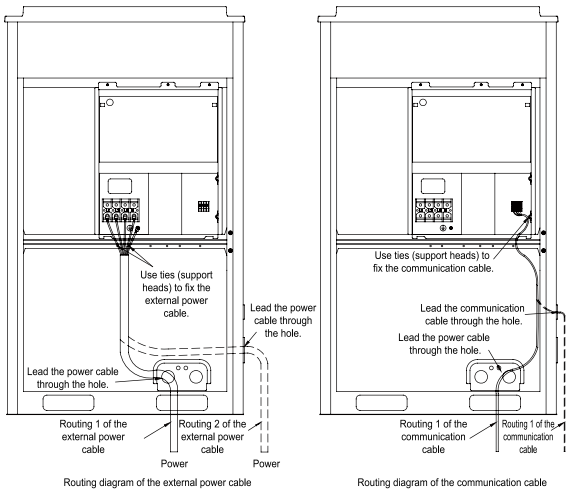
3. Procedure for Installing the Power Cable

(1). Knock off the knockouts used for threading the external power cable, fit the threading rubber ring to the hole, and thread the power cable through the hole. Connect L1, L2, L3, and N of the power cable, and the grounding cable to L1, L2, L3, and N on the power terminal block and the grounding screw next to the terminal block respectively.



(2). Fasten and fix the power cable with ties (support heads).

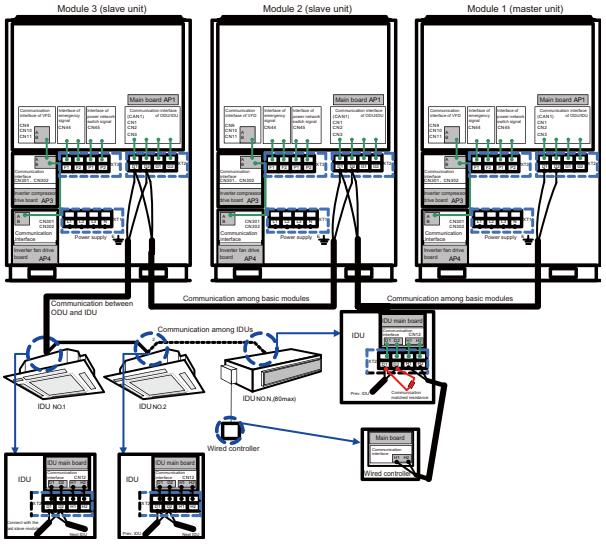
(3). Lay the power cable and communication cable for the ODU according to the following figures.



Note: Provide a threading rubber ring when threading a strong power cable or a communication cable.

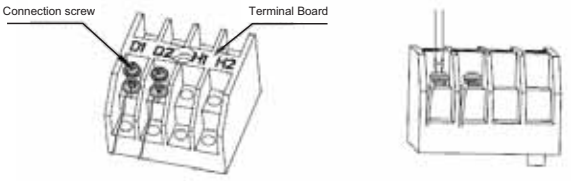
III. Installation of the Communication System

The CAN communication network is adopted for GMV5 VRF system. Manual DIP or identification on polarities of the communication power is not required for the IDU. Only the function DIP needs to be set for the ODU. For details, see the description on function setting of the ODU.



1. Connection of Communication Cable Terminals

All connections for communication of GMV5 are fastened by screws.



2. Connection of Communication Cables

The communication bus of indoor and ODUs must be connected in series instead of in star mode. The last IDU of the bus shall be connected to a matching resistor (placed in the package of the ODU).

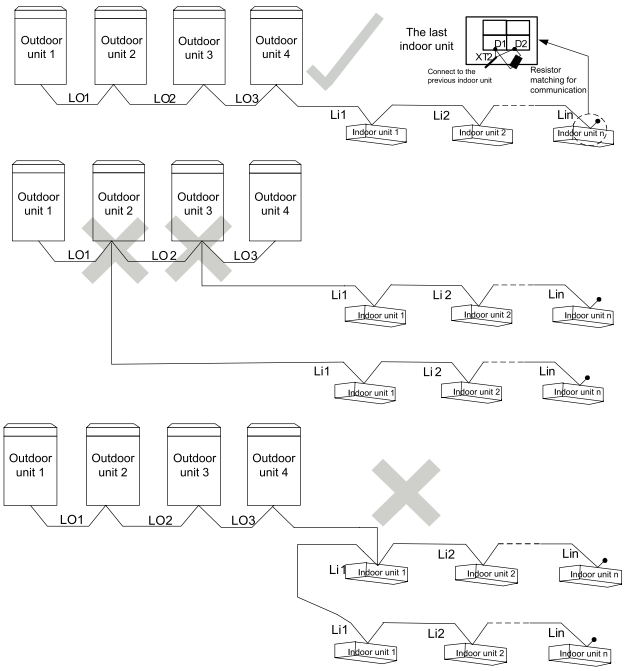


Figure 4 Communication cable connection for IDUs and ODUs

3. Communication Cable Connection Method and Procedure

(1). Communication cable connection between the IDUs and ODUs

The communication cable between the IDUs and ODUs is connected via interface D1/D2 on the terminal block XT2. Connection modes for the single-module system and multi-module system are shown in the following figures.

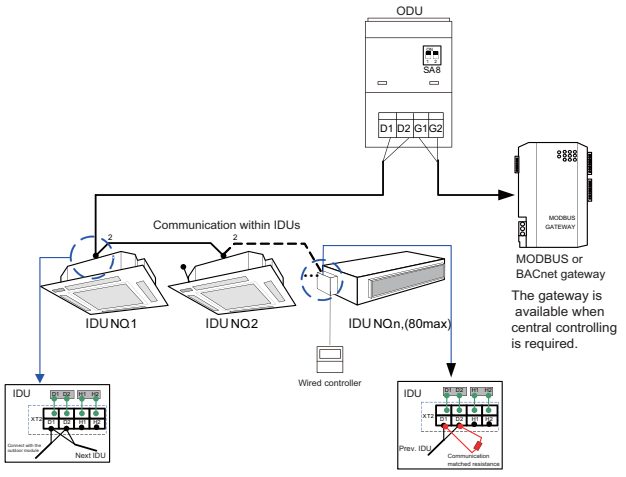


Figure 5 Communication cable connection for the single-module system

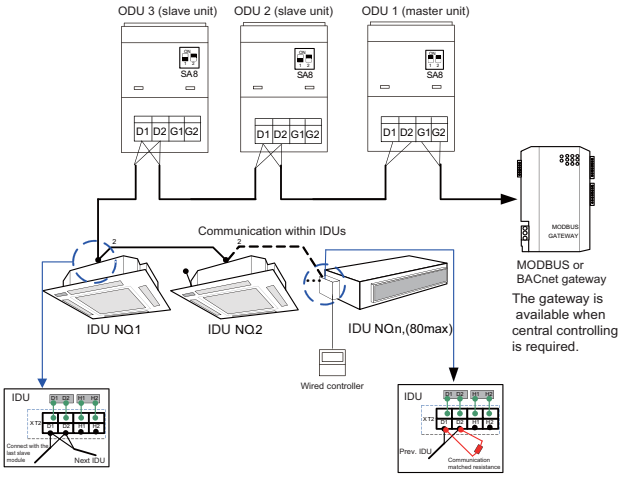


Figure 6 Communication cable connection for the multi-module system

Note:

① . If there are multiple modules for the modular ODU, the master unit must be the first ODU module on the communication cable and cannot be connected to the IDU. (The master unit is set by SA8 on the main board of the ODU.)

② . If there are multiple modules for the modular ODU, the IDU must be connected to the slave module of the last ODU. (The slave unit is set by SA8 on the main board of the ODU.)

③ . The communication cable and power cable must be laid separately to avoid interference.

④ . The communication cable must be long enough to avoid joints.

⑤ . Indoor units must be connected in series. The last IDU shall be connected to a matching resistor (placed in the package of the ODU).

(2). Communication cable connection between the IDU and wired controller

Connection modes for the communication cable between the IDU and wired controller are shown in the following figures.

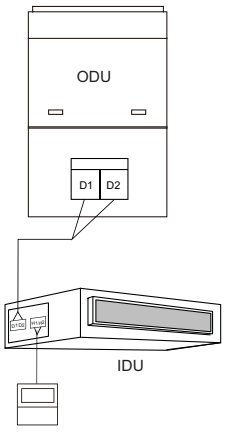


Figure 7.1 One wired controller controlling one IDU

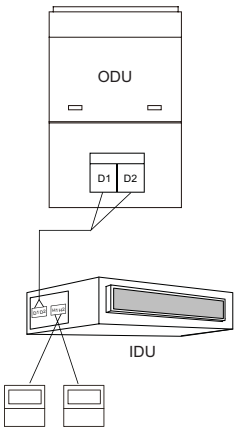


Figure 7.2 Two wired controllers controlling one IDU

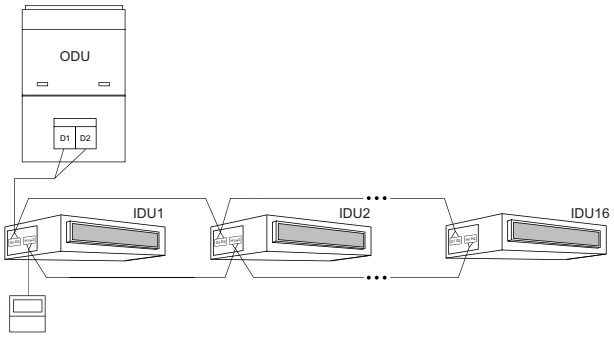


Figure 7.3 One wired controller controlling multiple IDUs

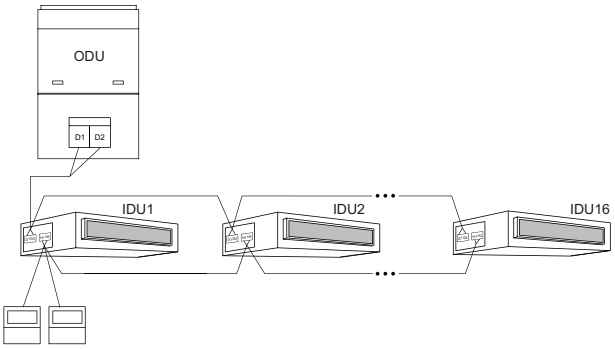


Figure 7.4 Two wired controllers controlling multiple IDUs

When two wired controllers control multiple IDUs, the wired controllers can be connected to any IDU which is in the same series. Set of the two wired controller to the secondary wired controller. The number of IDUs controlled by the wired controller cannot exceed 16. All connected IDUs must be in the same network.

The secondary wired controller can be set in start-up or shutdown mode.

① . Press the “FUNCTION” button for 5 seconds on the wired controller to be set as the secondary wired controller. The temperature area displays “C00”. Continue to press the “FUNCTION” button for 5 seconds, the parameter setting interface is displayed and the temperature area displays “P00”.

② . Select code P13 by pressing “∧” or “∨”. Press the “MODE” button to switch to parameter value setting. When the parameter value flickers, select code 02 by pressing “∧” or “∨”. Then press the “ENTER/CANCEL” button to finish setting.

③ . Users can press the “ENTER/CANCEL” button to return to the previous level till parameter setting exits.

The parameter setting list is shown below:

Parameter Code	Parameter Name	Parameter Range	Default Value	Remark
P13	Wired controller address setting	01: primary wired controller 02: Secondary wired controller	01	When two wired controllers control one or multiple IDUs, the addresses of the controllers must be different. The secondary wired controller (address: 02) does not support unit parameter setting except setting of its address.

Note:

① . All wired controllers are set to primary wired controllers upon delivery.

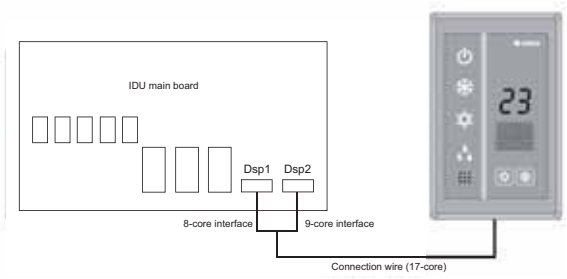
② . In parameter setting status, Fan, Timer, Sleep, and Swing buttons are unavailable. Press the “ON/OFF” button to return to the home page without executing the action of power-on or power-off.

③ . In parameter setting status, the remote controller signal is unavailable.

(3). Connection between the air duct type IDU and receiver board

When the air duct type IDU needs to be connected to the remote-control receiver board, connect via Dsp1 and Dsp2 on the main board of the IDU.

IDU Type	Remote-control Receiver Board	Connection Type	Corresponding Main Board Interface of the IDU
Air duct type	JS03	Inter-board connection (17 cores)	Dsp1 (interconnecting with the 8-core interface) Dsp 2 (interconnecting with the 9-core interface)



Note:

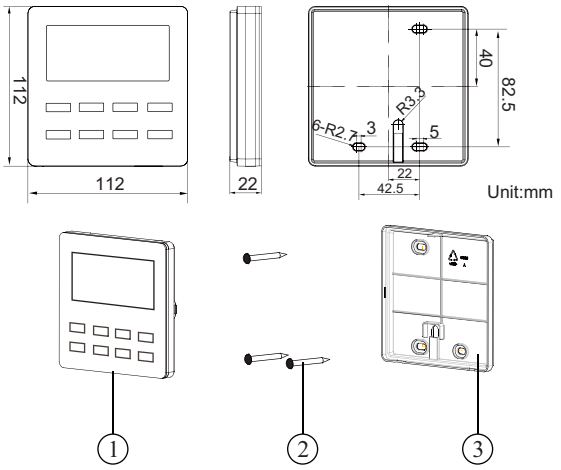
① . The wired controller and the remote-control receiver board can be used at the same time.

② . When selecting the remote-control receiver board, select a remote controller.

4. Installation and Disassembly of the Wired Controller (See the Manual)

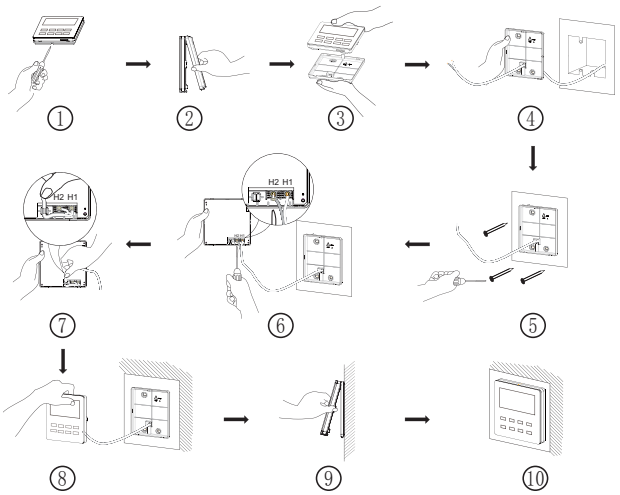
4.1 XK46 Wired Controller

Basic parameters and components of the wired controller

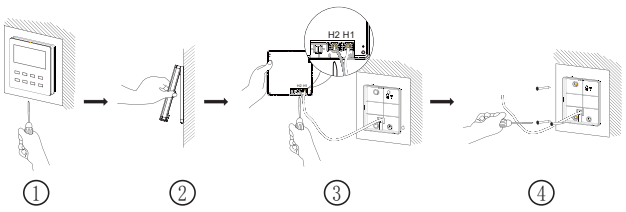


No.	1	2	3
Name	Panel of wired controller	Screw M4*25	Soleplate of wired controller
Q'ty	1	3	1

Installation of the wired controller



Disassembly of the wired controller



4.2 XK49 Wired Controller

Basic parameters and components of the wired controller

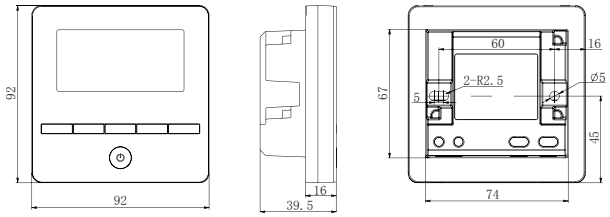


Figure 3.1 Size of the wired controller

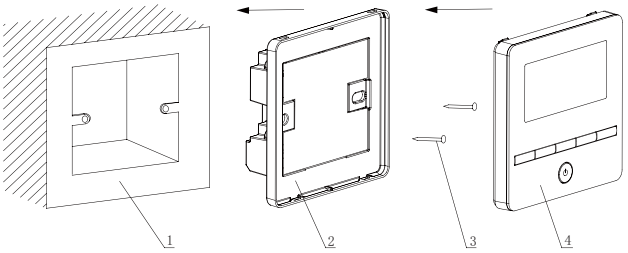
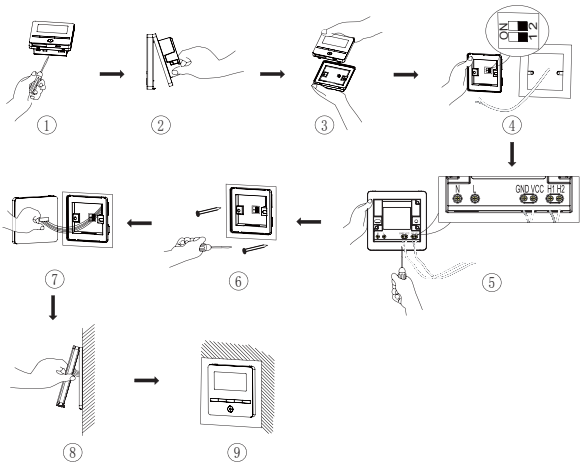


Figure 3.2 Components of the wired controller

SN	1	2	3	4
Name	Connecting box installed in the wall (86 box)	Base plate of the wired controller	Screw M4X25	Wired controller panel
Quantity	Provided by users	1	2	1

Installation of the wired controller



Installation diagram of the wired controller

Notes:

① . The wired controller must be installed by professional personnel. The power must be switched off during installation.

② . Pull out the two-core twisted-pair communication cable connected to the IDU from the installation hole in the wall and connect it to H1 and H2 of the terminal block and screw it on.

③ . Precautions for the door control system

If the wired controller is not connected to the door control system, set the switch “1” of the DIP S1 on the base plate to the digit.

To connect the wired controller to the door control system, set the switch "1" of the DIP S1 on the base plate to "ON" and connect the door control card interface to interfaces N and L or interfaces VCC and GND of the terminal block. Note:

Interfaces N and L are door control power interfaces with 100-240 V-50/60 Hz.

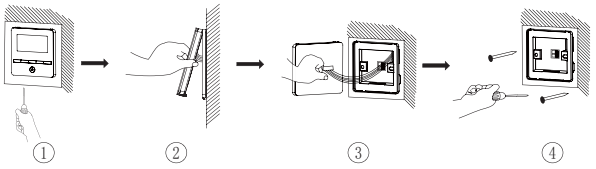
Interfaces VCC and GND are door control power interfaces with DC 5-24 V.

Users can select only one from 100-240 V and DC 5-24 V.

④. After cable connection is finished, cling the base plate of the wired controller to the wall and use the screw M4X25 to fix the base plate to the installation hole in the wall.

⑤. Insert the inter-board connection cable of the base plate to the needle file CN1 of the wired controller panel. Then place the panel and base plate together.

Disassembly of the wired controller



Disassembly diagram of the wired controller

Part 8: Vacuumization and Desiccation for the Refrigerant System

Works for the refrigerant system include cleaning and desiccating the pipes, performing an air-tightness test, and perfusing refrigerant.

I. Air-tightness Test

1. Importance of the Air-tightness Test

Air-tightness of the multi-module air conditioning system mainly refers to the tightness of the refrigerant pipes, which ensures secure and reliable running of the air conditioner.

Refrigerant leakage may affect functions of the air conditions or even damage the compressor and make the system to break down. Therefore, a air-tightness test must be performed. If refrigerant leakage is detected after the system is installed, it is very difficult to locate the leaking point as the suspending ceiling has been decorated. Therefore, the air-tightness test must be performed before ceiling sealing for indoor decoration is finished.

2. Procedure for Performing the Air-tightness Test

Stop valves of the gas and liquid pipes of the ODU are turned off at delivery.

Before test, apply a small amount of required lubricant on the block nut and pipe terminals and use two wrenches to fix the block nut.

The ODU pipes cannot be connected when the air-tightness test is being performed.

The test pressure for R410A system is 4.0 MPa. Use dry nitrogen as media for the air-tightness test. Increase the pressure slowly by following the steps below:

Step 1: Increase the pressure to 0.5 MPa. Stop for 5 minutes and then perform air-tightness check. Major leakage may be detected.

Step 2: Increase the pressure to 1.5 MPa. Stop for 5 minutes and then perform air-tightness check. Minor leakage may be detected.

Step 3: Increase the pressure for R410A system to 4.15 MPa. Stop for 5 minutes and then perform strength check. Slight leakage or blow holes may be detected.After increasing the pressure to the test pressure, keep the pressure for 24 hours and check whether it decreases. If the pressure does not decrease, it meets the requirement.

3. Precautions:

(1). The measuring range of the test pressure gauge for R410A system must be above 4.5 MPa.

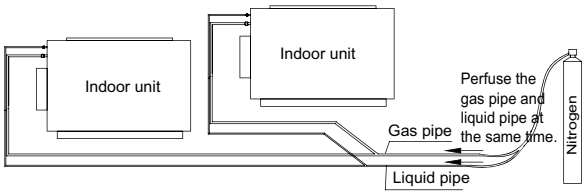
(2). Record the value displayed on the pressure gauge, ambient temperature, and test time.

(3). Pressure correction: The pressure changes by 0.01 MPa when the temperature changes by 1°C.

(4). The pressure meets the requirement if it does not change.

(5). If the pressure must be kept for a long time, decrease the pressure to 0.5 MPa or lower. High pressure for a long time may cause leakage at the welding point or safety hazard.

(6). Before performing the air-tightness test to the refrigerant pipes, do not conduct insulation or wrapping at the welding or flaring opening joints of the IDU. The pressure must be increased simultaneously for pipes on outdoor sides and cannot be increased for pipes on one side.



Note: Before performing the air-tightness test, do not conduct insulation or wrapping at the welding joints.

II. Vacuumization and Desiccation for the System

1. Requirements on the Vacuum Pump

The vacuum pump for different refrigerant systems cannot be the same.

The ultimate vacuum degree of the vacuum pump should reach -0.1 Mpa.

The air discharge capacity of the vacuum pump must be greater than 4 L/S.

The precision of the vacuum pump must be greater than 0.02 mmHg.

The system vacuum pump must be equipped with a check valve.

2. Procedure and Precautions for Vacuumization and Desiccation

2.1 Procedure

(1). Before vacuumization, ensure that the stop valves of the gas and liquid pipes are turned off.

(2). Use the perfusing duct to connect the regulator valve and vacuum pump to detection connectors of the gas pipe and liquid pipe.

(3). Vacuumize for 4 hours and check whether the vacuum degree reaches -0.1 MPa or more. If not, leakage may exist. Perform leakage check again. If no leakage exists, continue to vacuumize for 2 hours.

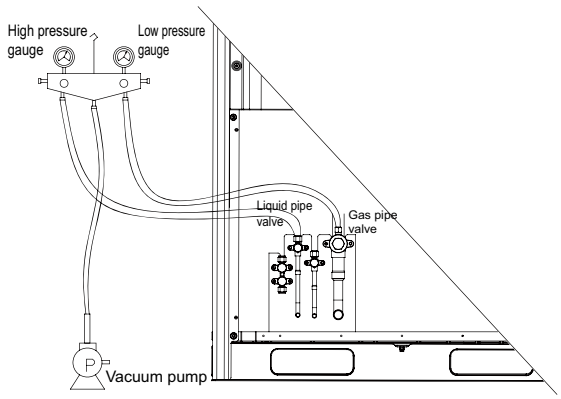
(4). If the vacuum degree cannot be kept after vacuumization

is performed for twice, there may be water in the pipe when it is confirmed that no leakage exists. In this case, discharge water by means of vacuum breaking. Perfuse nitrogen at 0.05 MPa to the pipe. Vacuumize for 2 hours and keep vacuuming for 1 hour. If the vacuum degree of -0.1 MPa cannot be reached, repeat this operation till water is discharged.

