KoolMan
The Cooling Engineer

R410A

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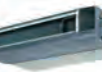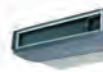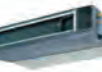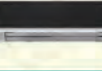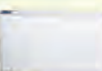
INTELLIGENT GREEN TECHNOLOGY
COMMERCIAL DC INVERTER R410a

Indoor Unit Line Up

Indoor Units	2.2kW	2.8kW	3.6kW	4.5kW	5.6kW	7.1kW	8.0kW	9.0kW	10.0kW	11.2kW	14kW	20kW	25kW	28kW
Four-way Cassette (Compact)	■	■	■	■	■									
Four-way Cassette		■	■	■	■	■	■	■	■	■	■			
Medium Static Pressure Duct			■	■	■	■	■	■		■	■			
High Static Pressure Duct												■	■	■
Ceiling & Floor			■	■	■	■	■	■		■	■			
Wall-mounted (EXV Integrated)	■	■	■	■	■	■								
Exposed Floor-standing (A)	■	■	■	■	■	■	■							
Exposed Floor-standing (B)	■	■	■	■	■	■	■							
Concealed Floor-standing (C)	■	■	■	■	■	■	■							

R410A DC Inverter VRF System 50Hz

Series	10.5kW	14/16kW	25.2/28kW	33.5/40/45kW
DC Inverter Mini Outdoor Unit	■	■		
DC Inverter Smart Outdoor Unit			■	■
DC Inverter Heat Recovery (3-Pipe) Outdoor Unit			■	

KoolMan DC Inverter Commercial A/C

R410A

Features

■ **Wide product range, including DC inverter mini series, DC inverter heat recovery series, and DC inverter smart series.**

■ **Wide adjustment range, high level and human nature design. KoolMan DC inverter A/C can create perfect living condition.**
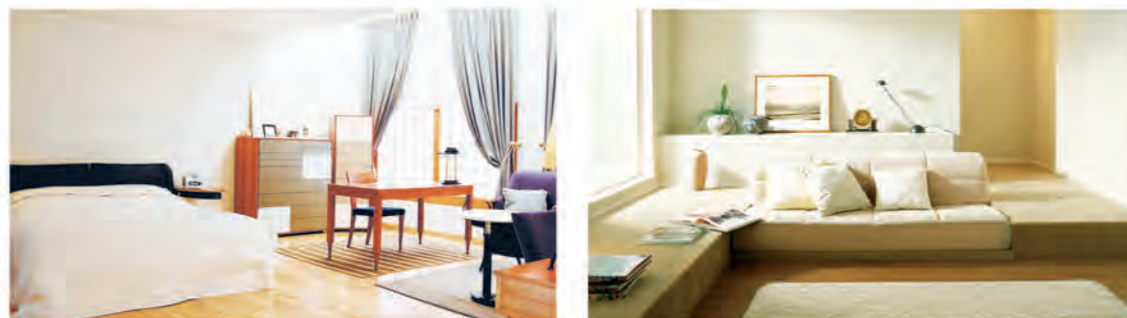
■ **Adopt DC inverter technology.**
  ■ **Energy saving.**

DC motor cuts surplus electric power

Power consumption / Motor speed

- Loss
- AC Motor
- DC Motor
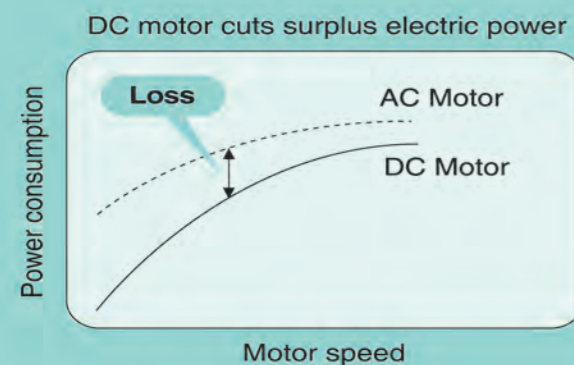
■ High efficiency from minimizing the conversion loss.
■ Rare earth magnets are used in the rotor.
■ Accurate run improves by digital control.

■ **Low noise.**

■ **Comfortable.**

At startup, full power is used to achieve the room temperature setting quickly. Then, the capacity is adjusted according to the outdoor temperature changes and subtle indoor load changes to achieve fine-control of the room temperature setting.

Non-inverter type air conditioners must be switched on and off repeatedly, causing large fluctuations of the room temperature.

cooling operation
■ Inverter power control
■ Non-inverter type air conditioner

Temp / Set temp / time
Cools a room in the time / Cools a room in the time
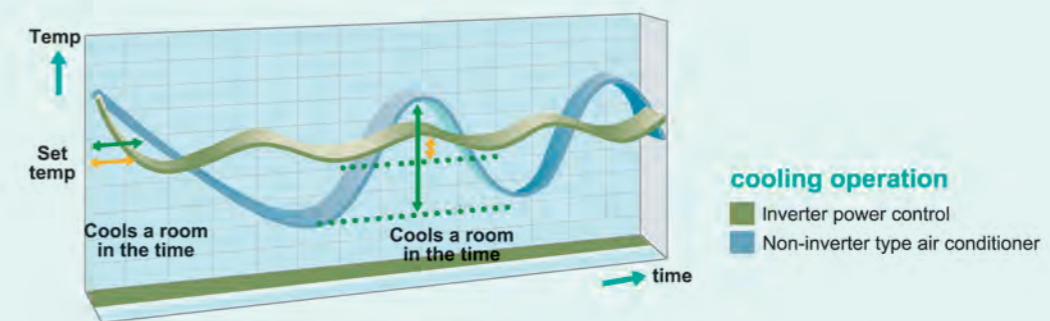
■ **Select the best indoor unit to match room requirement and design needs. We have over 10 type indoor units can be choosen from, including 4-way cassette, duct, ceiling and floor, wall-mounted, floor-standing, console, and so on.**

■ **Diversfication and universal controller for DC inverter air conditioners, including wireless remote controller, wired controller, weekly timer, central controller, and network controller.**

R410A DC INVERTER VRF SYSTEM 50Hz

HOW TO READ THE MODELS

INDOOR UNIT

K W V - H 22 3 A M D

- For DC Inverter System
- 220 ~ 240V 1Ph 50Hz R410a
- Series
- Factory Code
- Cooling Capacity (X100W)
- H - Cooling & Heating Model
- Inverter System
- W   - Wall Mounted
- X   - Ceiling & Floor
- T   - Cassette
- L   - Low Static Ducted
- M   - Mediun Static Ducted
- H   - High Static ducted
- D   - Concealed Floor
- E   - Exposed Floor
- KoolMan

OUTDOOR UNIT

K V F - H 280 3 A Q D

- DC Inverter Compressor
- 380 ~ 415V 3Ph 50Hz R410a
- Series
- Factory Code
- Cooling Capacity (X100W)
- H - Cooling & Heating Model
- F   - Free Modular
- M   - Mini
- T   - 3 Pipe Heat Recovery
- Inverter System
- KoolMan

Intelligent Built-in Management System

Intelligent management is an integrated building managements system (BMS) that uses our independed, high-speed multi-transmission method. It has a centralized controller function that can perform high-speed centralized control of our commercial A/C for buildings.

Various Control Solutions

Individual control, Group control, Network, etc.

1 computer can control max 16 indoor central controllers and monitor max 16 outdoor central controllers.

1 indoor central controller can control max 64 indoor units.

1 outdoor central controller can monitor max 32 outdoor units.

