R410A

Commercial Air Conditioners

Engineering Data

Medium Static Pressure Duct

VRF IDU

MDV-D22T2/N1-DA5(B)

MDV-D28T2/N1-DA5(B)

MDV-D36T2/N1-DA5(B)

MDV-D45T2/N1-DA5(B)

MDV-D56T2/N1-DA5(B)

MDV-D71T2/N1-DA5(B)

MDV-D80T2/N1-BA5(B)

MDV-D90T2/N1-BA5(B)

MDV-D112T2/N1-BA5(B)

MDV-D140T2/N1-BA5(B)

Medium Static Pressure Duct

1 Specifications

MDV- D22T2/N1-DA5(B) / MDV- D28T2/N1-DA5(B) / MDV- D36T2/N1-DA5(B)

Table 1.1: MDV-D22(28, 36)T2/N1-DA5(B) specifications

Model			MDV-D22T2/N1-DA5(B)	MDV-D28T2/N1-DA5(B)	MDV-D36T2/N1-DA5(B)
Power supply			1 phase, 220-240V, 50Hz		
Cooling[1]	Capacity	kW	2.2	2.8	3.6
		kBtu/h	7.5	9.6	12.3
	Power input	W	57	57	61
Heating[2]	Capacity	kW	2.6	3.2	4.0
		kBtu/h	8.9	10.9	13.7
	Power input	W	57	57	61
Fan motor	Type		AC		
	Number		1		
Indoor coil	Number of rows		2	2	2
	Tube pitch × row pitch	mm	21×13.37		
	Fin spacing	mm	1.5	1.5	1.5
	Fin type		Hydrophilic aluminum		
	Tube OD and type	mm	Φ7 Inner-groove		
	Dimensions (L×H ×W)	mm	515×147×26.74	515×147×26.74	515×147×26.74
	Number of circuits		3	3	3
Air flow rate(H/M/L)		m^3/h	550/397/309	550/397/309	605/442/351
Sound pressure level(H/M/L)		dB(A)	32/24/21	31/24/21	35/28/24
Indoor external static pressure		Pa	10(0~30)	10(0~30)	10(0~30)
Indoor unit	Net dimensions (W×H×D)	mm	778x210x500		
	Packed dimensions(W×H×D)	mm	870×285×525		
	Net/Gross weight	kg	18.5/22.2	18.5/22.2	18.5/22.2
Refrigerant type			R410A		
Pipe connections	Liquid/Gas pipe	mm	Φ6.35/ Φ12.7		
	Drain pipe	mm	OD Φ25		

Notes:

1. Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 7.5m with zero level difference.
2. Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 7.5m with zero level difference.

MDV- D45T2/N1-DA5(B) / MDV- D56T2/N1-DA5(B) / MDV- D71T2/N1-DA5(B)

Table 1.2: MDV-D45(56, 71)T2/N1-DA5(B) specifications

Model			MDV-D45T2/N1-DA5(B)	MDV-D56T2/N1-DA5(B)	MDV-D71T2/N1-DA5(B)
Power supply			1 phase, 220-240V, 50Hz		
Cooling[1]	Capacity	kW	4.5	5.6	7.1
		kBtu/h	15.4	19.1	24.2
	Power input	W	98	103	140
Heating[2]	Capacity	kW	5	6.3	8
		kBtu/h	17.1	21.5	27.3
	Power input	W	98	103	140
Fan motor	Type		AC		
	Number		1		
Indoor coil	Number of rows		2		
	Tube pitch × row pitch	mm	21×13.37		
	Fin spacing	mm	1.3		
	Fin type		Hydrophilic aluminum		
	Tube OD and type	mm	Φ7 Inner-groove		
	Dimensions (L×H×W)	mm	734×147×26.74	734×147×26.74	953×147×26.74
	Number of circuits		6		
Air flow rate(H/M/L)		m^3/h	800/573/479	800/573/479	985/738/630
Sound pressure level(H/M/L)		dB(A)	36/29/26	36/29/27	36/30/27
Indoor external static pressure		Pa	10(0~30)	10(0~30)	10(0~30)
Indoor unit	Net dimensions (W×H×D)	mm	997x210x500	997x210x500	1218x210x500
	Packed dimensions (W×H×D)	mm	1115×285×525	1115x285x525	1335x285x525
	Net/Gross weight	kg	22.5/26.8	22.5/26.8	28/33
Refrigerant type			R410A		
Pipe connections	Liquid/Gas pipe	mm	Φ6.35/ Φ12.7	Φ9.53/Φ15.9	Φ9.53/Φ15.9
	Drain pipe	mm	OD Φ25		

Notes:

1. Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 7.5m with zero level difference.
2. Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 7.5m with zero level difference.

The 2nd Generation AC Series VRF Indoor Units

MDV-D80T2/N1-BA5(B) / MDV-D90T2/N1-BA5(B)

Table 1.3: MDV-D80(90)T2/N1-BA5(B) specifications

Model			MDV-D80T2/N1-BA5(B)	MDV-D90T2/N1-BA5(B)
Power supply			1 phase, 220-240V, 50Hz	
Cooling[1]	Capacity	kW	8.0	9.0
		kBtu/h	27.3	30.7
	Power input	W	198	200
Heating[2]	Capacity	kW	9.0	10.0
		kBtu/h	30.7	34.1
	Power input	W	198	200
Fan motor	Type		AC	
	Number		1	
Indoor coil	Number of rows		4	4
	Tube pitch × row pitch	mm	21×13.5	21×13.5
	Fin spacing	mm	1.5	1.5
	Fin type		Hydrophilic aluminum	
	Tube OD and type	mm	Φ7 Inner-groove	
	Dimensions (L×H×W)	mm	955×336×53.5	955×336×53.5
	Number of circuits		5	8
Air flow rate(H/M/L)		m^3/h	1345/1165/1013	1345/1165/1013
Sound pressure level(H/M/L)		dB(A)	45/40/37	45/40/37
*Indoor external static pressure		Pa	20(10~50)	20(10~50)
Indoor unit	Net dimensions (W×H×D)	mm	1230×270×775	1230×270×775
	Packed dimensions (W×H×D)	mm	1355×350×795	1355×350×795
	Net/Gross weight	kg	35.5/41.5	36/42
Refrigerant type			R410A	
Pipe connections	Liquid/Gas pipe	mm	Φ9.53/Φ15.9	
	Drain pipe	mm	OD Φ25	

Notes:

1. Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 7.5m with zero level difference.
2. Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 7.5m with zero level difference.
3. *This is the available static pressure range which means the unit can run stably in this static pressure range, and the optimal static pressure range please refers to the Installation Manual. When choosing any static pressure which is out of optimal static pressure range, risk like bigger noise, lower air flow volume etc. should be considered in advanced.