(5). After vacuumization, turn off the regulator valve and keep for 1 hour. Ensure that the pressure of the regulator valve does not increase.

2.2. Precautions:

(1). The gas pipe and liquid pipe must be vacuumized at the same time.



(2). Turn off the valve before powering off the vacuum pump.

(3). Keep vacuuming for 2 hours. The vacuum meets the requirement if the pressure displayed by the vacuum gauge does not increase.

(4). The units parallel connected to the module and oil-equalizing pipe also need to be vacuumized.

Part 9: Refrigerant Perfusion

I. Calculation Method for Perfusing Refrigerant

Quantity of refrigerant perfused for the pipe (R) = Quantity of refrigerant perfused for the pipe (A) + ∑ Quantity of refrigerant perfused for each module (B)

1. Method for calculating the quantity of refrigerant perfused for the pipe (A):

Quantity of perfused refrigerant for the pipe (A) = ∑ Length of the liquid pipe x Quantity of perfused refrigerant for the liquid pipe per meter

Diameter of the Liquid Pipe	Φ28.6	Φ25.4	Φ22.2	Φ19.05	Φ15.9	Φ12.7	Φ9.52	Φ6.35
kg/m	0.680	0.520	0.350	0.250	0.170	0.110	0.054	0.022

2. Method for calculating ∑ for the quantity of refrigerant perfused for each module (B)

Quantity of Refrigerant Perfused for Each Module (B) (kg) (2)		Module Capacity (HP)				
Rated Capacity Configuration Rate C for Indoor and ODU (1)	Number of Configured IDUs	8	10	12	14	16
50% ≤ C ≤ 70%	≤ 4	0	0	0	0	0
	> 4	0.5	0.5	0.5	0.5	0.5
70% < C ≤ 90%	≤ 4	0.5	0.5	1	1.5	1.5
	> 4	1	1	1.5	2	2
90% < C ≤ 105%	≤ 4	1	1	1.5	2	2
	> 4	2	2	3	3.5	3.5
105% < C ≤ 115%	≤ 4	2	2	2.5	3	3
	> 4	3.5	3.5	4	5	5
115% < C ≤ 135%	≤ 4	3	3	3.5	4	4
	> 4	4	4	4.5	5.5	5.5

Note:

① . Rated capacity configuration rate C for IDUs and ODUs = Sum of rated cooling capacity of IDUs/Sum of rated cooling capacity of ODUs

② . If all IDUs are fresh air IDUs in GMV-NX series, the quantity of refrigerant perfused for each module (B) is 0 kg.

◆ Examples

(1). Example 1:

The ODU consists of modules GMV-280WM/B-X, GMV-400WM/B-X, and GMV-450WM/B-X. The IDU consists of 8 pieces of GMV-ND140PLS/A-T.

Rated capacity configuration rate C for IDUs and ODUs = 140 x 8/(280+400+450) = 108%. The number of IDUs is greater than 4, according to the above table,

The quantity of refrigerant perfused for module GMV-280WM/B-X (B) is 3.5 kg.

The quantity of refrigerant perfused for module GMV-400WM/B-X (B) is 5.0kg.

The quantity of refrigerant perfused for module GMV-450WM/B-X (B) is 5.0kg.

Therefore,

∑ Quantity of refrigerant perfused for each module (B) = 3.5+5.0+5.0 = 13.5 kg

Assume that the quantity of refrigerant perfused for the pipe (A) = ∑ Length of the liquid pipe x Quantity of refrigerant perfused for the liquid pipe per meter = 25 kg

Total quantity of refrigerant perfused for the system (R) = 25+13.5 = 38.5 kg

(2). Example 2:

The ODU consists of one GMV-450WM/B-X and the IDU consists of one fresh air IDU GMV-NX450P/A (X4.0)-M. The quantity of perfused refrigerant for this module is 0 kg.

Therefore,

∑ Quantity of refrigerant perfused for each module (B) = 0 kg

Assume that the quantity of refrigerant perfused for the pipe (A) = ∑ Length of the liquid pipe x Quantity of refrigerant perfused for the liquid pipe per meter = 5kg

Total quantity of refrigerant perfused for the system (R) = 5+0= 5 kg

II. Method for Perfusing Refrigerant

Refrigerant perfusion for the VRF system is classified into

pre-perfusion and perfusion during running.

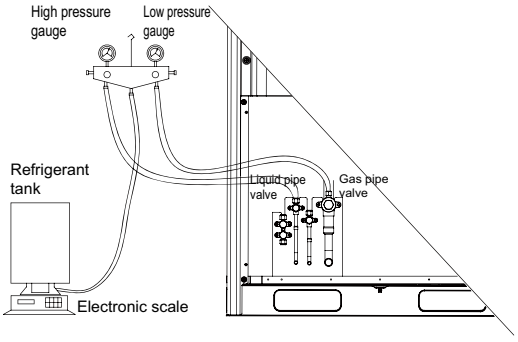
1. Refrigerant Pre-perfusion

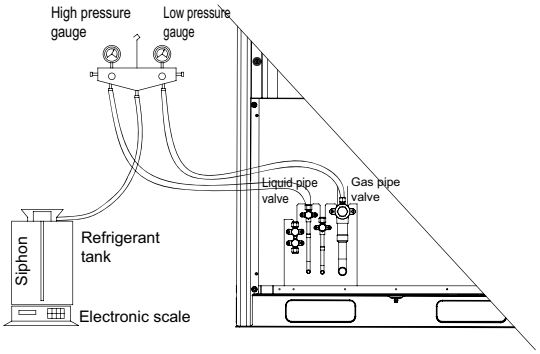
Step 1: Connect the high pressure gauge pipe to the detection opening of the liquid pipe, the low pressure gauge pipe to the detection opening of the gas pipe, and the medium gauge pipe to the vacuum pump. Power on the vacuum pump to perform vacuumization and desiccation.

Step 2: After vacuumization and desiccation are finished, turn off valves of the high pressure gauge and low pressure gauge. Disconnect the medium gauge pipe from the vacuum pump and connect it to the refrigerant tank.

Step 3: Properly loosen the joint between the medium gauge pipe and the pressure gauge and slightly turn on the valve of the refrigerant tank. Vacuumize the medium gauge pipe. After that, fasten the joint and turn on the valve of the refrigerant tank completely.

Step 4: If the refrigerant tank is not equipped with a siphon, reverse the refrigerant tank and place it on the electronic scale. Then record the current weight (m1). If the refrigerant tank is equipped with a siphon, record the current weight (m1) directly.





Step 5: Turn on the valve of the high pressure gauge (while keep the valve of the high pressure gauge turned off) and then perfuse refrigerant to the system. Record the change of weight of the refrigerant tank.

Step 6: When all refrigerant in the refrigerant tank is perfused, record the current weight m2.

Step 7: Turn off the valve of the high pressure gauge and replace the refrigerant tank.

Step 8: Perform step 3 again.

Step 9: Perform step 5 and step 6 again. Record the weight before perfusion m3 and weight after perfusion m4.

Step 10:If there is no sufficient refrigerant and the calculated quantity of refrigerant is not fulfilled for the system, record the current total perfusion quantity.

m=(m1-m2)+(m3-m4)+…+(mn-1-mn)

Quantity of refrigerant to be perfused during running m`=M-m

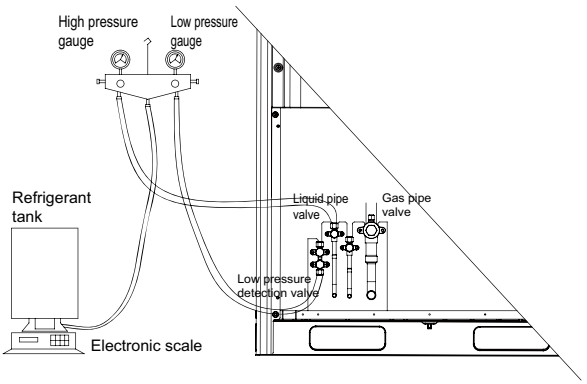
M is the required total quantity

If the pre-perfusion quantity (m) reaches the required total quantity for the system, turn off the valve of the refrigerant tank immediately to finish perfusing and proceed with step 11.

Step 11: Remove the pressure gauge.

2. Refrigerant Perfusion During Running

Step 1: Turn off the valve of the refrigerant tank and reconnect the pressure gauge pipe. Disconnect the low pressure gauge pipe from the detection valve opening of the gas liquid and connect it to the low pressure detection valve, as shown in the following figure.



Step 2: Turn on the valves for the liquid and gas pipes of each module completely. For the modular unit, the oil-equalizing valve of each module also needs to be turned on.

Step 3: Make the system to run in commissioning mode via the commissioning software or the main board of the ODU. (For details, see the description on commissioning.)

Step 4: When the commissioning step goes to refrigerant perfusion, turn on the valve of the refrigerant tank and perfuse the remaining quantity (m`).

Step 5: After all refrigerant is perfused, turn off valve of the refrigerant tank and wait till commissioning is automatically is completed for the system.

Step 6: Remove the pressure gauge to finish refrigerant perfusion.

Chapter 3 Commissioning Operation

CONTENTS

Part 1 Security Requirements

I. Precautions for Construction

(1). All commissioning and maintenance personnel must learn and strictly comply with construction security specifications. Security measures must be taken especially for outdoor operations.

(2). Workers of special types of labor, such as refrigerating engineers, electricians, and welders, must have professional certificates. No worker is allowed to do another type of labor.

(3). The equipment must be powered off before relevant operations, and other security requirements should be strictly complied with.

(4). All installation and maintenance operations must comply with design requirements of this product and national and local security operation requirements. Rule-breaking operations are prohibited.

II. Precautions for the Use of Refrigerants

The GMV5 serial unit is a refrigerating system of R410A working substances. Pay attention to the following points:

(1). The refrigerating system of R410A working substances has a higher working pressure than that of R22 working substances. The working pressure of the former is 1.6 times than that of the latter.

(2). The refrigerating system of R410A working substances uses thicker-walled copper tubes than that of R22 working substances. Adopt copper tubes with appropriate wall thickness.

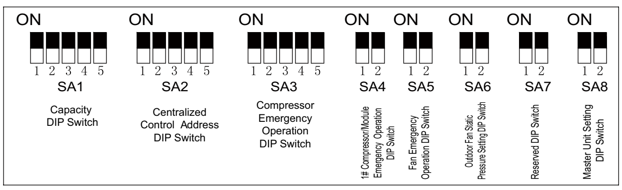
(3). R410A working substances are azeotropic mixture working substances. Refrigerants must be appended in the form of liquid.

Part 2 Introduction to Unit Functions

I. Function Settings of ODUs

Function application of ODUs consists of function DIP switch settings and function button settings, including special engineering requirements.

(1). System Function DIP Switch Settings



DIP Switch	Name	Meaning	Factory Settings	Remark
SA1_capacity	Capacity DIP switch	Defines the rated capacity of the unit.	Defined based on the model.	The factory settings cannot be changed.
SA2_Addr-CC	Centralized control address DIP switch	Defines and differentiates addresses of different systems in the case of centralized control by multiple systems.	00000	The address DIP switch is used only when centralized control is required. Otherwise, the factory settings are used without being changed. The address DIP switch is valid only when it is set on the master unit.
SA3_COMP-E	2#-6# compressor emergency operation DIP switch	Provides aftersales emergency settings for 2#-6# compressors.	00000	It is better not to use the emergency function. Replace the compressor at the first time when an exception occurs.
SA4_I/M-E	1# compressor/module emergency operation DIP switch	Provides aftersales emergency settings for 1# compressor/ module.	00	It is better not to use the emergency function. Replace the compressor at the first time when an exception occurs.
SA5_FAN-E	Fan emergency operation DIP switch	Provides aftersales emergency settings for fans.	00	It is better not to use the emergency function. Replace relevant parts of the fan at the first time when an exception occurs.
SA6_ESP_S	Outdoor fan static pressure setting DIP switch	Sets the static pressure of the fan according to the static pressure of the exhaust pipeline connected with the engineering unit, to guarantee normal operation of the unit.	00	This DIP switch should be set based on actual engineering conditions, neither over-large nor over-small. It is unnecessary to change the factory settings in outdoor scenarios.
SA7	Reserved DIP switch	——	00	——
SA8_MASTER-S	Master unit setting DIP switch	Defines the master unit.	00	A master unit must be set, and only one master unit can be set in each refrigerating system. This DIP switch is mandatory. The default factory setting is the master unit status.

Note:

①. On the master module, the SA8 DIP switch must be set again, the SA1 DIP switch cannot be further set, and other DIP switches retain the factory settings without special requirements.

②. Function DIP switches must be set when the ODU is powered off, and then the settings are valid after the ODU is powered on.

Meanings and setting methods of function DIP switches are as follows:

1. Unit Capacity DIP Switch (SA1_capacity)

The unit capacity DIP switch (SA1_capacity) has been set upon factory departure. It is unnecessary to further set the DIP switch. In addition, users are not allowed to change the DIP switch settings. Otherwise, the system may work abnormally or even the compressor may be damaged.

2. Centralized Control Address DIP Switch (SA2_Addr-CC)

The centralized control address DIP switch (SA2_Addr-CC) indicates the centralized control address required when different refrigerating systems are controlled in a centralized manner. The default factory setting is "00000".

If it is not required to use centralized control between multiple refrigerating systems, this DIP switch can retain the factory settings without being changed.

If it is required to use centralized control between multiple refrigerating systems, set the DIP switch according to the following methods:

(1). The DIP switch must be set on the master unit. Otherwise, the setting is invalid.

(2). On the same refrigerating system, the centralized control address DIP switch (SA2_Addr-CC) on a non-master unit is invalid, and it is unnecessary to change the settings.

(3). The centralized control address DIP switch (SA2_Addr-CC) on the master unit of a refrigerating system must be set to “00000”, and this system is the master system.

(4). The centralized control address DIP switch (SA2_Addr-CC) on the master unit of other refrigerating systems must be set as follows:

SA2					Address No.
DIP1	DIP2	DIP3	DIP4	DIP5	
1	0	0	0	0	2
0	1	0	0	0	3
0	0	1	0	0	4
0	0	0	1	0	5
0	0	0	0	1	6
1	0	0	0	1	7
0	1	0	0	1	8
0	0	1	0	1	9
0	0	0	1	1	10
1	0	0	1	1	11
0	1	0	1	1	12
0	0	1	1	1	13
1	0	1	1	1	14
0	1	1	1	1	15
1	1	1	1	1	16

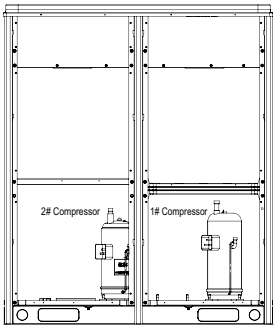
5) The centralized control address DIP switch (SA2_Addr-CC) cannot be the same between different refrigerating systems. Otherwise, address conflicts may occur and the unit cannot run properly.

3. Compressor Emergency Operation DIP Switch (SA3_ COMP-E)

Corresponding to 2#-6# compressors, the compressor emergency operation DIP switch (SA3_COMP-E) is used for aftersales emergency settings when an exception occurs on a compressor. It can shield the operation of the abnormal compressor in a short time and guarantee the emergency operation of other compressors.

When it is required to shield the operation of 2#-6# compressors upon failure, set the DIP switch according to the following methods:

Compressor Emergency Operation DIP Switch (SA3_COMP-E)					Remark
DIP1	DIP2	DIP3	DIP4	DIP5	
0	0	0	0	0	Not shielding the operation of 2#-6# compressors
1	0	0	0	0	Shielding the operation of 2# compressor
0	1	0	0	0	Shielding the operation of 3# compressor
0	0	1	0	0	Shielding the operation of 4# compressor
0	0	0	1	0	Shielding the operation of 5# compressor
0	0	0	0	1	Shielding the operation of 6# compressor



Precautions:

(1). When the DIP switch setting is not covered in the above scope, a DIP switch setting exception fault may occur.

(2). Only one compressor can be set to emergency mode on a module.

(3). The compressor emergency operation mode is valid only in a single-module multi-compressor system.

(4). The default factory setting is “00000”.

(5). The system cannot continually run for more than 24 hours in compressor emergency operation status. Once 24 hours are exceeded, the entire unit will be forcibly stopped and the limited operation code “Ad” is displayed on the IDU.

(6). 1#-6# compressors are defined from right to left facing the front of the unit.

4. 1# Compressor/Module Emergency Operation DIP Switch (SA4_I/M-E)

The 1# compressor/module emergency operation DIP switch (SA4_I/M-E) is used for aftersales emergency settings when an

exception occurs on the 1# compressor/module. It can shield the operation of the abnormal compressor/module in a short time and guarantee the emergency operation of other compressors.

When it is required to set the 1# compressor/module to emergency mode, set the DIP switch as follows:

1# Compressor/Module Emergency Operation DIP Switch (SA4_I/M-E)		
DIP1	DIP2	Remark
0	0	Not shielding the operation of 1# compressor/module
1	0	Shielding the operation of 1# compressor
0	1	Shielding the operation of the module

Precautions:

(1). When the DIP switch setting is not covered in the above scope, a DIP switch setting exception fault may occur.

(2). Only one compressor can be set to emergency mode on a module.

(3). The compressor emergency operation mode is valid only in a single-module multi-compressor system.

(4). The module emergency operation mode is valid only in a system with more than two modules connected in parallel.

(5). Only one module can be set to emergency operation mode in each system.

(6). The default factory setting is “00”.

(7). The system cannot continually run for more than 24 hours in compressor emergency operation status. Once 24 hours are exceeded, the entire unit will be forcibly stopped and the limited operation code “Ad” is displayed on the IDU.

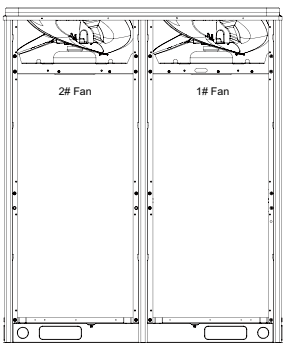
(8). The system cannot continually run for more than 48 hours in module emergency operation status. Once 48 hours are exceeded, the entire unit will be forcibly stopped and the limited operation code “Ad” is displayed on the IDU.

(9). 1#-6# compressors are defined from right to left facing the front of the unit.

5. Fan Emergency Operation DIP Switch (SA5_FAN-E)

The fan emergency operation DIP switch (SA5_FAN-E) is used for aftersales emergency settings when an exception occurs on a dual-module fan. It can shield the operation of a fan in a short time and guarantee the emergency operation of the system.

(1). Fan positions



(2). When it is required to set the fan to emergency mode, set the DIP switch as follows:

Fan Emergency Operation DIP Switch (SA5_FAN-E)		
DIP1	DIP2	Remark
0	0	No fan in emergency operation mode
1	0	Shielding the operation of 1# fan
0	1	Shielding the operation of 2# fan

Precautions:

1). When the DIP switch setting is not covered in the above scope, a DIP switch setting exception fault may occur.

2). Only one fan can be set to emergency mode on a module.

3). The default factory setting is “00”.

4). The system cannot continually run for more than 120 hours in fan emergency operation status. Once 120 hours are exceeded, the entire unit will be forcibly stopped and the limited operation code “Ad” is displayed on the IDU.

6. Outdoor Fan Static Pressure Setting DIP Switch (SA6_ ESP_S)

The outdoor fan static pressure setting DIP switch (SA6_ ESP_S) is used in special scenarios such as the unit installation equipment room. In scenarios where air ducts are required to be connected, zero static pressure (0 Pa), low static pressure (30 Pa), medium static pressure (50 Pa), and high static pressure (82 Pa) can be set according to the design of air ducts. The setting methods are as follows:

Outdoor Fan Static Pressure Setting DIP Switch (SA6_ESP_S)		
DIP1	DIP2	Static Pressure Range
0	0	0 Pa
1	0	30 Pa
0	1	50 Pa
1	1	82 Pa

The default factory setting is “00”.

Note that the DIP switch should be independently set on each module.

7. Reserved Function DIP Switch (SA7)

SA7 is the reserved function DIP switch and meaningless currently.

8. Master Unit Setting DIP Switch (SA8_MASTER-S)

The master unit setting DIP switch (SA8_MASTER-S) defines module management of a system. A master unit must be set, and only one master unit can be set in each refrigerating system (in power-off status). The setting methods are as follows:

Master Unit Setting DIP Switch (SA8_MASTER-S)		
DIP1	DIP2	Remark
0	0	Master unit
1	0	Sub-module

Upon factory departure, all modules are in “00” master unit status by default. When multiple modules are connected in parallel, only one module retains the master unit status and other modules are set to sub-module status. When a module is independently used, it uses the factory settings.

For the basic module set to master unit, the module address is displayed as “01” on the main board.

Precautions:

(1). When the DIP switch setting is not covered in the above scope, a DIP switch setting exception fault may occur.

(2). A module must be set to master unit status, and only one module can be set to master unit status in each refrigerating system. Other modules are set to sub-module status.

(3). Settings must be performed in power-off status.

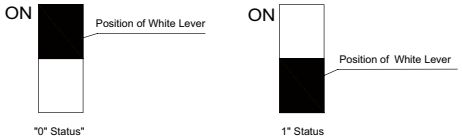
(4). The default factory setting is "00" master unit status.

9. DIP Switch Example

(1). Explanation of DIP switch positions

On the DIP switch, “ON” indicates “0” status and the opposite direction indicates "1” status.

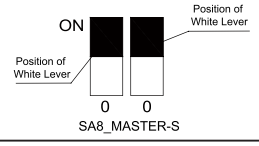
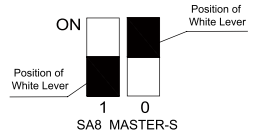
The position of white lever indicates the position to be set to.



(2). Example

The following takes master unit settings as an example. Assume that a system consists of three modules: module a, module b, and module c. Set module c to master unit and the other two modules to sub-modules. The settings are as follows:

II. System Function Button Operations

Module c (Master Module)	
Module a/Module b (Sub-module)	

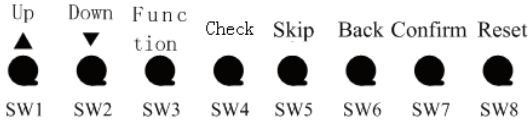
Note:

①. System function settings and query must be performed after commissioning of the entire unit.

②. System function settings and query can be used no matter whether the entire unit runs.

1. Introduction to Function Buttons

The main board AP1 of the ODU consists of eight function buttons:



Function Button Name and Meaning		
Button	Code	Function Meaning
SW1	UP	Indicates the upward selection button.
SW2	DOWN	Indicates the downward selection button.
SW3	FUNCTION	Indicates the function button, used for function settings.
SW4	CHECK	Indicates the query button, used for function query.
SW5	SKIP	Indicates the skip button.
SW6	BACK	Indicates the return button, used to return to the upper-level menu.
SW7	CONFIRM	Indicates the confirmation button.
SW8	RESET	Indicates the reset button, used to restore factory settings.

2. Introduction to Functions

2.1 List of functions

Function Code	Function Name	Function Meaning	Factory Settings		Remark
			Code	Meaning	
A2	Refrigerant recovery operation	Fully or partially recovers refrigerants in a faulty module or IDU pipeline according to the system pressure after automatic startup during maintenance.	——	——	It can only be set.
A6	Unit cooling/heating function	Sets the unit to cooling/heating, single-cooling, single-heating, or air supply mode for centralized management.	nA	Cooling/Heating function	It can be set and queried.
A7	Outdoor silent mode	Sets different silent modes to meet users' noise requirements.	00	No silent settings	It can be set and queried.
A8	Aftersales vacuuming mode	Automatically enables all electronic expansion valves and electromagnetic valves during maintenance to guarantee vacuum processing in all pipelines.	——	——	It can only be set.
n0	Conservation control 1	Automatically decreases the power consumption of the unit according to system operation parameters.	01	No automatic conservation settings	It can be set and queried.