1 computer can control max 1024 indoor units and monitor 512 outdoor units.
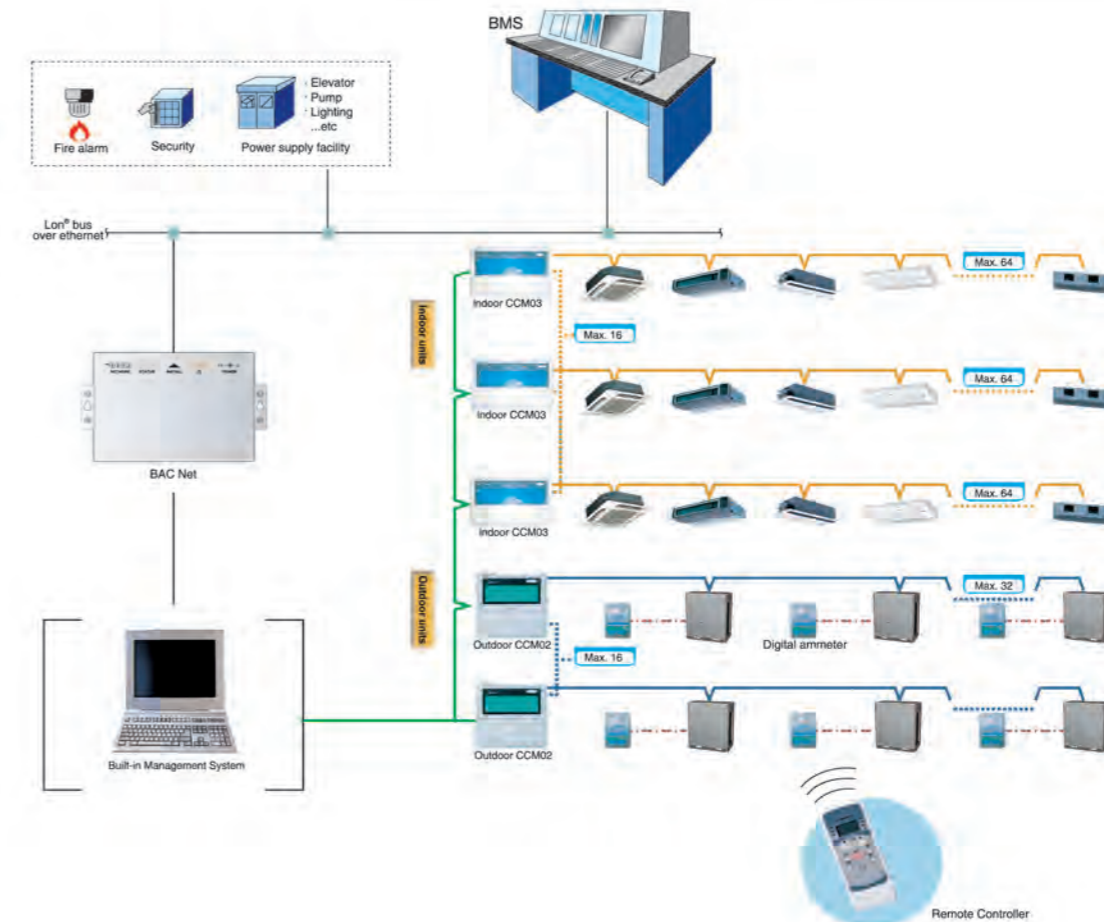
Independent Calculating System

Independent Calculating Report

Easy to know the charge of the A/C
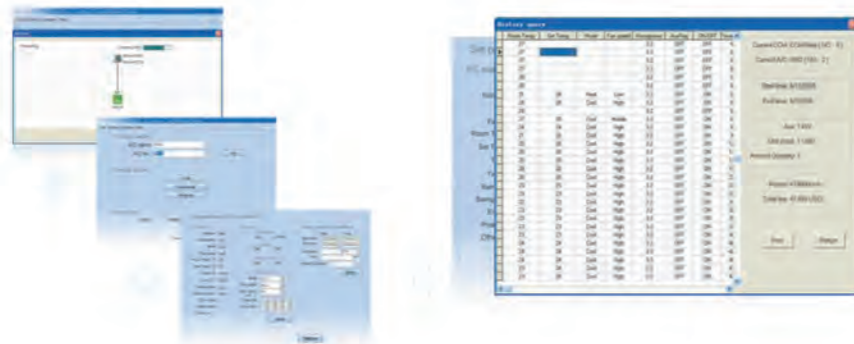
Group Setting, Simple and Efficient.

One group consists of on-line A/Cs in different Central controllers, maximum 1024 units.

One system can be set by 16 groups to manage a huge A/C system. The group setting can control each on-line unit, unionize them to be ON/OFF or change the parameters. It's so convenient and easy.

Schedule Management

With the advanced Schedule setting mode, the PC can easily manage the daily work of A/C. The system can set the weekly plan of A/C and operate automatically in cycle.

Model Selection Software

Windows Version

Operate directly on Windows interface;

Main functions includes load calculation, explicit quotation table output, piping calculation and capacity inquire
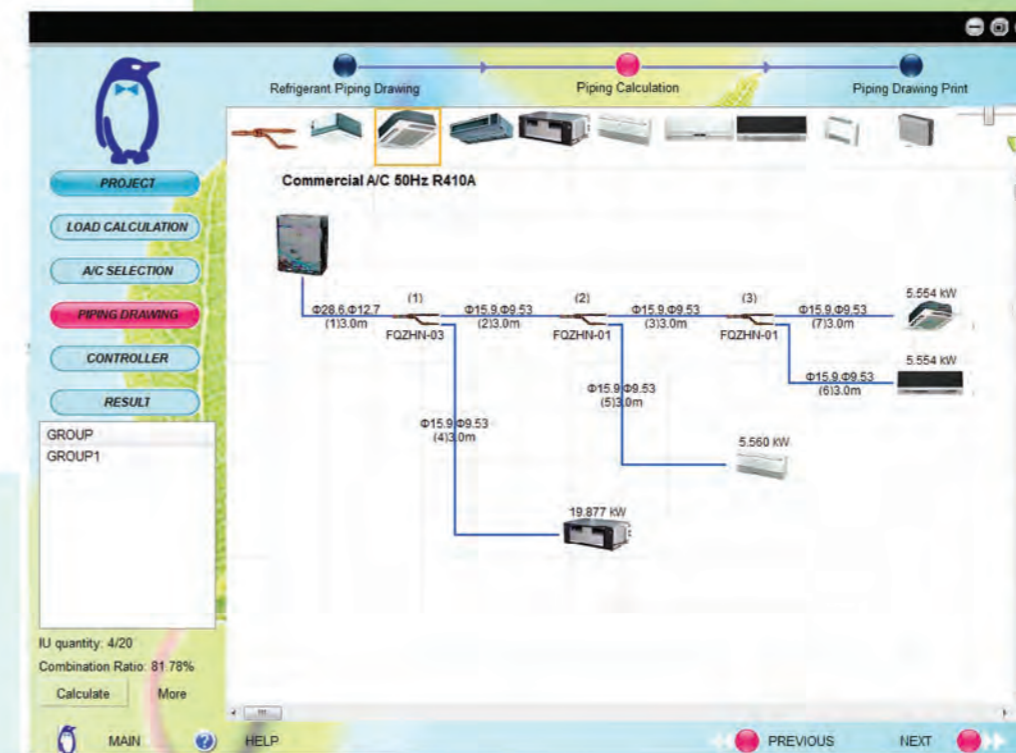
Features

Environment

Environmental-friendly refrigerant R410A will not destroy the ozonosphere.
Full compliance with EU ROHS direction.

Designer / Architect

- The outdoor unit is modular design, there are five basic modules which has capacity of 8HP, 10HP, 12HP, 14HP, 16HP. The capacity can be easily extended by modular combination. There can be 4 outdoor modules in one combination at most, so the full capacity range is from 8HP to 64HP with 2HP increment. Any module in one combination can be set as main unit.

- Many kinds of indoor unit are available, including vertical installation type and horizontal installation type. exposed type and concealed type.

- A big range of controller is available including wireless remote controller, wired controller, weekly timer, central controller, network controller.

- The pipe and communication wire of the A/C system can be much longer, give more flexibility during installation.
  The pipe length between indoor unit and outdoor unit can be 175m at most.
  The height difference between indoor unit and outdoor unit can be 70m at most.
  The communication wire can be 1200m at most.

175m the max. pipe length between indoor unit and outdoor unit.
70m the max. height difference between indoor unit and outdoor unit.
40m the max. distance between the first branch to the farthest indoor unit.
15m the max. height difference between indoor units.
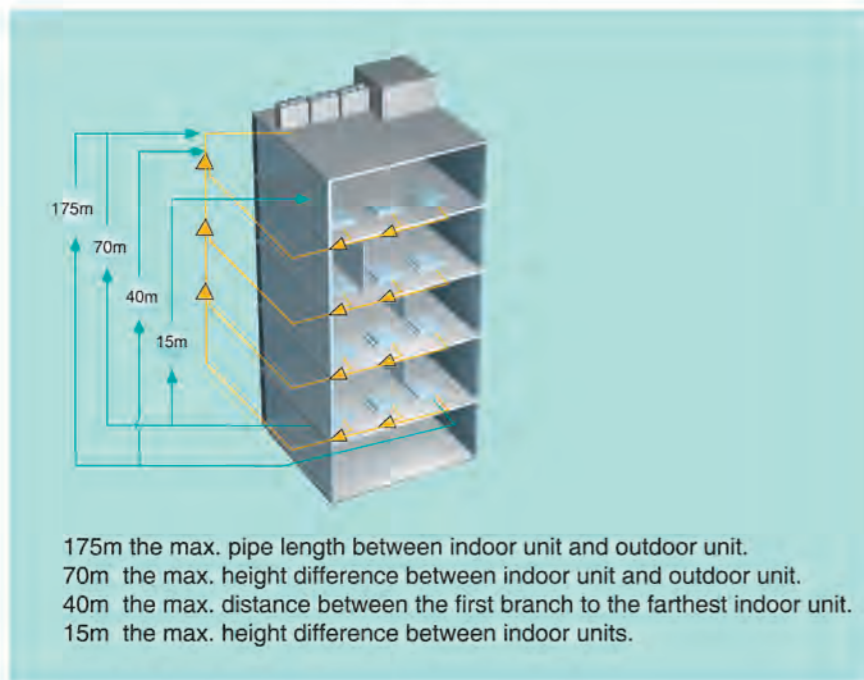
Installer / Contractor

- **Flexible installation**
  No need special room for the outdoor units.
  Easy transportation: all the outdoor module can be transported by elevator.
  This makes installation dramatically easy, and effectively reduces time and labor.