MDV-D112T2/N1-BA5(B) / MDV-D140T2/N1-BA5(B)

Table 1.3: MDV-D112(140)T2/N1-BA5(B) specifications

Model			MDV-D112T2/N1-BA5(B)	MDV-D140T2/N1-BA5(B)
Power supply			1 phase, 220-240V, 50Hz	
Cooling[1]	Capacity	kW	11.2	14.0
		kBtu/h	38.2	47.8
	Power input	W	313	274
Heating[2]	Capacity	kW	12.5	15.5
		kBtu/h	42.7	52.9
	Power input	W	313	274
Fan motor	Type		AC	
	Number		1	
Indoor coil	Number of rows		4	4
	Tube pitch × row pitch	mm	21×13.5	21×13.5
	Fin spacing	mm	1.5	1.5
	Fin type		Hydrophilic aluminum	
	Tube OD and type	mm	Φ7 Inner-groove	
	Dimensions (L×H×W)	mm	955×336×53.5	1030×378×53.5
	Number of circuits		8	8
Air flow rate(H/M/L)		m^3/h	1800/1556/1400	1905/1636/1400
Sound pressure level(H/M/L)		dB(A)	48/42/38	48/43/39
*Indoor external static pressure		Pa	40(10~80)	40(10~100)
Indoor unit	Net dimensions (W×H×D)	mm	1230×270×775	1290×300×865
	Packed dimensions (W×H×D)	mm	1355×350×795	1400×375×925
	Net/Gross weight	kg	36/42	46.5/55.5
Refrigerant type			R410A	
Pipe connections	Liquid/Gas pipe	mm	Φ9.53/Φ15.9	
	Drain pipe	mm	OD Φ25	

Notes:

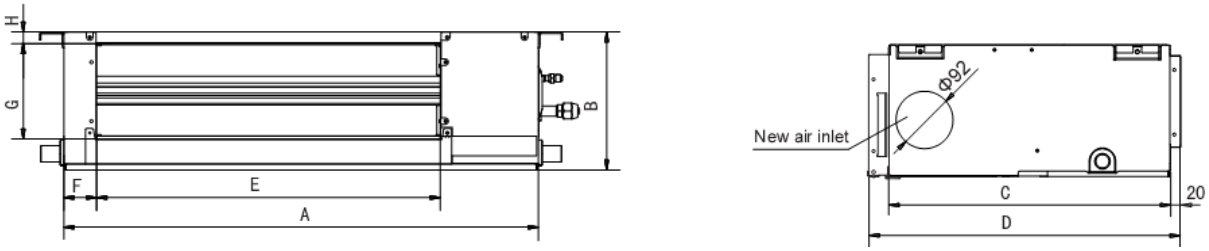
1. Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 7.5m with zero level difference.
2. Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 7.5m with zero level difference.
3. *This is the available static pressure range which means the unit can run stably in this static pressure range, and the optimal static pressure range please refers to the Installation Manual. When choosing any static pressure which is out of optimal static pressure range, risk like bigger noise, lower air flow volume etc. should be considered in advanced.

2 Dimensions

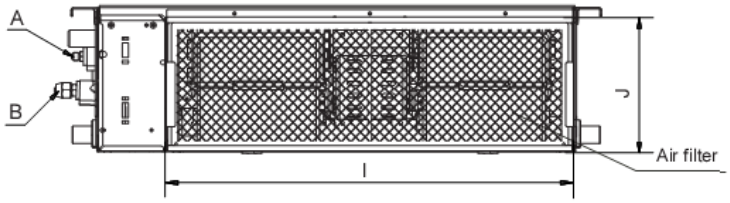
2.1 Unit Dimensions

Figure 2.1: 2.2-7.1kW Medium Static Pressure Duct dimensions (unit: mm)

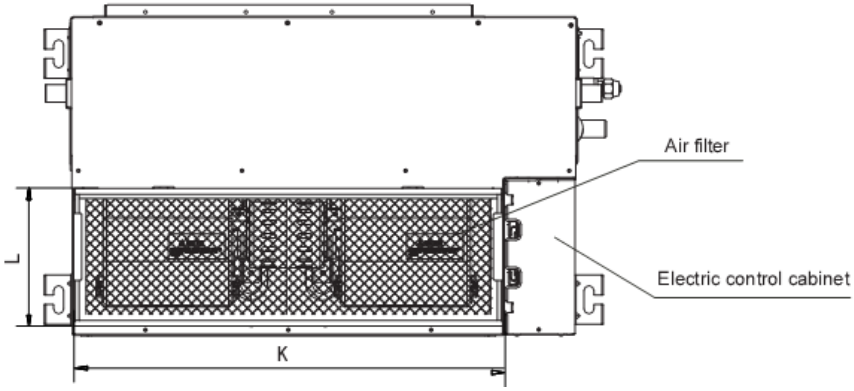
Outline dimension and air outlet opening size：



Air return opening size:



Position size of declensional ventilation opening：



Size of mounted lug:

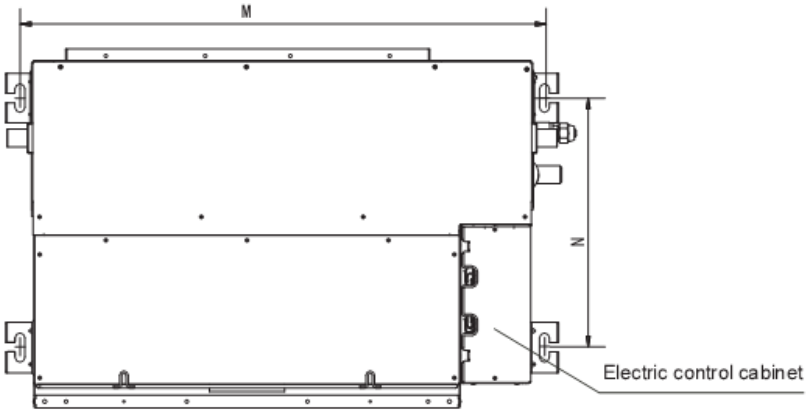
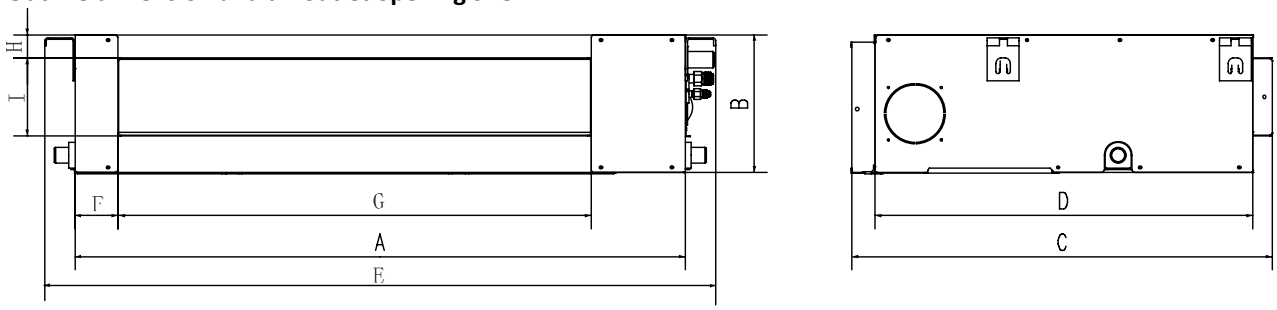


Table 2.1: 2.2-7.1kW Medium Static Pressure Duct dimensions (unit: mm)

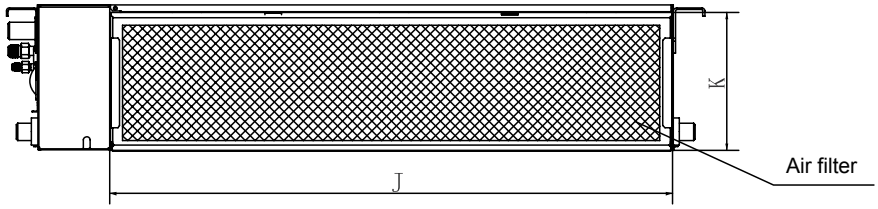
Model names	Dimensions (mm)													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
MDV-D22(28,36)T2/N1-DA5(B)	700	210	450	500	512	45	145	17	600	196	600	196	740	350
MDV-D45(56)T2/N1-DA5(B)	920	210	450	500	512	45	145	17	820	200	820	200	960	350
MDV-D71T2/N1-DA5(B)	1140	210	450	500	512	45	145	17	1040	200	1040	200	1180	350

Figure 2.2: 8.0-11.2kW High Static Pressure Duct dimensions (unit: mm)

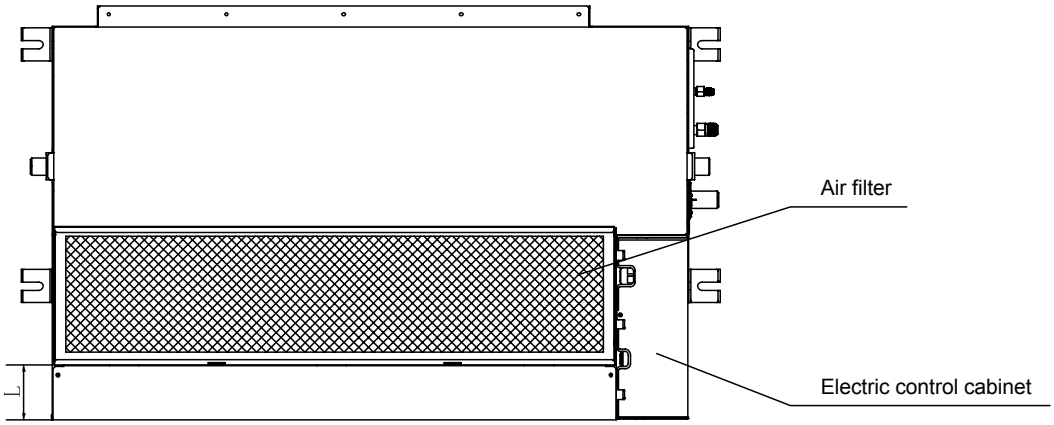
Outline dimension and air outlet opening size



Air return opening size:



Position size of declensional ventilation opening



Size of mounted lug

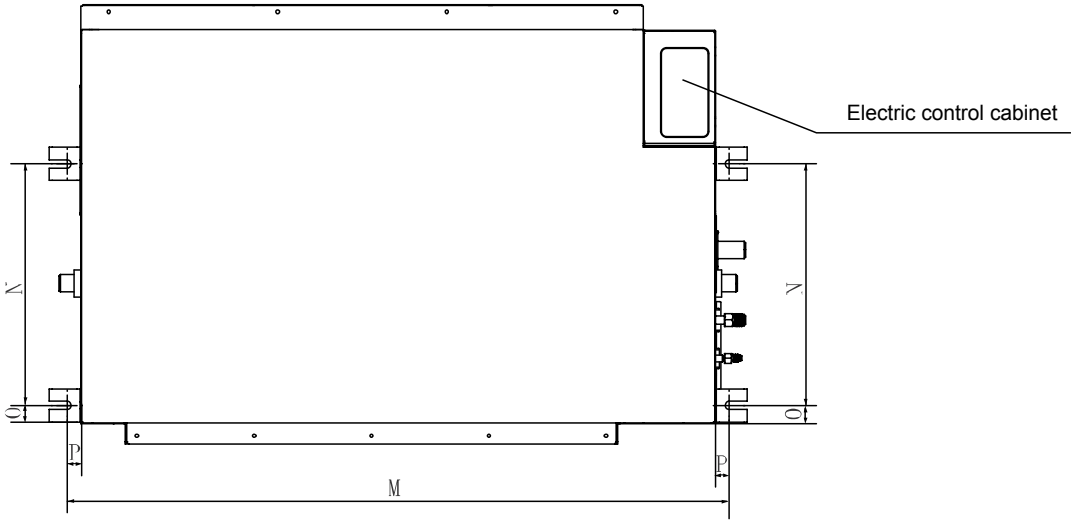


Table 2.2:8.0-14.0kW Medium Static Pressure Duct outline dimensions and air outlet opening size(unit: mm)

Model names	Outline dimensions (mm)					Air outlet opening size (mm)			
	A	B	C	D	E	F	G	H	I
MDV-D80T2/N1-BA5(B)	1140	270	775	710	1230	65	933	35	179
MDV-D90T2/N1-BA5(B)	1140	270	775	710	1230	65	933	35	179
MDV-D112T2/N1-BA5(B)	1140	270	775	710	1230	65	933	35	179
MDV-D140T2/N1-BA5(B)	1200	300	865	800	1290	80	968	40	204

Table 2.3: 8.0-14.0kW Medium Static Pressure Duct air return opening size dimensions and mounted lug size (unit: mm)

Model names	Air return opening size (mm)			Size of mounted lug (mm)			
	J	K	L	M	N	O	P
MDV-D80T2/N1-BA5(B)	1035	260	20	1180	490	26	20
MDV-D90T2/N1-BA5(B)	1035	260	20	1180	490	26	20
MDV-D112T2/N1-BA5(B)	1035	260	20	1180	490	26	20
MDV-D140T2/N1-BA5(B)	1094	288	45	1240	500	26	20

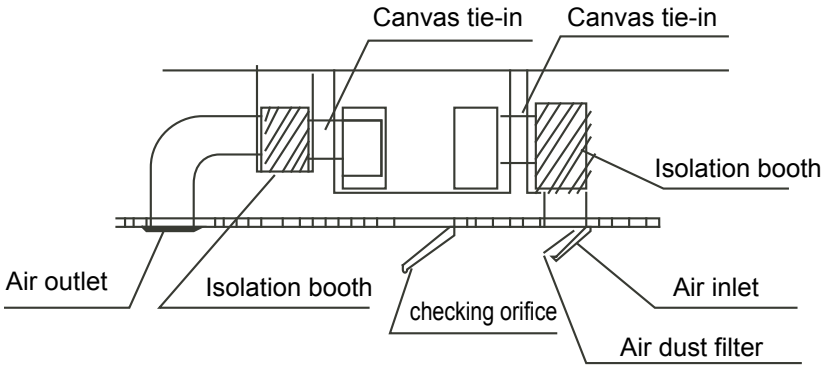
3 Unit Placement

3.1 Placement Considerations

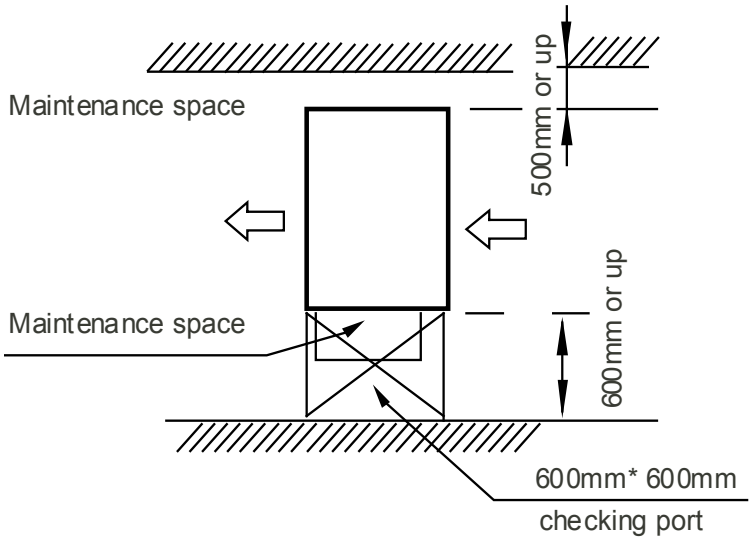
- Unit placement should take account of the following considerations:
  - Ensure the needed spaces for installation and maintenance.
  - The ceiling is horizontal, and its structure can endure the weight of the indoor unit.
  - The outlet and the inlet are not impeded, and the influence of external air is the least.
  - The air flow can reach throughout the room.
  - The connecting pipe and drainpipe could be extracted out easily.
  - There is no direct radiation from heaters.

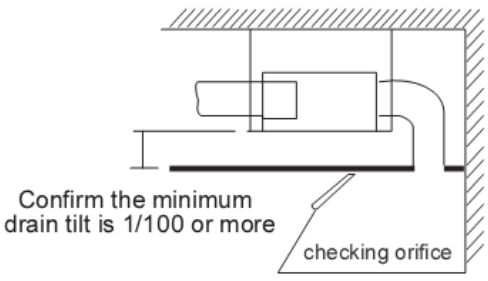
3.2 Space Requirements

- Below is the recommended duct installation method:



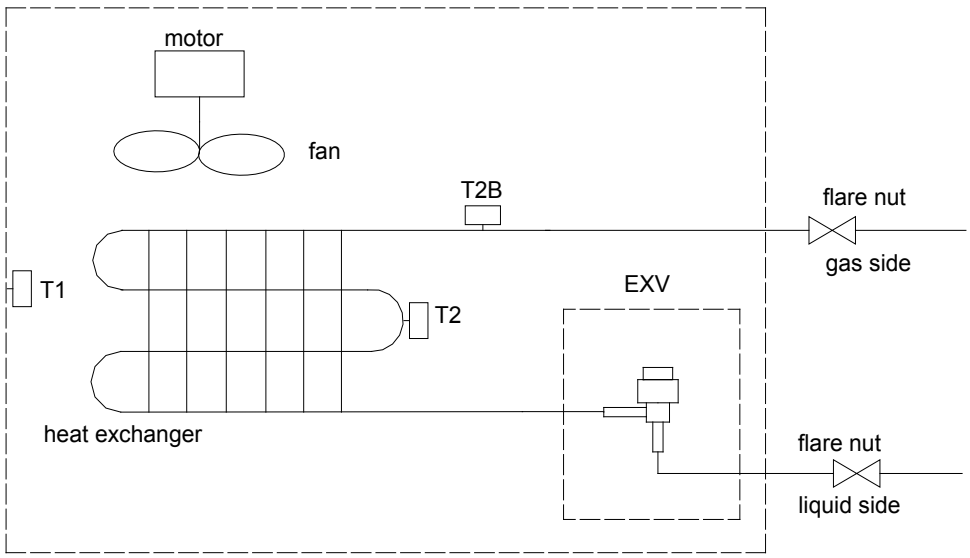
- Keep min. 600*600 space for checking &maintenance:





4 Piping Diagram

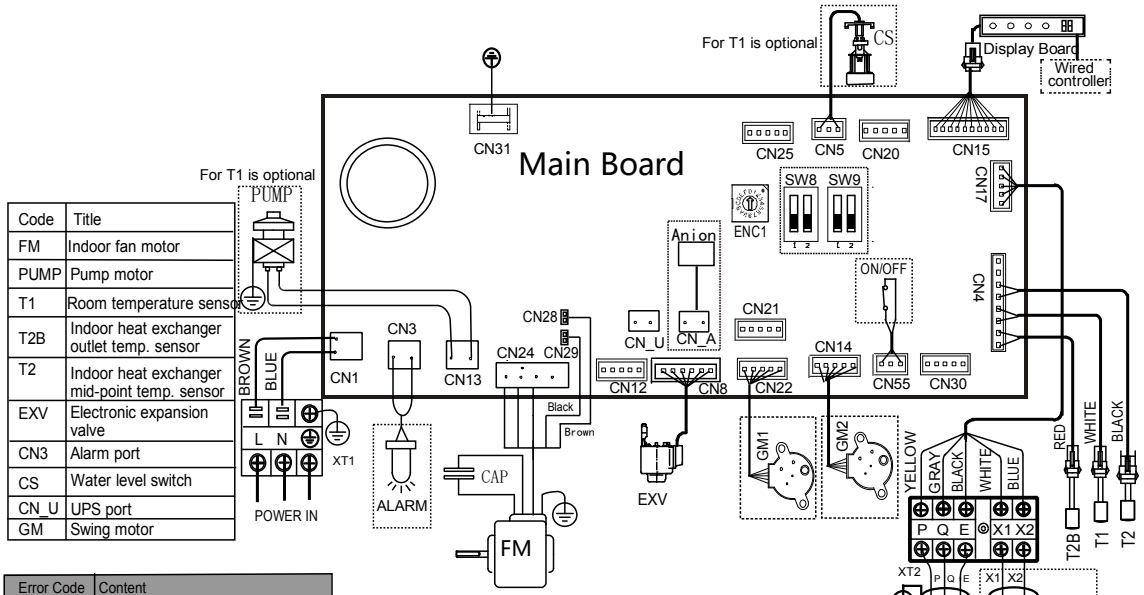
Figure 4.1: 2.2-14.0kW Medium Static Pressure Duct piping diagram



Legend	
T1	Indoor ambient temperature sensor
T2	Indoor heat exchanger mid-point temperature sensor
T2B	Indoor heat exchanger outlet temperature sensor

5 Wiring Diagram

Figure 5.1: 2.2-14.0kW Medium Static Pressure Duct wiring diagram



Code	Title
FM	Indoor fan motor
PUMP	Pump motor
T1	Room temperature sensor
T2B	Indoor heat exchanger outlet temp. sensor
T2	Indoor heat exchanger mid-point temp. sensor
EXV	Electronic expansion valve
CN3	Alarm port
CS	Water level switch
CN_U	UPS port
GM	Swing motor

Error Code	Content
E0	Mode conflict error
E1	Communication error with outdoor unit
E2	T1(Indoor ambient) temperature sensor error
E3	T2(Indoor heat exchanger mid-point) temperature sensor error
E4	T2B(Indoor heat exchanger outlet) temperature sensor error
E7	EEPROM error
E9	Communication Error with wired controller
Eb	Indoor EXV coil error
Ed	Outdoor unit error
EE	Water level alarm
A0	Emergency stop
A1	Refrigerant leakage error
FE	Indoor unit has not been assigned an address
FA	Capacity(HP number) has not been set
F7	Repeated indoor units address
F8	MS-Box error
U4	MS-Box self-check error
H4	The communication error between indoor unit and adapter board or panel
H5	EEPROM error (adapter board or panel)
HA	The Smart Eye error

Note:
1:Components in dash line is optional or field wiring
2:This manual is for reference only,actual product may vary
3:X1/X2 communication cable cannot be grounded

ENC1

Toggle Switch Code	Set horsepower Capacity(W*100)
0	10/12
1	15/17/18
2	22
3	25/28
4	32/36
5	40
6	45
7	50/56
8	63/71
9	80
A	85/90
B	100/104/106
C	112
D	120/125/128
E	140

SW9_1 definition	
SW9 [0]	Unit is forced shutdown when romote switch is ON (default)
SW9 [1]	Unit is forced shutdown when romote switch is open
SW9_2 definition(fuction Reserved)	

SW8 definition	
SW8 [00]	ALARM port is used to output alarm signal
SW8 [01]	ALARM port is used as fresh air port
SW8 [10]	ALARM port is used as running output of indoor units
SW8 [11]	ALARM port is used to output alarm signal

0/1 definition of each dial code switch:	
	means 0
	means 1

J1 definition	
J1	Auto restart function enabled
J1	Auto restart function disabled

J2 definition	
J2	CN20 network module enabled(external network module is needed), and the infra-red function of display board disabled
J2	CN20 network module disabled, and the infrared function of display board enabled

6 Fan Performance

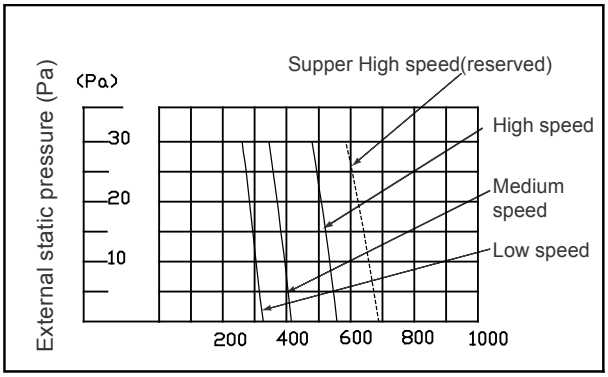
6.1 How to Read the Diagram

The vertical axis is the External Static Pressure (Pa) while the horizontal axis represents the Air Flow (m^3/h). The characteristic curve for the "SH," "H," "M," and "L" fan speed control, The nameplate values are shown based on the "H" air flow.

Therefore in the case of 80/90T2Type, the air flow is 900 m3/h, while the External Static Pressure is 80Pa at "H" position. If 90Pa needed, the airflow is at 'SH'.

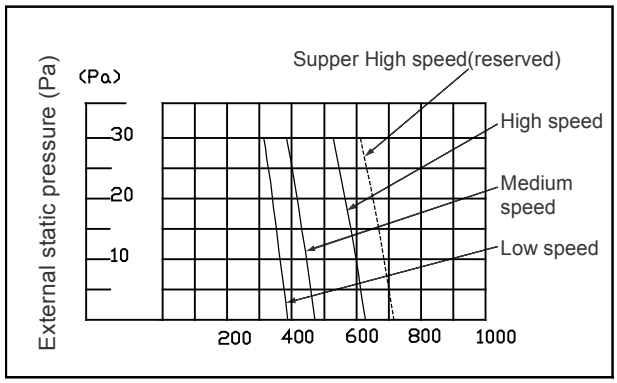
6.2 Medium Static Pressure Duct fan performance diagram

Table 6.1: MDV-D22(28)T2/N1-DA5(B) fan performance diagram



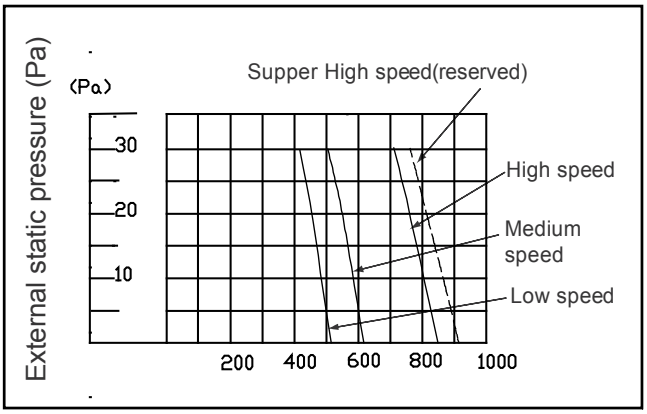
2.2KW~2.8KW

Table 6.2: MDV-D36T2/N1-DA5(B) fan performance diagram



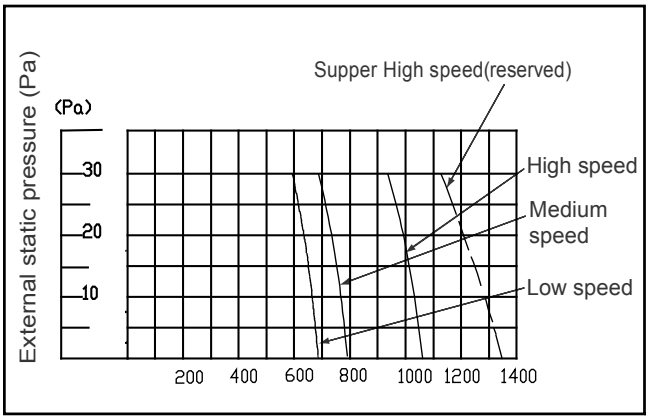
3.6KW

Table 6.3: MDV-D45(56)T2/N1-DA5(B) fan performance diagram



4.5KW~5.6KW

Table 6.4: MDV-D71T2/N1-DA5(B) fan performance diagram



7.1KW

Table 6.5: MDV-D80(90)T2/N1-BA5(B) fan performance diagram

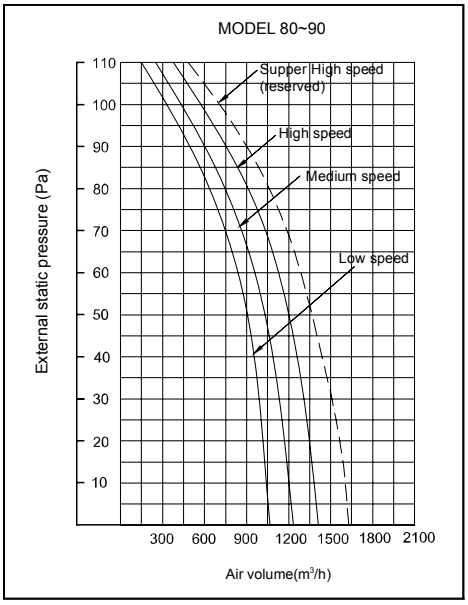


Table 6.6: MDV-D112T2/N1-BA5(B) fan performance diagram

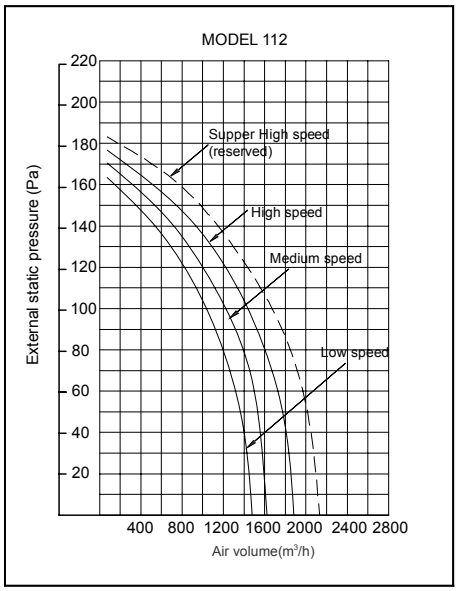
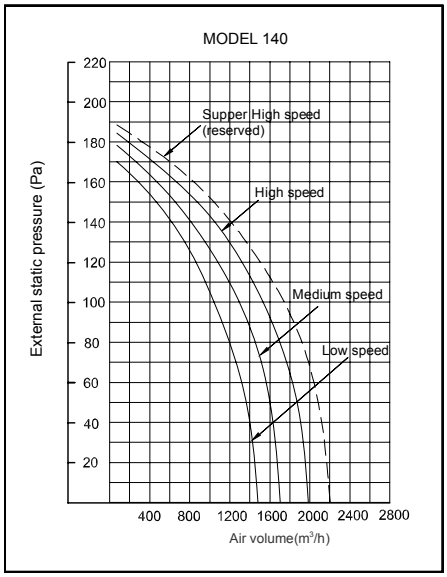


Table 6.7: MDV-D140T2/N1-BA5(B) fan performance diagram



- If the external static pressure is too great (due to long extension of duct, for example), the air flow volume may drop too low at each air outlet.
- So there's a limit air flow volume line for each speed, which is the min. airflow of this duct unit. At this flow volume, the fan achieve the max. ESP, and indoor evaporator may protect by low temperature.
- As well, there's a limit airflow volume, which is the max. Value at each speed. It request the unit to connect duct for air-inlet and outlet, to prevent damage from the high temperature of motor/evaporator.
- This is the available static pressure range which means the unit can run stably in this static pressure range, and the optimal static pressure range please refers to the Installation Manual.
- When choosing any static pressure which is out of optimal static pressure range, risk like bigger noise, lower air flow volume etc. should be considered in advanced.

7 Capacity Tables

7.1 Cooling Capacity Table

Table 7.1: High Static Pressure Duct heating capacity

Model	Indoor air temperature (°C WB/DB)													
	14/20		16/23		18/26		19/27		20/28		22/30		24/32	
	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC
MDV-D22T2/N1-DA5(A)	2.0	2.0	2.1	2.0	2.2	1.9	2.2	1.8	2.3	1.8	2.3	1.7	2.4	1.7
MDV-D28T2/N1-DA5(A)	2.5	2.5	2.7	2.5	2.8	2.4	2.8	2.3	2.9	2.3	2.9	2.2	3.0	2.1
MDV-D36T2/N1-DA5(A)	3.2	3.2	3.4	3.1	3.6	3.1	3.6	3.0	3.7	3.0	3.8	2.8	3.9	2.7
MDV-D45T2/N1-DA5(A)	4.0	3.9	4.3	3.9	4.5	3.9	4.5	3.7	4.6	3.6	4.7	3.5	4.8	3.3
MDV-D56T2/N1-DA5(A)	5.0	4.9	5.3	4.8	5.6	4.8	5.6	4.6	5.7	4.5	5.8	4.3	6.0	4.1
MDV-D71T2/N1-DA5(A)	6.3	6.1	6.7	6.1	7.0	6.0	7.1	5.8	7.2	5.7	7.4	5.4	7.6	5.2
MDV-D80T2/N1-BA5	7.1	6.7	7.6	6.7	7.9	6.7	8.0	6.5	8.1	6.3	8.3	6.0	8.5	5.8
MDV-D90T2/N1-BA5	8.0	7.5	8.5	7.5	8.9	7.5	9.0	7.3	9.1	7.1	9.4	6.8	9.6	6.5
MDV-D112T2/N1-BA5	9.9	9.3	10.6	9.4	11.1	9.4	11.2	9.1	11.3	8.8	11.6	8.4	11.9	8.1
MDV-D140T2/N1-BA5	12.4	11.6	13.2	11.7	13.8	11.6	14.0	11.3	14.2	11.0	14.5	10.5	14.9	10.1

Abbreviations:
TC: Total capacity (kW)
SC: Sensible capacity(kW)
Notes:
1. Shaded cells indicate rating condition.

7.2 Heating Capacity Table

Table 7.2: High Static Pressure Duct heating capacity

Model	Indoor air temperature (°C DB)					
	16	18	20	21	22	24
	TC	TC	TC	TC	TC	TC
MDV-D22T2/N1-DA5(A)	2.8	2.8	2.6	2.5	2.4	2.3
MDV-D28T2/N1-DA5(A)	3.4	3.4	3.2	3.1	3.0	2.8
MDV-D36T2/N1-DA5(A)	4.2	4.2	4.0	3.8	3.8	3.5
MDV-D45T2/N1-DA5(A)	5.3	5.3	5.0	4.8	4.7	4.4
MDV-D56T2/N1-DA5(A)	6.7	6.6	6.3	6.1	5.9	5.5
MDV-D71T2/N1-DA5(A)	8.5	8.4	8.0	7.8	7.5	7.0
MDV-D80T2/N1-BA5	9.5	9.5	9.0	8.7	8.5	7.8
MDV-D90T2/N1-BA5	10.6	10.5	10.0	9.7	9.4	8.8
MDV-D112T2/N1-BA5	13.3	13.1	12.5	12.1	11.8	10.9
MDV-D140T2/N1-BA5	16.4	16.3	15.5	15.0	14.6	13.5

Abbreviations:
TC: Total capacity (kW)
Notes:
1. Shaded cells indicate rating condition.

8 Electrical Characteristics

Table 7.1: Medium Static Pressure Duct electrical characteristics

Model name	Power supply						Indoor fan motors	
	Hz	Volts	Min. volts	Max. volts	MCA	MFA	Rated motor output (kW)	FLA
MDV-D22T2/N1-DA5(B)	50	220-240	198	264	0.3	15	0.03	0.2
MDV-D28T2/N1-DA5(B)	50	220-240	198	264	0.3	15	0.03	0.2
MDV-D36T2/N1-DA5(B)	50	220-240	198	264	0.3	15	0.03	0.2
MDV-D45T2/N1-DA5(B)	50	220-240	198	264	0.4	15	0.03	0.3
MDV-D56T2/N1-DA5(B)	50	220-240	198	264	0.4	15	0.03	0.3
MDV-D71T2/N1-DA5(B)	50	220-240	198	264	0.6	15	0.06	0.5
MDV-D80T2/N1-BA5(B)	50	220-240	198	264	1.0	15	0.15	0.8
MDV-D90T2/N1-BA5(B)	50	220-240	198	264	1.0	15	0.15	0.8
MDV-D112T2/N1-BA5(B)	50	220-240	198	264	1.3	15	0.15	1.0
MDV-D140T2/N1-BA5(B)	50	220-240	198	264	1.6	15	0.24	1.3

Abbreviations:
MCA: Minimum Circuit Amps
MFA: Maximum Fuse Amps
FLA: Full Load Amps

9 Sound Levels

9.1 Overall

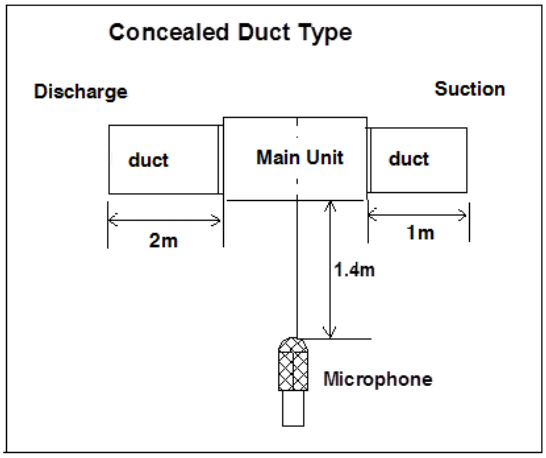
Table 8.1: High Static Pressure Duct sound pressure levels[1]

Model name	Sound pressure levels dB(A)		
	H	M	L
MDV-D22T2/N1-DA5(B)	32	24	21
MDV-D28T2/N1-DA5(B)	31	24	21
MDV-D36T2/N1-DA5(B)	35	28	24
MDV-D45T2/N1-DA5(B)	36	29	26
MDV-D56T2/N1-DA5(B)	36	29	27
MDV-D71T2/N1-DA5(B)	36	30	27
MDV-D80T2/N1-BA5(B)	45.4	39.8	37
MDV-D90T2/N1-BA5(B)	45.4	39.8	37
MDV-D112T2/N1-BA5(B)	48.0	41.9	38
MDV-D140T2/N1-BA5(B)	47.7	43.2	39

Notes:

1. Sound pressure levels are measured 1.4m below the unit in a semi-anechoic chamber. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.