Function Code	Function Name	Function Meaning	Factory Settings		Remark
			Code	Meaning	—
n3	Forcible defrosting operation	Forcibly enables ODU defrosting operation.	—	—	It can only be set.
n4	Conservation control 2	Forcibly decreases the maximum power consumption of the unit.	00	No capacity output limitation settings	It can be set and queried.
n5	Indoor unit project number offset	Prevents IDU project number conflicts when different refrigerating systems are controlled in a centralized manner.	—	—	It can only be set.
n6	Fault query	Queries historical fault information of the ODU.	—	—	It can only be queried.
n7	Parameter query	Queries real-time operation parameters of the ODU.	—	—	It can only be queried.
n8	Indoor unit project number query	Displays project numberes of all IDUs through ODU operations.	—	—	It can only be queried.
n9	Online IDU quantity query	Displays the number of online IDUs.	—	—	It can only be queried.
nb	Outdoor unit bar code function query	Queries the entire-unit bar code and controller bar code of ODU.	—	—	It can only be queried.

2.2. Description of Functions

(1) A2 Refrigerant recovery operation

This function partially recovers refrigerants in a faulty module or IDU pipeline during unit maintenance. The refrigerant recovery volume of each basic module is as follows:

Model of Basic Module	Maximum Refrigerant Recovery Volume (kg)
GMV-224WM/B-X	7.5
GMV-280WM/B-X	7.5
GMV-335WM/B-X	8.7
GMV-400WM/B-X GMV-450WM/B-X	13.5

This function falls into two modes: faulty module refrigerant recovery and IDU pipeline refrigerant recovery.

Refrigerant Recovery Mode Code	Refrigerant Recovery Mode Name	Remark
01	Basic module refrigerant recovery	This mode is selected when a basic module fails and it is required to recover refrigerants from this basic module.
02	Indoor unit pipeline refrigerant recovery	This mode is selected when an IDU fails and it is required to recover refrigerants from the IDU pipeline.

When this function is enabled, the ODU automatically starts and recovers refrigerants to the ODU or IDU pipeline.

(2) A6 Unit cooling/heating function

This function sets operation modes of the entire unit, including:

Function Mode of ODU		Operation Mode of IDU
Code	Name	
nA	Cooling/ Heating	Cooling mode, dehumidifying mode, heating mode, and air supply mode. (Note: The heating mode cannot work with other modes at the same time.) (factory settings)
nC	Single-cooling	Cooling mode, dehumidifying mode, and air supply mode.
nH	Single-heating	Heating mode and air supply mode. (Note: The heating mode cannot work with the air supply mode at the same time.)
nF	Air supply	Air supply mode.

The user or administrator can set operation modes of the ODU based on actual situations to prevent conflicts.

When it is required to set different refrigerating systems to the same function mode, set the master system according to the above requirements. For the master system settings, see the "Centralized Control Address DIP Switch (SA2_Addr-CC)" section.

(3) A7 Outdoor silent mode

This function is used when users require lower environment noises, including nighttime automatic silent mode and forcible silent mode.

For the nighttime automatic silent mode, the system

automatically judges the highest daytime environment temperature and then starts silent operations in a certain interval to guarantee nighttime low-noise operations. The nighttime automatic silent mode falls into nine categories:

Silent Mode	Code	Starting the Silent Mode X Hours after the Daytime Temperature Reaches the Highest	Stopping the Nighttime Silent Mode after Continual Operations for Y Hours	Noise Degree
Mode 1	01	6	10	Low-noise mode
Mode 2	02	6	12	
Mode 3	03	8	8	
Mode 4	04	8	10	
Mode 5	05	10	8	
Mode 6	06	10	10	
Mode 7	07	4	14	
Mode 8	08	6	8	Low- and medium-noise mode
Mode 9	09	12	10	superlow-noise mode

Note: The highest daytime temperature is generally in 13:00-15:00.

For the forcible silent mode, the system runs in low-noise mode no matter in the daytime or nighttime. The forcible silent mode falls in three categories:

Silent Mode	Code	Noise Degree
Mode 10	10	Low-noise mode
Mode 11	11	Low- and medium-noise mode
Mode 12	12	superlow-noise mode

Note: The system capacity may fall off after the silent mode is set. Therefore, try to balance the noise with the capacity in selecting a silent mode category.

The factory setting is “00”.

(4) A8 Aftersales vacuuming mode

This function ensures the vacuum degree of the entire system during maintenance to prevent operation functions of dead zones. Expansion valves and electromagnetic valves of the unit will be enabled after this function is set.

(5) n0 Conservation control 1

System conservation is set when conservation operations are required. The default factory setting is capacity priority control mode. The system capacity may fall off after the conservation mode is set.

Code	Function Name
01	Conservation control – invalid (factory settings)
02	Conservation control - valid

(6) n3 Forcible defrosting operation

This function is set when forcible defrosting is required for the unit during maintenance. After this function is enabled, the system automatically quits based on quitting conditions and then automatically runs based on system conditions.

(7) n4 Conservation control 2

The highest capacity output limitation is set when users require forcibly limiting the system power consumption. The setting scope is as follows:

Code	Highest Output Capacity
10	100% (factory settings)
09	90%
08	80%

Note: The cooling or heating effect may fall off after the capacity limitation is set.

(8) n5 Indoor unit project number offset

This function sets the IDU project number when multiple refrigerating systems are controlled in a centralized manner (by using a remote monitor or centralized controller), avoiding the same project number between different systems. If the project number is not set, project number conflicts may occur between systems.

This function only needs to be set on the master system, which is the system with the centralized control address SA2 DIP switch being “00000”. For details, see the "Centralized Control Address DIP Switch (SA2_Addr-CC)" section.

(9) n6 Fault query

This function queries historical faults of the system. Up to five historical faults can be memorized in time order.

(10) n7 Parameter query

This function queries operation parameters of each module of the ODU in real time.

(11) n8 Indoor unit address query

This function queries addresses of all IDUs through one operation of the ODU.

(12) n9 Online IDU quantity query

This function queries the number of online IDUs through the ODU.

3. Function Setting Operations

Step 1: Open the commissioning window of the master unit panel.

Step 2: Power on the entire unit.

Step 3: Press "SW3" on the master unit to enter the to-be-selected status of function settings. By default, the master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A7	Blinking	00	Blinking	00	Blinking

Users can select corresponding functions by pressing "SW1 (UP)" or "SW2 (DOWN)" on the master unit, including:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A7	Blinking	00	Blinking	00	Blinking
A6	Blinking	00	Blinking	00	Blinking
A2	Blinking	00	Blinking	00	Blinking

A8	Blinking	00	Blinking	00	Blinking
n0	Blinking	01	Blinking	00	Blinking
n3	Blinking	00	Blinking	00	Blinking
n4	Blinking	00	Blinking	00	Blinking
n5	Blinking	00	Blinking	00	Blinking

After selecting the functions to be set, press "SW7" to confirm entering function settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A7	On	00	Blinking	OC	Blinking
A6	On	nC	Blinking	nC	Blinking
A2	On	01	Blinking	00	Blinking
A8	On	00	Blinking	OC	Blinking
n0	On	01	Blinking	OC	Blinking
n3	On	00	Blinking	00	Blinking
n4	On	10	Blinking	OC	Blinking
n5	On	00	Blinking	OC	Blinking

Then go to step 4 to set corresponding functions.

Step 4: Set function parameters.

Setting methods of function parameters are as follows:

(1). A7 Outdoor silent mode settings

Step 1: Confirm entering the A7 outdoor silent mode settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Silent Mode Code	Display Mode	Current Status	Display Mode
A7	On	00	Blinking	OC	Blinking

Step 2: Select a corresponding silent mode by pressing "SW1 (UP)" or "SW2 (DOWN)".

LED1		LED2		LED3	
Function Code	Display Mode	Silent Mode Code	Display Mode	Current Status	Display Mode
A7	On	00	Blinking	OC	Blinking
A7	On	01	Blinking	OC	Blinking
A7	On	02	Blinking	OC	Blinking
A7	On	03	Blinking	OC	Blinking
A7	On	04	Blinking	OC	Blinking
A7	On	05	Blinking	OC	Blinking
A7	On	06	Blinking	OC	Blinking
A7	On	07	Blinking	OC	Blinking
A7	On	08	Blinking	OC	Blinking
A7	On	09	Blinking	OC	Blinking
A7	On	10	Blinking	OC	Blinking
A7	On	11	Blinking	OC	Blinking
A7	On	12	Blinking	OC	Blinking

Step 3: Press "SW7" to confirm selecting the mode. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Silent Mode Code	Display Mode	Current Status	Display Mode
A7	On	00	On	OC	On
A7	On	01	On	OC	On
A7	On	02	On	OC	On
A7	On	03	On	OC	On
A7	On	04	On	OC	On
A7	On	05	On	OC	On
A7	On	06	On	OC	On
A7	On	07	On	OC	On
A7	On	08	On	OC	On
A7	On	09	On	OC	On
A7	On	10	On	OC	On
A7	On	11	On	OC	On
A7	On	12	On	OC	On

On the master unit, press "SW6" to return to the upper level (press "SW6" in setting status to return to the upper level; press "SW6" after settings are completed to restore the normal operating status of the unit).

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit restores the current status.

The default factory setting is “00”, that is, no silent mode.

(2). A6 Unit cooling/heating function settings

Step 1: Confirm entering the A6 unit cooling/heating function settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Mode Code	Display Mode	ODU Function Mode Code	Display Mode
A6	On	nC	Blinking	nC	Blinking

Step 2: Select a corresponding cooling/heating function by pressing "SW1 (UP)" or "SW2 (DOWN)".

LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Mode Code	Display Mode	ODU Function Mode Code	Display Mode
A6	On	nC	Blinking	nC	Blinking
A6	On	nH	Blinking	nH	Blinking
A6	On	nA	Blinking	nA	Blinking
A6	On	nF	Blinking	nF	Blinking

Step 3: Press "SW7" to confirm selecting the mode. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Mode Code	Display Mode	ODU Function Mode Code	Display Mode
A6	On	nC	On	nC	On
A6	On	nH	On	nH	On
A6	On	nA	On	nA	On
A6	On	nF	On	nF	On

On the master unit, press "SW6" to return to the upper level (press "SW6" in setting status to return to the upper level; press "SW6" after settings are completed to restore the normal operating status of the unit).

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit restores the current status.

The default factory setting is “nA” cooling/heating.

(3). A2 Refrigerant recovery operation settings

Step 1: Confirm entering the A2 refrigerant recovery operation settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Refrigerant Recovery Code	Display Mode	Current Status	Display Mode
A2	On	01	Blinking	00	Blinking

Step 2: The default setting is “01”. Select "01" or "02" by pressing "SW1 (UP)" or "SW2 (DOWN)". Press "SW7" to confirm selecting the mode.

On the master unit, press "SW6" to return to the upper level.

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit restores the current status.

1). Indoor unit refrigerant recovery

Step 3: Select "01” as in step 2 to enter IDU refrigerant recovery. Digital LEDs and status LEDs of all basic modules are displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Refrigerant Recovery Code	Display Mode	Current Status	Display Mode
A2	On	01	On	[Module low-pressure Ps]	On

LED3 shows the low-pressure value of a module. If the value is negative, LED3 circularly displays the negative code "nE” and the numeric value every one second. For example, for -30°C, LED3 alternately displays “nE” for one second and then “30” for another second.

Step 4: Close liquid-tube stop valves of all basic modules of the ODU. When the low-pressure value displayed on LED3 continually blinks, quickly close air-tube stop valves of all basic modules and then press "SW7" on the master unit to confirm completing refrigerant recovery or power off the entire unit.

If no operations are performed after the low-pressure value displayed on LED3 continually blinks for three minutes, the entire unit will be forcibly stopped.

On the master unit, press "SW6" to return to the upper level for restoring the standby status of the entire unit (press "SW6" in setting status to return to the upper level; press "SW6" after settings are completed to restore the normal operating status of the unit).

Note:Another startup is not allowed within 10 minutes after refrigerant recovery.

2). Basic module refrigerant recovery

Step 3: Set the basic module requiring refrigerant recovery to module emergency operation status and close the liquid-tube stop valve of the emergency status module. Select "02” as in step 2 to enter basic module refrigerant recovery. The display is as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A2	On	02	On	Module high-pressure	On

LED3 shows the high-pressure value of the module.

Step 4: When the high-pressure value displayed on LED3 continually blinks (displayed as 0°C if the high pressure is less than 0°C), quickly close the air-tube stop valve of the emergency module and then press "SW7" on the master unit to confirm completing refrigerant recovery or power off the entire unit.

If no operations are performed after the high-pressure value displayed on LED3 continually blinks for three minutes, the entire unit will be forcibly stopped.

On the master unit, press "SW6" to return to the upper level for restoring the standby status of the entire unit (press "SW6" in setting status to return to the upper level; press "SW6" after settings are completed to restore the normal operating status of the unit).

Note: Before the basic module refrigerant recovery operation, users must close the liquid-tube stop valve of the basic module requiring refrigerant recovery.

Another startup is not allowed within 10 minutes after refrigerant recovery.

(4). A8 Aftersales vacuuming mode settings

Step 1: Confirm entering the A8 aftersales vacuuming mode settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A8	On	00	Blinking	OC	Blinking

Enter the to-be-confirmed status of system vacuuming mode settings.

Step 2: Press "SW7" to confirm entering the to-be-confirmed status of system vacuuming mode settings. All modules are displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A8	On	00	On	OC	On

Expansion valves and electromagnetic valves of all outdoor and IDUs are opened, and the entire unit cannot be enabled.

Press "SW6" on the master unit to quit the vacuuming status. Alternatively, the entire unit quits the vacuuming status after 24 hours.

(5). n0 System conservation operation settings

Step 1: Confirm entering the n0 system conservation operation settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Code	Display Mode	Current Status	Display Mode
n0	On	01	Blinking	OC	Blinking

Step 2: Select a corresponding mode by pressing "SW1 (UP)" or "SW2 (DOWN)".

LED1		LED2		LED3	
Function Code	Display Mode	Code	Display Mode	Current Status	Display Mode
n0	On	01	Blinking	OC	Blinking
n0	On	02	Blinking	OC	Blinking

Step 3: Press "SW7" to confirm selecting the mode. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Code	Display Mode	Current Status	Display Mode
n0	On	01	On	OC	On
n0	On	02	On	OC	On

If no button operations are performed for five minutes, the function setting automatically quits and the unit restores the current status. (Press "SW6" in setting status to return to the upper level; press "SW6" after settings are completed to restore the normal operating status of the unit.)

(6). n3 Forcible defrosting operation settings

Step 1: Confirm entering the n3 forcible defrosting operation settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n3	On	00	Blinking	00	Blinking

Step 2: Press "SW7" to confirm entering forcible defrosting. The master module is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n3	On	00	On	00	On

When the unit reaches defrosting quit conditions, the system automatically quits and restores the normal operation control.

(7). n4 Highest capacity output limitation settings

Step 1: Confirm entering the n4 highest capacity output limitation settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Highest Output Capacity	Display Mode	Current Status	Display Mode
n4	On	10	Blinking	OC	Blinking

Step 2: Select a corresponding capacity limitation value by pressing "SW1 (UP)" or "SW2 (DOWN)".

LED1		LED2		LED3	
Function Code	Display Mode	Highest Output Capacity	Display Mode	Current Status	Display Mode
n4	On	10	Blinking	OC	Blinking
n4	On	09	Blinking	OC	Blinking
n4	On	08	Blinking	OC	Blinking

Step 3: Press "SW7" to confirm selecting the mode. The master module is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Highest Output Capacity	Display Mode	Current Status	Display Mode
n4	On	10	On	OC	On
n4	On	09	On	OC	On
n4	On	08	On	OC	On

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit restores the current status. (Press "SW6" in setting status to return to the upper level; press "SW6" after settings are completed to restore the normal operating status of the unit.)

(8). n5 Indoor unit project number offset settings

Step 1: Confirm entering the n5 IDU project number offset settings. The master unit is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n5	On	00	Blinking	00	Blinking

Step 2: Press "SW7" to send the project number offset command. The master module is displayed as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n5	On	00	On	OC	On

After 10 seconds, the system quits this mode and restores the normal operation mode.

Note: This function only needs to be set on the master system,

which is the system with the centralized control address SA2 DIP switch being "00000". For details, see the "Centralized Control Address DIP Switch (SA2_Addr-CC)" section.

4. Function Query Operations

Step 1: Open the commissioning window of the master unit panel.

Step 2: Power on the entire unit.

Step 3: Press "SW4" on the master unit to enter the query status.

Step 4: Select a function to be queried by pressing "SW1 (UP)" or "SW2 (DOWN)" on the master unit. By default, the A7 outdoor silent mode is displayed for query.

For example, select the A6 unit cooling/heating function. The display is as follows:

LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Mode Code	Display Mode	ODU Function Mode Code	Display Mode
A6	On	nA	On	nA	On

Step 5: If the n8 IDU address query is selected, the display is as follows. Enter the to-be-confirmed status of IDU project number query.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n8	Blinking	00	Blinking	00	Blinking

Press "SW7" and select the IDU project number query on the master unit. The master unit is displayed as follows. Other modules are displayed in normal status.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n8	On	00	On	00	On

Regardless of the current display status of wired controllers or display panels of all IDUs, the current display status is all switched to the IDU project number. However, it does not influence the settings and operation status of outdoor and IDUs.

On the master unit, press "SW6" to return to the upper level. The IDU retains the project number display status.

On the master unit, press and hold "SW6" to quit the address display status for all IDUs and return to the upper level.

If no quit button operations are performed on the master unit for 30 minutes, the function setting automatically quits and the unit restores the current status.

Step 6: If the n8 IDU address query is selected, the display is as follow

LED1		LED2		LED3	
Function Code	Display Mode	Number of IDUs (Thousands-place Hundreds-place)	Display Mode	Number of IDUs (Tens-place Ones-place)	Display Mode
n9	On	00	On	00	Blinking

The digital LED2 displays the number of IDUs (thousands-place hundreds-place) and the digital LED3 displays the number of IDUs (tens-place ones place). For example, if the number of IDUs is 75, "0075" is displayed.

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit restores the current status.

Note: The online IDU quantity query function applies to a single refrigerating system only.

Step 7: If the n6 fault query is selected, the display is as follows. Enter the to-be-confirmed status of fault query.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n6	Blinking	00	Blinking	00	Blinking

Press "SW7" on the master unit to confirm fault query.

Select a fault to be queried by pressing "SW1 (UP)" or "SW2 (DOWN)". LED3 alternately displays the historical fault code and module address in an interval of one second in the sequence of fault records. LED2 displays the fault sequence number. If there not historical faults, LED2 and LED3 display “00” by default. Up to five historical faults can be queried. The faults that can be queried are as follows:

Code	description	Code	description
E1	High-pressure protection	P9	Inverter compressor out-of-step protection
E3	Low-pressure protection	C2	Communication failure between the master unit and inverter compressor driver
U4	Lack of refrigerant protection	P8	Over-high temperature protection for inverter compressor driver module
E2	Discharge low-temperature protection	P7	Temperature sensor failure of inverter compressor driver module
J9	Over-low pressure ratio protection	PF	Charge circuit failure of inverter compressor driver
J8	Over-high pressure ratio protection	HL	DC bus line over-low voltage protection for inverter outdoor fan driver
J7	Four-way valve leakage protection	HH	DC bus line over-high voltage protection for inverter outdoor fan driver
E5	High-temperature protection of compressor 1	H6	Inverter outdoor fan driver IPM module protection

E6	High-temperature protection of compressor 2	HJ	Inverter outdoor fan startup failure
J2	Over-current protection of compressor 2	HE	Inverter outdoor fan phase lack protection
EU	Top high-temperature protection of compressor 1	H3	Inverter outdoor fan driver module reset
Eb	Top high-temperature protection of compressor 2	H5	Inverter outdoor fan over-current protection
PL	DC bus line over-low voltage protection for inverter compressor driver	HC	Current detection circuit failure of inverter outdoor fan driver
PH	DC bus line over-high voltage protection for inverter compressor driver	H9	Inverter outdoor fan out-of-step protection
P6	Inverter compressor driver IPM module protection	C3	Communication failure between the master unit and inverter outdoor fan driver
PJ	Inverter compressor startup failure	H8	Over-high temperature protection for inverter outdoor fan driver module
PE	Inverter compressor phase lack protection	H7	Temperature sensor failure of inverter outdoor fan driver module
P3	Inverter compressor driver module reset		
P5	Inverter compressor over-current protection		
PC	Current detection circuit failure of inverter compressor driver		

The display is as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Fault Sequence	Display Mode	Current Status	Display Mode
n6	On	01	On	Historical fault/ module address	Displayed alternately
n6	On	02	On		Displayed alternately
n6	On	03	On		Displayed alternately
n6	On	04	On		Displayed alternately
n6	On	05	On		Displayed alternately

"01-05" indicates the fault sequence from the earliest to the latest.

If there are less than five historical faults, LED2 and LED3 display “00” indicating there are no more historical faults after the last fault is displayed.

In fault query status, press and hold "SW7" for five seconds to clear all historical faults of the ODU.

Step 8: If the n7 parameter query is selected, the display is as follows. Enter the to-be-confirmed status of parameter query.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
n7	Blinking	00	Blinking	00	Blinking

On the master unit, press "SW7" to confirm parameter query and enter the module confirmation status for parameter query. The display is as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Module Address	Display Mode	Current Status	Display Mode
n7	On	01	Blinking	00	Blinking
n7	On	02	Blinking	00	Blinking
n7	On	03	Blinking	00	Blinking
n7	On	04	Blinking	00	Blinking

Select a module for parameter query by pressing "SW1 (UP)" or "SW2 (DOWN)" and then press "SW7". The display is as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Parameter Code	Display Mode	Current Status	Display Mode
n7	On	XX	On	Parameter value	Blinking

LED2 displays the parameter code of the module and LED3 displays the parameter value. Parameters are displayed in the following sequence. By default, the outdoor environment temperature value is displayed. Select a corresponding parameter value by pressing "SW1 (UP)" or "SW2 (DOWN)".

Parameter Code	Parameter Name	Unit	Remark
01	Outdoor environment temperature	°C	
02	Operation frequency of compressor 1	Hz	
03	Operation frequency of compressor 2	Hz	
04	Operation frequency of outdoor fan	Hz	
05	Module high-pressure	°C	
06	Module low-pressure	°C	
07	Discharge temperature of compressor 1	°C	
08	Discharge temperature of compressor 2	°C	
09	Discharge temperature of compressor 3	°C	This parameter is invalid for the GMV5 series.
10	Discharge temperature of compressor 4	°C	This parameter is invalid for the GMV5 series.
11	Discharge temperature of compressor 5	°C	This parameter is invalid for the GMV5 series.

12	Discharge temperature of compressor 6	°C	This parameter is invalid for the GMV5 series.
13	Operation frequency of compressor 3	Hz	This parameter is invalid for the GMV5 series.
14	Current value of compressor 1	A	
15	Current value of compressor 2	A	
16	Current value of compressor 3	A	This parameter is invalid for the GMV5 series.
17	Current value of compressor 4	A	This parameter is invalid for the GMV series.
18	Current value of compressor 5	A	This parameter is invalid for the GMV5 series.
19	Current value of compressor 6	A	This parameter is invalid for the GMV5 series.
20	Reserved		
21	Module temperature of compressor 1	°C	
22	Module temperature of compressor 2	°C	
23	Module temperature of outdoor fan 1	°C	
24	Module temperature of outdoor fan 2	°C	
25	Outdoor unit heating EXV1	PLS	
26	Outdoor unit heating EXV2	PLS	
27	Subcooler EXV	PLS	
28	Defrosting temperature	°C	
29	Liquid-extracting temperature of subcooler	°C	
30	Outlet temperature of accumulator	°C	
31	Oil return temperature	°C	This parameter is invalid for the GMV5 series.
32	Inlet-tube temperature of condenser	°C	This parameter is invalid for the GMV5 series.
33	Outlet temperature of condenser	°C	This parameter is invalid for the GMV5 series.