- **Reduced piping and cost**
  Only two main refrigerant lines are required in one system, and the strainers, stop valves, two-way and three-way valves, used in traditional water piping systems are not required. With advance refrigerant balance technology, imbalances in refrigerant flow between units is avoided successfully even though in such a big system.

Water Chiller System	DC Inverter Smart
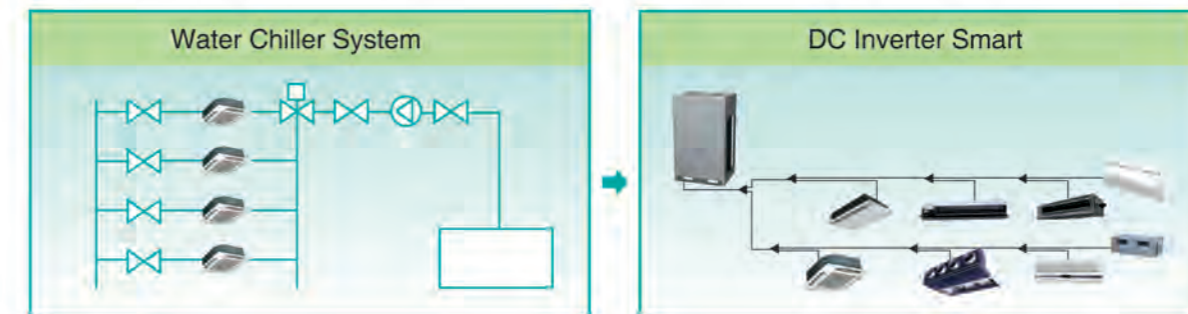
Thanks to R410A refrigerant, the pipe diameter is greatly reduced. So the whole system need less copper pipe and save cost for the installer.

- **Easy maintenance**
  Forced cooling button makes outdoor unit run in cooling mode at any condition, so it is very easy for you to charge refrigerant to the system when it need to be done.

  The self-diagnosis function detects malfunctions in major locations in the system and displays the type of malfunction and location. This allows service and maintenance to be performed more efficiently.

End User

- **Energy saving**
  Adopts high efficiency DC Inverter scroll type compressor.
  DC Inverter compressor and constant compressor are parallel connection in the outdoor unit.

In part load mode only the Inverter compressor runs; in full load mode, all the compressors run. So the Inverter compressor will mostly run at the middle frequency range (40-90Hz). Because at the middle frequency range the Inverter compressor has highest efficiency and lowest noise and vibration than the A/C has only one Inverter compressor. Also it has wide capacity adjusted range (15-130%) than the A/C has only one.

Inverter compressor, so it has higher SEER.
The constant compressor can output to 100% capacity in a short time when the unit start to work. So it can realize fast cooling or heating.

■ Wide operation range

With advance low ambient kit built-in with the outdoor unit, the system can work in heating mode when the ambient temperature is low to -15°C.

Cooling   **Heating**

■ Neat appearance

The outdoor units are installed together on the roof, so it has no any bad influence for the outlook of the building; All the outdoor module has same height and the installation place is neat though there are many outdoor modules.

■ Autorestart function

Even if there is an extended power failure, the A/C system will automatically restart operation. A power failure will not cause any settings to be lost, thus eliminating the need for re-programming.

■ Precise room temperature control

Electronic expansion valves respond to changes in load in indoor units and continually control the flow rate of refrigerant. In this way, the KoolMan Inverter smart system maintains a nearly constant room temperature without the typical temperature changes that occur with a traditional ON/OFF control system. The inverter smart system can maintain the room temperature within 0.5°C. of the set temperature.

Constant Temperature
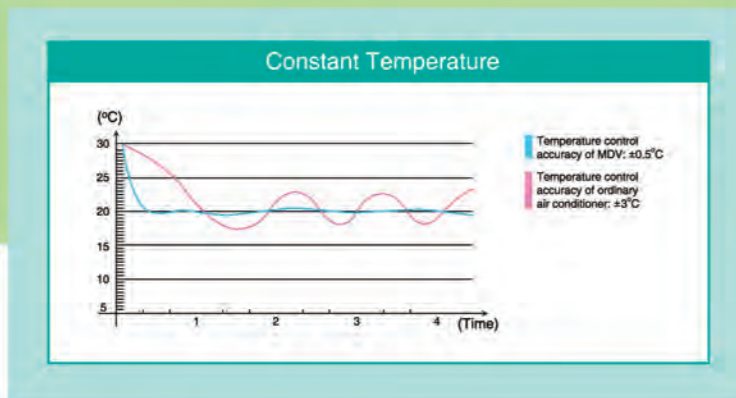
Outdoor Unit Combination

Design	Power supply (V~, Hz, Ph)	Capacity (HP)	Model	Recommend combination	Max. connection indoor units
	380~415V, 50Hz, 3Ph	8	KVF-H2523AQD	8	13
	380~415V, 50Hz, 3Ph	10	KVF-H2803AQD	10	16
	380~415V, 50Hz, 3Ph	12	KVF-H3353AQD	12	16
	380~415V, 50Hz, 3Ph	14	KVF-H4003AQD	14	16
	380~415V, 50Hz, 3Ph	16	KVF-H4503AQD	16	20
	380~415V, 50Hz, 3Ph	18	KVF-H5323AQD	8+10	20
	380~415V, 50Hz, 3Ph	20	KVF-H5603AQD	10+10	24
	380~415V, 50Hz, 3Ph	22	KVF-H6153AQD	10+12	24
	380~415V, 50Hz, 3Ph	24	KVF-H6803AQD	10+14	28
	380~415V, 50Hz, 3Ph	26	KVF-H7303AQD	10+16	28
	380~415V, 50Hz, 3Ph	28	KVF-H7853AQD	12+16	28
	380~415V, 50Hz, 3Ph	30	KVF-H8503AQD	14+16	32
	380~415V, 50Hz, 3Ph	32	KVF-H9003AQD	16+16	32
	380~415V, 50Hz, 3Ph	34	KVF-H9603AQD	10×2+14	36
	380~415V, 50Hz, 3Ph	36	KVF-H10103AQD	10×2+16	36
	380~415V, 50Hz, 3Ph	38	KVF-H10653AQD	10+12+16	36
	380~415V, 50Hz, 3Ph	40	KVF-H11303AQD	10+14+16	42
	380~415V, 50Hz, 3Ph	42	KVF-H11803AQD	10+16×2	42
	380~415V, 50Hz, 3Ph	44	KVF-H12353AQD	12+16×2	42
	380~415V, 50Hz, 3Ph	46	KVF-H13003AQD	14+16×2	48
	380~415V, 50Hz, 3Ph	48	KVF-H13503AQD	16×3	48
	380~415V, 50Hz, 3Ph	50	KVF-H14323AQD	16×2+10+8	54
	380~415V, 50Hz, 3Ph	52	KVF-H14603AQD	16×2+10×2	54
	380~415V, 50Hz, 3Ph	54	KVF-H15153AQD	16×2+10+12	54
	380~415V, 50Hz, 3Ph	56	KVF-H15803AQD	16×2+10+14	58
	380~415V, 50Hz, 3Ph	58	KVF-H16303AQD	10+16×3	58
	380~415V, 50Hz, 3Ph	60	KVF-H16853AQD	12+16×3	58
	380~415V, 50Hz, 3Ph	62	KVF-H17503AQD	14+16×3	64
	380~415V, 50Hz, 3Ph	64	KVF-H18003AQD	16×4	64

DC Inverter Free Modular

R410A

25.2/28kW

33.5/40/45kW

Specification

Model		KVF-H2523AQD	KVF-H2803AQD	KVF-H3353AQD	KVF-H4003AQD	KVF-H4503AQD
Cooling Capacity	kW	25.2	28	33.5	40	45
Cooling Input Power	kW	6.07	7.67	9.10	11.30	13.04
Heating Capacity	kW	27	31.5	37.5	45	50
Heating Input Power	kW	6.21	7.72	9.1	11.39	12.82
Operating Range-Cooling	°C	-5~48	-5~48	-5~48	-5~48	-5~48
Operating Range-Heating	°C	-15~24	-15~24	-15~24	-15~24	-15~24
Power	V-ph-Hz	380-3-50	380-3-50	380-3-50	380-3-50	380-3-50
Sound Pressure Level	dB(A)	57	57	58	60	60
Airflow	m³/h	12500	12500	7000×2	7000×2	7000×2
Vertical Pipe Length	m	Upper Outdoor: ≤70m; Lower Outdoor: ≤40m;				
Actual Pipe Length	m	150	150	150	150	150
Equivalent Pipe Length	m	175	175	175	175	175
Total Pipe Length	m	500	500	500	500	500
Max.No. of Indoor Units		13	16	16	16	20
Connection Ratio	%	50-130	50-130	50-130	50-130	50-130
Net Weight	kg	300	300	330	400	400
Gross Weight	kg	320	320	350	420	420
Net Dimension (WxHxD)	mm	980×1615×800	980×1615×800	1380×1615×830	1380×1615×830	1380×1615×830
Packing Dimension (WxHxD)	mm	1045×1790×865	1045×1790×865	1434×1790×860	1434×1790×860	1434×1790×860
Qty'Per 20'/40'/40'HQ		14/28/28	14/28/28	8/16/16	8/16/16	8/16/16

DC Inverter Heat Recovery Outdoor Unit (3-Pipe)

R410A

25.2/28kW

Note: This unit can't parallel connection.

