Part 1 General Information

1. Midea Product Development History

In 1999, Midea cooperated with Toshiba, produced the first AC Inverter VRF.

In 2001, Midea produced the first VRF in Air-conditioning industry.

In 2002, Midea developed the first AC Inverter VRF and D series VRF in China.

In 2003, Midea completed the 2nd D series and 2nd V series VRF.

In 2005, Midea cooperated with Hitachi, produced the first module's AC Inverter V3 and digital scroll D3.

In 2005, Midea cooperated with IR Company, founded united lab.

In 2008, Midea launched out the V4, which is the R410A DC Inverter VRF and Modular design also.

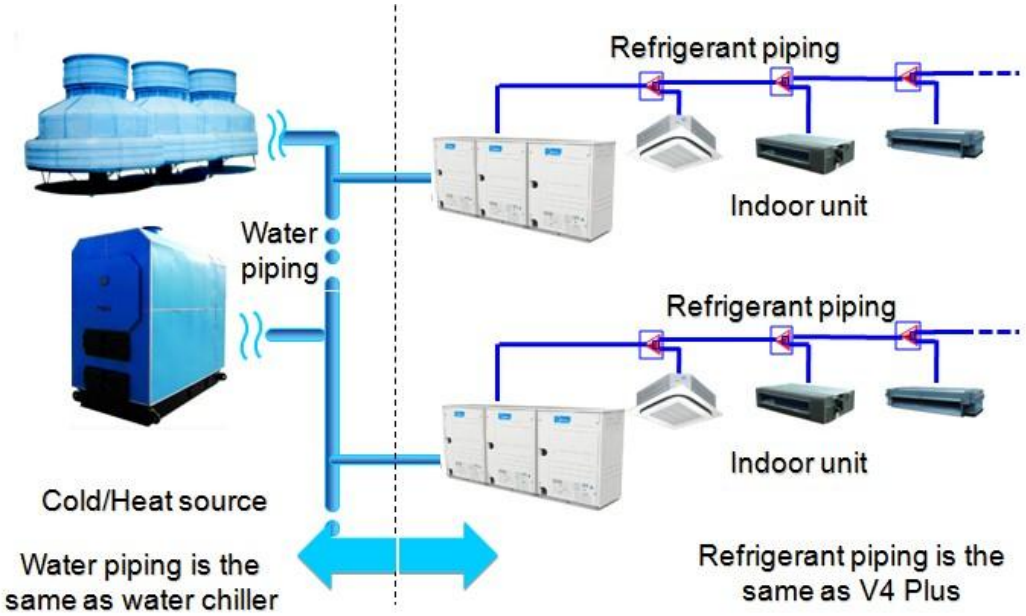
In 2010, the new V4+ was on sale, which owns the entirely DC Inverter technology and new low noise technology.

In 2011, Midea launched out the heat recovery VRF.

In 2012, Midea launched the DC Inverter V4 Plus W Series main unit which combines water system and refrigerant system perfectly.

2. V4+ W VRF System Introduction

Midea water source heat pump central air-conditioning system is a kind of VRF air-conditioning system which uses water as the cold/heat source. In this system, water is transported from the cold/heat source to the main unit through the water pipe, after the heat exchange between water and the refrigerant, main unit will send the refrigerant to indoor units.



3. DC Inverter V4+ W Series Introduction

3.1 Free combination, the World's Largest Capacity 36HP

V4 Plus W Series achieves world's largest capacity of 36HP by combining maximum 3 main units with 3 different capacities (8, 10 and 12 HP), and 59 indoor units can be connected max..