Note:

①. If a parameter value is negative, LED3 circularly displays the negative code "nE" and the numeric value every one second. For example, for -30°C, LED3 alternately displays “nE” for one second and then “30” for another second.

②. The discharge temperature and environment temperature are displayed as four-digit values, circularly displaying the higher two digits and the lower two digits. For example, if "01" and "15" are alternately displayed, it indicates 115°C. If "nE", "00", and "28" are alternately displayed, it indicates -28°C.

③. If a parameter is invalid for the unit, “00” is displayed.

④. If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit restores the current status.

⑤. Step 9: If the nb ODU bar code query is selected, the display is as follows. Enter the to-be-confirmed status of ODU bar code query.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/ Mode	Display Mode	Current Status	Display Mode
nb	Blinking	00	Blinking	00	Blinking

Press "SW7" on the master unit to enter the next-level menu selection. The display is as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Module Address	Display Mode	Current Status	Display Mode
nb	On	01	Blinking	00	Blinking
nb	On	02	Blinking	00	Blinking
nb	On	03	Blinking	00	Blinking
nb	On	04	Blinking	00	Blinking

Select a module for query by pressing "SW1 (▲)" or "SW2 (▼)" and then press "SW7". The display is as follows:

LED1		LED2		LED3	
Function Code	Display Mode	Parameter Code	Display Mode	Current Status	Display Mode
nb	On	Un/Pc	Blinking	-n	Blinking

Note: Un indicates the entire-unit bar code and Pc indicates the controller bar code.

After confirming the module, select a bar code sequence by pressing "SW1 (▲)" or "SW2 (▼)". The display sequence is as follows:

Entire-unit bar code (bits 1-13) and controller bar code (bits 1-13), that is, entire-unit bar code header → entire-unit bar code (bits 1-6) → entire-unit bar code (bits 7-12) → entire-unit bar code (bit 13) → controller bar code header → controller bar code (bits 1-6) → controller bar code (bits 7-12) → controller bar code (bit 13). The display is as follows:

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
Code	On	Code	On	Code	On

Example:

Entire-unit bar code: N1R0128150066

Controller bar code: N1M0128150067

The display sequence is as follows:

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
nb	On	Un	Blinking	-n	Blinking

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
N1	On	R0	On	12	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
81	On	50	On	06	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
6X	On/Off	XX	Off	XX	Off

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
nb	On	Pc	Blinking	-n	Blinking

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
N1	On	M0	On	12	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
81	On	50	On	06	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
7X	On/Off	XX	Off	XX	Off

If a parameter is invalid for the unit, "00" is displayed.

On the master unit, press "SW6" to return to the upper level if there are two levels of menu. Press "SW4" to quit the query status.

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit restores the current status.

Step 4: In query status, press "SW4" to quit.

5. Basic Operations for Engineering Commissioning

5.1 Basic Operations

Basic Operations	Operation Method	Remark
Starting engineering commissioning	Press and hold "SW7" on the master unit for more than five seconds.	——
Selecting no-wired-controller commissioning mode	Press "SW4" and "SW5" simultaneously in any commissioning progress after the unit enters the commissioning status.	In this mode, the system does not detect the communication status between the IDU and wired controller any more. Commissioning can be performed on the IDU without configuring the wired controller.
Quitting engineering commissioning	In engineering commissioning status, press and hold "SW7" for more than five seconds on the master unit to quit commissioning.	——
Pausing engineering commissioning	In engineering commissioning status, press "SW6" on the master unit to retain the previous commissioning completion phase of the current commissioning phase.	This function is valid after step 9. For example, if receiving a pausing engineering commissioning signal during the process of "10. Pre-startup ODU valve status judging phase" in step 11, the system will restore the completion phase of "9. Pre-startup refrigerant judging phase" in step 10.
Continuing engineering commissioning	In engineering commissioning pause status, press "SW6" on the master unit to continue engineering commissioning.	——

5.2 Restoring Factory Settings

Restoring Factory Settings	Setting Method	Prompt for Successful Settings	Remark
Restoring setting 1	Press and hold "SW8" on the master unit for more than 10 seconds.	All LEDs blink for three seconds.	All factory settings of the ODU are restored and the unit waits for re-commissioning.
Restoring setting 2	Press and hold "SW3" and "SW8" on the master unit for more than 10 seconds.	All LEDs blink for five seconds.	Re-commissioning is not required. The number of outdoor and IDUs is memorized. Addresses of outdoor and IDUs are all cleared. All the other function settings are cleared.
Restoring setting 3	Press and hold "SW5" and "SW8" on the master unit for more than 10 seconds.	All LEDs blink for seven seconds.	Re-commissioning is not required. The number of outdoor and IDUs is memorized. Addresses of outdoor and IDUs retain the preceding settings. All the other function settings are cleared.

II. Function Application of IDUs

Indoor unit functions cover user operation functions and engineering application functions. For user operation functions, refer to operating instructions of the IDU, wired controller, and remote controller.

Engineering application functions include:

SN	Function Name
1	Master IDU query and settings
2	Indoor unit project number query and settings
3	User parameter query
4	User parameter settings
5	Engineering parameter query
6	Engineering parameter settings

Engineering application functions can be operated through the IDU wired controller (XK46 or XK49) or remote controller (YV1L1, fittings selectable).

(1). Engineering Application Functions Operated through the XK46 Wired Controller

1). Master IDU Settings

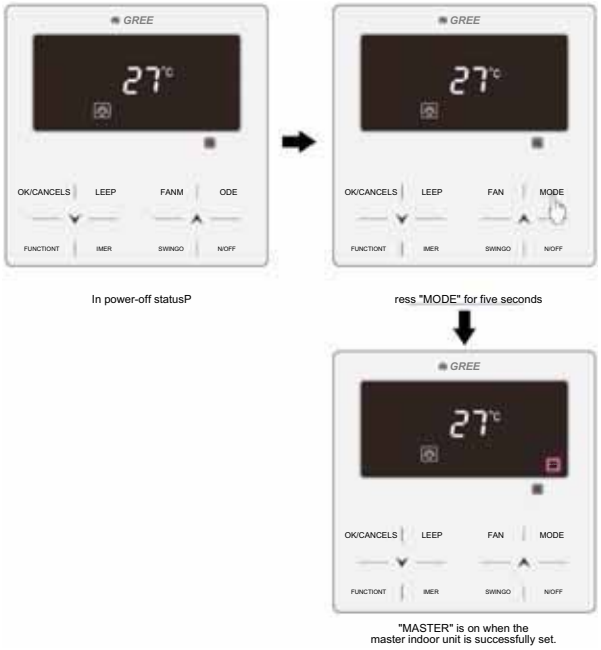
The master IDU can be set through the wired controller or remote controller. The methods for setting the master IDU through the wired controller are as follows:

Method 1:

Step 1: Set an IDU to power-off status.

Step 2: Press and hold the "MODE" button on the wired controller for more than five seconds.

Step 3: Check whether the setting is successful. If it is, "MASTER" on the wired controller will be on. Otherwise, repeat steps 1 and 2.



Method 2:

Step 1: Press and hold the “FUNCTION” button for five seconds in power-on or power-off status to enter the parameter query interface.

Step 2: Press and hold the “FUNCTION” button for five seconds in "C00" status to enter the parameter setting interface.

Step 3: Press “▲” or “▼” to switch level 2 parameter codes till “P10” is displayed on the temperature area.

Step 4: Press the “MODE” button to set the parameter to "01" and then Press the “ENTER” button. If the setting is successful, "MASTER" on the wired controller will be on.

Master IDU Display

① . For IDUs connected with wired controllers, "MASTER" on the wired controller connected with the master IDU will be on.

② . For IDUs embedded or connected with LED panels, the operation LED on the LED panel of the master IDU will blink three times.

Note: After the master IDU is successfully set, stick the “” flag to the wired controller or unit panel for convenience of user operation and engineering maintenance. This flag is placed in the package bag of the ODU.

2). Project number Query and Settings

a. Project number query of a single IDU

Press and hold the “FUNCTION” button for five seconds in power-on or power-off status to enter the parameter query interface "C00". The timer area of the wired controller displays the project number of the current IDU. Synchronously, the double-eight digital LED of the IDU embedded or connected with an LED panel displays its own project number. If the current wired controller works in one-to-many mode, the timer area displays the IDU that has the minimum project number.

b. Project number of multiple IDUs

a). Project number query of IDUs in one-to-many mode: Press and hold the “FUNCTION” button for five seconds in power-on or power-off status to enter the parameter query interface "C00". Press “▼” to switch to “C01”. Press the “MODE” button to enter query. The timer area displays the project numberes of IDUs from small to large. Press “▲” or “▼” to switch project numberes. Synchronously, the double-eight digital LED of the IDU embedded or connected with an LED panel displays its own project number.

Note: It is normal if the buzzer of the IDU operated by the wired controller rings. The purpose of ringing the buzzer is to facilitate engineering commissioning personnel to locate the IDU, especially for the IDU without any LED panel because it cannot display its project number.

b). Project number query of IDUs in the entire communication network: Press and hold the “FUNCTION” button for five seconds in power-on or power-off status to enter the parameter query interface "C00". Press “▼” to switch to “C18”. Press the “MODE” button to enter query. The timer area of each wired controller in the entire network displays the project number of the corresponding IDU. Synchronously, the double-eight digital LED of each IDU embedded or connected with an LED panel displays its own project number.

Method for quitting query:

- Quit the “C18” query interface.
- Press the “ON/OFF” button on any wired controller in the network.

c. Project number settings of IDU

Press and hold the “FUNCTION” button for five seconds in power-on or power-off status to enter the parameter query interface “C00”. Continuously press the “MODE” button for three

times, and then press and hold the “FUNCTION” button for five seconds to enter the engineering parameter setting interface. The temperature area displays “P00”. Press "▼" to switch to “P42”.

- ◆ Single IDU: Press the “MODE” button. The project number blinks in the timer area. Press “▲” or “▼” to adjust the project number, and then Press the “ENTER” button to confirm and return to the upper-level menu.
- ◆ One-to-many: Press the “MODE” button to enter the IDU selection menu. Press “▲” or “▼” to switch IDUs. Press the “MODE” button to set the project number of the current IDU in the same method as above.

3). User Parameter Query

User parameters can be queried in power-on or power-off status.

a. Press and hold the “FUNCTION” button for five seconds to enter the user parameter query interface. The temperature area displays “C00” and “View” is on.

b. Select a parameter code by pressing “^” or “v”.

c. Press the “ENTER/CANCEL” button to return to the upper-level menu till quitting parameter query.

The user parameter query list is as follows:

Table 2.1 User Parameter Query List

Parameter Code	Parameter Name	Parameter Range	View Method
C00	Parameter setting ingress	-	Display mode: Timer area: displays the project number of the current IDU. Note: If the current HBS network consists of multiple IDUs, only the IDU that has the minimum project number is displayed.
C01	Project number query of IDU and faulty IDU location	1-255: project number of online IDU	Operation method: In “C01” status, press the “MODE” button to enter project number query of IDU. Press “▲” or “▼” to switch the IDU SN. Display mode: Temperature area: displays the fault of the current IDU (in the case of multiple faults, they are circularly displayed every three seconds). Timer area: displays (project number conflict C5 fault)/project number of the current IDU (project numberes are arranged from small to large). Special operations: After users press the “MODE” button to enter project number query, the buzzer of the IDU operated by the wired controller will ring till users quit "C01" query or switch to the next IDU.
C03	Indoor unit quantity query in the system network	1-80	Timer area: displays the number of IDUs in the system network.
C06	Preferential operation query	00: common operation 01: preferential operation	**Operation method:** In “C06” status, press the “MODE” button to enter the preferential operation query interface. Press “^” or “v” to switch the IDU SN. **Display mode:** Temperature area: displays the project number of the current IDU. Timer area: displays the preferential operation setting value of the current IDU.
C07	Indoor environment temperature query	-	**Operation method:** In “C07” status, press the “MODE” button to enter the indoor environment temperature query interface. Press “^” or “v” to switch the IDU SN. **Display mode:** Temperature area: displays the project number of the current IDU. Timer area: displays the temperature value of the indoor environment temperature sensor after replenishment.
C08	Prompt time query for air filter cleaning	4-416: days	Timer area: displays the prompt time for air filter cleaning.
C09	Wired controller adress query	01, 02	Timer area: displays the adress of the current wired controller.
C11	Indoor unit quantity query in one-to-many mode	1-16	Timer area: displays the number of IDUs controlled by the wired controller.
C12	Outdoor environment temperature query	-	Timer area: displays the temperature value of the environment temperature sensor of the master ODU.

C17	Indoor relative humidity query	20-90	**Operation method:** In “C17” status, press the “MODE” button to enter the indoor relative humidity query interface. Press “▲” or “▼” to switch the IDU SN. **Display mode:** Temperature area: displays the relative humidity value. Timer area: displays the project number of IDU (project numberes are arranged from small to large). If the HBS network consists of only one IDU, the timer area directly displays the IDU relative humidity value in the “C17” interface.
C18	Indoor unit project number query in the communication network	1-255	**Operation method:** In “C18” status, press the “MODE” button to enter the IDU project number query interface. Press “▲” or “▼” to switch the IDU SN. **Cancellation method:** ① . If users quit the "C18" query interface within 20 seconds, the project number display is cancelled. ② .If the query interface is quit after 20 seconds upon timeout, press the “ON/OFF” button in power-on or power-off status to cancel the project number display. ③ .The method for cancelling the project number display on any wired controller in the network is the same as ② . **Display mode:** Temperature area: displays the SN of the current IDU (project numberes are arranged from small to large). Timer area: displays the project number of the current IDU. Each IDU/wired controller in the network displays its own project number (the wired controller circularly displays project numberes of IDUs every second from small to large).
C20	Fresh-air IDU outlet temperature query	-9 to 99	**Operation method:** In “C20” status, press the “MODE” button to enter the fresh-air IDU temperature query interface. Press “▲” or “▼” to switch the IDU SN. **Display mode:** Temperature area: displays the project number of the current IDU (1-16, project numberes are arranged from small to large). Timer area: displays the fresh-air IDU outlet temperature. If the HBS network consists of only one IDU, the timer area directly displays the fresh-air IDU outlet temperature in the "C20" interface.

Note:

① . In parameter query status, "FAN", “TIMER”, "SLEEP", and "SWING" are invalid. By pressing the “ON/OFF” button, users can return to the main interface but not power on/off the unit.

② . In parameter query status, signals of the remote controller are invalid.

4). User Parameter Settings

User parameters can be set in power-on or power-off status.

a. Press and hold the “FUNCTION” button for five seconds. The temperature area displays “C00”. Press and hold the “FUNCTION” button for another five seconds to enter the wired controller parameter setting interface. The temperature area displays “P00”.
b. Select a parameter code by pressing “ ” or “ ” . Press the “MODE” button to switch to parameter value settings. The parameter value blinks. Adjust the parameter value by pressing “ ” or “ ” and then press the “ENTER/CANCEL” button to complete settings.
c. Press the “ENTER/CANCEL” button to return to the upper-level menu till quitting parameter settings.

The user parameter setting list is as follows:

Table 2.2 User Parameter Setting List

Parameter Code	Parameter Name	Parameter Range	Default Value	Remark
P10	Master IDU settings	00: does not change the master/slave status of the current IDU 01: sets the current IDU to master IDU	00	After the IDU connected with the current wired controller is successfully set to master IDU, "MASTER" on the wired controller is on.
P11	Infrared connection settings of wired controller	00: disabled 01: enabled	01	This setting can only be enabled through the master wired controller. When the infrared remote receiving function of the wired controller is disabled, neither the master nor slave wired controller can receive remote signals. The wired controllers can only be operated by pressing.
P13	Wired controller address settings	01: master wired controller 02: slave wired controller	01	When two wired controllers simultaneously control one or more IDUs, the two wired controllers should use different addresses. The slave wired controller (address: 02) does not have the unit parameter setting function except its own address settings.
P14	Group-controlled IDU quantity settings	00: disabled 01-16: number of indoor units	01	This value is set based on the number of connected IDUs. If the current value is inconsistent with the actual number of group-controlled IDUs, an “L9” fault may occur.

P30	Static pressure settings for indoor fan	Type 1: 03.04.05.06.07 Type 2: 01. 02. 03. 04. 05. 06. 07. 08. 09	05	After identifying the IDU type, the wired controller only displays the available static pressure levels. 1. The static pressure levels fall into five levels and nine levels for VRF IDUs. The wired controller only displays the static pressure levels matched with the identified IDU type. 2. When the HBS network consists of IDUs with both five and nine static pressure levels, the wired controller displays nine adjustable static pressure levels according to the maximum control principle. If the static pressure levels received by the IDU from the wired controller, remote controller, or remote monitoring system exceed the setting range, the limit value prevails. 3. During power-on and synchronization, the setting value of static pressure levels is determined by settings of the IDU.
P31	High-ceiling installation	00: standard-ceiling installation height 01: high-ceiling installation height	00	
P33	Timer function settings	00: common timing 01: time-point timing	00	
P34	Repeating validity for time-point timing	00: single timing 01: repeated everyday	00	This setting is valid only when the timer function is set to time-point timing.
P37	Cooling setting temperature in automatic mode	17°C -30°C	25	Cooling setting temperature – heating setting temperature ≥ 1. Note: The two settings are still valid in remote shielding status.
P38	Heating setting temperature in automatic mode	16°C -29°C	20	
P43	Preferential operation settings	00: common operation 01: preferential operation	00	When power supply is insufficient, users are allowed to power on/off the IDU set with preferential operation and other IDUs are forcibly powered off. A fault code is displayed on the IDU that is forcibly powered off.
P46	Accumulated time clearing for air filter cleaning	00: not cleared 01: cleared	00	

Note:

① . In parameter setting status, "FAN", “TIMER”, "SLEEP", and "SWING" are invalid. By pressing the “ON/OFF” button, users can return to the main interface but not power on/off the unit.

② . In parameter setting status, signals of the remote controller are invalid.

5). Engineering Parameter Query

Engineering parameters can be queried in power-on or power-off status.

Press and hold the “FUNCTION” button for five seconds to enter the engineering parameter query interface. The temperature area displays “C00” and “View**” is on.**

a. Within five seconds after “C00” is displayed, continuously press the “MODE” button for three times in an interval less than one second to enter engineering parameter query.

b. Select a parameter code by pressing “▲” or “▼” .

c. Press the “ENTER/CANCEL” button to return to the upper-level menu till quitting parameter query.

In the engineering parameter query interface, users can also query user parameters listed in Table 3.1.

The engineering parameter query list is as follows:

Table 2.3 Engineering Parameter Query List

Parameter Code	Parameter Name	Parameter Range	View Method
C00	Parameter setting ingress (default)	-	**Display mode:** Timer area: displays the project number of the current IDU. Note: If the current HBS network consists of multiple IDUs, only the IDU that has the minimum project number is displayed.
C02	Indoor unit capacity query	-	**Operation method:** In “C02” status, press the “MODE” button to enter the preferential operation query interface. Press “▲” or “▼” to switch the project number of IDU. **Display mode:** Temperature area: displays the project number of the current IDU. Timer area: displays the current IDU capacity/IDU capacity after adjustment.
C04	Project number query of master IDU	1-255: project number 00: no master IDU	Timer area: displays the project number of the master IDU/00.

C05	Historical fault query ingress of IDU	Five historical faults	**Operation method:** 1. In “C05” status, press the “MODE” button to enter the historical fault query interface. Press “▲” or “▼” to switch the project number of IDU. Press the “MODE” button to enter fault code query of the current IDU. Press “▲” or “▼”to switch the fault SN. Press the “ENTER/CANCEL” button to return to the upper-level menu. **Display mode:** Temperature area: displays the fault SN and fault code. Timer area: displays the project number of IDU.
C10	Static pressure setting query of ODU	00: 0 Pa 20: 20 Pa 50: 50 Pa 80: 80 Pa	**Operation method:** In “C10” status, press the “MODE” button to enter static pressure setting query of ODU. Press “▲” or “▼” to switch the ODU address. **Display mode:** Temperature area: displays the address of the current ODU. Timer area: displays the static pressure setting value.
C13	Outdoor unit network number query	1-255	Timer area: displays the network number of the current ODU.
C14	Temperature query for inlet-tube temperature sensor of IDU	-9 to 99	**Operation method:** In “C14” status, press the “MODE” button to enter inlet-tube temperature sensor query of IDU. Press “▲” or “▼” to switch the IDU SN. **Display mode:** Temperature area: displays the project number of the current IDU. Timer area: displays the temperature value. If the HBS network consists of only one IDU, the timer area directly displays the temperature value in the “C14” interface. No matter Fahrenheit or Centigrade remote signals are received, the temperature is displayed in Centigrade. When the wired controller displays the inlet-tube temperature after receiving signals from the remote controller, the inlet-tube temperature of the IDU that has the minimum project number in the HBS network is displayed by default.
C15	Temperature query for outlet temperature sensor of IDU	-9 to 99	**Operation method:** In “C15” status, press the “MODE” button to enter outlet temperature sensor query of IDU. Press “▲” or “▼” to switch the IDU SN. **Display mode:** Temperature area: displays the project number of the current IDU. Timer area: displays the temperature value. If the HBS network consists of only one IDU, the timer area directly displays the temperature value in the "C14" interface. No matter Fahrenheit or Centigrade remote signals are received, the temperature is displayed in Centigrade. When the wired controller displays the inlet-tube temperature after receiving signals from the remote controller, the inlet-tube temperature of the IDU that has the minimum project number in the HBS network is displayed by default.
C16	Opening degrees query of electronic expansion valve of IDU	0-20	**Operation method:** In “C16” status, press the “MODE” button to enter electronic expansion valve opening degree query of IDU. Press “▲” or “▼” to switch the IDU SN. **Display mode:** Temperature area: displays the project number of the current IDU. Timer area: displays the opening degree value. If the HBS network consists of only one IDU, the timer area directly displays the opening degree value of electronic expansion valve in the “C16” interface. When the wired controller displays the opening degree of electronic expansion valve after receiving signals from the remote controller, the opening degree of electronic expansion valve of the IDU that has the minimum project number in the HBS network is displayed by default.
n2	Capacity configuration ratio upper-limit of outdoor/IDU	35: 135% 50: 150%	Temperature area: displays the parameter code. Timer area: displays the setting value of capacity configuration ratio of the current outdoor/IDU.
n6	Historical fault query ingress of ODU	Five historical faults	**Operation method:** In “n6” status, press the “MODE” button to enter fault code query of ODU (when a wired controller controls multiple IDUs, only the faults memorized by the IDU that has the minimum project number can be queried). Press “▲” or “▼” to switch the fault SN. Press the “ENTER/CANCEL” button to return to the upper-level menu. **Display mode:** Temperature area: displays the fault SN and fault code from left to right (1-5, faults are arranged from the earliest to the latest). Timer area: displays the project number of the ODU.