Features

Cooling and Heating synchronously

For many large-scale building, there are many closed area which some rooms need cooling while others need heating. Traditional A/C just only cooling or heating in one system while heat recovery system can achieve cooling and heating synchronously in one system by MS switch equipment.
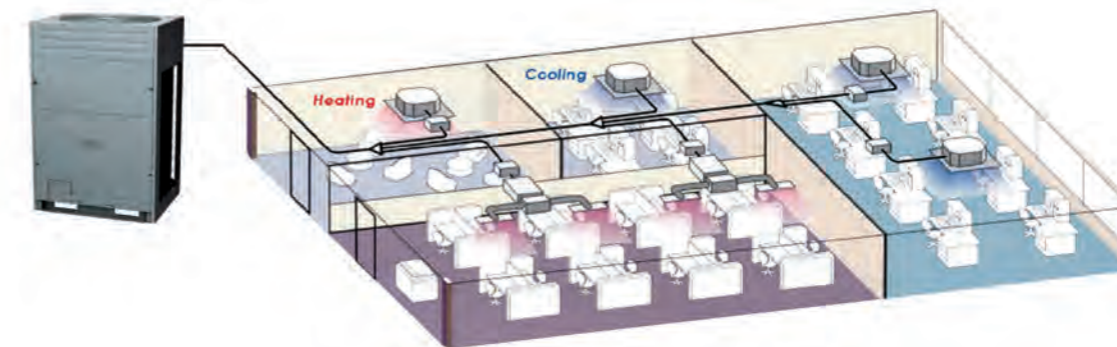
Design exquisite, easy installation

Outdoor unit is compact and portable; MS equipment is small and exquisite, the installation space demand for whole system is very small.

Heat recovery, more energy-saving

The surplus heat of some indoor units condensation can be used for other indoor units for evaporation. Compared to traditional A/C can energy-save 15% at least.

■ Heating ■ Heating ■ Heating ■ Stop ■ Cooling ■ Cooling

MS equipment

DC Inverter Mini Outdoor Unit

R410A

10.5kW (3N)

14/16kW (1N, 3N)
10.5kW (1N)
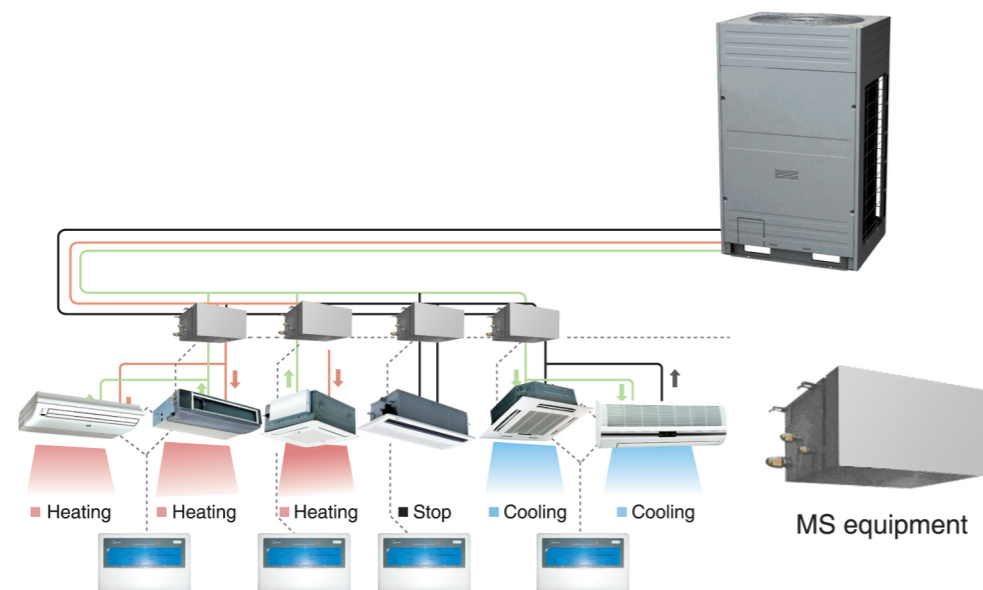
Specification

Model		KVT-H2523AQD	KVT-H2803AQD
Cooling Capacity	kW (Btu/h)	25.2 (86000)	28 (95500)
Cooling Input Power	kW	6.0	7.37
Heating Capacity	kW	27 (92100)	31.5 (107500)
Heating Input Power	kW	6.09	7.55
Operating Range-Cooling	ºC	-5~43	-5~43
Operating Range-Heating	ºC	-15~24	-15~24
Power	V-ph-Hz	(380~415-3-50)	(380~415-3-50)
Sound Pressure Level	dB(A)	57/55	57/55
Airflow	m³/h	12500/11000	12500/11000
Vertical Pipe Length	m	Upper Outdoor: ≤70m; Lower Outdoor: ≤40m;	
Actual Pipe Length	m	150	150
Equivalent Pipe Length	m	175	175
Total Pipe Length	m	350	350
Max.No. of Indoor Units		13	16
Connection Ratio	%	50-130	50-130
Net Weight	kg	302	302
Gross Weight	kg	317	317
Net Dimension (WxHxD)	mm	980x1615x800	980x1615x800
Packing Dimension (WxHxD)	mm	1045x1790x865	1045x1790x865
Qty'Per 20'/40'/40'HQ		14/28/28	14/28/28

Features

■ From 2.2kW to 14kW with different type indoor units and outdoor units, it is full compliance with residential and light commercial place.

■ Only two main refrigerant lines (liquid pipe and gas pipe) are required in one system.

■ In some large residential spaces or some light commercial space, such as villa, restaurant, usually it need more than one indoor unit, so outside the building are also full of outdoor unit. Now KoolMan can provide an effective solution- KoolMan DC Inverter mini system. Since now the beauty of the building will be back.
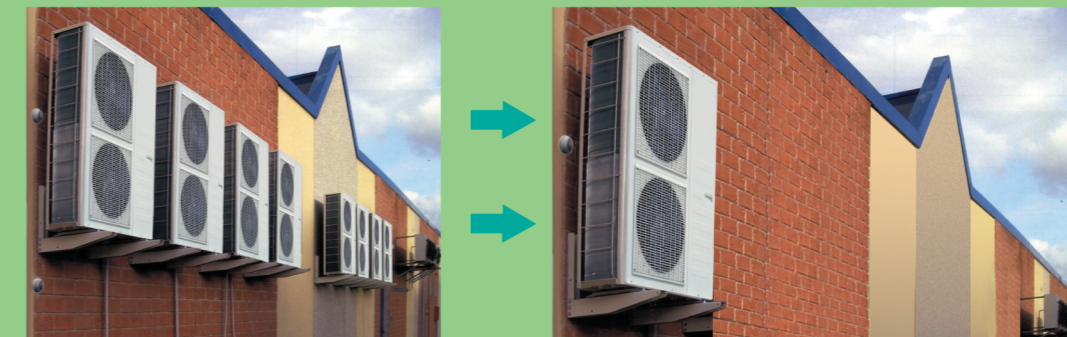
- **Indoor unit is over 50 models in 8 type variations can be choosen, including Four-way Cassette, Duct, Ceiling & Floor, Wall-mounted, Floor-standing, give you the most fashionable and comfortable living space.**

- **The outdoor unit can be used as unitary type outdoor unit or multi type outdoor unit. So there can be only one indoor unit matched with outdoor unit.**

- **Even for 14kW outdoor unit, single phase 230V type power supply is also available, more flexible installation for residential place.**

- **Indoor unit is the same as the Inverter Free modular series**

Specification

Model		KVM-H1053AMD	KVM-H1403AMD	KVM-H1053AQD	KVM-H1403AQD	KVM-H1603AQD
Cooling Capacity	kW	10.5	14.0	10.5	14.0	16.0
Cooling Input Power	kW	3.26	4.36	3.38	4.08	4.6
Heating Capacity	kW	12.2	15.0	12.0	15.5	17.8
Heating Input Power	kW	3.38	4.13	3.61	4.12	4.83
Operating Range-Cooling	°C	-15~43	-15~43	-15~43	-15~43	-15~43
Operating Range-Heating	°C	-15~21	-15~21	-15~21	-15~21	-15~21
Power	V-ph-Hz	220~240-1-50	220~240-1-50	380-3-50	380-3-50	380-3-50
Sound Pressure Level	dB(A)	58	57	58	57	57
Airflow	m³/h	5400	6500	5400	6500	6500
Vertical Pipe Length	m	20	20	20	20	20
Actual Pipe Length	m	45	45	45	45	45
Equivalent Pipe Length	m	50	50	50	50	50
Total Pipe Length	m	100	100	100	100	100
Max.No. of Indoor Units		5	6	5	6	7
Connection Ratio	%	50-130	50-130	50-130	50-130	50-130
Weight	kg	108	108	104	124	124
Net Dimension (WxHxD)	mm	940×1245×360	940×1245×360	990×966×354	940×1245×360	940×1245×360
Packing Dimension (WxHxD)	mm	1058×1380×438	1058×1380×438	1120×1100×435	1058×1380×438	1058×1380×438
Qty'Per 20'/40'/40'HQ		27/55/56	27/55/56	50/106/108	27/55/56	27/55/56

Sample Selection

House	Room type	Area (m²)	A/C selection	Quantity	Remark
3 rooms	Living room	20~24	KTV-H563AMD	1	Comfortable selection
	Bedroom 1	13~15	KWV-H283AMD	1	
	Bedroom 2	16~18	KWV-H363AMD	1	
			KVM-H1053AQD	1	
	Living room	20~24	KTV-H453AMD*	1	Economic selection
	Bedroom 1	13~15	KWV-H283AMD	1	
	Bedroom 2	16~18	KWV-H363AMD	1	
			KVM-H1053AQD*	1	
4 rooms	Living room	24~28	KTV-H563AMD	1	Comfortable selection
	Bedroom 1	16~18	KWV-H363AMD	1	
	Bedroom 2	13~15	KWV-H283AMD	1	
	Bedroom 3	10~14	KWV-H283AMD	1	
			KVM-H1403AQD	1	
	Living room	24~28	KTV-H563AMD	1	Economic selection
	Bedroom 1	16~18	KWV-H283AMD*	1	
	Bedroom 2	13~15	KWV-H283AMD	1	
	Bedroom 3	10~14	KWV-H223AMD*	1	
			KVM-H1053AQD*	1	
5 rooms	Living room	24~28	KTV-H563AMD	1	Comfortable selection
	Dinning-room	10~13	KMV-H363AMD	1	
	Bedroom 1	16~18	KWV-H363AMD	1	
	Bedroom 2	13~15	KWV-H283AMD	1	
	Bedroom 3	10~14	KWV-H283AMD	1	
			KVM-H1603AQD	1	
	Living room	24~28	KTV-H563AMD	1	Economic selection
	Dinning-room	10~13	KMV-H363AMD	1	
	Bedroom 1	16~18	KWV-H363AMD	1	
	Bedroom 2	13~15	KWV-H283AMD	1	
	Bedroom 3	10~14	KWV-H223AMD*	1	
			KVM-H1403AQD*	1	
6 rooms	Living room	24~28	KTV-H563AMD	1	Comfortable selection
	Dinning-room	10~13	KMV-H363AMD	1	
	Bedroom 1	16~18	KWV-H363AMD	1	
	Bedroom 2	13~15	KWV-H283AMD	1	
	Bedroom 3	10~14	KWV-H283AMD	1	
	Studing room	8~10	KWV-H223AMD	1	
			KVM-H1603AQD	1	
	Living room	24~28	KTV-H563AMD	1	Economic selection
	Dinning-room	10~13	KMV-H283AMD*	1	
	Bedroom 1	16~18	KWV-H283AMD	1	
	Bedroom 2	13~15	KWV-H283AMD	1	
	Bedroom 3	10~14	KWV-H223AMD	1	
	Studing room	8~10	KWV-H223AMD	1	
			KVM-H1403AQD*	1	

"*" in the table means different selection for the same room

4 Ways Compact Cassette

Specification

Model			KTV-H223AMD	KTV-H283AMD	KTV-H363AMD	KTV-H453AMD	KTV-H563AMD
Capacity	Cooling	kW	2.2	2.8	3.6	4.5	5.6
	Heating	kW	2.6	3.2	4.0	5.0	6.3
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	58	58	58	63	63
Performance	Air flow volume	m³/h	880	880	880	920	920
	Noise level	dB(A)	38	38	38	39	39
Refrigerant	Type		R410A	R410A	R410A	R410A	R410A
Net dimension	Body (WxHxD)	mm	580x254x580	580x254x580	580x254x580	580x254x580	580x254x580
	Panel (WxHxD)	mm	650x30x650	650x30x650	650x30x650	650x30x650	650x30x650
Packing dimension	Body (WxHxD)	mm	750x340x745	750x340x745	750x340x745	750x340x745	750x340x745
	Panel (WxHxD)	mm	715x115x715	715x115x715	715x115x715	715x115x715	715x115x715
Net weight	Body	kg	18	18	18	24	24
	Panel	kg	3	3	3	3	3
Gross weight	Body	kg	25	25	25	30	30
	Panel	kg	5	5	5	5	5
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	110/245/252	110/245/252	110/245/252	110/245/252	110/245/252
Pipe diameter	Liquid side	mm	Φ6.4	Φ6.4	Φ6.4	Φ6.4	Φ9.5
	Gas side	mm	Φ12.7	Φ12.7	Φ12.7	Φ12.7	Φ15.9
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25	ODΦ25	ODΦ25

4 ways Cassette
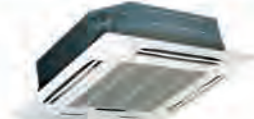
Specification

Model			KTV-H283BMD	KTV-H363BMD	KTV-H453BMD	KTV-H563BMD	KTV-H713BMD
Capacity	Cooling	kW	2.8	3.6	4.5	5.5	7.1
	Heating	kW	3.2	4	5	6.3	8
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	90	90	90	90	115
Performance	Air flow volume	m³/h	950	950	950	950	1220
	Noise level	dB(A)	42	42	42	42	45
Refrigerant	Type		R410A	R410A	R410A	R410A	R410A
Net dimension	Body (WxHxD)	mm	840x230x840	840x230x840	840x230x840	840x230x840	840x230x840
	Panel (WxHxD)	mm	950x46x950	950x46x950	950x46x950	950x46x950	950x46x950
Packing dimension	Body (WxHxD)	mm	955x247x955	955x247x955	955x247x955	955x247x955	955x247x955
	Panel (WxHxD)	mm	1035x90x1035	1035x90x1035	1035x90x1035	1035x90x1035	1035x90x1035
Net weight	Body	kg	27	27	30	30	30
	Panel	kg	6	6	6	6	6
Gross weight	Body	kg	31	31	34	34	34
	Panel	kg	9	9	9	9	9
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	72/149/168	72/149/168	72/149/168	72/149/168	72/149/168
Pipe diameter	Liquid side	mm	Φ6.4	Φ6.4	Φ6.4	Φ9.5	Φ9.5
	Gas side	mm	Φ12.7	Φ12.7	Φ12.7	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ32	ODΦ32	ODΦ32	ODΦ32	ODΦ32

Model			KTV-H803BMD	KTV-H903BMD	KTV-H1003BMD	KTV-H1123BMD
Capacity	Cooling	kW	8	9	10	11.2
	Heating	kW	9	10	11	12.5
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	115	160	160	160
Performance	Air flow volume	m³/h	1220	1540	1540	1540
	Noise level	dB(A)	45	48	48	48
Refrigerant	Type		R410A	R410A	R410A	R410A
Net dimension	Body (WxHxD)	mm	840x230x840	840x300x840	840x300x840	840x300x840
	Panel (WxHxD)	mm	950x46x950	950x46x950	950x46x950	950x46x950
Packing dimension	Body (WxHxD)	mm	955x247x955	955x317x955	955x317x955	955x317x955
	Panel (WxHxD)	mm	1035x90x1035	1035x90x1035	1035x90x1035	1035x90x1035
Net weight	Body	kg	30	36	36	36
	Panel	kg	6	6	6	6
Gross weight	Body	kg	34	41	41	41
	Panel	kg	9	9	9	9
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	72/149/168	48/102/122	48/102/122	48/102/122
Pipe diameter	Liquid side	mm	Φ9.5	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ15.9	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ32	ODΦ32	ODΦ32	ODΦ32

Medium Static Ducted
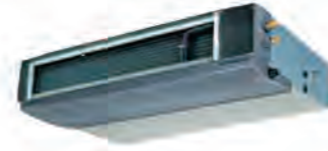
Specification

Model			KMV-H453AMD	KMV-H563AMD	KMV-H713AMD	KMV-H803AMD
Capacity	Cooling	kW	4.5	5.6	7.1	8
	Heating	kW	5	6.3	8	9
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	110	110	150	150
Performance	Air flow volume	m³/h	1160	1160	1460	1460
	Static pressure	Pa	40	40	40	40
	Noise level	dB(A)	45	45	46	46
Refrigerant	Type		R410A	R410A	R410A	R410A
Net dimension	WxHxD	mm	1000x298x800	1000x298x800	1000x298x800	1000x298x800
Packing dimension	WxHxD	mm	1205x370x940	1205x370x940	1205x370x940	1205x370x940
Net weight		kg	38	38	38	38
Gross weight		kg	45	45	45	45
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	60/140/164	60/140/164	60/140/164	60/140/164
Pipe diameter	Liquid side	mm	Φ6.4	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ12.7	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ32	ODΦ32	ODΦ32	ODΦ32

Model			KMV-H903AMD	KMV-H1123AMD	KMV-H1403AMD
Capacity	Cooling	kW	9	11.2	14
	Heating	kW	10	12.5	16
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	215	215	215
Performance	Air flow volume	m³/h	1800	1800	1800
	Static pressure	Pa	70	70	70
	Noise level	dB(A)	47	47	47
Refrigerant	Type		R410A	R410A	R410A
Net dimension	WxHxD	mm	1350x298x800	1350x298x800	1350x298x800
Packing dimension	WxHxD	mm	1555x370x940	1555x370x940	1555x370x940
Net weight		kg	48	52	51
Gross weight		kg	57	63	58
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	48/100/112	48/100/112	48/100/112
Pipe diameter	Liquid side	mm	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ32	ODΦ32	ODΦ32

High Static Ducted

Specification

Model			KHV-H2003AMD	KHV-H2503AMD	KHV-H2803AMD
Capacity	Cooling	kW	20	25	28
	Heating	kW	22.6	27.5	31.1
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	1400	1400	1400
Performance	Air flow volume	m³/h	4180	4180	4400
	Static pressure	Pa	196	196	196
	Noise level	dB(A)	61	61	61
Refrigerant	Type		R410A	R410A	R410A
Net dimension	WxHxD	mm	1425×500×928	1425×500×928	1425×500×928
Packing dimension	WxHxD	mm	1509×570×964	1509×570×964	1509×570×964
Net weight		kg	122	122	122
Gross weight		kg	128	128	128
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	31/63/79	31/63/79	31/63/79
Pipe diameter	Liquid side	mm	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ32	ODΦ32	ODΦ32

Ceiling & Floor

Specification

Model			KXV-H363AMD	KXV-H453AMD	KXV-H563AMD	KXV-H713AMD
Capacity	Cooling	kW	3.6	4.5	5.6	7.1
	Heating	kW	4	5	6.3	8
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	120	120	122	125
Performance	Air flow volume	m³/h	650	800	800	800
	Noise level	dB(A)	40	43	43	43
Refrigerant	Type		R410A	R410A	R410A	R410A
Net dimension	WxHxD	mm	990x660x206	990x660x206	990x660x206	990x660x206
Packing dimension	WxHxD	mm	1089x744x296	1089x744x296	1089x744x296	1089x744x296
Net weight		kg	29	29	29	29
Gross weight		kg	35	35	35	35
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	127/224/295	127/224/295	127/224/295	127/224/295
Pipe diameter	Liquid side	mm	Φ6.4	Φ6.4	Φ9.5	Φ9.5
	Gas side	mm	Φ12.7	Φ12.7	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25	ODΦ25

Model			KXV-H803AMD	KXV-H903AMD	KXV-H1123AMD	KXV-H1403AMD
Capacity	Cooling	kW	8	9	11.2	14
	Heating	kW	9	10	12.5	16
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	130	130	182	182
Performance	Air flow volume	m³/h	1200	1200	1980	1980
	Noise level	dB(A)	45	45	47	47
Refrigerant	Type		R410A	R410A	R410A	R410A
Net dimension	WxHxD	mm	1280x660x206	1280x660x206	1670x680x244	1670x680x244
Packing dimension	WxHxD	mm	1379x744x296	1379x744x296	1764x760x329	1764x760x329
Net weight		kg	37	37	54	54
Gross weight		kg	42	42	61	61
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	96/175/226	96/175/226	63/132/151	63/132/151
Pipe diameter	Liquid side	mm	Φ9.5	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ15.9	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25	ODΦ25

Wall Mounted

Specification

Model			KWV-H223AMD	KWV-H283AMD	KWV-H363AMD
Capacity	Cooling	kW	2.2	2.8	3.6
	Heating	kW	2.6	3.2	4
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	30	30	30
Performance	Air flow volume	m³/h	580	580	580
	Noise level	dB(A)	35	35	35
Refrigerant	Type		R410A	R410A	R410A
Net dimension	Body(WxHxD)	mm	915x210x290	915x210x290	915x210x290
Packing dimension	Body(WxHxD)	mm	1020x300x385	1020x300x385	1020x300x385
Net weight	Body	kg	12	12	12
Gross weight	Body	kg	16	16	16
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	264/543/611	264/543/611	264/543/611
Pipe diameter	Liquid side	mm	Φ6.4	Φ6.4	Φ6.4
	Gas side	mm	Φ12.7	Φ12.7	Φ12.7
	Drainage water pipe	mm	ODΦ15	ODΦ15	ODΦ15

Model			KWV-H453AMD	KWV-H563AMD	KWV-H713AMD
Capacity	Cooling	kW	4.5	5.6	7.2
	Heating	kW	5	6.3	8.0
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	45	45	60
Performance	Air flow volume	m³/h	900	900	900
	Noise level	dB(A)	40	40	40
Refrigerant	Type		R410A	R410A	R410A
Net dimension	WxHxD	mm	1070x210x315	1070x210x315	1070x210x315
Packing dimension	WxHxD	mm	1180x300x410	1180x300x410	1180x300x410
Net weight		kg	15	16	16
Gross weight		kg	19	19	19
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	185/402/472	185/402/472	185/402/472
Pipe diameter	Liquid side	mm	Φ6.4	Φ9.5	Φ9.5
	Gas side	mm	Φ12.7	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ15	ODΦ15	ODΦ15

Exposed Floor Standing (A)

Specification

Model			KDV-H223AMD	KDV-H283AMD	KDV-H363AMD	KDV-H453AMD
Capacity	Cooling	kW	2.2	2.8	3.6	4.5
	Heating	kW	2.6	3.2	4	5
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	40	46	35	49
Performance	Air flow volume	m³/h	510	680	765	850
	Noise level	dB(A)	37	39	41	43
Refrigerant	Type		R410A	R410A	R410A	R410A
Net dimension	WxHxD	mm	1000×625×220	1000×625×220	1200×625×220	1200×625×220
Packing dimension	WxHxD	mm	1089x722x312	1089x722x312	1289x722x312	1289x722x312
Net weight		kg	30	30	37	37
Gross weight		kg	35	35	43	43
Qty Per 20'/40'/40'HQ	Indoor unit	Pieces	126/251/294	126/251/294	103/212/249	103/212/249
Pipe diameter	Liquid side	mm	Φ6.4	Φ6.4	Φ6.4	Φ6.4
	Gas side	mm	Φ12.7	Φ12.7	Φ12.7	Φ12.7
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25	ODΦ25

Model			KDV-H563AMD	KDV-H713AMD	KDV-H803AMD
Capacity	Cooling	kW	5.6	7.1	8
	Heating	kW	6.3	8	9
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	88	130	130
Performance	Air flow volume	m³/h	1020	1360	1530
	Noise level	dB(A)	44	46	48
Refrigerant	Type		R410A	R410A	R410A
Net dimension	WxHxD	mm	1500×625×220	1500×625×220	1500×625×220
Packing dimension	WxHxD	mm	1589x722x312	1589x722x312	1589x722x312
Net weight		kg	44	44	44
Gross weight		kg	50	50	50
Qty Per 20'/40'/40'HQ	Indoor unit	Pieces	84/172/200	84/172/200	84/172/200
Pipe diameter	Liquid side	mm	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25

Exposed Floor Standing (B)

Specification

Model			KDV-H223BMD	KDV-H283BMD	KDV-H363BMD	KDV-H453BMD
Capacity	Cooling	kW	2.2	2.8	3.6	4.5
	Heating	kW	2.6	3.2	4	5
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	40	46	35	49
Performance	Air flow volume	m³/h	510	680	765	850
	Noise level	dB(A)	37	39	41	43
Refrigerant	Type		R410A	R410A	R410A	R410A
Net dimension	WxHxD	mm	1000×625×220	1000×625×220	1200×625×220	1200×625×220
Packing dimension	WxHxD	mm	1179x722x312	1179x722x312	1379x722x312	1379x722x312
Net weight		kg	30	30	37	37
Gross weight		kg	38	38	46	46
Qty Per 20'/40'/40'HQ	Indoor unit	Pieces	116/220/268	116/220/268	97/195/224	97/195/224
Pipe diameter	Liquid side	mm	Φ6.4	Φ6.4	Φ6.4	Φ6.4
	Gas side	mm	Φ12.7	Φ12.7	Φ12.7	Φ12.7
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25	ODΦ25

Model			KDV-H563CMD	KDV-H713CMD	KDV-H803CMD
Capacity	Cooling	kW	5.6	7.1	8
	Heating	kW	6.3	8	9
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	88	130	130
Performance	Air flow volume	m³/h	1020	1360	1530
	Noise level	dB(A)	44	46	48
Refrigerant	Type		R410A	R410A	R410A
Net dimension	WxHxD	mm	1500×625×220	1500×625×220	1500×625×220
Packing dimension	WxHxD	mm	1679x722x312	1679x722x312	1679x722x312
Net weight		kg	44	44	44
Gross weight		kg	53	53	53
Qty Per 20'/40'/40'HQ	Indoor unit	Pieces	80/162/187	80/162/187	80/162/187
Pipe diameter	Liquid side	mm	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25

Concealed Floor Standing

Specification

Model			KDV-H223CMD	KDV-H283CMD	KDV-H363CMD	KDV-H453CMD
Capacity	Cooling	kW	2.2	2.8	3.6	4.5
	Heating	kW	2.6	3.2	4	5
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	40	46	35	49
Performance	Air flow volume	m³/h	510	680	765	850
	Noise level	dB(A)	37	39	41	43
Refrigerant	Type		R410A	R410A	R410A	R410A
Net dimension	WxHxD	mm	840×544×212	840×544×212	1036×544×212	1036×544×212
Packing dimension	WxHxD	mm	939x639x305	939x639x305	1139x639x305	1139x639x305
Net weight		kg	26	26	29.5	29.5
Gross weight		kg	29.5	29.5	34	34
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	119/236/273	119/236/273	93/190/190	93/190/190
Pipe diameter	Liquid side	mm	Φ6.4	Φ6.4	Φ6.4	Φ6.4
	Gas side	mm	Φ12.7	Φ12.7	Φ12.7	Φ12.7
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25	ODΦ25

Model			KDV-H563CMD	KDV-H713CMD	KDV-H803CMD
Capacity	Cooling	kW	5.6	7.1	8
	Heating	kW	6.3	8	9
Power supply		V-ph-Hz	220~240-1-50	220~240-1-50	220~240-1-50
Rated power		W	88	130	130
Performance	Air flow volume	m³/h	1020	1360	1530
	Noise level	dB(A)	44	46	48
Refrigerant	Type		R410A	R410A	R410A
Net dimension	WxHxD	mm	1336×544×212	1336×544×212	1336×544×212
Packing dimension	WxHxD	mm	1439x639x305	1439x639x305	1439x639x305
Net weight		kg	36	36	36
Gross weight		kg	40	40	40
Qty'Per 20'/40'/40'HQ	Indoor unit	Pieces	72/151/151	72/151/151	72/151/151
Pipe diameter	Liquid side	mm	Φ9.5	Φ9.5	Φ9.5
	Gas side	mm	Φ15.9	Φ15.9	Φ15.9
	Drainage water pipe	mm	ODΦ25	ODΦ25	ODΦ25

# Heat Recovery Ventilator

HRV-200 ~ 1000

HRV-1500 ~ 2000

■ Adopt centrifugal fan with lower power consumption and longer air supply distance; Easy control, operation friendly.
■ Compact design, easy installation & maintenance.
■ Optional sprayer to increase unit heat-exchanging efficiency.
■ Can be controlled together with other fresh-air units.

Features

■ **Energy saving**
Fresh-air and exhaust air are crossed through the heat exchanger. Temperature exchange were happened in the heat recovery ventilator. Fresh-air can begot a great deal of energy from exhaust air.

■ **High efficiency**
Adopt high quality heat-exchange core. Small air resistance.

■ **Low noise**
Add sound absorption material, quiet operation.
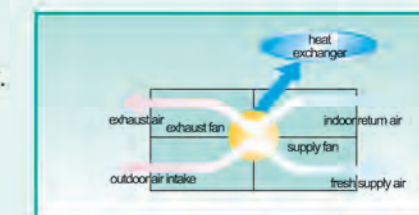
■ **Flexible multi control ways**
Can be controlled together with other indoor units by controller.

Specification

Model		HRV-200	HRV-300	HRV-400	HRV-500
Power supply	V-Ph-Hz	220-1-50	220-1-50	220-1-50	220-1-50
Cooling — Temp. efficiency	%	60	60	60	60
Cooling — Enthaipy efficiency	%	50	50	50	50
Heating — Temp. efficiency	%	65	65	65	70
Heating — Enthaipy efficiency	%	55	55	60	60
Indoor fan — Material		ABS	ABS	ABS	ABS
Indoor fan — Type		Centrifugal fan	Centrifugal fan	Centrifugal fan	Centrifugal fan
Indoor fan — Diameter	mm	Φ146	Φ195	Φ195	Φ205
Indoor fan — Height	mm	104	90	90	140
Indoor air flow	m³/h	200	300	400	500
Indoor external static pressure (Hi)	Pa	75	75	80	80
Indoor sound level (sound pressure level)	dB(A)	27	30	32	35
Indoor unit — Dimension (WxHxD)	mm	666×264×580	744×270×599	744×270×804	824×270×904
Indoor unit — Packing (WxHxD)	mm	968×456×835	1046×462×855	1046×462×1059	1126×462×1159
Indoor unit — Net/Gross weight	kg	22/46	23/48	30/57	35.5/65.5
Connection wiring — Power wiring	mm²	3×2.5	3×2.5	3×2.5	3×2.5
Connection wiring — Signal wiring	mm²	3×0.75	3×0.75	3×0.75	3×0.75
Controller		Wired controller (KJR-27B/E)			
Fresh air — Fresh air diameter	mm	Φ144	Φ144	Φ144	Φ194
Fresh air — Air drop (static pressure)	Pa	75	75	80	80

Model		HRV-800	HRV-1000	HRV-1500	HRV-2000
Power supply	V-Ph-Hz	220-1-50	220-1-50	380-3-50	380-3-50
Cooling — Temp. efficiency	%	60	60	60	60
Cooling — Enthaipy efficiency	%	50	50	50	50
Heating — Temp. efficiency	%	70	70	70	70
Heating — Enthaipy efficiency	%	60	60	60	60
Indoor fan — Material		ABS	ABS	Metal	Metal
Indoor fan — Type		Centrifugal fan	Centrifugal fan	Centrifugal fan	Centrifugal fan
Indoor fan — Diameter	mm	Φ246	Φ246	Φ252	Φ252
Indoor fan — Height	mm	203	203	225	233
Indoor air flow	m³/h	800	1000	1500	2000
Indoor external static pressure (Hi)	Pa	100	100	160	170
Indoor sound level (sound pressure level)	dB(A)	39	40	51	53
Indoor unit — Dimension (WxHxD)	mm	1116×388×884	1116×388×1134	1500×540×1200	1550×540×1400
Indoor unit — Packing (WxHxD)	mm	1418×580×1139	1418×580×1389	1672×1372×716	1722×1572×716
Indoor unit — Net/Gross weight	kg	57.5/91.5	59/95	160/200	175/215
Connection wiring — Power wiring	mm²	3×2.5	3×2.5	5×2.5	5×2.5
Connection wiring — Signal wiring	mm²	3×0.75	3×0.75	3×0.75	3×0.75
Controller		Wired controller (KJR-27B/E)			
Fresh air — Fresh air diameter	mm	Φ242	Φ242	320×160	320×160
Fresh air — Air drop (static pressure)	Pa	100	150	160	170

Accessories

Wireless Remote Controller

Wireless Remote Controller		Description
	R05	Background light, LCD display screen, clock function, ON/OFF/Temperature setting/Mode setting/Fan speed setting/horizontal swing/vertical swing setting functions, but need match functions with corresponding indoor units.
	R51	LCD display, clock function, ON/OFF/Temperature setting/Mode setting/Fan speed/Swing etc.
	R06	Control function as ON/OFF/ Mode setting/ Swing/ Direction/ Temperature setting/Time/ Turbo function (on COOL mode, push it the air conditioner can go into powerful cooling operation) /Sleep/Reset/ Fan speed setting/ Timer/Cancel/ Clock/ Lock/ O2.

Wired Remote Controller

Wired Remote Controller		Description
	KJR-10B	ON/OFF/Mode setting/Temp. setting/Fan speed/Time setting/Swing, etc..
	KJR-12B	The basic function is the same as KJR-10B, Temp. sensor built-in. Note: Special order for indoor PCB.

Central Control Monitor

CCM02 Outdoor CCM		Max. 32 outdoor units control. Note: Special order for outdoor PCB.
CCM03 Indoor CCM		Max. 64 indoor units control; New mode lock function.
CCM09 Indoor CCM		Max. 64 indoor units control; Weekly schedule timer function. Note: It can't be connected to the web control system.

Network Interface Adapter

NIM01		Used for indoor unit whose PCB without integration network module function but with network module port, it can connect indoor units to indoor central control monitor.

BMS Accessories

(V3.0) 3rd network central control system kit		Network control software (V3.0)
CCM07 LonWorks gateway		Matched with network CCM system (V3.0), connect to LonWorks.
CCM08		BACNET LONWORK/ETHERNET optional, Max. connecting 4 group air-conditions (each group can connect Max. 64 indoor units or 32 outdoor units).

Weekly Timer

CCM04 weekly schedule timer		Control one indoor unit. Note: Weekly schedule timer and indoor CCM cannot be used simultaneously.

Refrigerant Distributors

FQZHN-01
Gas side joint
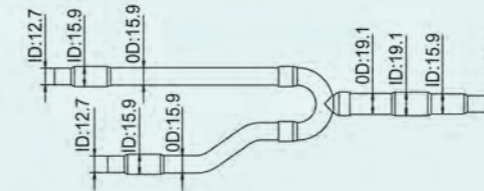
Liquid side joint
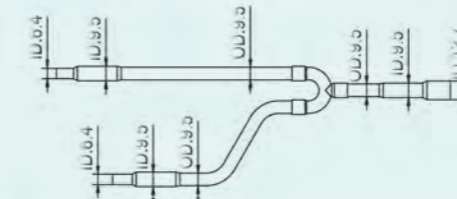
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Gas side joint
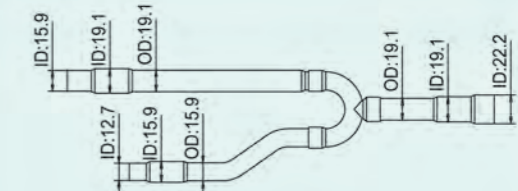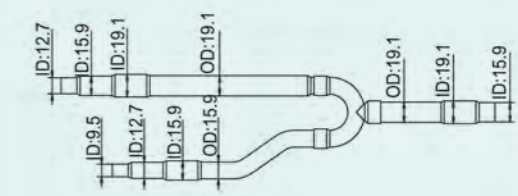
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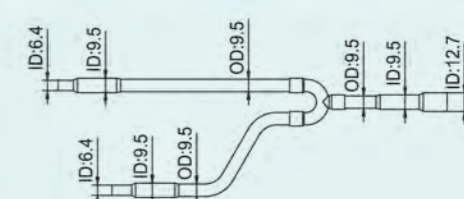
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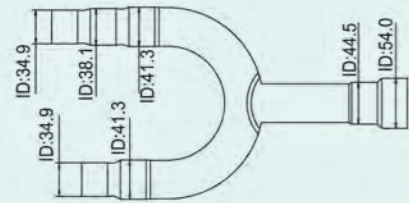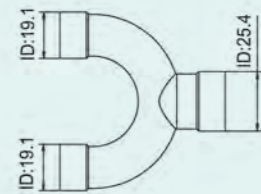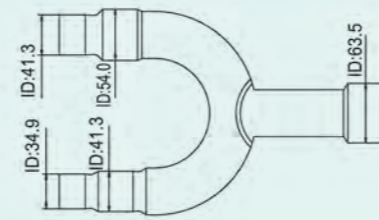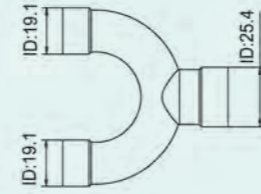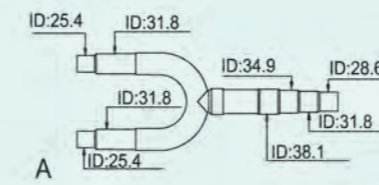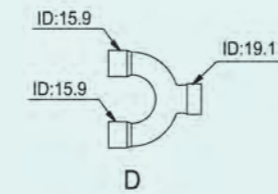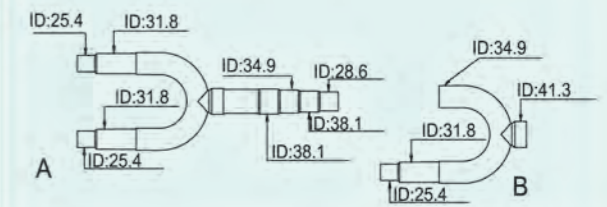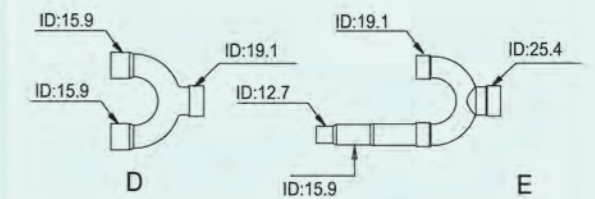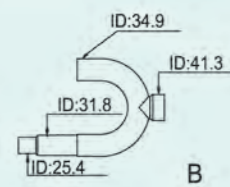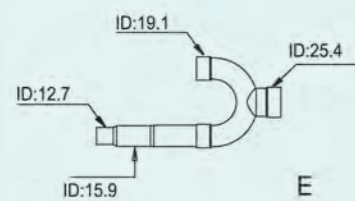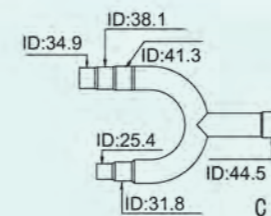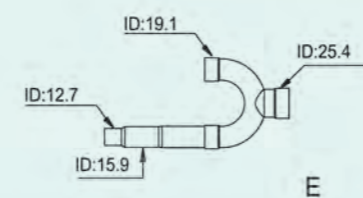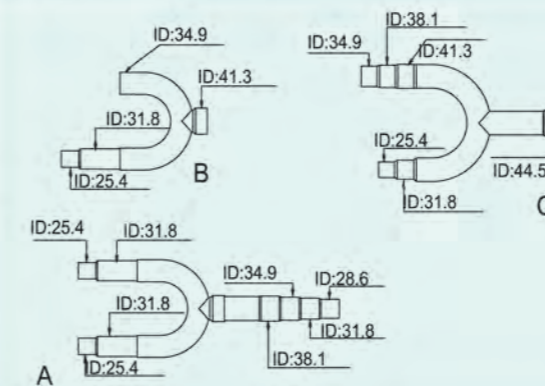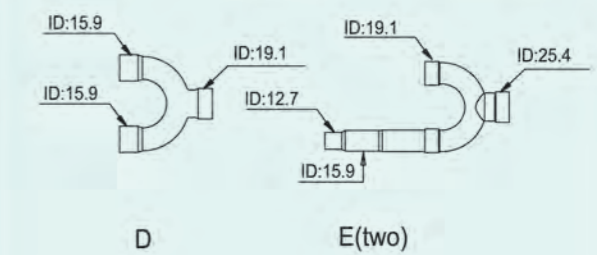Gas side joint
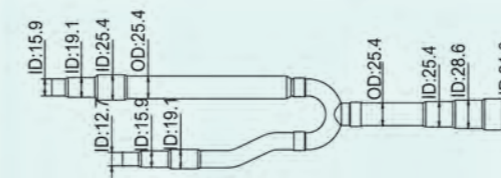
Liquid side joint
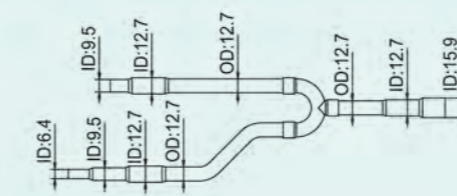
FQZHN-04
Gas side joint
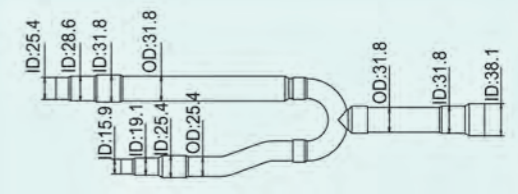
Liquid side joint

FQZHN-05

Gas side joint

ID:34.9 ID:38.1 ID:41.3 ID:44.5 ID:54.0
ID:34.9 ID:41.3

Liquid side joint

ID:19.1 ID:25.4
ID:19.1

FQZHN-06

Gas side joint

ID:41.3 ID:54.0 ID:63.5
ID:34.9 ID:41.3

Liquid side joint

ID:19.1 ID:25.4
ID:19.1

FQZHW-02N1

Gas side joint

ID:25.4 ID:31.8 ID:34.9 ID:28.6
ID:31.8 ID:31.8
ID:25.4 ID:38.1
A

Liquid side joint

ID:15.9 ID:19.1
ID:15.9
D

FQZHW-03N1

Gas side joint

ID:25.4 ID:31.8 ID:34.9 ID:28.6 ID:34.9
ID:31.8 ID:38.1 ID:41.3
ID:25.4 ID:38.1 ID:31.8
A B
ID:25.4

Liquid side joint

ID:15.9 ID:19.1 ID:19.1 ID:25.4
ID:15.9 ID:12.7
D ID:15.9 E

FQZHW-01N1A

Gas side joint

ID:34.9
ID:41.3
ID:31.8
ID:25.4 B

Liquid side joint

ID:19.1 ID:25.4
ID:12.7
ID:15.9 E

FQZHW-01N1B

Gas side joint

ID:38.1
ID:34.9 ID:41.3
ID:25.4 ID:44.5
ID:31.8 C

Liquid side joint

ID:19.1 ID:25.4
ID:12.7
ID:15.9 E

FQZHW-04N1

Gas side joint

ID:34.9 ID:38.1
ID:41.3 ID:34.9 ID:41.3
ID:31.8 ID:25.4
ID:25.4 B ID:44.5
ID:31.8 C
ID:25.4 ID:31.8 ID:34.9 ID:28.6
ID:31.8 ID:31.8
A ID:25.4 ID:38.1

Liquid side joint

ID:15.9 ID:19.1 ID:19.1 ID:25.4
ID:15.9 ID:12.7
ID:15.9
D E(two)

Note: FQZHW-01N1A and FQZHW-01N1B can not be used individually, which must be cooperate with FQZHW-02N1 or FQZHW-03N1. FQZHW-03N1=FQZHW-02N1+FQZHW-01N1A; FQZHW-04N1=FQZHW-03N1+FQZHW-01N1B.