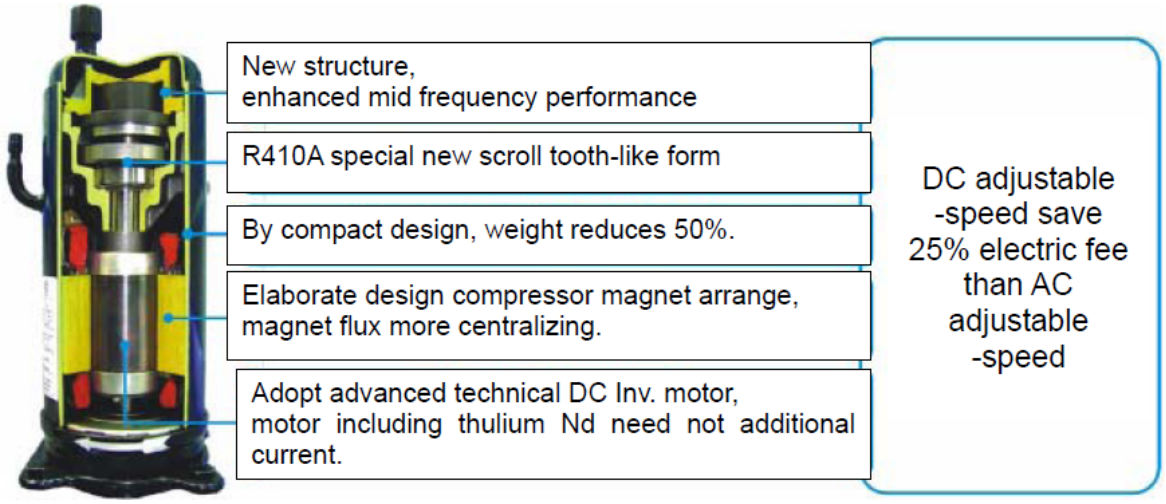
3.2 High efficiency and Energy saving:

V4 Plus W Series achieves the industry's top class energy efficiency of cooling and heating by utilizing DC inverter compressor, high performance double-pipe heat exchanger and adopting many famous core components. Moreover, it combines water system and refrigerant system perfectly. These all

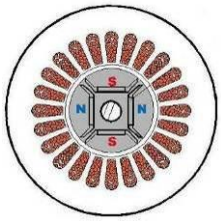
contribute to higher IPLV greatly. The highest IPLV can reach up to 5.9.

3.2.1 High efficiency DC inverter compressor, saving power 25%

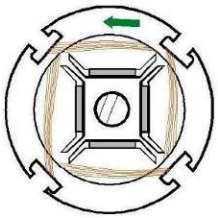
All series of 8HP, 10HP and 12HP adopt one DC inverter compressor each. With DC inverter compressors, V4 Plus W Series offers increases energy efficiency by 25%.



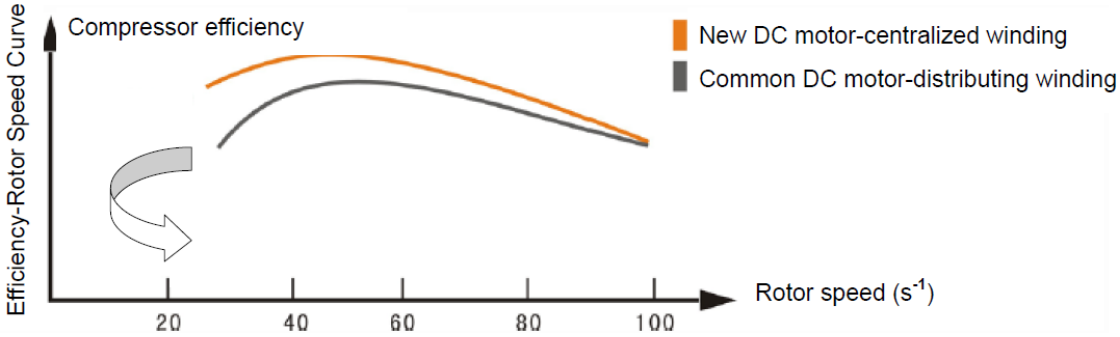
The A/C load ratio of building is 30%-75%, the area use ratio is 55%, most of the A/C runs in the mid load, so the mid load operation ratio control the whole year AC running charge.



Centralizing winding

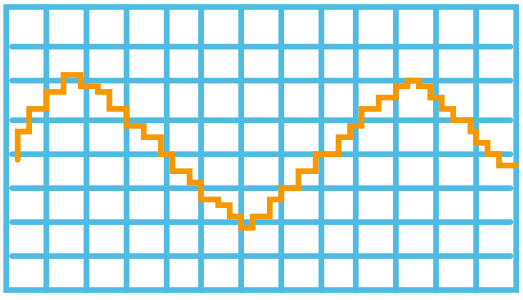


Distributing winding

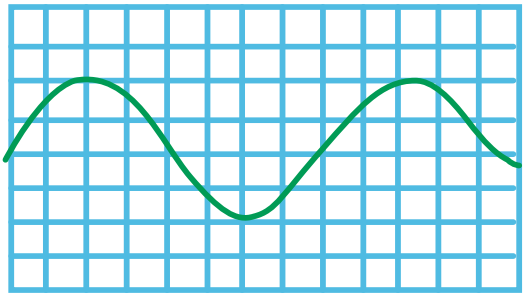


Smooth Sine Wave DC Inverter

Motor uses 180° sine wave vector drive technology to ensure transducer to output smooth curve, which shows motor rotor speed to run smooth. While, common frequency motor outputs sawtooth wave not precisely to show motor speed, so its efficiency is low.



Common Sawtooth Wave



Sine Wave DC Inverter

3.2.2 High efficiency double-pipe heat exchanger

With the innovative designed double-pipe heat exchange technology, the water quality required is low. The water side has large circulation area, and it is not easy to get stuck, higher reliability, easy to clean and maintenance.

3.2.3 Wide side heat recovery

In the modern large-scale buildings, the load between the internal and external areas is different. It may occur situations that both cooling and heating are required. The V4 PLUS W series modular design, not only can realize meticulous system division in different areas but also can realize heat recovery at the same time, significantly improved energy efficiency.

3.3 More flexible design

3.3.1 More options of indoor units and high capacity connection

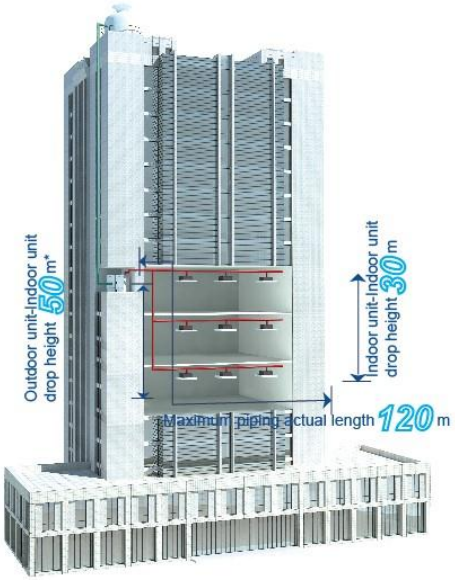
Lineup of heat pump types is 8 to 36 HP. Indoor units consist of 14 types with 115 models, capacity ranges from 1.8kW to 56kW. A maximum 130% indoor unit's connective ratio is allowed for all main unit capacities. This wide selection of models makes it possible to build a system that suits the customer's requirements.

3.3.2 Wide operation range

Main unit ambient temperature: 0℃~40℃
Indoor temperature:
cooling: 17℃~32℃, heating: 15℃~30℃
Main unit water inlet temperature: 7℃~45℃
Main unit water inlet flow:
8HP: 2.7~8.1m³/h; 10HP: 3~9m³/h; 12HP: 3.6~10.8m³/h.
If the current heat source's water temperature is between 7℃~45℃, it may be possible to use the existing source as heat / cold source. This makes it an ideal system solution for building refurbishment projects.

3.3.3 Long piping length

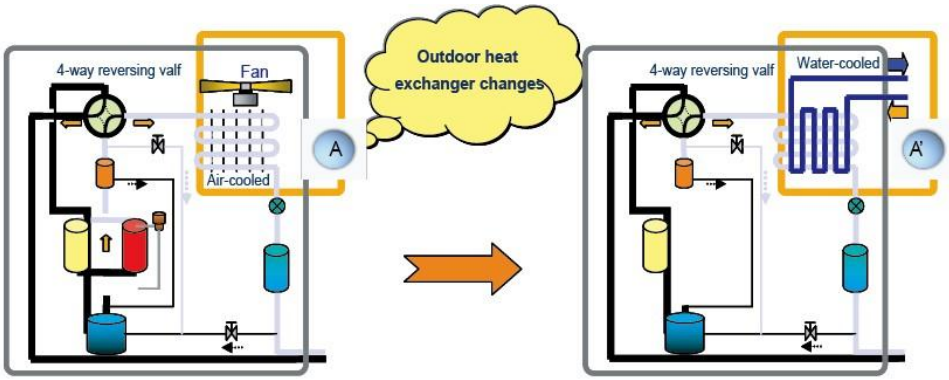
With the refrigerant piping system, total length of refrigerant pipe can reach up to 300m, and maximum piping actual length of 120m and drop height between indoor unit and main unit of 50m is available. Max. pressure of water side can be as high as 1.96 Mpa(200m height difference), making its design in high-rise buildings flexible. Water piping does not enter occupied spaces, so there is little chance of water leakage.



3.4 High Comfort

4.1 Low noise

Compare to air-cooled VRF, V4 PLUS W series have no outdoor fan noise, fully enclosed design, lower noise.



3.5 High Reliability

3.5.1 Alternative Cycle Duty operation of main units

V4+W intelligent control, according to the system load, cyclically changes start-up sequence of multiple main units, equalizes compressor duty and extends operation life-span.

Take 36HP system for example:

Everytime after oil-returning/defrosting or restart, ODU will start in different sequence.

3.5.2 Back-Up operation function

Any single unit can be set as the master unit in a multiple system when the previous master unit failed, and other units left will keep on operating. This can be set on PCB by DIP switches at site.

3.5.3 Dynamic gas balance technology

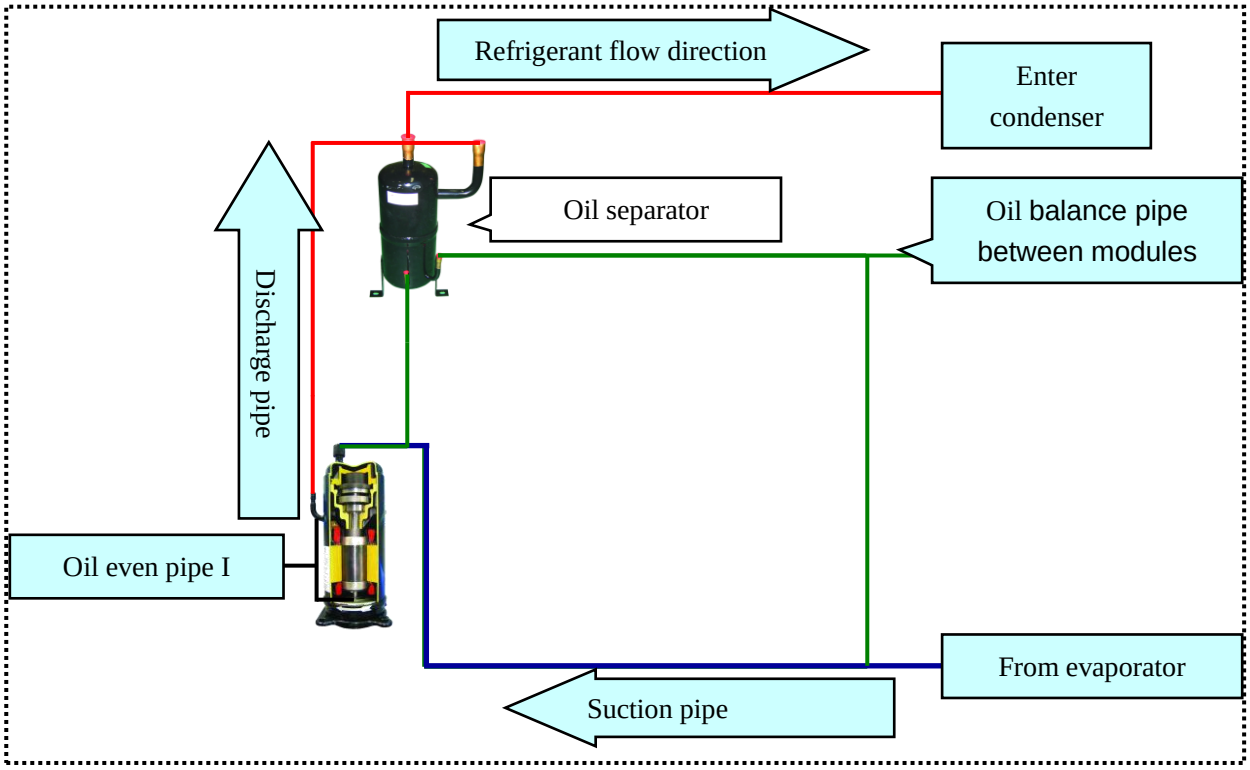
Dynamic vector balance technology, no need to install gas balance pipe:

- High-precision pressure sensor monitors the system pressure on time and transfers the data to master unit
- Master unit sends the pressure data to every unit and make sure each main unit in balance situation.

3.5.4 High efficiency oil balance technology

Oil balance pipes set among the modules, and individual oil balance vector control ensures oil distribution among the modules to compressor smoothly and running reliably. When one compressor's oil is overfull, oil balance pipes and outlet pipes both send the oil to the system, and then the system distributes the oil to other compressors in average.

Oil balance diagram：



It adopts high efficient centrifugal type oil separator, which separates the oil from the discharged refrigerant with the efficiency up to 99% and makes all the lubricant discharged from the compressor can be returned in time.

- New designed low pressure liquid receiver with high efficiency of oil return effect.
- Oil balance ensures sufficient refrigerant lubricant supply. Elaborately designed oil return hole, which ensures reliable oil return for every compressor.

3.5.5 Oil return technology

Centrifugal oil separator can be up to over 99% separating efficiency, which in time and efficiently send the oil to compressors to ensure compressor oil volume.

System auto back oil design can complete through PC core to send oil back instruction by system running time and state.

The accumulator is large volume design, which can save more refrigerant to avoid liquid strike.

Multi back oil holes can ensure the oil back of the compressor smoothly.

3.5.6 Intelligent soft start technology, rapidly enhance refrigerant cycle volume

Compressor soft start complete low frequency and low current start by DC Inverter compressor, and to reduce strike to electric network. When start DC Inverter Compressor, the system runs in large volume and offers more heating capacity.

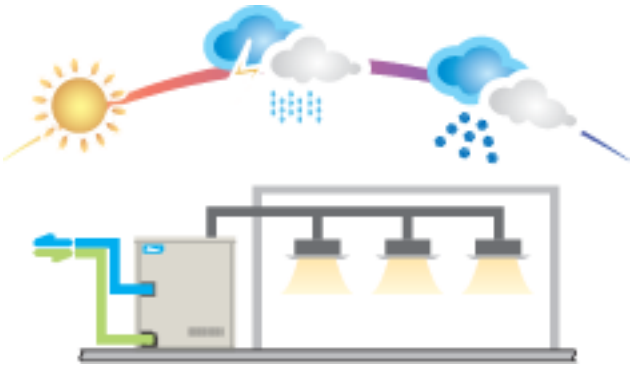
· Compressor soft start

Compressor soft start complete low frequency and low current start by DC Inverter compressor, and to induce strike to electric network.

· Lubrication system soft start

3.5.7 No effect of climate on the operation

Due to the stable source of water as the cold/heat source of the system, both in cold winter and hot summer, air conditioning capacity won't be influenced by the environmental temperature. Especially when heating in winter, the unit does not exist frost/defrost process, making the heating effect more stable and strong.



3.5.8 Avoid indoor flooding phenomenon

The water piping of V4 Plus W Series system can be concentratedly arranged in the engine room or tube well. No water piping is installed in the indoor area for eliminating leakage risks.

3.6 Convenient for installation and service

3.6.1 Compact and lightweight

8,10,12HP three basic model with the same size and weight: **W780mm×H1000mm×D550mm, 146kg.**

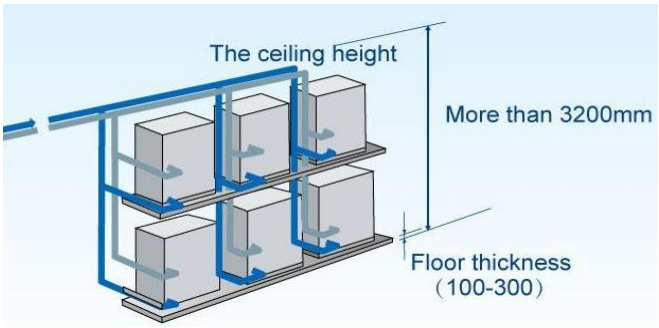
It can be transported through the elevator or forklift.

More compact, can also be installed in the narrow space of the engine room.

3.6.2 Modular design

Modular design, one main unit can be installed above another one and greatly saved installation space.

Various installation environment: Storehouse, basement, close balcony, corridor, plant room and so on.



3.6.3 Auto addressing

Addressing main units and indoor units are automatically done just by pressing the button of the controller.

· The main unit can automatically distribute the address to indoor units without any manual settings.

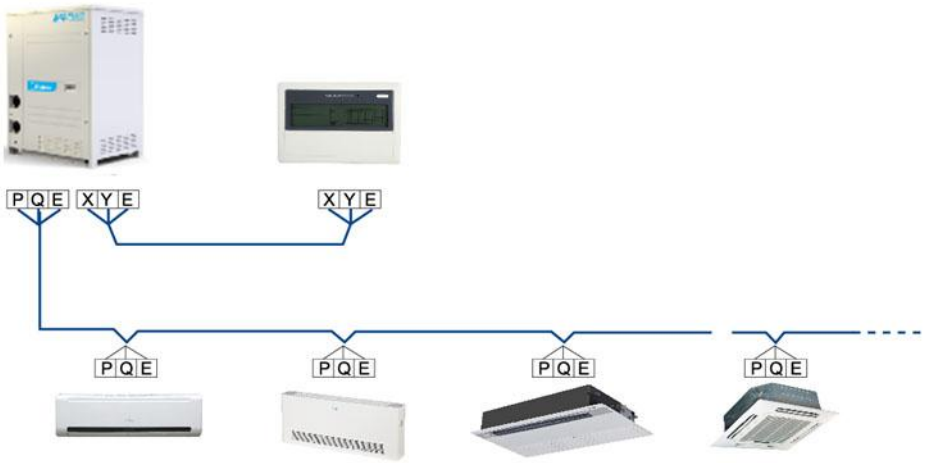
· Wireless controller can enquiry and modify every indoor units address.

· Up to 64 indoor units can be connected to one system and identified automatically.

3.6.4 Super Wiring

It is possible to enable the shared use of the wiring between indoor & main units, as well the centralized control. Hence make it easy for the user to retrofit the existing system with a centralized control, by simply connecting it to the main units.

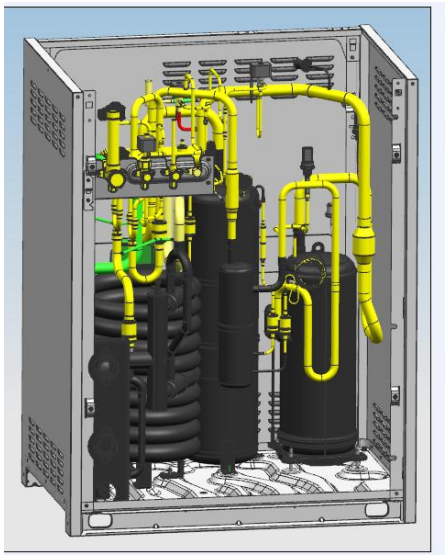
- PQE & XYE, just only one group of communication wire of PQE, achieved both of communication for indoor & main unit and network.
- Reversible communication, central controller can connect from indoor side or outdoor side at will.



3.6.5 Convenient for maintenance

Convenient electronic control check window. Can directly observe the operation status from the LED display, and directly press the FORCE COOLING / CHECK button.

The high/low pressure valves adopt the Stop Valves, which have screwed thread nipple joint, can be connected to the meter connector directly in air tight test. And also make it more efficient and easy for installation.



Compressor is near the outside, and there is simple pipe system for convenient maintenance.
Simplified internal piping system makes the maintenance work easier and time reduction,

4 Model Lineup

Main units (Combination Unit):

8, 10, 12 HP	16 ,18 ,20, 22, 24 HP
	
26, 28, 30, 32, 34, 36 HP	
	

5 Units Combination Table

Capacity (HP)	Model	Recommend combination			Max. indoor units nos.
		8(HP)	10(HP)	12(HP)	
8	MDVS-252(8)W/DRN1	●			13
10	MDVS-280(10)W/DRN1		●		16
12	MDVS-335(12)W/DRN1			●	19
16	MDVS-450(16)W/DRN1	●●			23
18	MDVS-532(18)W/DRN1	●	●		29
20	MDVS-560(20)W/DRN1		●●		33
22	MDVS-615(22)W/DRN1		●	●	36
24	MDVS-680(24)W/DRN1			●●	39
26	MDVS-730(26)W/DRN1	●●	●		43
28	MDVS-800(28)W/DRN1	●	●●		46
30	MDVS-850(30)W/DRN1		●●●		50
32	MDVS-900(32)W/DRN1		●●	●	53
34	MDVS-960(34)W/DRN1		●	●●	56
36	MDVS-1010(36)W/DRN1			●●●	59

6 Capacity Range of Indoor Units

Power supply of all the indoor units is 1 phase, 220-240V, 50Hz

Capacity (kW)	2.2	2.8	3.6	4.5	5.6	7.1	8	9	10	11.2	12.5	14	16	20	25	28	40	45	56
BTU/H	7500	9600	12300	15400	19100	24200	27300	30700	34100	38200	42600	47800	54600	68200	85300	95500	136500	153500	191100
Ton	0.6	0.8	1	1.3	1.6	2	2.3	2.6	2.9	3.2	3.5	4	5	5.7	7.1	8	11	12.3	15.4
HP	0.8	1	1.25	1.6	2	2.5	2.8	3.2	3.6	4	4.4	5	6	8	9	10	14	15.7	19.6
INDEX	22	28	36	45	56	71	80	90	100	112	123	140	160	200	250	280	400	450	560
One-way Cassette		√	√	√	√	√													
Two- way Cassette	√	√	√	√	√	√													
Compact Four- way Cassette	√	√	√	√															
Four-way Cassette Type	√	√	√	√	√	√	√	√	√	√		√							
Low Static Pressure Duct	√	√	√	√	√														
Ductable Unit A5 Type	√	√	√	√	√	√	√	√		√		√							
High Static Pressure Duct						√	√	√		√		√	√	√	√	√	√	√	√
Ceiling & Floor			√	√	√	√	√	√		√		√	√						
Wall-mounted -S Type	√	√	√	√	√														
Wall-mounted -C Type	√	√	√	√	√														
Wall-mounted -R Type						√	√	√											
Console	√	√	√	√															
Concealed Floor-standing	√	√	√	√	√	√	√												
Exposed Floor-standing	√	√	√	√	√	√	√												
Exposed Floor-standing(New panel)	√	√	√	√	√	√	√												
Fresh Air processing Unit											√	√		√	√	√			

7 External Appearance and model names of Indoor Units

External Appearance	Model Name	External Appearance	Model Name
 One-way cassette	MDV-D28Q1/N1-C MDV-D36Q1/N1-C MDV-D45Q1/N1-C MDV-D56Q1/N1-C MDV-D71Q1/N1-C	 Two-way cassette	MDV-D22Q2/N1 MDV-D28Q2/N1 MDV-D36Q2/N1 MDV-D45Q2/N1 MDV-D56Q2/N1
 Compact four-way cassette	MDV-D22Q4/N1-A3 MDV-D28Q4/N1-A3 MDV-D36Q4/N1-A3 MDV-D45Q4/N1-A3	 Four-way Cassette Type	MDV-D28Q4/N1-D MDV-D36Q4/N1-D MDV-D45Q4/N1-D MDV-D56Q4/N1-D MDV-D71Q4/N1-D MDV-D80Q4/N1-D MDV-D90Q4/N1-D MDV-D100Q4/N1-D MDV-D112Q4/N1-D MDV-D140Q4/N1-D
 Low Static Pressure Duct	MDV-D18T3/N1-B MDV-D22T3/N1-B MDV-D28T3/N1-B MDV-D36T3/N1-B MDV-D45T3/N1-B MDV-D56T3/N1-B	 Concealed Duct Unit (A5 Type)	MDV-D22T2/N1X-BA5 MDV-D28T2/N1X-BA5 MDV-D36T2/N1X-BA5 MDV-D45T2/N1X-BA5 MDV-D56T2/N1X-BA5 MDV-D71T2/N1X-BA5 MDV-D80T2/N1X-BA5 MDV-D90T2/N1X-BA5 MDV-D112T2/N1X-BA5 MDV-D140T2/N1X-BA5
 71~112 Model  140~160 Model High Static Pressure Duct	MDV-D71T1/N1-B MDV-D80T1/N1-B MDV-D90T1/N1-B MDV-D112T1/N1-B MDV-D140T1/N1-B MDV-D160T1/N1-B	 High Static Pressure Duct	MDV-D200T1/N1-B MDV-D250T1/N1-B MDV-D280T1/N1-B
 High Static Pressure Duct	MDV-D400T1/N1-B MDV-D450T1/N1-B MDV-D560T1/N1-B	 Ceiling & Floor	MDV-D36DL/N1-C MDV-D45DL/N1-C MDV-D56DL/N1-C MDV-D71DL/N1-C MDV-D80DL/N1-C MDV-D90DL/N1-C MDV-D112DL/N1-C MDV-D140DL/N1-C MDV-D160DL/N1-C

 Wall-mounted S Type	MDV-D22G/N1-S MDV-D22G/DN1-S MDV-D28G/N1-S MDV-D28G/DN1-S MDV-D36G/N1-S MDV-D36G/DN1-S MDV-D45G/N1-S MDV-D45G/DN1-S MDV-D56G/N1-S MDV-D56G/DN1-S	 Wall-mounted C Type	MDV-D22G/N1YB MDV-D22G/DN1YB MDV-D28G/N1YB MDV-D28G/DN1YB MDV-D36G/N1YB MDV-D36G/DN1YB MDV-D45G/N1YB MDV-D45G/DN1YB MDV-D56G/N1YB MDV-D56G/DN1YB
 Wall-mounted R type	MDV-D71G-R3/N1Y MDV-D80G-R3/N1Y MDV-D90G-R3/N1Y	 Concealed floor standing	MDV-D22Z/N1-F3B MDV-D28Z/N1-F3B MDV-D36Z/N1-F3B MDV-D45Z/N1-F3B MDV-D56Z/N1-F3B MDV-D71Z/N1-F3B MDV-D80Z/N1-F3B
 Exposed floor standing Type (New Panel)	MDV-D22Z/N1-F4(F5) MDV-D28Z/N1-F4(F5) MDV-D36Z/N1-F4(F5) MDV-D45Z/N1-F4(F5) MDV-D56Z/N1-F4(F5) MDV-D71Z/N1-F4(F5) MDV-D80Z/N1-F4(F5)	 Console	MDV-D22Z/DN1-B MDV-D28Z/DN1-B MDV-D36Z/DN1-B MDV-D45Z/DN1-B
 Outdoor fresh air processing unit	MDV-D125T1/N1-FA MDV-D140T1/N1-FA	 Outdoor fresh air-processing unit	MDV-D200T1/N1-FA MDV-D250T1/N1-FA MDV-D280T1/N1-FA

※The specifications, designs, and information in this book are subject to change without notice for product improvement.

8 Nomenclature

1.1 Main unit:

MDV S – 252 (8) W / D R N1

- **Refrigerant type**
  N1:R410A Omit for R22
- **Power Supply**
  R: 380~415V, 50Hz, 3N
- **Inverter Type**
  D:DC Inverter Omit for AC Inverter
- **Main unit**
- **Rated Capacity (HP), (only for combinable type)**
- **Cooling Capacity (×100W)**
- **Water source type**
- **Midea VRF**

1.2 Indoor unit:

MDV – D 28 Z / D D N1 A

- **Design Serial Number& Improved code**
  Such as A1, A2, B1, B2, C, D, etc.
- **Refrigerant type**
  N1:R410A Omit for R22
- **Electrical Auxiliary Heater**
  D: with EAH Omit for without EAH
- **Motor Type**
  D: DC Fan Motor Omit for AC fan Motor
- **Indoor Unit Structural category**
  Q4: Standard four way cassette
  Q4-A: Compact four way cassette
  Q2: Two way cassette
  T1: High Static Pressure Ductable Unit
  T2: Medium static pressure duct, such as T2-A3, T2-A5
  T3: Low Static Pressure Ductable Unit
  DL: Ceiling & Floor Type
  G: Wall mounted Type, such as G-S, G-C, G-E1, etc.
  Z: Floor Standing (Z-F3: Concealed)
- **Cooling Capacity (×100W)**
- **VRF Indoor Unit**
- **Midea VRF**