<table>
<tr>
<td>n7</td>
<td>Parameter query ingress of ODU</td>
<td>01-13
25-29</td>
<td>
Operation method (n7 query is not supported for the slave wired controller):
In “n7” status, the timer area is not displayed. Press the “MODE” button to enter parameter query of ODU. The first bit in the temperature area (display bit of the ODU module ID) blinks. Press “▲” or “▼” to switch the ODU module ID. Press the “MODE” button to select an ODU module. In this case, the first bit in the temperature area stops blinking, and the second and third bits in the temperature area display the parameter code. The timer area displays a corresponding parameter value. Press “▲” or “▼” to switch the parameter code and press the “ENTER/CANCEL” button to return to the upper-level menu.
Display mode:
Temperature area: displays the ODU module ID and parameter code from left to right.
Timer area: displays a corresponding parameter value to the right.
<table>
<tr><th>Parameter Code</th><th>Parameter Name</th><th>Unit</th></tr>
<tr><td>01</td><td>Outdoor environment temperature</td><td>°C</td></tr>
<tr><td>02</td><td>Operation frequency of compressor 1</td><td>Hz</td></tr>
<tr><td>03</td><td>Operation frequency of compressor 2</td><td>Hz</td></tr>
<tr><td>04</td><td>Operation frequency of outdoor fan</td><td>Hz</td></tr>
<tr><td>05</td><td>Module high-pressure</td><td>°C</td></tr>
<tr><td>06</td><td>Module low-pressure</td><td>°C</td></tr>
<tr><td>07</td><td>Discharge temperature of compressor 1</td><td>°C</td></tr>
<tr><td>08</td><td>Discharge temperature of compressor 2</td><td>°C</td></tr>
<tr><td>09</td><td>Discharge temperature of compressor 3</td><td>°C</td></tr>
<tr><td>10</td><td>Discharge temperature of compressor 4</td><td>°C</td></tr>
<tr><td>11</td><td>Discharge temperature of compressor 5</td><td>°C</td></tr>
<tr><td>12</td><td>Discharge temperature of compressor 6</td><td>°C</td></tr>
<tr><td>13</td><td>Operation frequency of compressor 3</td><td>Hz</td></tr>
<tr><td>25</td><td>Outdoor unit heating EXV1
(Actual value = Displayed value * 10)</td><td>PLS</td></tr>
<tr><td>26</td><td>Outdoor unit heating EXV2
(Actual value = Displayed value * 10)</td><td>PLS</td></tr>
<tr><td>27</td><td>Subcooler EXV
(Actual value = Displayed value * 10)</td><td>PLS</td></tr>
<tr><td>28</td><td>Defrosting temperature</td><td>°C</td></tr>
<tr><td>29</td><td>Liquid-extracting temperature of subcooler</td><td>°C</td></tr>
<tr><td>30</td><td>Outlet temperature of accumulator</td><td>°C</td></tr>
<tr><td>31</td><td>Oil return temperature</td><td>°C</td></tr>
<tr><td>32</td><td>Inlet-tube temperature of condenser</td><td>°C</td></tr>
<tr><td>33</td><td>Outlet temperature of condenser</td><td>°C</td></tr>
</table>
</td>
</tr>
<tr>
<td>A6</td>
<td>Unit cooling/ heating function</td>
<td>nA: cooling/heating
nC: single-cooling
nH: single-heating
nF: air supply</td>
<td>Temperature area: displays the parameter code.
Timer area: displays the cooling/heating function setting value of the current unit.</td>
</tr>
</table>

<table>
<tr>
<td>nb</td>
<td>Bar code query of IDU</td>
<td>0-9, A-Z, a-z, -</td>
<td>
Operation method (nb query is not supported for the slave wired controller):
In “nb” status, the timer area is not displayed. Press the “MODE” button to enter bar code query. The temperature area displays “nb” and the project number in the timer area blinks. Press “▲” or “▼” to switch the project number of IDU.
Press the “MODE” button to select an IDU. The temperature area displays “Un” and the timer area displays “-n”. Press “▲” or “▼” to display the entire-unit bar code and controller bar code of IDU. Press the “ENTER/CANCEL” button to return to the upper-level menu. The temperature area displays “nb” and the timer area displays the project number of the queried IDU. Press the “ENTER/CANCEL” button again to return to the upper-level menu.
Display mode:
Temperature area: displays nb/Un/Pc/bar code.
Timer area: displays -n/project number/bar code.
The following is an example:
<table>
<tr><th>Example</th><th>Temperature Area</th><th>Timer Area</th><th>Remark 1</th><th>Remark 2</th></tr>
<tr><td rowspan="3">Entire-init bar code of IDU N1r0128150066</td><td>Un (to the right)</td><td>-n (in the middle)</td><td>It indicates that the following is the entire-unit bar code of IDU.</td><td rowspan="6">Press “▼” to display downward and press “▲” to display upward.</td></tr>
<tr><td>N1r</td><td>0128</td><td>It indicates the former seven bits of the bar code.</td></tr>
<tr><td>150</td><td>066</td><td>It indicates the latter six bits of the bar code.</td></tr>
<tr><td rowspan="3">Controller bar code of IDU N1r0128150067</td><td>Pc</td><td>-n</td><td>It indicates that the following is the controller bar code of IDU.</td></tr>
<tr><td>N1r</td><td>0128</td><td>It indicates the former seven bits of the bar code.</td></tr>
<tr><td>150</td><td>067</td><td>It indicates the latter six bits of the bar code.</td></tr>
</table>
Note:
①. Un indicates the entire-unit bar code of IDU and Pc indicates the controller bar code of IDU.
②. When there is only one IDU, press the “MODE” button in “nb” status to enter bar code query without selecting the project number of IDU.
③. The system quits the query status if no operations are performed in 60 seconds.
④. The bar code query starts from the entire-unit bar code of IDU and ends at the controller bar code of IDU without circulation. That is, the query does not start again even if users press “▼”.
</td>
</tr>
</table>

Note:

①. In parameter query status, "FAN", “TIMER”, "SLEEP", and "SWING" are invalid. By pressing the “ON/OFF” button, users can return to the main interface but not power on/off the unit.

②. In parameter query status, signals of the remote controller are invalid.

6). Engineering Parameter Settings

Engineering parameters can be set in power-on or power-off status.

a. Press and hold the “FUNCTION” button for five seconds. The temperature area displays “C00”. Continuously press the “MODE” button for three times, and then press and hold the “FUNCTION” button for five seconds to enter the engineering parameter setting interface. The temperature area displays “P00”.

b. Select a parameter code by pressing “ ” or “ ”. Press the “MODE” button to switch to parameter value settings. The parameter value blinks. Adjust the parameter value by pressing “ ” or “ ”and then press the “ENTER/CANCEL” button to complete settings.

c. Press the “ENTER/CANCEL” button to return to the upper-level menu till quitting parameter settings.

In the engineering parameter setting interface, users can also set user parameters listed in Table 3.2.

The engineering parameter setting list is as follows:

Table 2.4 Engineering Parameter Setting List

Parameter Code	Parameter Name	Parameter Range	Default Value	Remark
P15	Power-down memory mode	00: standby after power-down recovery 01: restoring the original status after power-down recovery	00	
P17	Historical fault clearing for IDU	00: not cleared 01: cleared	00	Historical faults of all IDUs controlled by the current wired controller are cleared.
P20	Environment temperature sensor settings for IDU	01: temperature sensor of air return vent 02: temperature sensor of wired controller 03: temperature sensor of air return vent for cooling, dehumidifying, and air supply; temperature sensor of wired controller for heating 04: temperature sensor of wired controller for cooling, dehumidifying, and air supply; temperature sensor of air return vent for heating	03	When there are master and slave wired controllers and the temperature sensor of wired controller is used, only the temperature sensor of the master wired controller is used by default. Note: ①. In automatic mode, the environment temperature sensor settings are invalid for a common IDU but the setting value is memorized. ②. The environment temperature sensor settings are invalid for a fresh-air IDU. The temperature sensor of air return vent is used by default.
P21	Corrected value of environment temperature sensor of IDU (for cooling, dehumidifying, and air supply)	-15 to +15	Temperature sensor of unit: 0°C; temperature sensor of wired controller: 0°C	Press "∧" or "∨" to add or reduce by 1°C.
P22	Corrected value of environment temperature sensor of IDU (for heating, fast heating, and air warming)	-15 to +15	Temperature sensor of unit: -2°C; temperature sensor of wired controller: 0°C	Press "∧" or "∨" to add or reduce by 1°C. The temperature sensor of unit and the temperature sensor of wired controller share the same corrected value. In heating mode, corrected value of temperature sensor of unit = corrected value of temperature sensor of wired controller - 2°C.
P32	Capacity adjustment function of IDU	-40% to +40%	00	Press "∧" or "∨" to add or reduce by 10%.
P35	Factory setting recovery for user functions	00: invalid 01: valid	00	Select "01" and then press and hold the "ENTER/CANCEL" button to restore the factory settings for user functions (factory setting recovery fails if remote shielding is valid).
P36	Factory setting recovery for engineering settings	00: invalid 01: valid	00	Select "01" and then press and hold the "ENTER/CANCEL" button to restore the factory status for engineering settings (factory setting recovery fails if remote shielding is valid).
P40	Prevention for heat collection	00: disabled 10: 10 seconds 20: 20 seconds 30: 30 seconds 40: 40 seconds 50: 50 seconds 60: 60 seconds	00	It indicates the number of seconds for enabling the low-level fan every 15 minutes.
P42	Project number settings of IDU	1-255	Automatically generated upon the initial system operation	In "P42" status, press the "MODE" button to enter the setting menu. The project number blinks in the timer area. Press "∧" or "∨" to adjust the project number. Press the "ENTER/CANCEL" button to confirm settings and return to the upper-level menu.
P45	One-key project number reset for IDU	00: invalid 01: valid	00	When it is set to "01", the wired controller initiates an IDU project number reset command.

P48	Minimum opening degree setting for heating breakdown of IDU expansion valves	00: automatically controlled 1-500		After the default minimum opening degree for heating breakdown is manually modified, the opening degree remains unchanged upon heating breakdown.
P50	Target outlet temperature setting for fresh-air IDU in cooling mode	16-30°C		**Operation method:** Enter query in “P50” status and press “▲” or “▼” to set the target outlet temperature of fresh-air IDU. The default value is 18°C upon factory departure. Press the “ENTER/CANCEL” button to confirm settings and return to the upper-level menu. **Display mode:** Temperature area: displays the target outlet temperature of fresh-air IDU.
P51	Target outlet temperature setting for fresh-air IDU in heating mode	16-30°C		**Operation method:** Enter query in “P51” status and press “▲” or “▼” to set the target outlet temperature of fresh-air IDU. The default value is 22°C upon factory departure. Press the “ENTER/CANCEL” button to confirm settings and return to the upper-level menu. **Display mode:** Temperature area: displays the target outlet temperature of fresh-air IDU.
P54	Linked settings for fresh-air IDU	00: no linked control (default) 01: linked control		There is not linked control by default upon factory departure. After the linked control function is set, the fresh-air IDU can be independently controlled.
n0	System conservation operation settings	00: comfortability preferred 01: conservation preferred	00	
n1	Defrosting period settings	40: 40 minutes 50: 50 minutes 60: 60 minutes	50	
n3	Forcible defrosting	00: common 01: forcible defrosting		After settings, it automatically restores to "00".
n4	Highest capacity output limitation settings for ODU	08: 80% 09: 90% 10: 100%	10	Enter query in “n4” status. The temperature area displays the function code and the timer area displays the corresponding function setting value.
A7	Silent function of ODU	00: no silent function 01-09: intelligent nighttime silent mode 10-12: forcible silent mode	00	Enter query in “A7" status. The temperature area displays the function code and the timer area displays the corresponding function setting value.

Note:

① . In parameter setting status, "FAN", “TIMER”, "SLEEP", and "SWING" are invalid. By pressing the “ON/OFF” button, users can return to the main interface but not power on/off the unit.

② . In parameter setting status, signals of the remote controller are invalid.

7). Failure Display

When a fault occurs during the system operation, the temperature area of wired controller displays the fault code. When multiple faults occur, fault codes are circularly displayed.

When a fault occurs, power off the unit and ask for professional maintenance personnel for help.

The following figure shows the power-on high-pressure protection fault interface.

Power-on High-pressure Protection Fault Interface

Note: If the IDU connected with the current wired controller is a fresh-air IDU, “FAP” is displayed on the main interface of the wired controller. Only the outlet temperature can be set for the fresh-air IDU. For the setting method, see the "IDU Function Settings" section.

(2). Engineering Application Functions Operated through the XK49 Wired Controller

XK49 Wired Controller

1). Master IDU Settings

Method 1: In power-off status, press and hold the “MODE” button for five seconds to set the IDU connected with the current wired controller to master IDU. If the setting is successful, “主” will be on.

Method 2:

Step 1: In power-on or power-off status, press and hold the “MODE” button and "SWING" simultaneously for five seconds to enter the parameter query interface.

Step 2: In "C00" status, press and hold the “MODE” button and "SWING" simultaneously for five seconds to enter the parameter setting interface.

Step 3: Press "▲" or "▼" to switch level 2 parameter codes till “P10” is displayed on the temperature area.

Step 4: Press the “MODE” button to set the parameter to "01" and then Press the “ENTER” button. If the setting is successful, "MASTER" on the wired controller will be on.

2). User Parameter Query

User parameters can be queried in power-on or power-off status.

a. Press and hold the “MODE” button and "SWING" simultaneously for five seconds to enter the user parameter query interface. The temperature area displays “C00” and “查看” is on.
b. Select a parameter code by pressing “∨” or “∧”.
c. Press the “SWING” button to return to the upper-level menu till quitting parameter query.

For the user parameter query list of the XK49 wired controller, refer to the user parameter query list in XK46 user parameter query.

Note: In parameter query, the function of "SWING" on the XK49 wired controller is equivalent to the function of “ENTER/CANCEL” on the XK46 wired controller.

3). User Parameter Settings

User parameters can be set in power-on or power-off status.

a. Press and hold the “MODE” button and "SWING" simultaneously for five seconds. The temperature area displays “C00”. Press and hold the “MODE” button and "SWING" simultaneously for another five seconds to enter the wired controller user parameter setting interface. The temperature area displays “P00”.
b. Select a parameter code by pressing “∨” or “∧”. Press the “MODE” button to switch to parameter value settings. The parameter value blinks. Adjust the parameter value by pressing “∨” or “∧” and then press the “SWING” button to complete settings.
c. Press the “SWING” button to return to the upper-level menu till quitting parameter settings.

For the user parameter setting list of the XK49 wired controller, refer to the user setting query list in XK46 user parameter settings.

Note: In parameter settings, the function of "SWING" on the XK49 wired controller is equivalent to the function of “ENTER/CANCEL” on the XK46 wired controller.

4). Engineering Parameter Query

Engineering parameters can be queried in power-on or power-off status.

a. Press and hold the “MODE” and "SWING" button simultaneously for five seconds to enter the engineering parameter query interface. The temperature area displays “C00” and “VIEW” is on.
b. In "C00" status, continuously press the “MODE” button for three times to enter engineering parameter query.
c. Select a parameter code by pressing “∨” or “∧”.
d. Press the “SWING” button to return to the upper-level menu till quitting parameter query.

For the engineering parameter query list of the XK49 wired controller, refer to the engineering parameter query list in XK46 engineering parameter query.

Note: In parameter query, the function of "SWING" on the XK49 wired controller is equivalent to the function of “ENTER/CANCEL” on the XK46 wired controller.

5). Engineering Parameter Settings

Engineering parameters can be set in power-on or power-off status.

a. Press and hold the “MODE” and "SWING" button simultaneously for five seconds. The temperature area displays “C00”. Continuously press the “MODE” button for three times, and then press and hold the “MODE” button and "SWING" simultaneously for another five seconds to enter the wired controller engineering parameter setting interface. The temperature area displays “P00”.
b. Select a parameter code by pressing “∨” or “∧”. Press the “MODE” button to switch to parameter value settings. The parameter value blinks. Adjust the parameter value by pressing “∨” or “∧” and then press the “SWING” button to complete settings.
c. Press the “SWING” button to return to the upper-level menu till quitting parameter settings.

For the engineering parameter setting list of the XK49 wired controller, refer to the engineering setting query list in XK46 engineering parameter settings.

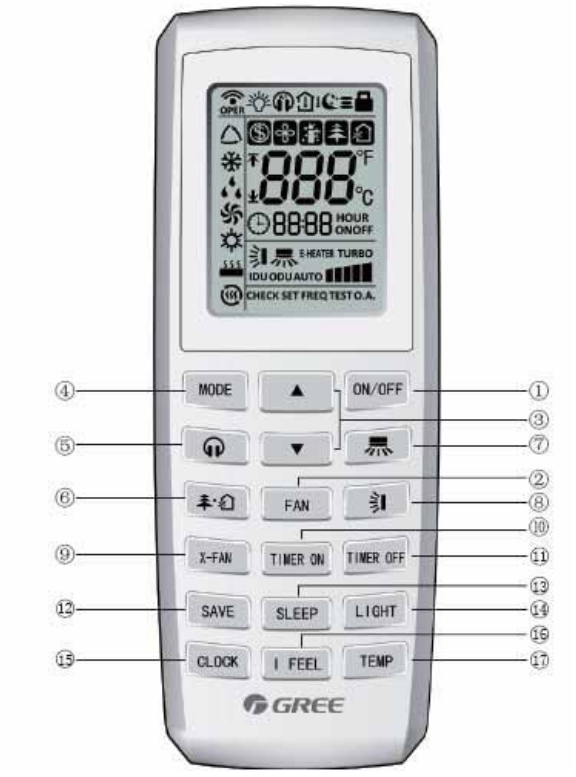
Note: In parameter settings, the function of "SWING" on the XK49 wired controller is equivalent to the function of “ENTER/CANCEL” on the XK46 wired controller.

(3). Engineering Application Functions Operated through the YV1L1 Remote Controller

The YV1L1 remote controller provides all engineering application functions. It is set to common type by default upon factory departure. It can use engineering application functions only after being set to professional type. The following only describes engineering application functions. For other user operation functions, refer to the "Remote Controller Operating Instructions".

Method for setting the professional remote controller: Press "MODE" and "TEMP" simultaneously in power-off status. If "⚙" blinks for three times, it indicates that the setting succeeds.

Method for restoring the common remote controller: Press "MODE" and "TEMP" simultaneously in power-off status. If "⚙" blinks for three times, it indicates that the setting succeeds.



No.	Button name	Function
1	ON/OFF	Turn on or turn off the unit
2	FAN	Set fan speed
3	▲/▼	Set temperature and time
4	MODE	Set operation mode
5		Set quiet function
6		Set health function and air function
7		Set left&right swing status
8		Set up&down swing status
9	X-FAN	Set X-FAN function
10	TIMER ON	Set timer on function
11	TIMER OFF	Set timer off function
12	SAVE	Set energy-saving function
13	SLEEP	Set sleep function
14	LIGHT	Set light function
15	CLOCK	Set clock of the system
16	I FEEL	Set I FEEL function
17	TEMP	Switch temperature displaying type on the unit's display

1). Master IDU Settings

The master IDU can be set through the wired controller or remote controller. The methods for setting the master IDU through the remote controller are as follows:

Step 1: Set an IDU to air-supply status and set the temperature to 30°C.

Step 2: Continuously press "—" and "+" for three times within five seconds.

Step 3: Check whether the setting is successful. If it is, the LED panel of the IDU will display "UC" for five seconds and "MASTER" on the wired controller will be on. Otherwise, repeat steps 1 and 2.

2). Parameter Query

Engineering application functions cover parameter query and parameter settings.

For parameter query, users can query user parameters and engineering parameters of the unit. The parameter query method is as follows:

1) On the professional remote controller of YV1L1, press and hold " CLOCK " for five seconds to enter the parameter query status. The viewing text is displayed. The query code "C00" blinks in the temperature area.

2) Press " ▲/▼ " to switch the query code and select a unit parameter to be queried (see Table 2.5 for parameters that can be queried).

3) If the timer area displays query sub-items, it indicates that there are level 2 query menus. Press " MODE " to enter level 2 query menu selection. The content blinks in the timer area. Press " ▲/▼ " to switch query sub-items and select a level 2 menu to be queried.

4) Press " TEMP " to confirm query and return to step 2.

After entering the engineering application function, the system automatically quits the engineering commissioning status if no valid operations are performed within 20 seconds. To directly quit the engineering commissioning status, press " CLOCK ".

Table 2.5 Query Parameters

Query Code	Query Content	Query Sub-item	Level 2 Query Content
C00	Invalid		
C01	Project number query of the current IDU		
C02	Capacity query of the current IDU		
C03	Indoor unit quantity query in the CAN1 network		
C04	Project number query of the master IDU		
C05	Historical fault query ingress of the current IDU	01	Fault 1
		02	Fault 2
		03	Fault 3
		04	Fault 4
		05	Fault 5
C06	Preferential operation query		
C07	Temperature query for environment temperature sensor of the current IDU		
C08	Prompt time query for air filter cleaning		
C10	Static pressure setting query of ODU	01	Module 1
		02	Module 2
		03	Module 3
		04	Module 4
C11	Indoor unit quantity query in one-to-many control mode		
C12	Temperature query for outdoor environment temperature sensor		
C13	CAN2 bus line ID query		
C14	Inlet-tube temperature query of IDU		
C15	Outlet temperature query of IDU		
C16	Opening degrees query of electronic expansion valve of IDU		
n2	Capacity configuration ratio upper-limit query of outdoor and IDUs		
n4	Highest capacity output limitation query		
n6	Historical fault query ingress of ODU	01	Fault 1
		02	Fault 2
		03	Fault 3
		04	Fault 4
		05	Fault 5
A6	Unit cooling/heating function		
A7	Outdoor silent mode		

3). Parameter Settings

For parameter settings, users can set user parameters and engineering parameters of the unit. The parameter setting method is as follows:

a. After entering parameter query, switch the query code to "C00". Press and hold " CLOCK " for five seconds to enter the parameter setting status. The setting text is displayed and "P00" blinks in the temperature area.

b. Press " ▲/▼ " to switch the setting code and select a unit parameter to be set (see Table 2.6 for parameters that can be set).

c. Press " TEMP " to enter parameter settings. The current parameter value blinks in the timer area. Press " ▲/▼ " to change the parameter value.

d. Press " TEMP " to confirm query and return to step 2.

After entering engineering commissioning, the system automatically quits the engineering commissioning status if no valid operations are performed within 20 seconds. To directly quit the engineering commissioning status, press " CLOCK ".Table 2.6 Setting Parameters

Setting Code	Setting Content	Setting Value
P00	Invalid	
P10	Master IDU settings	00: not changing the current settings 01: setting the corresponding IDU to master IDU 001-255: setting the IDU corresponding to *** to master IDU
P15	Power-down memory mode settings	00: standby after power-down recovery 01: restoring the original status after power-down recovery
P17	Historical fault clearing	00: not cleared 01: cleared
P20	Indoor environment temperature value	01: temperature sensor of air return vent 02: temperature sensor of wired controller 03: temperature sensor of air return vent for cooling, dehumidifying, and air supply; temperature sensor of wired controller for heating 04: temperature sensor of wired controller for cooling, dehumidifying, and air supply; temperature sensor of air return vent for heating and automatic mode
P21	Corrected value settings of environment temperature sensor of IDU (for cooling, dehumidifying, and air supply)	-15 to 15
P22	Corrected value settings of environment temperature sensor of IDU (for heating)	-15 to 15
P30	Static pressure settings for indoor fan	Type 1: 03.04.05.06.07 Type 2: 01.02.03.04.05.06.07.08.09
P31	High-ceiling installation settings	00: standard-ceiling installation height 01: high-ceiling installation height
P32	Capacity adjustment function of IDU	-40% to +40%
P34	Repeating validity for time-point timing	00: invalid 01: valid
P35	Factory setting recovery for user functions	00: invalid 01: factory setting recovery
P36	Factory setting recovery for engineering settings	00: invalid 01: factory setting recovery
P40	Prevention for heat collection	00: disabled 10: 10 seconds 20: 20 seconds 30: 30 seconds 40: 40 seconds 50: 50 seconds 60: 60 seconds
P42	Project number settings of IDU	1-255
P43	Preferential operation settings	00: no preferential operation 01: preferential operation
P44	One-key project number setting query for IDU	00: not displayed 01: displayed
P45	One-key project number reset for IDU	00: invalid 01: project number reset
P46	Accumulated time clearing for air filter cleaning	00: not cleared 01: cleared
P47	Prompt settings for air filter cleaning	00: no cleaning prompt settings 10-39: The first digit indicates the pollution degree of the using place and the second digit indicates the accumulated operating time of IDU. The two digits are described as follows: ①. Slight pollution: The first digit is "1". If the second digit is "0", it indicates that the accumulated operating time is 5500 hours. The accumulated operating time is added by 500 hours when the second digit is increased by "1". When the second digit is "9", the accumulated operating time is 10000 hours. ②. Medium pollution: The first digit is "2". If the second digit is "0", it indicates that the accumulated operating time is 1400 hours. The accumulated operating time is added by 400 hours when the second digit is increased by "1". When the second digit is "9", the accumulated operating time is 5000 hours. ③. Heavy pollution: The first digit is "3". If the second digit is "0", it indicates that the accumulated operating time is 100 hours. The accumulated operating time is added by 100 hours when the second digit is increased by "1". When the second digit is "9", the accumulated operating time is 1000 hours.
n0	System conservation operation settings	00: comfortability preferred 01: conservation preferred
n1	Defrosting period settings	40: 40 minutes 50: 50 minutes 60: 60 minutes
n3	Forcible defrosting	00: no defrosting 01: forcible defrosting
A7	Silent function of ODU	00: no silent function 01-09: intelligent nighttime silent mode 10-12: forcible silent mode
n4	Highest capacity output limitation settings	08: highest energy consumption limitation being 80% 09: highest energy consumption limitation being 90% 10: no conservation limitation

4). Engineering Application Functions Operated through the YAD1F Remote Controller

The YAD1F remote controller only provides engineering application functions for setting the master IDU. For other user operation functions, refer to the "Remote Controller Operating Instructions".

