
I General Information

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1. MDV system series

1.1 What is MDV-D

The MDV-D (Digital Scroll Air Conditioner) air conditioning system is operated by a variable-capacity compressor and is accommodated by multiple evaporators (indoor units). It is considered as the next-generation modular system with high efficiency air conditioning in the world. It has undoubtedly changed the face of cooling associated with high-storied buildings. It provides a broad range of different applications for settings such as offices, hotels and schools. With the advantage of easy installation and simple controlling system and so on, the MDV-D system can meet the demands of the air conditioning market better.

1.2 Features of MDV-D

(1) Variable compressor

The world's first PWM (Pulse Width Modulation) compressor controls the cooling and heating capacity automatically according to the load.

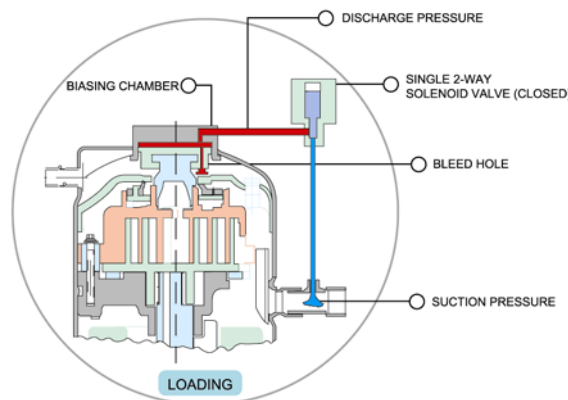
Principle of the digital scroll compressor:

[1] Composition

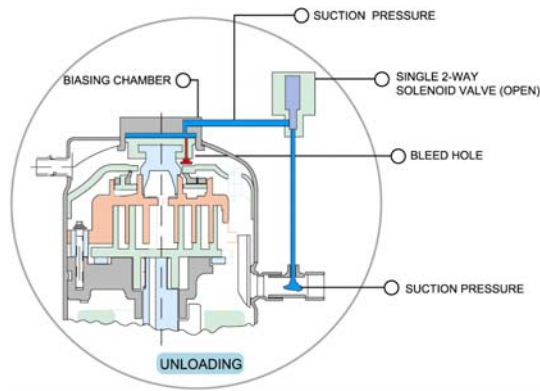
The solenoid valve is installed for the compressor's loading/ unloading between the upper part of the fixed scroll and the suction pipe.

[2] Mechanism

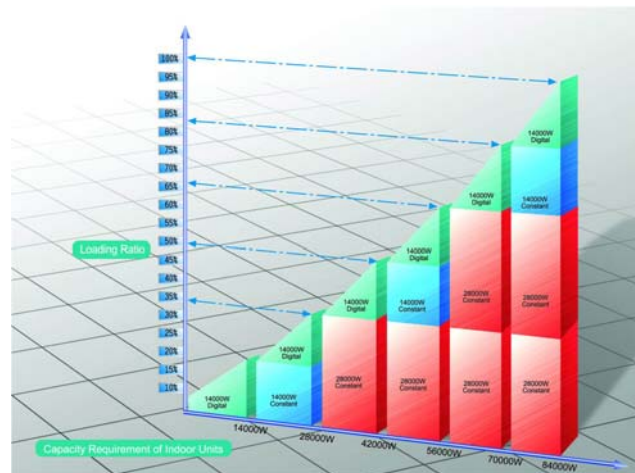
a. When the solenoid valve is turned off, the fixed scroll is close to the orbiting (Loading).



b. When the solenoid valve is turned on, the fixed scroll is separated from the orbiting scroll. (Unloading).

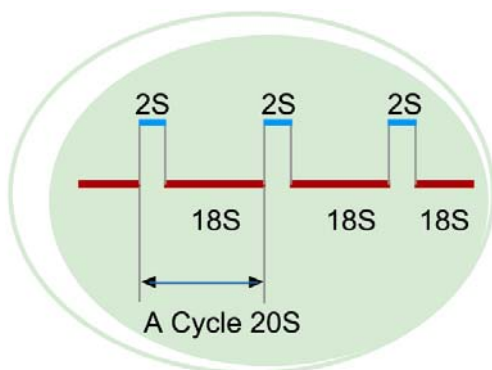


- c. This process controls the On / Off time of the valve and the rotating refrigerants in the circle thus adjusting the capacity.
- d. The cooling capacity of the outdoor units is adjusted automatically, according to the number of operating indoor unit(s).

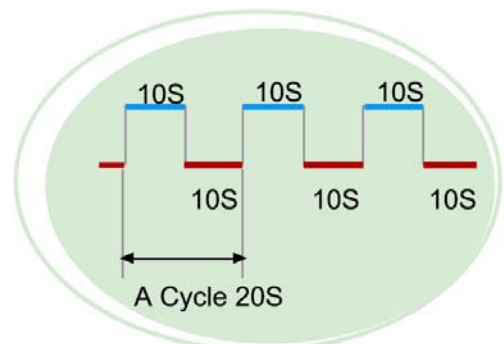


[3] PWM (Pulse Width Modulation) Valve

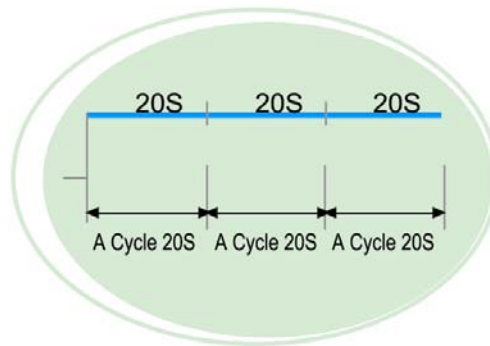
PWM valve is the valve to take away the fixed scroll by lifting up through the difference of pressure after the digital scroll compressor being connected to the outlet and inlet of suction. Therefore, the capacity of compressor is controlled automatically according to the operation status such as loading when the valve is closed or unloading when the valve is opened. PWM means the ON/OFF signal to the valve for loading /unloading.



10% Capacity Output



50% Capacity Output



100% Capacity Output

(2) Modular multi technology and flexible system

- ① Taking advantage of the modular Multi technology, 3 MDV Digital Scroll outdoor units can parallel connect only by one group of copper tubes to expand the maximum capacity up to 84kw.
- ② Both outdoor and indoor units have various models with different capacity.

Outdoor units

Model	Refrigerant type
4HP(Forward airflow, one fan)	R22, R407
6HP(Forward airflow, one fan)	R22, R407
6HP(Forward airflow, two fans)	R410A
10HP(Upward airflow, two fans)	R22, R407
10HP(Upward airflow, one fan)	R22, R407, R410A
20HP(Upward airflow, two fans)	R22, R407
30HP(Upward airflow, three fans)	R22, R407

Indoor Units

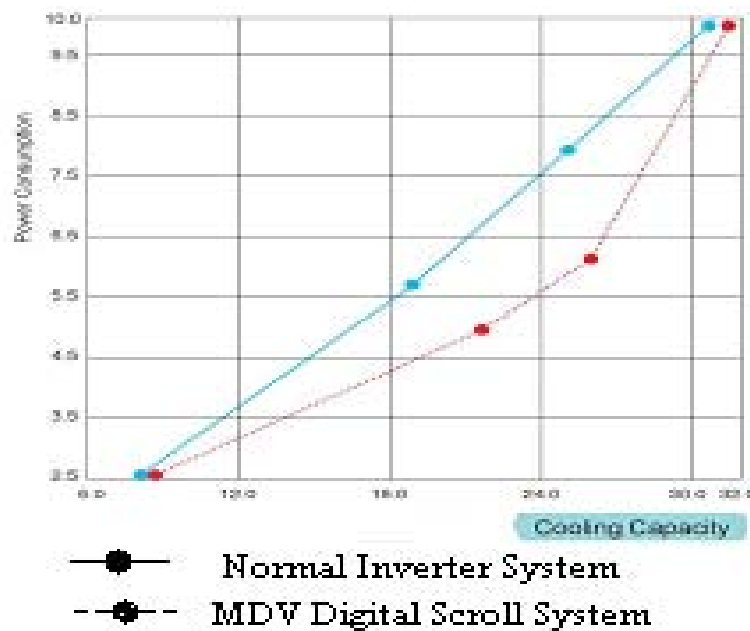
Type	Model	Capacity (kW)	Refrigerant Type
Cassette	One-way cassette type (Q1)	2.8 3.6 4.5 5.6 7.1	R22 R407C
	Four-way cassette type (Q4)	2.8 3.6 4.5 5.6 7.1 8.0 9.0 11.2	R22 R407C R410A

Duct	Low static pressure duct type (T3)	2.8	3.6	4.5	5.6	7.1	R22 R407C
	Duct type (T2-A3)	2.2 8.0	2.8 9.0	3.6 11.2	4.5 14.0	5.6 7.1	R22 R407C R410A
	Slim Duct type (T2-A)	2.8	3.6				R22 R407C
	Duct type (T1)	7.1	8.0	9.0	11.2	14.0	R22 R407C
	Low static pressure duct type (T3) (Plastic body)	2.2	2.8	3.6			R410A
Ceiling & floor type (DL)		3.6 9.0	4.5 11.2	5.6	7.1	8.0	R22 R407C R410A
Wall-mounted type (G)		2.2	2.8	3.6	4.5	5.6	R22 R407C R410A

Remark: This capacity table shows different refrigerant and different indoor units that are available now, and the boldface number shows the R410A indoor units' capacity in above table.

(3) High efficiency

EER is up to 3.2.

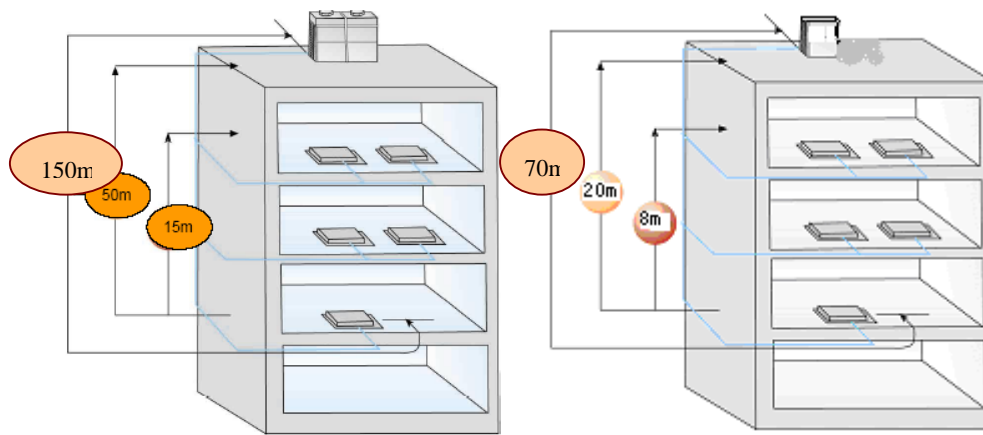


(4) Long & single piping system

Digital scroll system is the only system that is free of oil separator and oil recycling equipment. In the loading state, the speed of the refrigerant is enough to move oil back to the compressor.

For 28Kw, 56kw, 84kw system, the max. Pipe length between indoor unit and outdoor unit is 150m, the max. Height difference between indoor unit and outdoor unit is 50m, the max. Height difference between indoor units is 15m.

For 10kw, 14kw system, the max. Pipe length between indoor unit and outdoor unit is 70m, the max. Height difference between indoor unit and outdoor unit is 20m, the max. Height difference between indoor units is 8m.

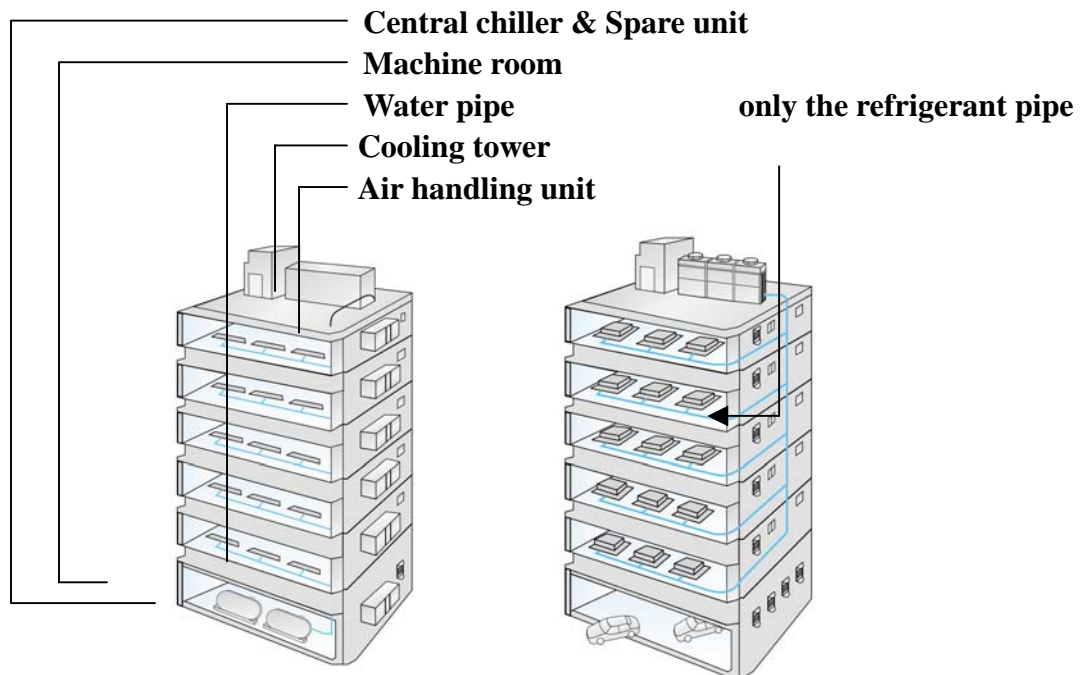


(5) Advanced oil return technology

Combining the electronic control and the mechanical control, the oil level controller keeps appropriate oil level in the compressor crankcase. Equipped with oil balance pipe and low-pressure accumulator, it is applicable to both low-pressure & high-pressure oil cycling system. Besides, with the innovative design of one-way valve and capillary, the system can meet the continual oil level change of digital compressor and protect the compressor in whole hog.

The digital Scroll Compressor is in the state of loading or unloading. In the loading state, the full speed operation of the compressor motor ensures the refrigerant has enough power to bring the oil back to the compressor. In the unloading state, there is no oil moving out of since there is no refrigerant output, the inertia of the refrigerant can also bring some oil back to the compressor.

(6) Space saving



(7) Simple installation and easy maintenance

① Easy installation

The structure of the MDV-D system and the piping work are simple, thus the installation is easy.

- Outdoor units installation: For the 20HP and 30HP digital scroll system, it has been connected before out of factory.
- Indoor units installation: Whole series indoor units have the same gas/liquid connection size for R22 and R407C (for the R410A indoor units, a series indoor units have the same gas/liquid connection size) and by flare nut connection, it is easy to connect and decrease your installation cost up to 30%.

② Independent system

The MDV-D system can be installed by stages and the owners can install their system at their convenient time. Thus the system has less installation time limit.

- Installation by stages can avoid the noninstallment for the new project
- Convenient installation is realized for the rebuilt project.

③ No need special maintenance work

Simple refrigerant piping system without any complicated maintenance work

Compared with the water-cooled system:

Without water-cooled system, there is no need to clean the water pipe

No full-time person is needed to do the maintenance work

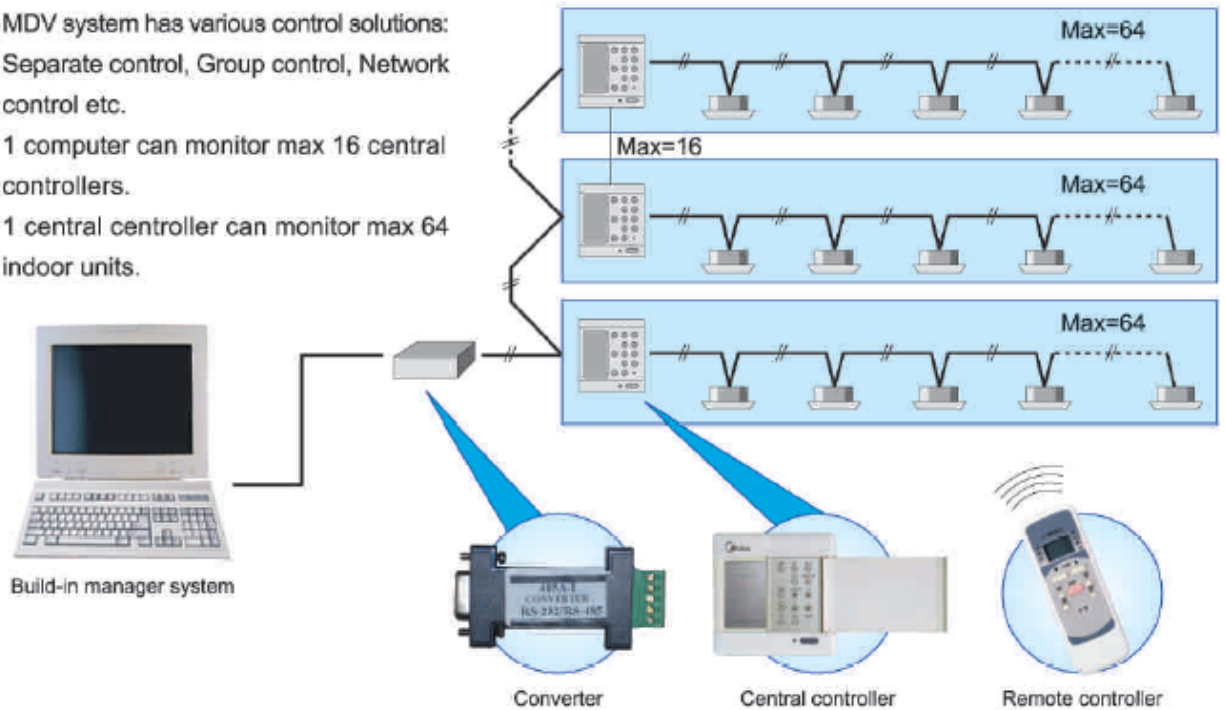
Module construction enables the system to be free from large-scale repair regularly

(8) Flexible control system

- Wireless remote control Individual indoor unit control
- Wired remote control Individual indoor unit control & group indoor units control
- Central control monitor Realize group control of multi-indoor units (Max: 64 indoor units)
- Intelligent Net-work Air-conditioner control& monitor System Realize intelligent network control via PC monitoring system (Max: 16 CCM, 1024 indoor units)

Intelligent Manager is an integrated building management system that uses our independent, 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.

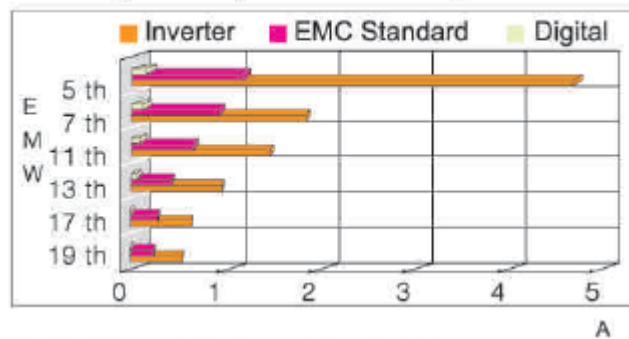
MDV system has various control solutions: Separate control, Group control, Network control etc.
 1 computer can monitor max 16 central controllers.
 1 central controller can monitor max 64 indoor units.



(9) No electromagnetic disturbance

MDV Digital Scroll System causes no electromagnetic disturbance, since the loading and unloading of compressor are merely mechanical movement. This special feature makes the Digital Scroll System applicable to telecommunication companies, power stations, and all kinds of precise science labs.

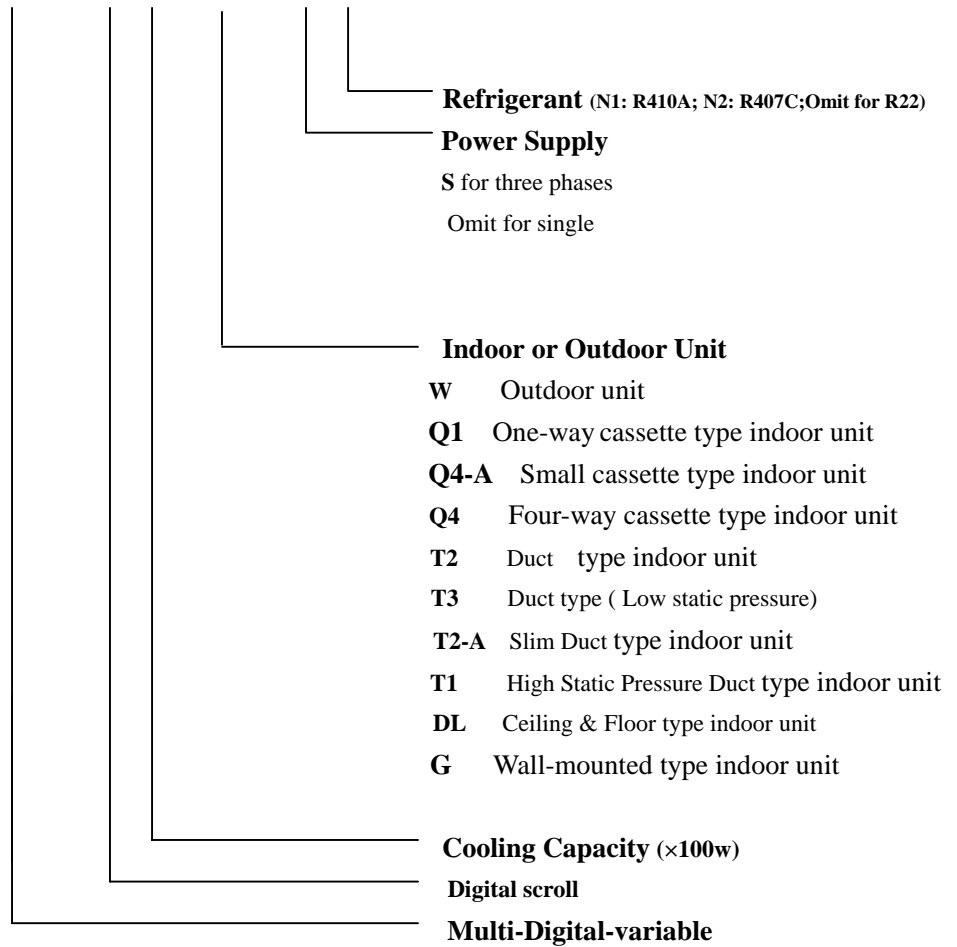
Electromagnetic Comparison Between Digital And Inverter



2. MDV-D Line up





2.1 Nomenclature

M D V --D280 W / S N1



2.2 Combination

(1) Indoor unit

Design	Refrigerant	2.2kW (7000Btu/h)	2.8Kw (9000Btu/h)	3.6kW (12000Btu/h)	4.5kW (16000Btu/h)	5.6kW (18000Btu/h)
	R22		MDV-D28Q1/B	MDV-D36Q1/B	MDV-D45Q1/B	MDV-D56Q1/B
	R407C		MDV-D28Q1/BN2 MDV-D28Q1/N2-B	MDV-D36Q1/BN2 MDV-D36Q1/N2-B	MDV-D45Q1/BN2 MDV-D45Q1/N2-B	MDV-D56Q1/BN2 MDV-D56Q1/N2-B
	R22		MDV-D28T3	MDV-D36T3	MDV-D45T3	MDV-D56T3
	R407C		MDV-D28T3/N2 MDV-D28T3/N2-B	MDV-D36T3/N2 MDV-D36T3/N2-B	MDV-D45T3/N2 MDV-D45T3/N2-B	MDV-D56T3/N2 MDV-D56T3/N2-B
	R22		MDV-D28Q4	MDV-D36Q4	MDV-D45Q4	MDV-D56Q4
	R410A		MDV-D28Q4/N1	MDV-D36Q4/N1	MDV-D45Q4/N1	MDV-D56Q4/N1
	R407C		MDV-D28Q4/N2 MDV-D28Q4/N2-B	MDV-D36Q4/N2 MDV-D36Q4/N2-B	MDV-D45Q4/N2 MDV-D45Q4/N2-B	MDV-D56Q4/N2 MDV-D56Q4/N2-B
	R22		MDV-D28Q4-A	MDV-D36Q4-A	MDV-D45Q4-A	
	R410A		MDV-D28Q4/N1-A	MDV-D36Q4/N1-A	MDV-D45Q4/N1-A	
	R407C		MDV-D28Q4/N2-A	MDV-D36Q4/N2-A	MDV-D45Q4/N2-A	
	R22	MDV-D22T2-A3	MDV-D28T2-A3	MDV-D36T2-A3	MDV-D45T2-A3	MDV-D56T2-A3
	R410A				MDV-D45T2/N1-A3	MDV-D56T2/N1-A3
	R407C	MDV-D22T2/N2-A3	MDV-D28T2/N2-A3	MDV-D36T2/N2-A3	MDV-D45T2/N2-A3	MDV-D56T2/N2-A3
	R22			MDV-D36DL	MDV-D45DL	MDV-D56DL
	R407C			MDV-D36DL/N2	MDV-D45DL/N2	MDV-D56DL/N2
	R410A			MDV-D36DL/N1	MDV-D45DL/N1	MDV-D56DL/N1
	R22	MDV-D22G-A	MDV-D28G-A	MDV-D36G-A	MDV-D45G-A	MDV-D56G-A
	R407C	MDV-D22G/N2-A	MDV-D28G/N2-A	MDV-D36G/N2-A	MDV-D45G/N2-A	MDV-D56G/N2-A
	R410A	MDV-D22G/N1-A	MDV-D28G/N1-A	MDV-D36G/N1-A	MDV-D45G/N1-A	MDV-D56G/N1-A
	R22		MDV-D28T2-A	MDV-D36T2-A		
	R407C		MDV-D28T2/N2-A	MDV-D36T2/N2-A		