Figure 8.1: sound pressure level measurement



9.2 Octave Band Levels

Figure 8.2: MDV-D22T2/N1-DA5(B) octave band levels

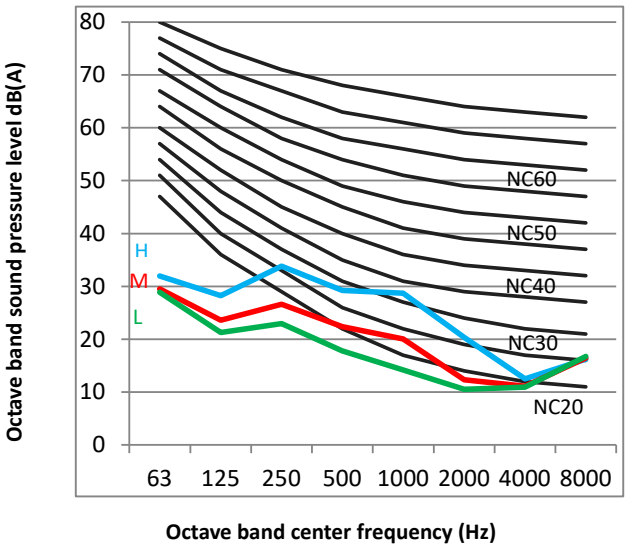


Figure 8.3: MDV-D28T2/N1-DA5(B) octave band levels

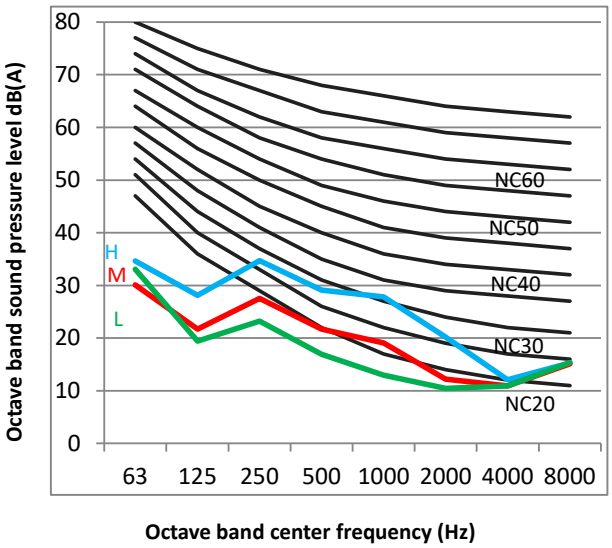


Figure 8.4: MDV-D36T2/N1-DA5(B) octave band levels

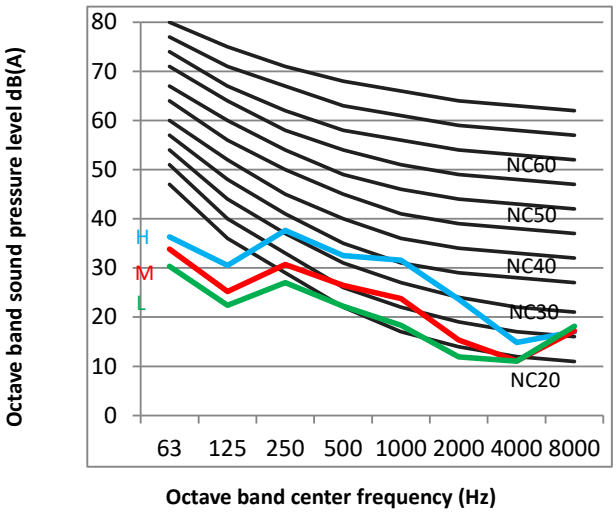


Figure 8.5: MDV-D45T2/N1-DA5(B) octave band levels

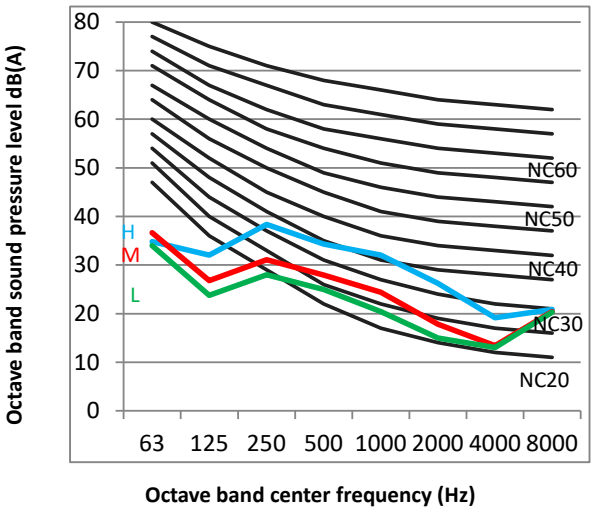


Figure 8.6: MDV-D56T2/N1-DA5(B) octave band levels

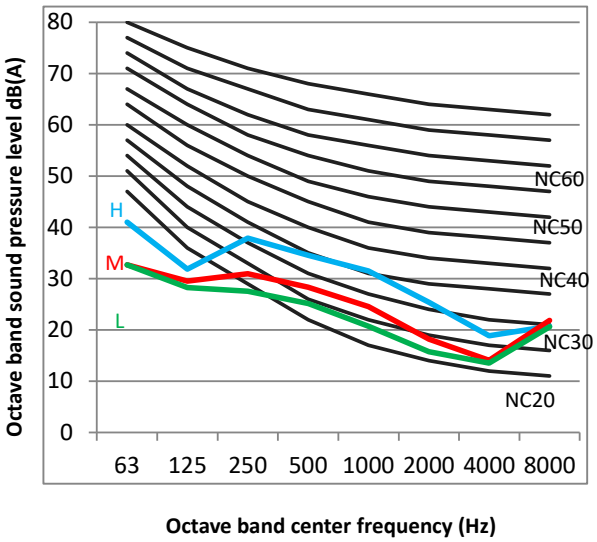


Figure 8.7: MDV-D71T2/N1-DA5(B) octave band levels

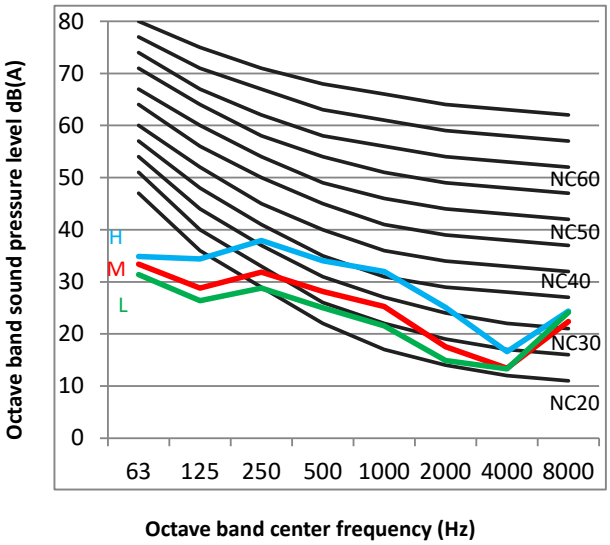


Figure 8.8: MDV-D80(90)T2/N1-DA5(B) octave band levels

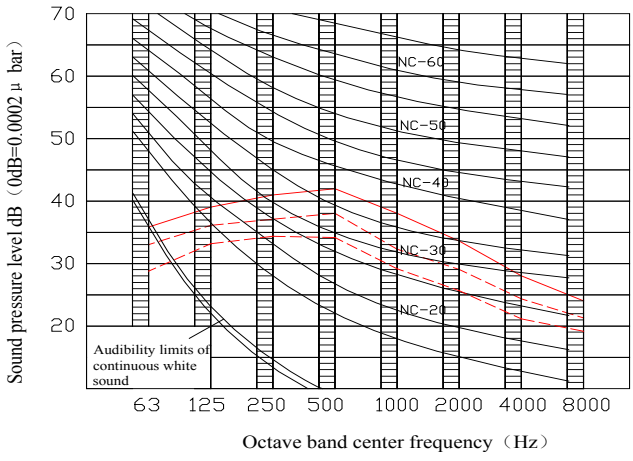


Figure 8.9: MDV-D112T2/N1-DA5(B) octave band levels

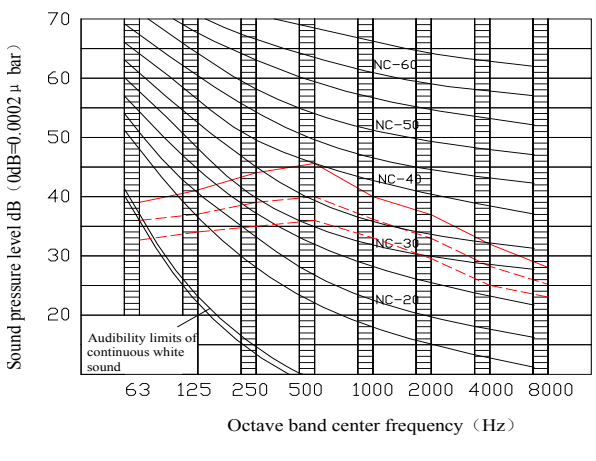
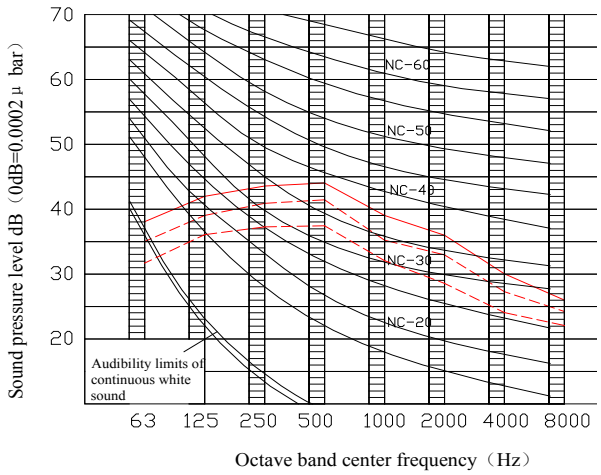


Figure 8.10: MDV-D140T2/N1-DA5(B) octave band levels



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