The method for setting the master IDU through the YAD1F remote controller is as follows:

a. Button name and function introduction (outside)

No.	Button name	Function
1	ON/OFF	Turn on or turn off the unit
2	FAN	Set fan speed
3	▲/▼	Set temperature and time
4	COOL	Set cooling function
5	HEAT	Set heating function
6	SWING	Set swing status
7	TURBO	Set turbo function

b. Button name and function introduction (inside)

No.	Button name	Function
1	MODE	Set operation mode
2	TIMER ON	Set timer on function
3	TIMER OFF	Set timer off function
4	LIGHT	Set light function
5	I FEEL	Set I FEEL function
6	X-FAN	Set X-FAN function
7	TEMP	Switch temperature displaying type on the unit's display
8	HEALTH	Set health function
9	CLOCK	Set clock of the system
10	SLEEP	Set sleep function

(For details about the above figures, refer to the instructions 66174100016.)

Perform settings by pressing "▲" and "▼" in air supply mode:

①. Set the temperature to 30°C.

②. Press "▼" and then "▲" in five seconds. Repeat this operation for three times.

After successful settings, "UC" is displayed on the receiving indicator panel of the remote controller for five seconds and "MASTER" is displayed on the wired controller.

Part 3 Commissioning Process

Note:

①. It is forbidden to directly connect the compressor with power supply and forcibly power it on during commissioning and maintenance.

②. Engineering commissioning operations must be performed on the GMV5 serial unit. Otherwise, the unit cannot properly run.

③. Before commissioning is completed, the main board of ODU displays "module address 0F A0" and that of IDU displays "A0".

④. A module must be set to master module and only one can be set during commissioning.

⑤. An IDU must be set to master IDU and only one can be set during commissioning.

⑥. Other functions can use the factory settings if there are not special engineering requirements.

I. Necessity of VRF Engineering Commissioning

Different form ordinary air conditioning units, the VRF system raises high design requirements and easily incurs operation-affected factors such as impurities and water during engineering installation. Due to the requirements on engineering design/installation complexity and high-precise system control, commissioning is mandatory after engineering installation. Only a qualified unit can be delivered for use.

II. Required Files and Tools for Engineering Commissioning

1. Required Tools for Engineering Commissioning of GREE VRF

Inner hexagon spanner	Digital thermometer
Shifting spanner	Noise meter
Cross screwdriver	Clamp meter
Straight screwdriver	Digital multimeter
Vacuum pump	Electricity meter
Electronic balance	Timer
System high and low pressure gauges for corresponding refrigerants	Step ladder
Wind-speed transmitter	

The GMV5 VRF provides two commissioning methods. One is to perform commissioning by pressing buttons on the main board of ODU. The other is to perform commissioning on a PC through professional software. Parameters of the ODU and IDU can be simultaneously disp.

ayed with the second method. (For details about these methods, refer to respective instructions.)

2. Commissioning Files

The following commissioning files are required to record installation and commissioning of units: pre-commissioning scheme determination meeting minutes, commissioning personnel record tables, commissioning system appearance check record tables, commissioning data record tables, and commissioning reports. See attached tables for file formats.

III. Engineering Commissioning Procedures

1. Step 1: Pre-commissioning Preparations

1.1 Overall Commissioning Plan

Before commissioning, the person-in-charge should learn about the overall engineering progress plan, overall workload of engineering commissioning, possible influence factors in achieving the commissioning progress, and required labors and materials.

1.2 Composition of Commissioning Members

Commissioning members comprise aftersales commissioning personnel and installation personnel.

All commissioning participants must take part in professional training courses before unit commissioning. All participants can be grouped as required and each group should include at least professional commissioning personnel and assistants.

1.3 Preparations of Commissioning Tools and Instruments

(1). Make sure that the following tools or instruments are prepared before commissioning.

(2). Make sure that the commissioning software is correct before commissioning.

(3). The professional aftersales commissioning software provided by GREE should be used for commissioning of GREE VRF system.

(4). Make sure that all required files and parameter records are prepared.

2. Step 2: Pre-commissioning Check

Installation environment check covers the heat exchange environment of unit and electromagnetic radiant components. All requirements should comply with national and local electrical standards. For any installation incompliance, records should be made for providing an analysis basis during refrigerating system testing.

2.1 Installation Appearance Check

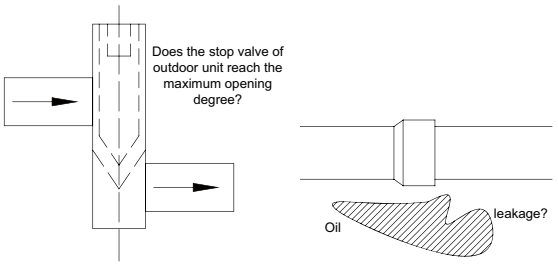
Installation appearance check covers whether pipeline installation complies with specifications, whether refrigerant pipes and condensing drainage pipes are thermal insulated, and whether

Refrigerant pipes should be tidily installed, with outdoor and indoor disperse pipes leaning in the required scope. For any installation incompliance, records should be made for providing an analysis basis during refrigerating system testing.

Refrigerant pipes and condensing drainage pipes should not be exposed. If any pipe is exposed, an immediate amendment is required to avoid serious loss.

2.2 Refrigerating System Check

(1). Before commissioning, make sure that the stop valve of each module reaches the maximum opening degree. Check whether there is any refrigerator oil leakage around the valve. If there is, immediately check for leakage with soap bubbles or leak detectors. If confirming that leakage exists, immediately stop commissioning and solve the problem before continuing commissioning.



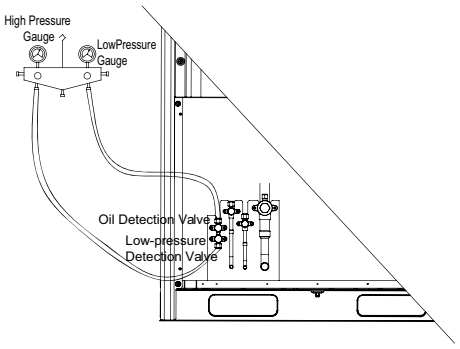
(2). Check system refrigerants before startup.

Before the system is started, connect the liquid-tube valve of ODU with a high pressure gauge and the air-tube valve of ODU with a low pressure gauge, and then read their values. In this case, high pressure and low pressure of the system should be in balance status, and the difference between the saturation temperature corresponding to the balanced pressure value and the environment temperature (the higher in outdoor and indoor temperatures is taken as environment temperature) should not be larger than 5°C. If the difference is larger than 5°C, it is required to check the ODU for leakage.

Note: Guarantee that the system has never been started before this test. Otherwise, the high pressure value will be over-higher than the environment temperature or the low pressure value will be over-lower than the environment temperature.

Example:

The outdoor environment temperature is 30°C and the indoor environment temperature is 28°C. The pressure gauges connected with the system show that the high pressure value is 28°C and the low pressure value is 27°C. The difference between the outdoor environment temperature and either pressure value is less than 5°C. It indicates that the system standby pressure is normal.



2.3 Electrical System Check

(1). Check for high electromagnetic interference, dusts, and acidic or alkaline gas in the unit environment.

1). The air conditioning unit can neither share the same power supply system with the equipment containing variable-frequency drives, nor reside near the equipment generating high electromagnetic interference. Otherwise, the air conditioning unit may fail to properly work due to interference. If this case exists, records should be made. In the case of serious influence, the air conditioning unit must be relocated or relevant measures must be taken.

2). Prevent acidic or alkaline gas/liquid from rusting cables of the air conditioning unit.

(2). Check the installation appearance of power cables.

Check whether power cables of indoor and ODUs are

installed according to vendor requirements and whether cable connectors are reliably connected. Except the connection part of patch panels, wire exposure is not allowed on any connection part of power cables.

(3). Check the power capacity required for the unit.

The air conditioning unit works at a current much larger than the rated current (the working current changes in a large scope in different conditions). The power grid provides unstable voltages and the line power factor decreases. Therefore, the power capacity should not be less than the maximum power of the unit.

(4). Check air switches and fuse links for their models and using methods.

1). Commercial air conditioning units must be installed with independent air switches, fuse links, and similar protectors. Reasonable models and using methods should be selected for air switches and fuse links.

Remarks:

c. Air switches work for overload and short-circuit protection. Air switches provide a less breaking current than fuse links and air switches react more slowly than fuse links. The advantage of air switches is that they can be manually reset after a protection action.

d. Fuse links only work for short-circuit protection. They provide a large breaking current and act slowly. However, fuses must be replaced after a protection action.

2). Select air switch models according to the power cable diameter and air switch specifications. In general, the rated current of air switches should be larger than or equal to the load current calculated based on the line, and less than or equal to the persistent current rating allowed by the conductor.

(5). Check components in the electric box.

In the case of unit power-off, visually check whether any component in the electric box drops during transportation. Then, check whether any component or cable is loose or drops by hand. For a large-scale unit, power cable terminals of the patch panel and cable terminals connected with connectors must be tightened with a sleeve spanner or screwdriver, and tightened once more after two months of normal operation. Auxiliary contacts of AC connectors cannot be removed because they have been debugged upon factory departure.

(6). Check the input power.

1). Power consistency check: Measure the power supply to be connected with the air conditioning unit for its voltage, frequency, three-phase voltage unbalance factor, and frequency offset. Specifications of the power supply should be consistent with power specifications displayed on the unit nameplate. The fluctuation range of voltage should be within ±10%.

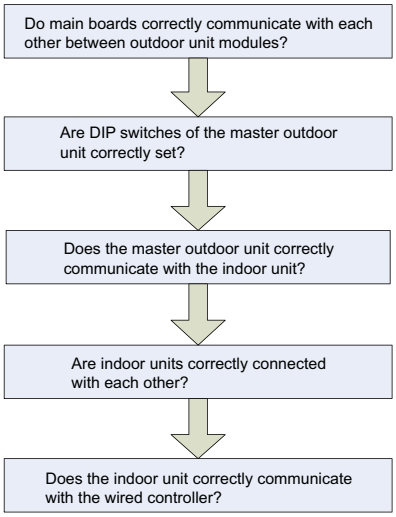
2). Phase sequence check:

a. After powering on the unit, measure the grounded voltage value of N-bit on the power patch panel and the voltage value between every two of L1, L2, and L3 bits. In general, the voltage between N-bit and L1/L2/L3-bit should approach 220 V and the voltage between every two of L1, L2, and L3 bits should approach 380 V. If the measurement result does not match the above-mentioned normal value, check whether the external power cable is inversely connected between the N wire and one of L wires.

b. Observe the code displayed on the digital LED of the main board AP1. If the fault code “U3” is displayed, it indicates that the phase sequence of the external power cable connected with the air conditioning unit is incorrect. Power off the unit and exchange any two phases among L1, L2, and L3 bits on one end of the external power cable. Power on the unit and observe the code again. The fault code “U3” should disappear.

2.4 Communication System Check

(1). The following communication contents must be checked again before commissioning:



(2). Communication cables cannot be laid out in the same trough as power cables. Communication cables should be independently laid out in hard fire-resistant PVC tubes. The parallel spacing between communication cables and strong electric wires should be larger than 20 cm.

2.5 Installation and Master of Commissioning Software

2.6 Spot Check

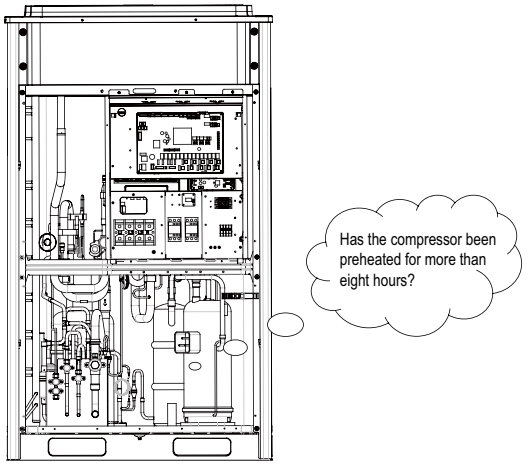
Spot Check for GMV5 Commissioning		
SN	Spot Check Item	Qualified
1	Is the engineering design diagram complete?	
2	Does the construction comply with the design diagram?	
3	Is the rated capacity of the IDU/ODU of a single refrigerating system within 50%-135%?	
4	Is the number of connected IDUs in a single refrigerating system within 80?	
5	Is the access capacity of a fresh-air unit within 30%?	
6	Does the difference of level between IDUs and ODUs comply with unit design requirements?	
7	Does the difference of level between IDUs comply with unit design requirements?	
8	Is an oil loop installed on the riser every 10 m?	
9	Are long pipes of IDUs and ODUs less than or equal to 165 m?	
10	Is the total length of pipes less than 1000 m?	
11	Is the spacing between the ODU and the first disperse pipe larger than 90 m? If yes, is the corresponding pipe diameter increased?	

12	Is the spacing between the IDU and the nearest disperse pipe larger than 10 m? If yes, is the corresponding pipe diameter increased?	
13	Does the wall thickness of copper tubes meet design requirements?	
14	Are disperse pipes horizontal or vertical?	
15	Does the diameter of cables connected with IDUs and ODUs comply with unit design requirements?	
16	Do the circuit breaker and leakage switch comply with unit design requirements?	
17	Is the spacing between the power cable and the TV set larger than 1 m?	
18	Do communication cable materials comply with unit design requirements?	
19	Are all communication cables of IDUs and ODUs serially connected?	
20	Is the last-communicating IDU installed with a communication-matched resistance?	
21	What is the load of the selected IDU model?	
22	Is the foundation of ODU firm? Do shock absorption and water drainage comply with requirements?	
23	Are basic modules installed on the same horizontal line?	
24	Does the drainage pipe of IDU retain a 1/100 ratio of slope?	
25	Is the raised height of drainage pipe of IDU less than 85 cm?	
26	Is the drainage of IDU smooth?	
27	Does a U-shaped trap exist in the drainage pipe of IDU?	
28	Are the air outlet and air return vent of IDU connected with soft connectors? Is a plenum chamber installed for air return?	
29	Is the water pipe of IDU installed with an air exhaust vent?	
30	Is "MASTER" stuck to the wired controller or panel of the master IDU?	
31	Does appending refrigerants to the system comply with requirements?	
32	Does the ODU run with static pressure? Has a static pressure value been set?	
33	Has the ODU been preheated for more than eight hours before commissioning?	

3. Step 3: Commissioning Operation

3.1 Precautions

(1). Before starting commissioning, make sure that the unit compressor has been preheated for more than eight hours and check whether preheating is normal by touching. Commissioning can be started only when preheating is normal. Otherwise, the compressor may be damaged. Commissioning must be performed or guided by professional personnel.



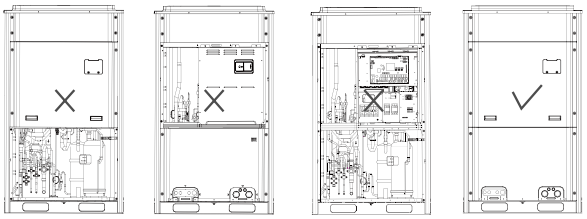
(2). When unit commissioning is started, the system automatically selects an operation mode according to the environment temperature:

Cooling mode when the outdoor environment temperature is higher than 20°C.

Heating mode when the outdoor environment temperature is lower than 20°C.

(3). Before starting commissioning, make sure again that stop valves of all basic modules of the ODU have been completely opened.

(4). During commissioning, the front panel of ODU must be completely covered. Otherwise, commissioning accuracy may be affected (as shown in the following figure).



(5). Before commissioning, make sure that appending refrigerants to pipes has finished completely or for more than 70%.

6) The following table describes progress display of each phase during commissioning:

Progress Description for Commissioning Phases							
——	Commissioning Code		Progress Code		Status Code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
01_Master unit setting detection	db	On	01	On	A0	On	The system is in non-commissioning status.
	db	On	01	On	CC	On	The system does not set any master unit, and a master unit should be set.
	db	On	01	On	CF	On	The system sets more than two master units, and a master unit should be set again.
	db	On	01	On	OC	On	The system successfully sets a master unit and automatically enters the next step.
02_Unit address assignment	db	On	02	On	Ad	Blinking	The system is assigning addresses.
	db	On	02	On	L7	Blinking	There is not any master IDU, and a master IDU should be set through the commissioning software. If no master IDU is set within one minute, the system will automatically set one.
	db	On	02	On	OC	On	The system successfully assigns addresses and automatically enters the next step.
03_Basic module quantity confirmation for ODU	db	On	03	On	01-04	Blinking	LED3 displays the module quantity, which should be manually confirmed.
	db	On	03	On	OC	On	The system confirms the module quantity and automatically enters the next step.
04_Indoor unit quantity confirmation	db	On	04	On	01-80	Blinking	LED3 displays the IDU quantity, which should be manually confirmed.
	db	On	04	On	OC	On	The system confirms the IDU quantity and automatically enters the next step.
05_Internal communication detection for basic modules	db	On	05	On	C2	On	The system detects communication failure between master unit and inverter compressor driver.
	db	On	05	On	C3	On	The system detects communication failure between master unit and inverter fan driver.
	db	On	05	On	CH	On	The rated capacity ratio is over-high between IDUs and ODUs.
	db	On	05	On	CL	On	The rated capacity ratio is over-low between IDUs and ODUs.
	db	On	05	On	OC	On	The system completes detection and automatically enters the next step.
06_Internal component detection for basic modules	db	On	06	On	Corresponding fault code	On	The system detects component failure of ODU.
	db	On	06	On	OC	On	The system detects that no ODU component fails and automatically enters the next step.
07_Component detection for IDU	db	On	07	On	XXXX/ Corresponding fault code	On	The system detects component failure of IDU. "XXXX" indicates the project number of the faulty IDU. The corresponding fault code is displayed after three seconds. For example, if a d5 fault occurs on IDU 100, LED3 will circularly display "01", "00" (two seconds later), and "d5" (two seconds later).
	db	On	07	On	OC	On	The system detects that no IDU component fails and automatically enters the next step.
08_Compressor preheating confirmation	db	On	08	On	U0	On	The system gives a prompt if the compressor preheating period is less than eight hours.
	db	On	08	On	OC	On	The system detects that the compressor preheating period is more than eight hours and automatically enters the next step.

09_Pre-startup refrigerant detection	db	On	09	On	U4	On	The system detects insufficient refrigerants and stops to balance the pressure lower than 0.3 MPa.
	db	On	09	On	OC	On	The system detects that refrigerants are normal and automatically enters the next step.
10_Pre-startup ODU valve status detection	db	On	10	On	ON	On	Outdoor unit valves are being opened.
	db	On	10	On	U6	On	Outdoor unit valves have not been completely opened.
	db	On	10	On	OC	On	Outdoor unit valves have been properly opened.
11_Manually calculated refrigerant perfusion status	db	On	11	On	AE	On	The refrigerant perfusion status is manually calculated (appended refrigerants must be accurately calculated).
12_Unit commissioning startup confirmation	db	On	12	On	AP	Blinking	The system waits for a unit commissioning startup command.
	db	On	12	On	AE	On	The unit is set to manually-calculated refrigerant perfusion commissioning operation status.
13_	——	——	——	——	——	——	No meaning.
14_	——	——	——	——	——	——	No meaning.
15_Cooling operation by manual perfusion	db	On	15	On	AC	On	The system is in cooling-mode commissioning operation (the system automatically selects the commissioning operation mode without needing manual settings).
	db	On	15	On	Corresponding fault code	On	A fault occurs on the cooling-mode commissioning operation.
	db	On	15	On	J0	On	A fault occurs on other modules during the cooling-mode commissioning operation.
	db	On	15	On	U9	On	A fault occurs on ODU pipes or valves.
	db	On	15	On	XXXX/U8	On	The system detects pipe failure of IDU. "XXXX" indicates the project number of the faulty IDU. The fault code "U8" is displayed after three seconds. For example, if a U8 fault occurs on IDU 100, LED3 will circularly display "01", "00" (two seconds later), and "U8" (two seconds later).
16_Heating operation by manual perfusion	db	On	16	On	AH	On	The system is in heating-mode commissioning operation (the system automatically selects the commissioning operation mode without needing manual settings).
	db	On	16	On	Corresponding fault code	On	A fault occurs on the heating-mode commissioning operation.
	db	On	16	On	J0	On	A fault occurs on other modules during the heating-mode commissioning operation.
	db	On	16	On	U9	On	A fault occurs on ODU pipes or valves.
	db	On	16	On	XXXX/U8	On	The system detects pipe failure of IDU. "XXXX" indicates the project number of the faulty IDU. The fault code "U8" is displayed after three seconds. For example, if a U8 fault occurs on IDU 100, LED3 will circularly display "01", "00" (two seconds later), and "U8" (two seconds later).
17_Commissioning completion status	01-04	On	OF	On	OF	On	The unit has completed commissioning and in standby status. LED1 displays the module address; LED2 and LED3 display "OF".

Note: In commissioning status, press and hold "SW3" and "SW4" simultaneously for more than five seconds to enter the no-wired-controller commissioning mode. In this mode, the system does not detect the communication status between the wired controller and IDU.

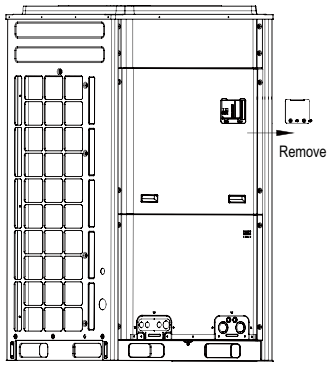
3.2 Commissioning Operation Mode

The GMV5 VRF provides two commissioning methods. One is to perform commissioning through the main board of ODU. The other is to perform commissioning on a PC through professional software. Parameters of the ODU and IDU can be simultaneously displayed and historical data can be stored and queried with the second method. (For details about these methods, refer to respective instructions.)

3.2.1 Commissioning Through the Main Board of ODU

When unit commissioning is performed through the main board of ODU, the main board provides the following commissioning operation functions:

Step 1: Completely cover the front panel of ODU and open commissioning windows of all basic modules.

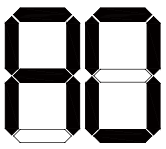


Step 2: In power-off status of ODU, set the ODU to a corresponding static pressure mode according to static pressure design requirements for outdoor engineering. For details about the setting method, see the "Outdoor Fan Static Pressure Setting DIP Switch (SA6_ESP_S)" section. If there are not static pressure requirements, retain the factory settings.

Step 3: In power-off status of ODU, set one module of ODU to master unit and other modules to sub-modules. For details about the setting method, see the "Master Unit Setting DIP Switch (SA8_MASTER-S)" section.

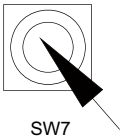
Step 4: If centralized control is required, set the centralized control address in power-off status of ODU. For details about the setting method, see the "Centralized Control Address DIP Switch (SA2_Addr-CC)" section. If centralized control is not required, retain the factory settings.

Step 5: Power on all outdoor and IDUs. If LED3 displays “A0” on main boards of all modules of ODU and the wired controller of each IDU displays “A0”, it indicates that the unit is in non-commissioning status.



LED3

Step 6: Find the module with its address being “01”, which is the master unit. On the master unit, press and hold "SW7" for more than five seconds to enter unit commissioning.



SW7

Step 7: Wait for the unit to automatically operate commissioning steps 01 and 02.