General Information

Design	Refrigerant	7.1kW (24000Btu/h)	8.0kW (28000Btu/h)	9.0kW (30000Btu/h)	11.2kW (40000Btu/h)	140kW (48000Btu/h)
	R22	MDV-D71Q4	MDV-D80Q4	MDV-D90Q4	MDV-D112Q4	
	R410A	MDV-D71Q4/N1	MDV-D80Q4/N1	MDV-D90Q4/N1	MDV-D112Q4/N1	
	R407C	MDV-D71Q4/N2 MDV-D71Q4/N2- B	MDV-D80Q4/N2 MDV-D80Q4/N2- B	MDV-D90Q4/N2 MDV-D90Q4/N2- B	MDV-D112Q4/N2 MDV-D112Q4/N2- B	
	R22	MDV-D71T2	MDV-D80T2	MDV-D90T2	MDV-D112T2	MDV-D140T2
	R410A	MDV-D71T2/N1- A3	MDV-D80T2/N1- A3	MDV-D90T2/N1- A3	MDV-D112T2/N1 -A3	MDV-D140T2/N1 -A3
	R407C	MDV-D71T2/N2- A3	MDV-D80T2/N2- A3	MDV-D90T2/N2- A3	MDV-D112T2/N2 -A3	MDV-D140T2/N2 -A3
	R22	MDV-D71DL	MDV-D80DL	MDV-D90DL	MDV-D112DL	
	R407C	MDV-D71DL/N2	MDV-D80DL/N2	MDV-D90DL/N2	MDV-D112DL/N2	
	R410A	MDV-D71DL/N1	MDV-D80DL/N1	MDV-D90DL/N1	MDV-D112DL/N1	
 	R22	MDV-D71T1	MDV-D80T1	MDV-D90T1	MDV-D112T1	MDV-D140T1
	R407C	MDV-D71T1/N2	MDV-D80T1/N2	MDV-D90T1/N2	MDV-D112T1/N2	MDV-D140T1/N2
	R410A	MDV-D22T2/N1- A3	MDV-D28T2/N1- A3	MDV-D36T2/N1- A3		

Remark: In the model name, "B" stands for the electric throttle kit inside the body of indoor unit and you don't need to connect it with indoor unit. Except for the ceiling & floor type and wall-mounted type (The electric throttle kit is inside in the indoor unit), the electric throttle kit of other types is out of the indoor unit for R22 and R407C indoor units. But for R410A indoor units, except the wall-mounted type the electric throttle kit is inside in the indoor unit, the electric throttle kit of other types is inside the body of indoor unit.

(2) Outdoor unit

Design	Power supply		Model	Capacity (HP)	Refrigerant	Max.connectible indoor units
	50Hz	220-240V~, 1N	MDV-D100W/(N2)	4	R22	6
		380-450V, 3N~	MDV-D100W/S(N2)		R407C	6
		380-450V, 3N~	MDV-D140W/S	6	R22	8
			MDV-D140W/SN2		R407C	
	50Hz	380-450V, 3N~	MDV-D140W/SN1	6	R410A	8
	50Hz	380-450V, 3N~	MDV-D280W/S-810	10	R22	16
			MDV-D280W/SN2-810		R407C	
	50Hz	380-450V, 3N~	MDV-D280W/S-820	10	R22	16
			MDV-D280W/SN2-820		R407C	
			MDV-D280W/SN1-820		R410A	
	50Hz	380-450V, 3N~	MDV-D560W/S	20	R22	20
			MDV-D560W/SN2		R407C	
	50Hz	380-450V, 3N~	MDV-D840W/S	30	R22	32
			MDV-D840W/SN2		R407C	

Caution: The system enables the connection of indoor units with a total capacity of between 50 % to 130% of that of the corresponding outdoor unit but when this capacity ratio exceeds 100% then the actual capacity of each indoor unit will decrease compared to rated capacity when all the units operated simultaneously.