Exception 1: If the master unit is incorrectly set in step 01, the following faults are displayed in step 01:

	Commissioning Code		Progress Code		Status Code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
01_ Master unit settings	db	On	01	On	CC	On	The system does not set any master unit, and a master unit should be set.
	db	On	01	On	CF	On	The system sets more than two master units, and a master unit should be set again.
	db	On	01	On	OC	On	The system successfully sets a master unit and automatically enters the next step.

According to the above fault symptoms, set the master unit again by referring to the setting method in the "Master Unit Setting DIP Switch (SA8_MASTER-S)" section. Then enter unit commissioning again.

Exception 2: If no master IDU is detected in step 02, the following faults are displayed in step 02:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
db	On	02	On	L7	Blinking

In this case, all buttons are invalid. Users can set the master IDU through the commissioning software, wired controller, or commissioning remote controller within one minute. If no master IDU is set within one minute, the system will automatically set a master IDU. Then the system automatically enters the next step.

Step 7: When the unit runs to step 03, users need to manually confirm the number of outdoor modules. The main board of each module is displayed as follows:

	Commissioning Code		Progress Code		Status Code	
Progress	LED1		LED2		LED3	
	Code	Display Status	Code	Display Status	Code	Display Status
03_Module quantity confirmation	db	On	03	On	Module quantity	Blinking

If the displayed quantity is consistent with the number of actually connected modules, press "SW7" on the master unit to confirm. The main board is displayed as follows and the unit automatically enters commissioning step 04.

	Commissioning Code		Progress Code		Status Code	
Progress	LED1		LED2		LED3	
	Code	Display Status	Code	Display Status	Code	Display Status
03_Module quantity confirmation	db	On	03	On	OC	On

If the displayed quantity is inconsistent with the number of actually connected modules, check whether communication cables are correctly connected between modules in power-off status. Then perform commissioning again.

Note: It is very important to correctly confirm the number of ODUs. If the confirmed quantity is inconsistent with the actual quantity, the system may improperly run.

Step 8: When the unit runs to step 04, users need to manually confirm the number of indoor modules. The main board of each module is displayed as follows:

	Commissioning Code		Progress Code		Status Code	
Progress	LED1		LED2		LED3	
	Code	Display Status	Code	Display Status	Code	Display Status
04_Indoor unit quantity confirmation	db	On	04	On	Number of connected IDUs	Blinking

If the displayed quantity is consistent with the number of actually connected modules, press "SW7" on the master unit to confirm. The main board is displayed as follows and the unit automatically enters the next commissioning step.

	Commissioning Code		Progress Code		Status Code	
Progress	LED1		LED2		LED3	
	Code	Display Status	Code	Display Status	Code	Display Status
04_Indoor unit quantity confirmation	db	On	04	On	OC	On

Note: It is very important to correctly confirm the number of IDUs. If the confirmed quantity is inconsistent with the actual quantity, the system may improperly run.

Step 9: Unit commissioning step 05 is internal communication detection.

If no exception is detected, the main board is displayed as follows and the unit automatically enters the next commissioning step.

	Commissioning Code		Progress Code		Status Code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
05_Internal communication detection	db	On	05	On	OC	On	The system completes detection and automatically enters the next step.

If an exception is detected, the unit retains the current status and waits for manual troubleshooting. Corresponding faults include:

	Commissioning Code		Progress Code		Status Code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
05_Internal communication detection	db	On	05	On	C2	On	The system detects communication failure between master unit and inverter compressor driver.
	db	On	05	On	C3	On	The system detects communication failure between master unit and inverter fan driver.
	db	On	05	On	CH	On	The rated capacity ratio is over-high between indoor and ODUs.
	db	On	05	On	CL	On	The rated capacity ratio is over-low between indoor and ODUs.

For details about the above troubleshooting method, refer to the "Troubleshooting Method" part.

Step 10: Unit commissioning step 06 is component detection for ODU.

If no exception is detected, the main board is displayed as follows and the unit automatically enters the next commissioning step.

	Commissioning Code		Progress Code		Status Code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
06_ Component detection for ODU	db	On	06	On	OC	On	The system detects that no ODU component fails and automatically enters the next step.

If an exception is detected, the unit retains the current status and waits for manual troubleshooting. Corresponding faults include:

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
06_ Component detection for ODU	db	On	06	On	Corres-ponding fault code	On	The system detects component failure of ODU.

For details about the above troubleshooting method, refer to the "Troubleshooting Method" part.

Step 11: Unit commissioning step 07 is component detection for IDU.

If no exception is detected, the main board is displayed as follows and the unit automatically enters the next commissioning step.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
07_ Component detection for IDU	db	On	07	On	OC	On	The system detects that no IDU component fails and automatically enters the next step.

If an exception is detected, the unit retains the current status and waits for manual troubleshooting. Corresponding faults include:

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
07_ Component detection for IDU	db	On	07	On	XXXX/Corres-ponding fault code	On	The system detects component failure of IDU.

"XXXX" indicates the project number of the faulty IDU. The corresponding fault code is displayed after three seconds. For example, if a d5 fault occurs on IDU 100, LED3 will circularly display "01", "00" (two seconds later), and "d5" (two seconds later).

For details about the above troubleshooting method, refer to the "Troubleshooting Method" part.

Step 12: Unit commissioning step 08 is compressor preheating confirmation.

If it is detected that the compressor preheating period is more than eight hours, the main board is displayed as follows and the unit automatically enters the next step.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
08_ Compressor preheating confirmation	db	On	08	On	OC	On	The system detects that the compressor preheating period is more than eight hours and automatically enters the next step.

If it is detected that the compressor preheating period is less than eight hours, an exception is prompted and the main board is displayed as follows. In this case, press "SW7" to skip the waiting time and automatically enter the next commissioning step. However, the compressor may be damaged if it is forcibly started.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
08_ Compressor preheating confirmation	db	On	08	On	U0	On	The system gives a prompt if the compressor preheating period is less than eight hours.

Step 13: Unit commissioning step 09 is pre-startup refrigerant confirmation.

If the refrigerant volume meets the system startup requirements, the main board is displayed as follows and the unit automatically enters the next commissioning step.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
09_Pre-startup refrigerant detection	db	On	09	On	0C	On	The system detects that refrigerants are normal and automatically enters the next step.

If no refrigerant exists in the system or the refrigerant volume does not meet the system startup requirements, "U4 lack of refrigerant protection" is prompted and the main board is displayed as follows. The unit cannot enter the next commissioning step. In this case, check for leakage or append refrigerants till the exception disappears.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
09_Pre-startup refrigerant detection	db	On	09	On	U4	On	The system detects insufficient refrigerants and stops to balance the pressure lower than 0.3 MPa.

Step 14: Unit commissioning step 10 is pre-startup ODU valve status detection.

If the master unit is displayed as follows, it indicates that the unit is being enabled.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
10_Pre-startup ODU valve status detection	db	On	10	On	ON	On	Outdoor unit valves are being opened.

If the master unit is displayed as follows, it is required to check again whether the ODU valves are completely opened.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
10_Pre-startup ODU valve status detection	db	On	10	On	U6	On	It is required to check again whether the ODU valves are completely opened.

After confirming that all valves are completely opened, press "SW7" to enter the next commissioning step.

If it is detected that the unit valve status is normal, the main board is displayed as follows and the unit automatically enters the next commissioning step.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
10_Pre-startup ODU valve status detection	db	On	10	On	OC	On	Outdoor unit valves have been properly opened.

Step 15: Unit commissioning step 11 is manually calculated refrigerant perfusion status.

Without operations, the system gives a function prompt and automatically enters the next step.

Step 16: Unit commissioning step 12 is unit commissioning startup confirmation.

To avoid enabling the unit before all preparations are completed, it is required to confirm again whether to enable the unit.

If the master unit is displayed as follows, it indicates that the unit is waiting for enabling confirmation.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
12_Unit commissioning startup confirmation	db	On	12	On	AP	Blinking	The system waits for a unit commissioning startup command.

If it is confirmed to enable the unit, press "SW7". The main board is displayed as follows and the unit automatically enters the next commissioning step.

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
12_Unit commissioning startup confirmation	db	On	12	On	AE	On	The unit is set to manually-calculated refrigerant perfusion commissioning status.

Step 17: After unit startup confirmation, the system automatically selects the cooling or heating mode according to the environment temperature.

A. If the system selects the cooling mode, the main board is displayed as follows:

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
15_Cooling commissioning operation	db	On	15	On	AC	On	The system is in cooling-mode commissioning operation (the system automatically selects the commissioning operation mode without needing manual settings).
	db	On	15	On	Corresponding fault code	On	A fault occurs on the cooling-mode commissioning operation.
	db	On	15	On	J0	On	A fault occurs on other modules during the cooling-mode commissioning operation.
	db	On	15	On	U9	On	A fault occurs on ODU pipes.
	db	On	15	On	XXXX/U8	On	The system detects pipe failure of IDU. "XXXX" indicates the project number of the faulty IDU. The fault code "U8" is displayed after three seconds. For example, if a U8 fault occurs on IDU 100, LED3 will circularly display "01", "00" (two seconds later), and "U8" (two seconds later).

B. If the system selects the heating mode, the main board is displayed as follows:

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
16_Heating commissioning operation	db	On	16	On	AH	On	The system is in heating-mode commissioning operation (the system automatically selects the commissioning operation mode without needing manual settings).
	db	On	16	On	Corresponding fault code	On	A fault occurs on the heating-mode commissioning operation.
	db	On	16	On	J0	On	A fault occurs on other modules during the heating-mode commissioning operation.
	db	On	16	On	U9	On	A fault occurs on ODU pipes.
	db	On	16	On	XXXX/U8	On	The system detects pipe failure of IDU. "XXXX" indicates the project number of the faulty IDU. The fault code "U8" is displayed after three seconds. For example, if a U8 fault occurs on IDU 100, LED3 will circularly display "01", "00" (two seconds later), and "U8" (two seconds later).

Step 18: If no exception occurs when the unit continuously operates for 40 minutes, the system automatically confirms commissioning completion, stops the entire unit, and restores the standby status. The main board is displayed as follows:

Progress	Commissioning Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display Status	Code	Display Status	Code	Display Status	
17_ Commissioning completion status	01~04	On	OF	On	OF	On	The unit has completed commissioning and in standby status. LED1 displays the module address; LED2 and LED3 display "OF".

Step 19: After unit commissioning is completed, set unit functions according to the actual engineering requirements on functions. For details about the setting method, refer to the "System Function Setting Method" part. Skip this step if there are not special requirements.

Step 20: Deliver the unit for use and let users know the precautions.

3.2.2 Commissioning Through the Commissioning Software

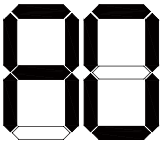
Step 1: Install commissioning software to the computer and connect monitoring communication cables (for details about the operation method, see the "GREE Central Air Conditioning Commissioning Software" section).

Step 2: Completely cover the front panel of ODU.

Step 3: In power-off status of ODU, set the ODU to a corresponding static pressure mode according to static pressure design requirements for outdoor engineering. For details about the setting method, see the "Outdoor Fan Static Pressure Setting DIP Switch (SA6_ESP_S)" section.

Step 4: In power-off status of ODU, set one module of ODU to master unit. For details about the setting method, see the "Master Unit Setting DIP Switch (SA8_MASTER-S)" section.

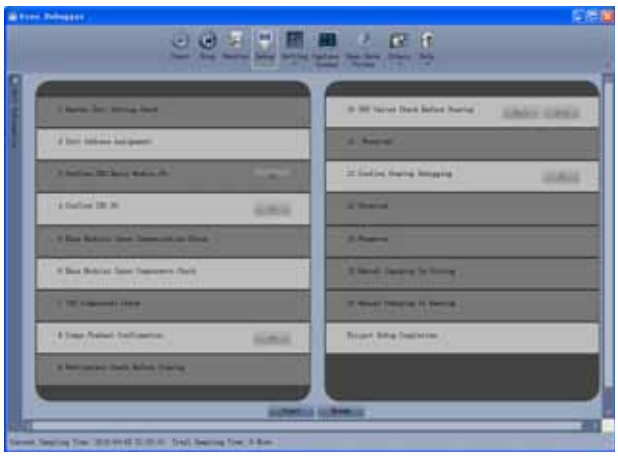
Step 5: Power on all outdoor and IDUs. In this case, all modules of ODU display that the unit is in non-commissioning status.



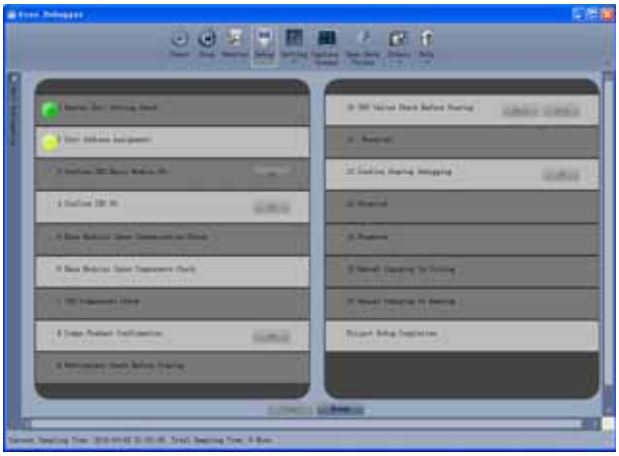
LED3

Step 6: Switch the commissioning software to the commissioning control interface.

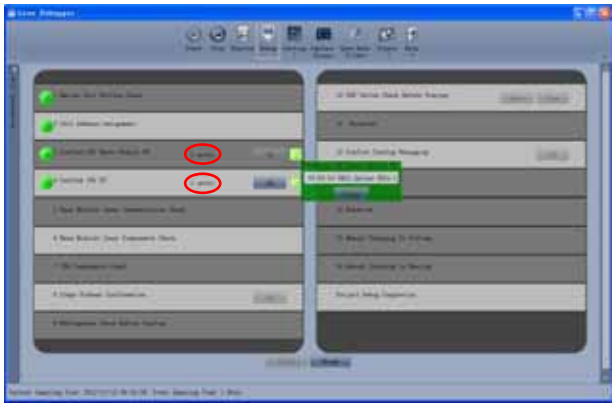
Click "Debug" to switch to the engineering commissioning interface. The unit will automatically operate the commissioning modules listed in this interface from top to bottom and from left to right. Note: The commissioning function only applies to the single-system network.

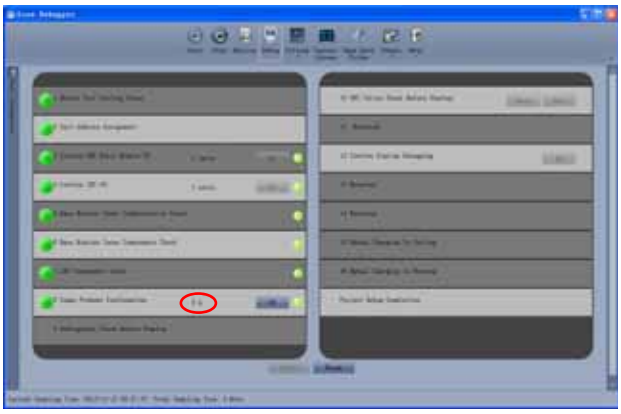


Click "Start" to enter the commissioning function and the software automatically performs commissioning. "" indicates that commissioning is being performed on the phase and "" indicates that commissioning is passed on the phase.

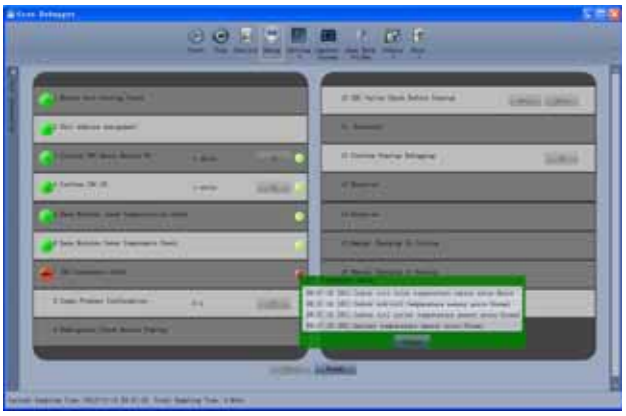


For the phase with "OK" displayed, a manual confirmation is required for entering the next commissioning step. Click "" to display relevant information detected on this phase, which provides references for selection. Click "Close" to close the information (the number of commissioning units is displayed in "3 Confirm ODU Basic Module NO." and "4 Confirm IDU NO."; the preheating period is displayed in “8 Compr. Preheat Confirmation").

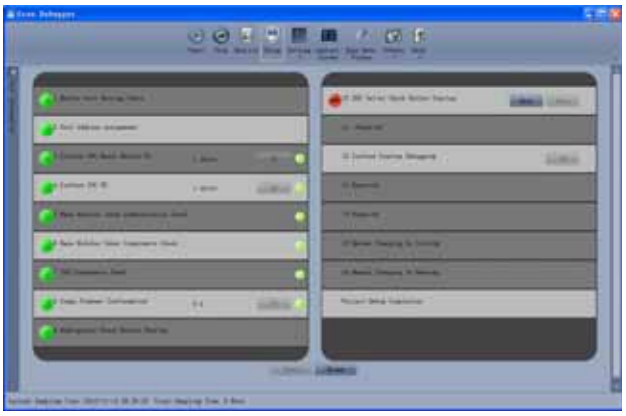


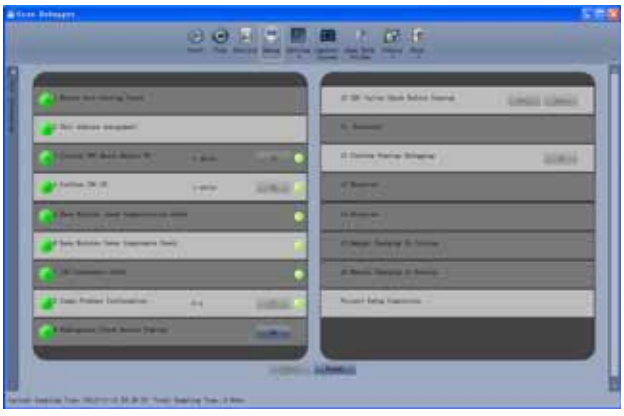


"  " indicates that commissioning is not passed on the phase and troubleshooting is required (after troubleshooting, the unit automatically enters the next step if no "OK" exists or click "OK" to enter the next step). Click "  " to display relevant information detected on this phase, which provides references for troubleshooting. Click "Close" to close the information.



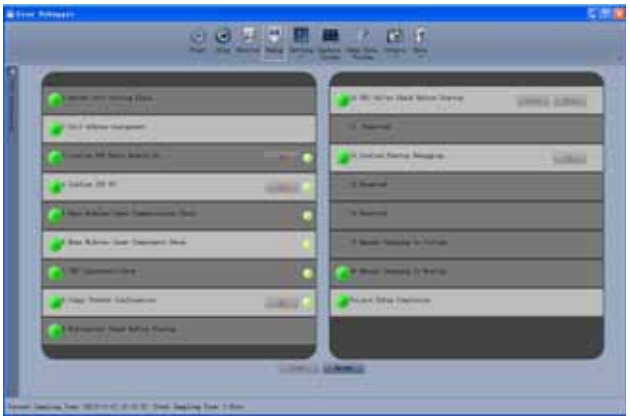
During commissioning, click "Stop" to stop commissioning and then click "Start" to continue commissioning till commissioning ends. "Back" and "Skip" are provided in "10 ODU Valves Check Before Startup". When an exception occurs in step 10, click "Back" to return to step 9 and then click "OK" in step 9 to perform commissioning again for step 10. If a U6 fault (valve exception) occurs in step 10, users can click "Skip" to skip the fault. For other faults, "Skip" is unavailable.





Commissioning steps 11, 13, and 14 are reserved. Steps 13, 14, 15, and 16 are parallel steps (one of the four steps will be selected according to the actual unit).

At last, engineering commissioning is completed when "  " is displayed on "Project Debug Completion".



Note: During commissioning, users must listen to the operating sound of outdoor and indoor fans and compressors to check for exceptions.

3.3 Operations after Commissioning

Sort and save data. Make detailed records of exceptions and troubleshooting methods during commissioning for later maintenance and query. At last, make a commissioning report and hand it over to users.

3.4 Precautions to Let Users Know after Commissioning

(1). Let users know where the master IDU is located and stick a label to the master IDU. Tell users that modes of other IDUs are limited by the mode of master IDU.

(2). An ODU that has been in power-off status for more than 24 hours should be preheated for more than eight hours before startup to prevent damaging compressors.

IV. References for Proper Unit Operation Parameters

SN	Commissioning Item		Parameter Name	Unit	Reference Value
1	System parameter	Outdoor unit parameter	Outdoor environment temperature	°C	——
2			Discharge pipe temperature of compressor	°C	●When the system compressor is running, the normal discharge pipe or top temperature for cooling is 70-95°C, which is more than 10°C higher than the saturation temperature corresponding to the system high-pressure. The normal temperature for heating is 65-80°C, which is more than 10°C higher than the saturation temperature corresponding to the system high-pressure.
3			Defrosting temperature	°C	●When the system runs for cooling, the defrosting temperature is 5-11°C lower than the system high-pressure value. ●When the system runs for heating, the defrosting temperature is 2°C higher or lower than the system low-pressure value.
4			System high-pressure	°C	●The normal system high-pressure value is 20-55°C. With the change of environment temperature and system operation capacity, the system high-pressure value is 10-40°C higher than the environment temperature. The higher the environment temperature, the less the temperature difference. ●When the system runs for cooling with the environment temperature being 25-35°C, the system high-pressure value is 44-53°C. ●When the system runs for cooling with the environment temperature being -5 to 10°C, the system high-pressure value is 40-52°C.
5			System low-pressure	°C	●When the system runs for cooling with the environment temperature being 25-35°C, the system low-pressure value is 0-8°C. ●When the system runs for cooling with the environment temperature being -5 to 10°C, the system high-pressure value is -15 to 5°C.
6			Opening degree of heating electronic expansion valves	PLS	●During the cooling operation, the heating electronic expansion valves always remain at 480 PLS. ●During the heating operation, the adjustable electronic expansion valves change between 120 and 480 PLS.
7			Operation frequency of inverter compressor	Hz	●The operation frequency of inverter compressor 1 changes between 20 and 95 Hz. ●The operation frequency of inverter compressor 2 changes between 30 and 100 Hz.
8			Current of inverter compressor	A	●According to different operation frequencies and loads, the current of inverter compressor 1 changes between 7 and 25 A. The current of inverter compressor 2 changes between 7 and 20 A.
9			IPM module temperature of inverter compressor	°C	●When the environment temperature is lower than 35°C, the temperature of the IPM module is lower than 80°C. The highest temperature is not higher than 95°C.
10			Driver bus line voltage of inverter compressor	V	●The normal bus line voltage is 1.414 times larger than the power voltage. For example, if the three-phase power voltage is 390 V, the bus line voltage after current rectification is 390 V × 1.414 = 551 V. It is normal if the difference between the actual test value and the calculation value is within 15 V.
11			Operation frequency of fan	Hz	●With the adjustment of system pressure, the fans run between 0 and 65 Hz.
12		Indoor unit parameter	Environment temperature of IDU	°C	——
13			Inlet-tube temperature of indoor heat exchanger	°C	●As the environment temperature is different, the inlet-tube temperature is 1-7°C lower than the outlet-tube temperature of the same IDU in cooling mode. ●The inlet-tube temperature is 10-20°C lower than the outlet-tube temperature of the same IDU in heating mode.
14			Outlet-tube temperature of indoor heat exchanger	°C	
15			Opening degree of indoor electronic expansion valves	PLS	The opening degree automatically changes between 0 and 2000 PLS or between 0 and 480 PLS.
16	Communication parameter	Communication data		—	●The commissioning software shows that the number of IDUs/ODUs is consistent with the actual engineering quantity, without communication failure.
17	Drainage system	——		—	●The drainage effect of IDU is smooth and thorough, and no adverse-slope water storage exists in condensing drainage pipes. The ODU can implement drainage completely from the drainage pipe, without drops from the unit foundation.
18	Other	——			●No exceptional sound occurs on compressors and indoor/outdoor fans. No fault occurs on the unit operation.

Chapter 4 Maintenance

CONTENTS

Part 1 Failure Code Table

1. System Failure Code Table

GREE VRF Display Code (1)																							
Content symbol / Distinctive symbol		0	1	2	3	4	5	6	7	8	9	A	H	C	L	E	F	J	P	U	b	d	n	y
Indoor	L	Indoor unit fault (unified)	Indoor fan protection	Auxiliary heating protection	Water overflow protection	Power supply over-current protection	Anti-freezing protection	Mode conflict	No master IDU	Power supply shortage	Inconsistent number of multi-split IDUs	Inconsistent series of multi-split IDUs	Warning about poor air quality	Mismatching indoor and ODU models										
	d		Indoor unit PCB fault		Temperature sensor fault	Intake temperature sensor fault	Middle temperature sensor fault	Exhaust temperature sensor fault	Humidity sensor fault	Water temperature sensor fault	Jumper cap fault	Indoor unit network address exception	Wired controller PCB exception	Volume dial switch setting exception	Air outlet temperature sensor fault	Indoor CO2 sensor fault					Project commissioning			

GREE VRF Display Code (2)																								
Content symbol / Distinctive symbol		0	1	2	3	4	5	6	7	8	9	A	H	C	L	E	F	J	P	U	b	d	n	y
Outdoor	E	Outdoor unit fault (unified)	High-pressure protection	Low exhaust temperature protection	Low-pressure protection	High exhaust temperature protection	High exhaust temperature protection for compressor 1	High exhaust temperature protection for compressor 2	High exhaust temperature protection for compressor 3	High exhaust temperature protection for compressor 4	High exhaust temperature protection for compressor 5	High exhaust temperature protection for compressor 6		Exhaust temperature sensor falling protection for compressor 1	Exhaust temperature sensor falling protection for compressor 2	Exhaust temperature sensor falling protection for compressor 3	Exhaust temperature sensor falling protection for compressor 4	Exhaust temperature sensor falling protection for compressor 5	Exhaust temperature sensor falling protection for compressor 6	High cover temperature protection for compressor 1	High cover temperature protection for compressor 2			
	F	Outdoor unit main board fault	High pressure sensor fault		Low pressure sensor fault		Compressor 1 exhaust temperature sensor fault	Compressor 2 exhaust temperature sensor fault	Compressor 3 exhaust temperature sensor fault	Compressor 4 exhaust temperature sensor fault	Compressor 5 exhaust temperature sensor fault	Compressor 6 exhaust temperature sensor fault	Compressor 1 current sensor fault	Compressor 2 current sensor fault	Compressor 3 current sensor fault	Compressor 4 current sensor fault	Compressor 5 current sensor fault	Compressor 6 current sensor fault		Compressor 1 cover temperature sensor fault	Compressor 2 cover temperature sensor fault			

GREE VRF Display Code (3)																							
Content symbol		0	1	2	3	4	5	6	7	8	9	A	H	C	L	E	F	J	P	U	b	d	n	y
Distinctive symbol																								
Outdoor	J	Other module protection	Over-current protection for compressor 1	Over-current protection for compressor 2	Over-current protection for compressor 3	Over-current protection for compressor 4	Over-current protection for compressor 5	Over-current protection for compressor 6	Four-way valve leakage protection	High system pressure ratio protection	Low system pressure ratio protection	Exceptional pressure protection		Water flow switch protection	Low high pressure protection									
	b		Outdoor ambient temperature sensor fault	Defrosting temperature sensor 1 fault	Defrosting temperature sensor 2 fault	Subcooler outflow temperature sensor fault	Subcooler exhaust temperature sensor fault	Air intake temperature sensor 1 fault	Air intake temperature sensor 2 fault	Outdoor humidity sensor fault	Heat exchanger exhaust temperature sensor fault	Oil return temperature sensor fault	System clock exception	Cover temperature sensor falling protection for compressor 1	Cover temperature sensor falling protection for compressor 2									

GREE VRF Display Code (4)																								
Content symbol		0	1	2	3	4	5	6	7	8	9	A	H	C	L	E	F	J	P	U	b	d	n	y
Distinctive symbol																								
Outdoor	P	Compressor driver board fault (displayed on the IDU)	Compressor driver board failure (displayed on the IDU)	Compressor driver board power voltage protection (displayed on the IDU)	Compressor drive module reset protection	Compressor drive PFC protection	Inverter compressor over-current protection	Compressor drive IPM module protection	Compressor drive temperature sensor fault	Compressor drive IPM over-temperature protection	Inverter compressor out-of-step protection	Inverter compressor drive storage chip fault	Compressor drive DC bus high voltage protection	Compressor drive current detection circuit fault	Compressor drive DC bus low voltage protection	Inverter compressor out-of-phase protection	Compressor drive recharging circuit fault	Inverter compressor starting failure	Inverter compressor AC current protection					
	H	Fan driver board fault (displayed on the IDU)	Fan driver board failure (displayed on the IDU)	Fan driver board power voltage protection (displayed on the IDU)	Fan drive module reset protection	Fan drive PFC protection	Variable frequency fan over-current protection	Fan drive IPM module protection	Fan drive temperature sensor fault	Fan drive IPM over-temperature protection	Variable frequency fan out-of-step protection	Variable frequency fan drive storage chip fault	Fan drive DC bus high voltage protection	Fan drive current detection circuit fault	Fan drive DC bus low voltage protection	Variable frequency fan out-of-phase protection	Fan drive recharging circuit fault	Variable frequency fan starting failure	Variable frequency fan AC current protection					

GREE VRF Display Code (5)																				
Content symbol	0	1	2	3	4	5	6	7	8	9	A	H	C	L	E	F	J	P	U	b	d	n	y
Distinctive symbol																							
Commissioning	U																						
	Deficient preheating of the compressor		Wrong ODU capacity code/jumper cap setting	Power phase sequence protection	Refrigerant shortage protection	Wrong compressor drive board address	Valve exception warning		Indoor unit pipeline fault	Outdoor unit pipeline fault			Master IDU is set	Wrong compressor emergency operation dial	Invalid refrigerant injection								

GREE VRF Display Code (6)																				
Content symbol	0	1	2	3	4	5	6	7	8	9	A	H	C	L	E	F	J	P	U	b	d	n	y
Distinctive symbol																							
Status	A																						
	The unit is not commissioned.		After-sales refrigerant recycling	Defrosting	Oil recycling		Cooling and heating setting	Silent mode setting	Vacuum mode			Heating	Cooling		Refrigerant injecting	Ventilation	Filter cleaning reminder	Unit starting commissioning confirmation	Remote emergency shutdown	Emergency shutdown	Restricted operation		
	n																						
	Economic mode setting		Upper indoor/ outdoor capacity ratio		Maximum output capacity		Unite fault enquiry	Unit parameter enquiry	Indoor unit project number enquiry		Cooling and heating model	Heating model	Cooling model		Negative code	Ventilation model							

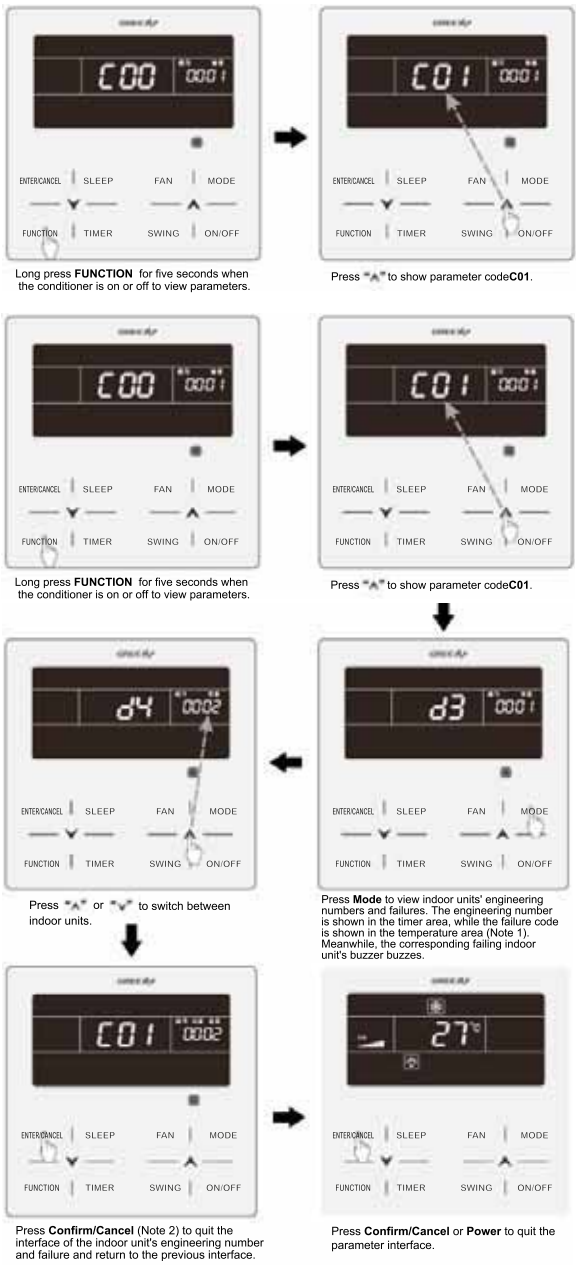
For example, when E4 is displayed on the ODU, find line E and column 4 in the above tables. The fault is shown in the intersection of the line and column: High exhaust temperature protection.

Note: Previous faults in the system can be queried on the main board of the ODU and commissioning software. See n6 Fault Enquiry of the ODU or enquiry function of the commissioning software for the method.

Part 2 Exception and Troubleshooting

1. How to locate a faulty IDU promptly

Use the IDU project number enquiry and faulty IDU locating function to locate a faulty IDU or wired controller's corresponding IDU as follows when multiple IDUs are running in one place:



C01 Indoor project number and fault enquiry

Note 1: If the enquired IDU is normal, no fault code will be displayed in the temperature area; if the unit indoor has multiple

faults, fault codes will be displayed in the temperature area at an interval of 3 seconds.

Note 2: Press the “ON/OFF” button on the interface of IDU project number and fault enquiry to exist the parameter enquiry interface.

2. Exception Analyzing and Troubleshooting

(1). Form analyzing

1). Control

Fault code	Fault	Possible reasons	Solution
F0	Faults in the ODU's main board (such as memory and address chip exceptions)	①. The clock chip on the main board is damaged. ②. The memory chip on the main board is damaged. ③. The address chip on the main board is damaged.	①. Replace the small CPU board. ②. Replace the control board. ③. Replace the control board.
FC	Faults in the constant frequency compressor's current sensor	①. The constant-frequency compressor is not started. ②. The current detection board is faulty. ③. The main board's detection circuit is faulty.	①. If the compressor is not started, check if the AC contact is closed. If not, replace the AC contact. ②. If the connection is loose, reconnect it; ③. Replace the current detection board. ④. Replace the main board.
U2	Wrong outdoor capacity code setting	①. The capacity code is wrong. ②. The dial component is faulty.	①. Modify the capacity code setting. ②. Replace the main board.
U3	Power phase sequence protection	①. The three-phase power cable is not connected correctly. ②. The main board's detection circuit is faulty.	①. Check connection of the power cable. ②. Replace the control board.
UL	Wrong emergency operation dial code	①. The dial setting is wrong. ②. The dial component is faulty.	③. Modify the dial setting. ④. Replace the main board.
C0	Communication failure between indoor and ODUs and IDU's communicator	①. The communication cable is not connected. ②. The communicator is disconnected. ③. The communication cable is poorly connected. ④. The communicator controller is faulty.	If C0 is not displayed on the control board of the ODU, check the network between the IDU and communicator. If C0 is displayed, check the network between the IDUs and ODUs and between the IDU and communicator as follows: ①. Check if the cables connecting the control board of the ODU and the IDU and connecting the IDU and communicator are loose. If yes, reconnect them; ②. Check if the cables connecting the control board and IDU and connecting the IDU and communicator are broken. If yes, replace the cables; ③. Check the contact of the communication cables; ④. Replace the control board. If the fault is solved, the control board is faulty. Replace the IDU. If the fault is solved, the IDU is faulty.
C2	Communication failure between main control board and inverter compressor drive	①. The communication cable is not connected. ②. The communicator is disconnected. ③. The communication cable is poorly connected. ④. The communicator is faulty.	①. Check if the cable connecting the control board and the compressor's drive board is loose. If yes, reconnect it; ②. Check if the cable connecting the control board and compressor's drive board is broken. If yes, replace the cable; ③. Check the contact of the communication cable connecting the control board and compressor's drive board; ④. Replace the control board. If the fault is solved, the control board is faulty. Replace the compressor's drive board. If the fault is solved, the compressor's drive board is faulty.
C3	Communication failure between main control board and variable frequency fan drive	①. The communication cable is not connected. ②. The communicator is disconnected. ③. The communication cable is poorly connected. ④. The communicator is faulty.	①. Check if the cable connecting the fan's drive board and the compressor's drive board is loose. If yes, reconnect it; ②. Check if the cable connecting the fan's drive board and compressor's drive board is broken. If yes, replace the cable; ③. Check the contact of the communication cable connecting the fan's drive board and compressor's drive board; ④. Replace the control board. If the fault is solved, the control board is faulty. Replace the fan's drive board. If the fault is solved, the fan's drive board is faulty.
C5	Indoor unit project number conflict warning	Project numbers conflict with each other.	Change conflicting project numbers and ensure that no IDU's project number is repeated.

C6	Outdoor unit number inconsistency warning	①. Communication cables between ODUs are loose. ②. Communication cables between ODUs are broken. ③. Communication cables between ODUs are poorly connected. ④. The control board is faulty.	①. If the communication cable is loose, reconnect it; ②. If the communication cable is broken, replace it; ③. Check contact of the communication cable; ④. Replace the control board.
CC	No controlling unit	①. The SA8 dial switch of the ODU is not switched to 00. ②. The SA8 dial switch of the ODU is faulty.	①. Switch the SA8 dial switch of an ODU to 00; ②. Replace the control board or switch an ODU's SA8 dial switch to 00.
CF	Multiple controlling units	①. SA8 dial switches of multiple ODUs are switched to 00. ②. Dial switches of multiple ODUs are faulty.	①. Leave one SA8 dial switch unchanged, while switch all the other dial switches to 11; ②. Replace the control board.
L7	No master IDU	①. The master IDU is powered off. ②. The communication of the master IDU fails. ③. The main board of the master IDU is faulty. ④. No master IDU is set in the system.	①. Check if the master IDU is powered on. If yes, replace the main board; ②. Check the contact of the communication cable of the master IDU. If no communication failure (C0) is reported, replace the main board. ③. Replace the IDU's main board and reset the master IDU. ④. Set the master IDU.
C5	Project number conflict	Multiple IDUs share one project number.	Reset the repeated project number (useful when there is no centralized control of multiple systems).

Note: Solution of C5 fault when multiple cooling systems are controlled in a centralized way

When multiple cooling systems are controlled in a centralized way, the C5 fault, i.e. project number conflict, may occur on different cooling systems. In such case, set project numbers of each system and solve the fault as follows:

a. Project number conflict:

When multiple systems are controlled in a centralized way, if two or more IDUs share the same project number, the engineer number conflict occurs. In that case, IDUs cannot be switched to varied modes or be turned on or off. The whole device cannot be started before the conflict is solved. The commissioning software will show the following page:

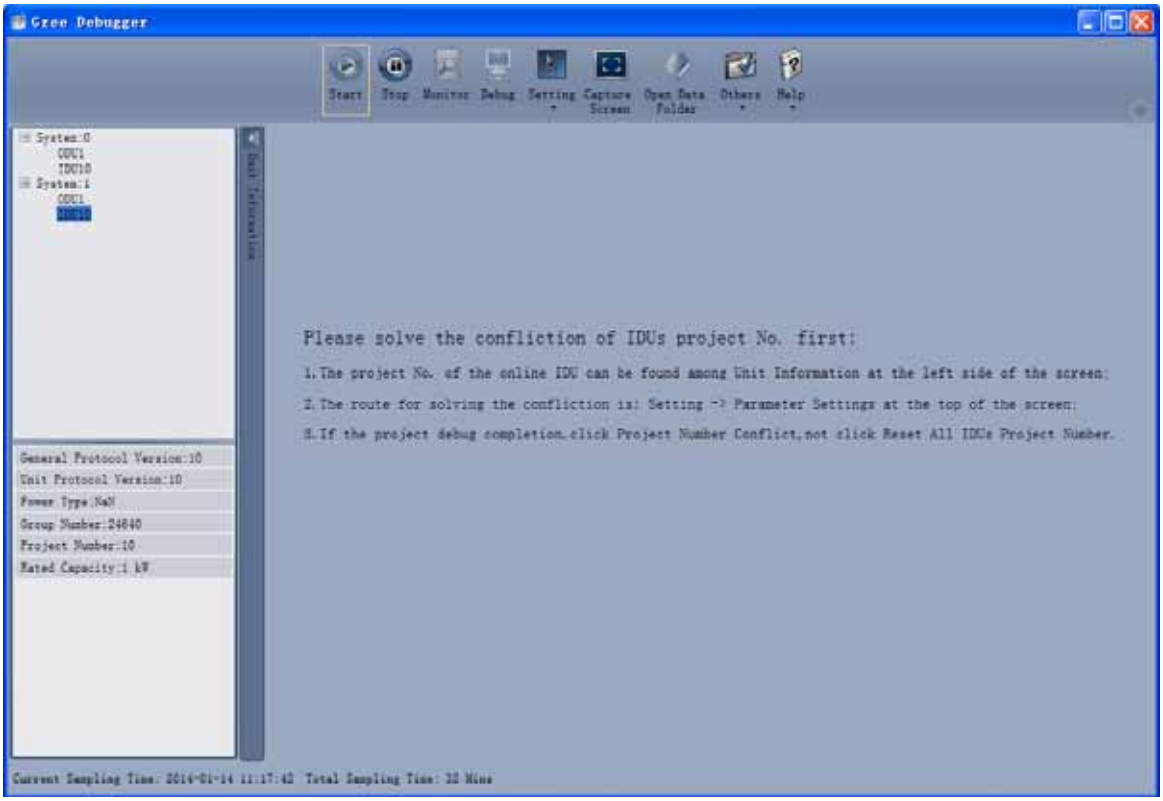


Figure 1

b. Solution of project number conflict:

a). Manual setting on the commissioning software:

Use the commissioning software to set IDUs' project numbers separately in every system or reset projects numbers in multiple systems.

Choose Setting -> Parameter Settings, as shown in Figure 2:

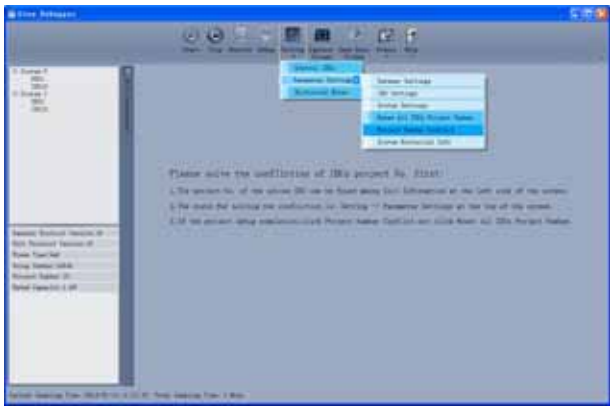


Figure 2

If project commissioning is finished and the IDU where the conflict occurs needs to be set separately. Click Project Number Conflict, as shown in Figure 3. The pop-up box comprises two parts: conflicting IDU box, showing the IDU's project number, system number and time; setting box, showing the IDU project number setting and setting button.

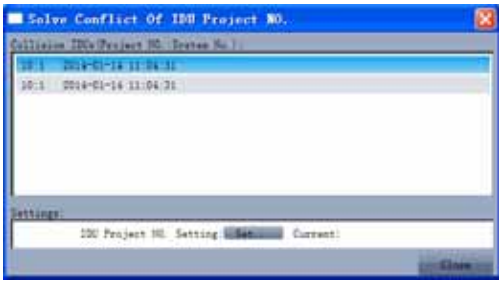


Figure 3

Choose one IDU in the conflicting IDU box shown in Figure 3 and click Set in the setting box. Choose a value in the pop-up box shown in Figure 4 and click Set.

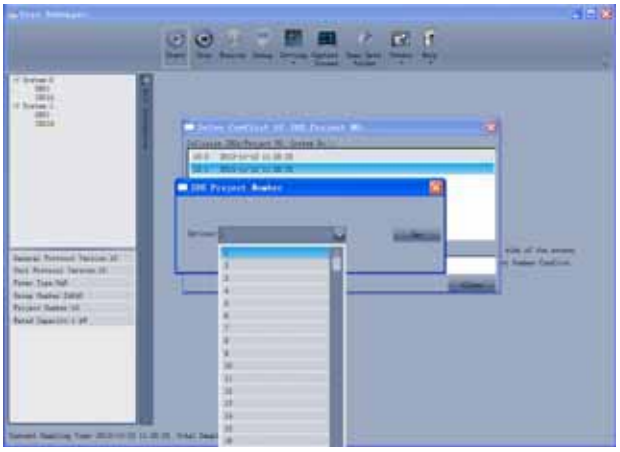


Figure 4

If the conflict is solved, the system will return to the normal status and IDUs can be operated, as shown in Figure 5:

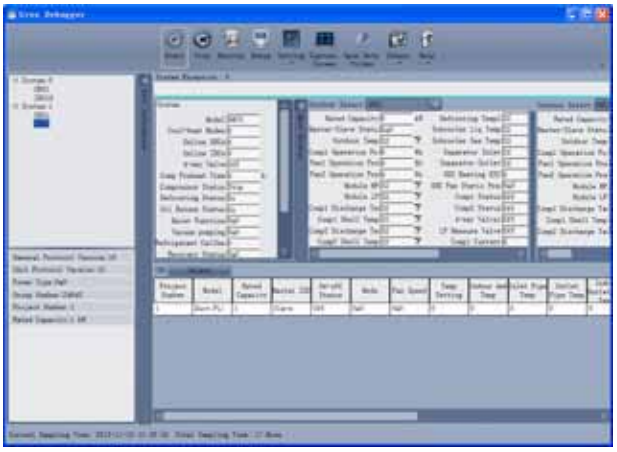


Figure 5

If project commissioning is not finished and all the IDUs' project numbers need to be reset, click Set All IDUs Project Number shown in Figure 2. As shown in Figure 6, the pop-up box comprises two parts: Systems Selection, where you can choose the system to be reset; Settings box, where you can give the resetting instruction.

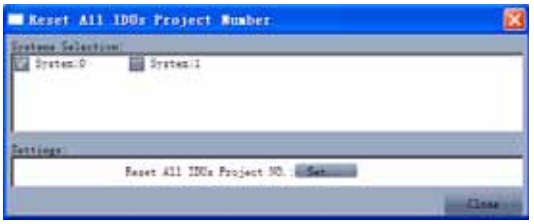


Figure 6

Choose one or multiple systems in the Systems Selection box and click Set in the Settings box, as shown in Figure 6. Click Set, as shown in Figure 7.

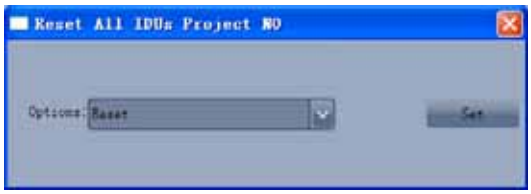


Figure 7

If the conflict is solved, the system will return to the normal status and IDUs can be operated as shown in Figure 5.

b). Manual setting on the communicator and remote controller:

When the project number conflict occurs, you can use the communicator or remote controller to revise project numbers and solve the conflict. See the manual of the communicator or remote controller for the method.

c). Setting of auto project number deviation on ODU's main board (recommended)

You can set auto IDU project number deviation via the ODU's main board as follows:

①. After the whole system is commissioned, short press SW3 on the controlling unit and the system will enter the standby status as follows: