

# Engineering Data

## Ceiling & Floor VRF IDU

### AC 50Hz



**MDV-D36DL/N1-C(B)**

**MDV-D80DL/N1-C(B)**

**MDV-D45DL/N1-C(B)**

**MDV-D90DL/N1-C(B)**

**MDV-D56DL/N1-C(B)**

**MDV-D112DL/N1-C(B)**

**MDV-D71DL/N1-C(B)**

**MDV-D140DL/N1-C(B)**

# Ceiling & Floor

|  |           |
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## 1 Specifications

MDV-D36DL/N1-C(B) / MDV-D45DL/N1-C(B) / MDV-D56DL/N1-C(B) / MDV-D71DL/N1-C(B)

| Model                       |                      |                   | MDV-D36DL/N1-C(B)        | MDV-D45DL/N1-C(B) | MDV-D56DL/N1-C(B) | MDV-D71DL/N1-C(B) |
|-----------------------------|----------------------|-------------------|--------------------------|-------------------|-------------------|-------------------|
| Power supply                |                      |                   | 1 phase, 220-240V,50Hz   |                   |                   |                   |
| Cooling                     | Capacity             | kW                | 3.6                      | 4.5               | 5.6               | 7.1               |
|                             | Input                | W                 | 49                       | 120               | 122               | 125               |
| Heating                     | Capacity             | kW                | 4                        | 5                 | 6.3               | 8                 |
|                             | Input                | W                 | 49                       | 120               | 122               | 125               |
| Indoor fan motor            | Type                 |                   | AC                       |                   |                   |                   |
|                             | Quantity             |                   | 1                        |                   |                   |                   |
| Indoor coil                 | Number of rows       |                   | 2                        | 3                 |                   |                   |
|                             | Tube pitchxrow pitch | mm                | 25.4×22                  |                   |                   |                   |
|                             | Fin spacing          | mm                | 1.8                      |                   |                   |                   |
|                             | Fin type             |                   | Hydrophilic aluminum     |                   |                   |                   |
|                             | Diameter & type      | mm                | Φ9.53, inner-groove tube |                   |                   |                   |
|                             | Dimensions (LxHxW)   | mm                | 804×254×44               | 804×254×66        |                   |                   |
|                             | Number of circuits   |                   | 3                        |                   |                   |                   |
| Indoor air flow (H/M/L)     |                      | m <sup>3</sup> /h | 650/570/500              | 800/600/500       |                   |                   |
| Sound pressure level(H/M/L) |                      | dB(A)             | 40/38/36                 | 43/41/38          |                   |                   |
| Sound power level(H/M/L)    |                      | dB(A)             | 53/51/49                 | 56/54/51          |                   |                   |
| Indoor unit                 | Dimension (WxHxD)    | mm                | 990×203×660              |                   |                   |                   |
|                             | Packing (WxHxD)      | mm                | 1089×296×744             |                   |                   |                   |
|                             | Net/Gross weight     | kg                | 26/32                    | 28/34             |                   |                   |
| Piping connections          | Liquid pipe          | mm                | Φ6.35                    |                   | Φ9.53             |                   |
|                             | Gas pipe             | mm                | Φ12.7                    |                   | Φ15.9             |                   |
|                             | Drain pipe           | mm                | ODΦ25                    |                   |                   |                   |

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. Fan motor speed and air flow rate are from the highest speed to the lowest speed, total 3 steps for each model.
4. Sound pressure level is from highest level to lowest level, total 3 steps for each model. Sound pressure level is measured in a semi-anechoic chamber.
5. Unit body dimensions given are the largest external dimensions of the unit, including hanger attachments.

## MDV-D80DL/N1-C(B) / MDV-D90DL/N1-C(B) / MDV-D112DL/N1-C(B) / MDV-D140DL/N1-C(B)

| Model                       |                        |                   | MDV-D80DL/N1-C(B)        | MDV-D90DL/N1-C(B) | MDV-D112DL/N1-C(B) | MDV-D140DL/N1-C(B) |
|-----------------------------|------------------------|-------------------|--------------------------|-------------------|--------------------|--------------------|
| Power supply                |                        |                   | 1 phase, 220-240V,50Hz   |                   |                    |                    |
| Cooling                     | Capacity               | kW                | 8                        | 9                 | 11.2               | 14                 |
|                             | Input                  | W                 | 130                      | 130               | 182                | 182                |
| Heating                     | Capacity               | kW                | 9                        | 10                | 12.5               | 15                 |
|                             | Input                  | W                 | 130                      | 130               | 182                | 182                |
| Indoor fan motor            | Type                   |                   | AC                       |                   |                    |                    |
|                             | Quantity               |                   | 1                        |                   | 2                  |                    |
| Indoor coil                 | Number of rows         |                   | 3                        |                   |                    |                    |
|                             | Tube pitch x row pitch | mm                | 25.4×22                  |                   |                    |                    |
|                             | Fin spacing            | mm                | 1.8                      |                   |                    |                    |
|                             | Fin type               |                   | Hydrophilic aluminum     |                   |                    |                    |
|                             | Diameter & type        | mm                | Φ9.53, inner-groove tube |                   |                    |                    |
|                             | Dimensions (L x H x W) | mm                | 1094×254×66              |                   | 1360×254×66        |                    |
|                             | Number of circuits     |                   | 5                        |                   |                    |                    |
| Indoor air flow (H/M/L)     |                        | m <sup>3</sup> /h | 1200/900/700             |                   | 1980/1860/1730     |                    |
| Sound pressure level(H/M/L) |                        | dB(A)             | 45/43/40                 |                   | 47/45/42           |                    |
| Sound power level(H/M/L)    |                        | dB(A)             | 58/56/53                 |                   | 60/58/55           |                    |
| Indoor unit                 | Dimensions (W x H x D) | mm                | 1280×203×660             |                   | 1670×244×680       |                    |
|                             | Packing (W x HxD)      | mm                | 1379×296×744             |                   | 1764×329×760       |                    |
|                             | Net/Gross weight       | kg                | 34.5/41                  |                   | 54/59              |                    |
| Piping connections          | Liquid pipe            | mm                | Φ9.53                    |                   |                    |                    |
|                             | Gas pipe               | mm                | Φ15.9                    |                   |                    |                    |
|                             | Drain pipe             | mm                | ODΦ25                    |                   |                    |                    |

- Notes:
- Indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB; equivalent refrigerant piping length 7.5m with zero level difference.
  - Indoor temperature 20°C DB; outdoor temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 7.5m with zero level difference.
  - Fan motor speed and air flow rate are from the highest speed to the lowest speed, total 3 steps for each model.
  - Sound pressure level is from highest level to lowest level, total 3 steps for each model. Sound pressure level is measured in a semi-anechoic chamber.
  - Unit body dimensions given are the largest external dimensions of the unit, including hanger attachments.

## 2 Dimensions

### 2.1 Unit Dimensions

Figure 2.1: Ceiling & floor dimensions (unit: mm)

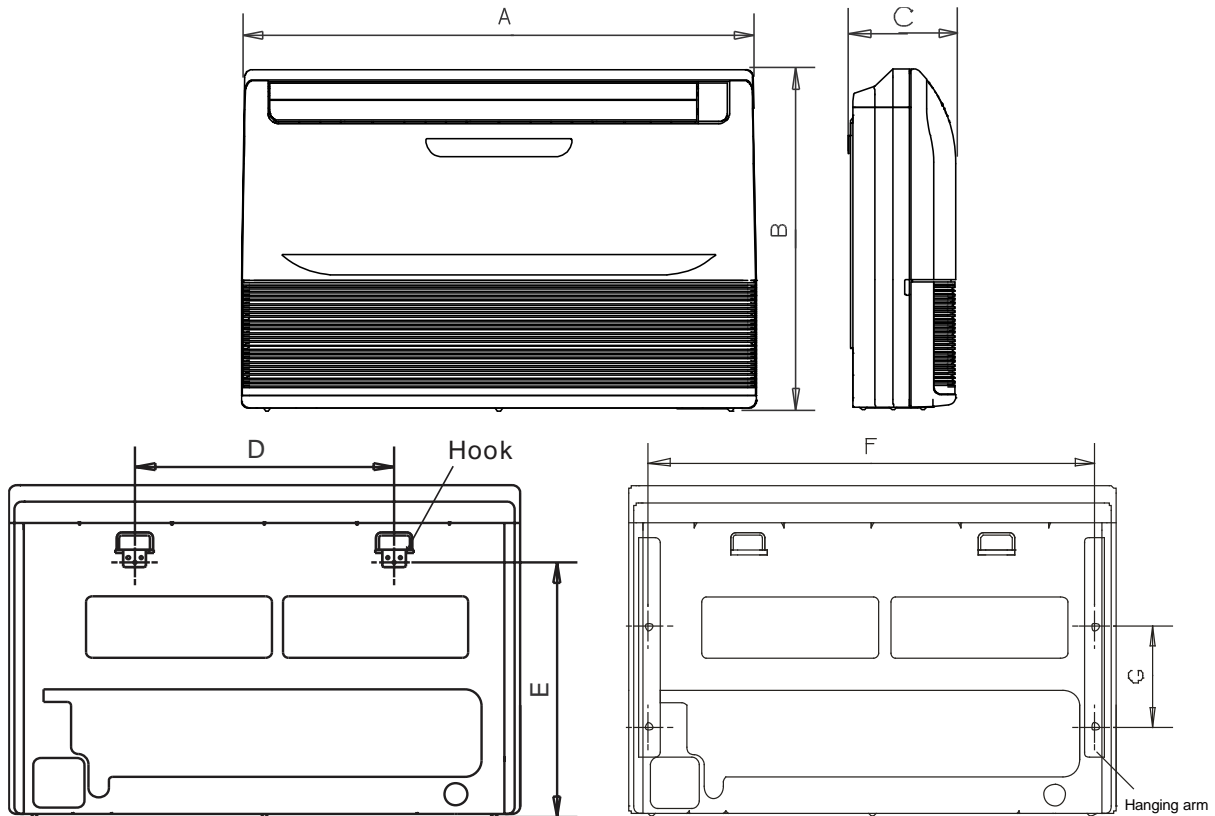


Table 2.2: Ceiling & floor piping connections

| Model  | Gas pipe (mm) | Liquid pipe (mm) |
|--|---------------|------------------|
| MDV-D36DL/N1-C(B)<br>MDV-D45DL/N1-C(B)   | Φ12.7         | Φ6.35            |
| MDV-D56DL/N1-C(B)<br>MDV-D71DL/N1-C(B)<br>MDV-D80DL/N1-C(B)<br>MDV-D90DL/N1-C(B)<br>MDV-D112DL/N1-C(B)<br>MDV-D140DL/N1-C(B) | Φ15.9         | Φ9.53            |

Table 2.1: Ceiling & floor dimensions

| Model  | Dimensions (mm) |     |     |      |     |      |     |
|--|-----------------|-----|-----|------|-----|------|-----|
|  | A               | B   | C   | D    | E   | F    | G   |
| MDV-D36DL/N1-C(B)<br>MDV-D45DL/N1-C(B)<br>MDV-D56DL/N1-C(B)<br>MDV-D71DL/N1-C(B) | 990             | 660 | 203 | 505  | 506 | 907  | 200 |
| MDV-D80DL/N1-C(B)<br>MDV-D90DL/N1-C(B)   | 1280            | 660 | 203 | 795  | 506 | 1195 | 200 |
| MDV-D112DL/N1-C(B)<br>MDV-D140DL/N1-C(B)   | 1670            | 680 | 244 | 1070 | 450 | 1542 | 200 |

## 3 Unit Placement

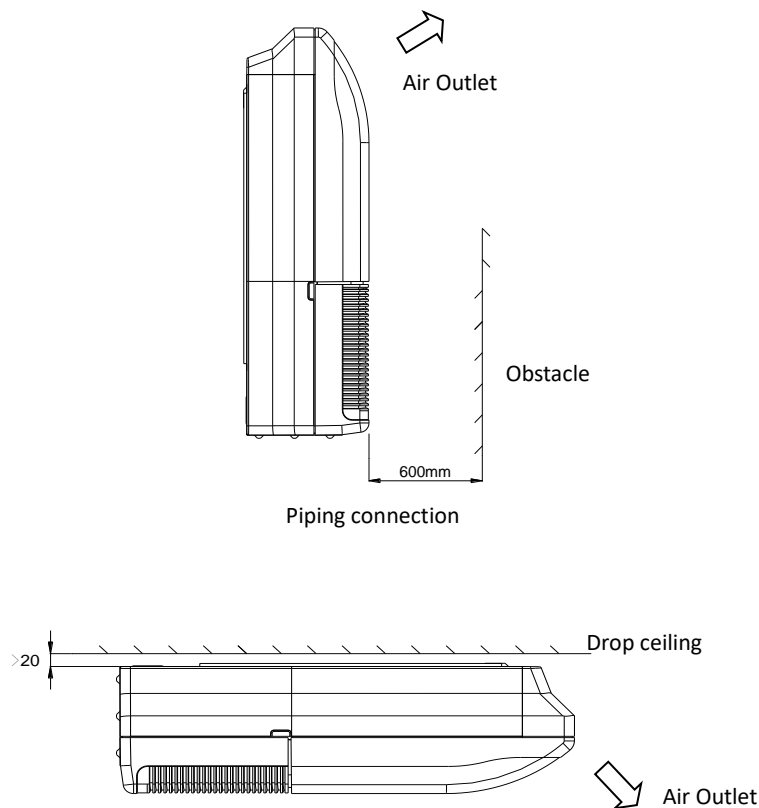
### 3.1 Placement Considerations

Unit placement should take account of the following considerations:

- Units should not be installed in the following locations:
  - Where exposure to direct radiation from a high-temperature heat source or to interference from a source of electromagnetic radiation may occur.
  - Where dust or dirt may affect heat exchangers.
  - Where exposure to oil or to corrosive or harmful gases, such as acidic or alkaline gases, may occur.
  - Where exposure to salinity may occur, such as seaside locations.
  - Where highly flammable materials are present.
  - Where exposure to oily air may occur, such as a kitchen.
  - Where exposure to very high humidity may occur, such as a laundry.
- Units should be installed in positions where:
  - The ceiling is horizontal and is able to bear the unit's weight.
  - There are no obstructions that could impede the airflow into and out of the unit.
  - The airflow out of the unit can reach throughout the room.
  - There is sufficient space for access during installation, servicing and maintenance.
  - The refrigerant piping and drain piping can be easily connected to the refrigerant piping and drain piping systems.
  - Short-circuit ventilation (where outlet air returns quickly to a unit's air inlet) will not occur.

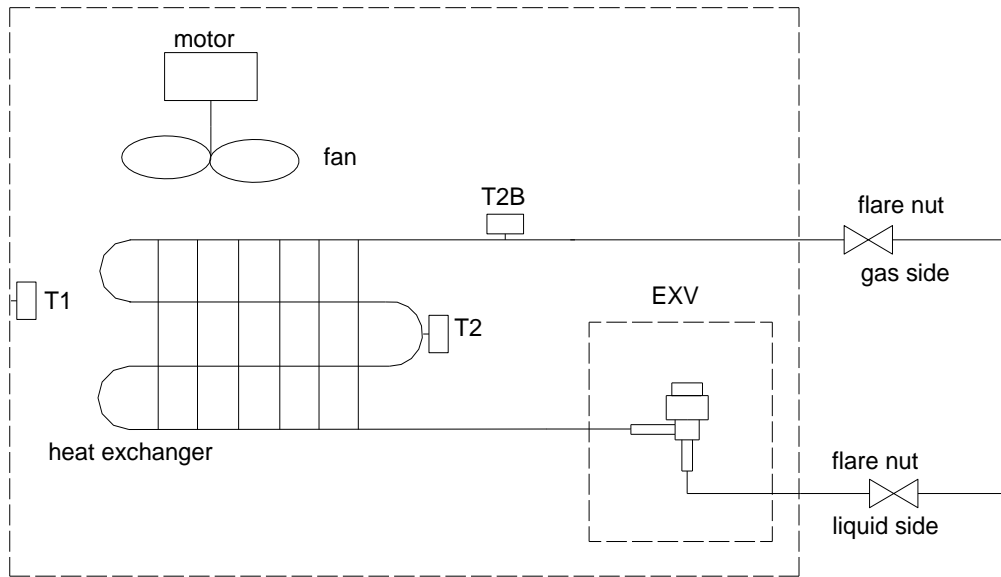
### 3.2 Space Requirements

Figure 3.1: Ceiling & floor space requirements (unit: mm)



## 4 Piping Diagram

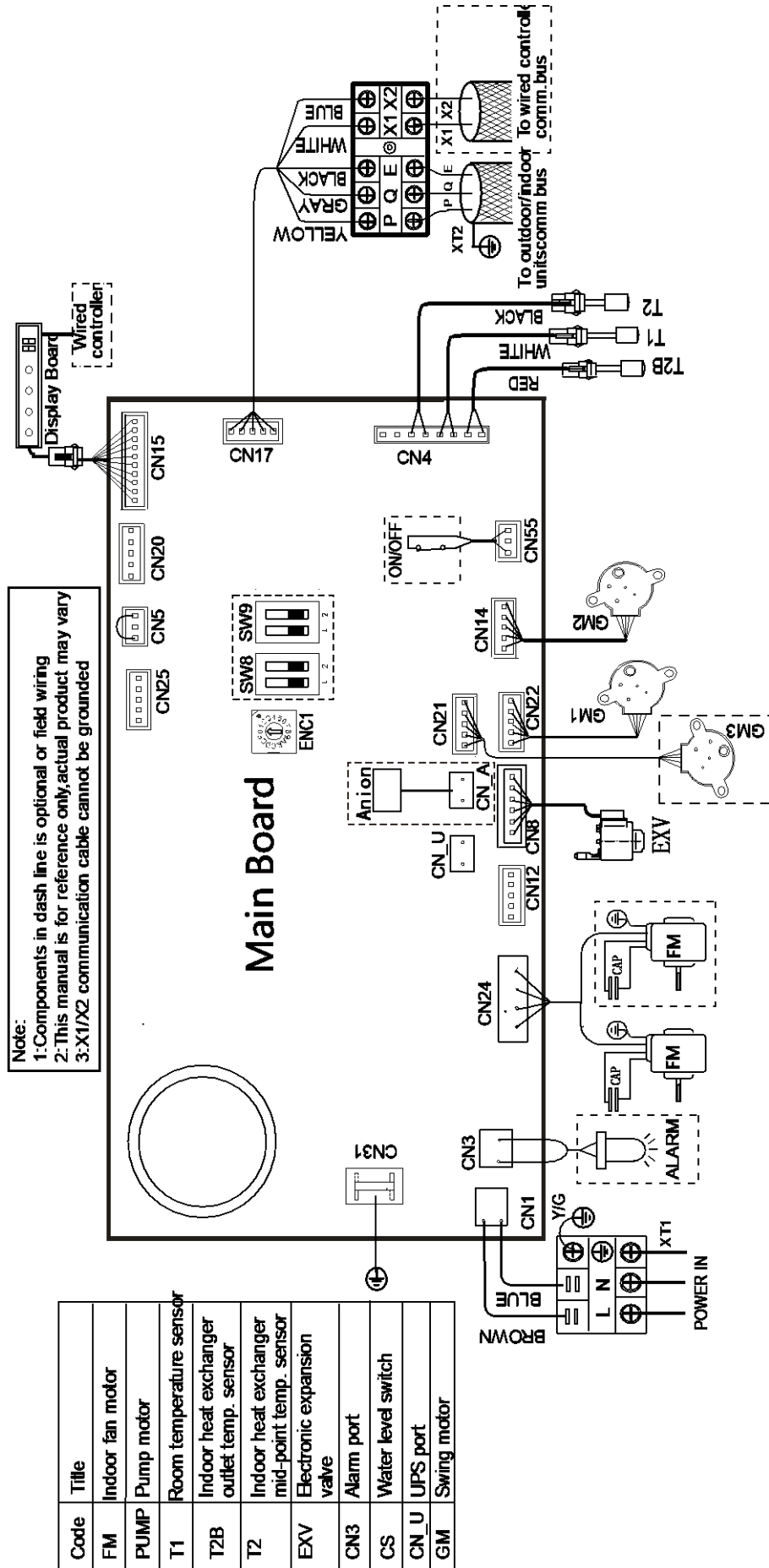
Figure 4.1: Ceiling & floor piping diagram



| 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: Ceiling & floor MDV-D36(45,56,71,80,90,112,140)DL/N1-C(B)wiring diagram





## Notes for installers and service engineers

### Caution

- All installation, servicing and maintenance must be carried out by competent and suitably qualified, certified and accredited professionals and in accordance with all applicable legislation.
- Units should be grounded in accordance with all applicable legislation. Metal and other conductive components should be insulated in accordance with all applicable legislation.
- Power supply wiring should be securely fastened at the power supply terminals – loose power supply wiring would represent a fire risk.
- After installation, servicing or maintenance, the electric control box cover should be closed. Failing to close the electric control box cover risks fire or electric shock.
- Switch ENC1 (indoor unit capacity setting) is factory-set and its setting should normally not be changed. The only circumstances in which a switch ENC1 might need to be set in the field is when replacing a main PCB. When replacing a main PCB, ensure that the capacity setting on switch ENC1 on the new PCB is consistent with the unit capacity given on the unit's nameplate.

## 6 Capacity Tables

### 6.1 Cooling Capacity Table

Table 6.1: Ceiling & floor cooling capacity tables

| Model              | Indoor air temp. (°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-D36DL/N1-C(B)  | 3.2                         | 3.1  | 3.4   | 3.1  | 3.6   | 3.1  | 3.6   | 3.0  | 3.7   | 2.9  | 3.8   | 2.8  | 3.9   | 2.7  |
| MDV-D45DL/N1-C(B)  | 4.0                         | 3.8  | 4.3   | 3.9  | 4.5   | 3.8  | 4.5   | 3.7  | 4.6   | 3.6  | 4.7   | 3.4  | 4.8   | 3.3  |
| MDV-D56DL/N1-C(B)  | 5.0                         | 4.8  | 5.3   | 4.8  | 5.6   | 4.8  | 5.6   | 4.6  | 5.7   | 4.5  | 5.8   | 4.2  | 6.0   | 4.1  |
| MDV-D71DL/N1-C(B)  | 6.3                         | 6.0  | 6.7   | 6.0  | 7.0   | 5.9  | 7.1   | 5.8  | 7.2   | 5.6  | 7.4   | 5.4  | 7.6   | 5.2  |
| MDV-D80DL/N1-C(B)  | 7.1                         | 6.8  | 7.6   | 6.8  | 7.9   | 6.7  | 8.0   | 6.5  | 8.1   | 6.3  | 8.3   | 6.0  | 8.5   | 5.8  |
| MDV-D90DL/N1-C(B)  | 8.0                         | 7.6  | 8.5   | 7.6  | 8.9   | 7.6  | 9.0   | 7.3  | 9.1   | 7.1  | 9.4   | 6.8  | 9.6   | 6.5  |
| MDV-D112DL/N1-C(B) | 9.9                         | 9.5  | 10.6  | 9.6  | 11.1  | 9.5  | 11.2  | 9.2  | 11.3  | 8.9  | 11.6  | 8.4  | 11.9  | 8.1  |
| MDV-D140DL/N1-C(B) | 12.4                        | 11.9 | 13.2  | 11.9 | 13.8  | 11.8 | 14.0  | 11.4 | 14.2  | 11.1 | 14.5  | 10.5 | 14.9  | 10.1 |

# The 2<sup>nd</sup> Generation AC Series VRF Indoor Units



## 6.2 Heating Capacity Table

Table 6.2: Ceiling & floor heating capacity tables

| Model              | Indoor air temp. (°C DB) |      |      |      |      |      |
|--------------------|--------------------------|------|------|------|------|------|
|                    | 16                       | 18   | 20   | 21   | 22   | 24   |
|                    | TC                       | TC   | TC   | TC   | TC   | TC   |
| MDV-D36DL/N1-C(B)  | 4.2                      | 4.2  | 4.0  | 3.8  | 3.8  | 3.5  |
| MDV-D45DL/N1-C(B)  | 5.3                      | 5.3  | 5.0  | 4.8  | 4.7  | 4.4  |
| MDV-D56DL/N1-C(B)  | 6.7                      | 6.6  | 6.3  | 6.1  | 5.9  | 5.5  |
| MDV-D71DL/N1-C(B)  | 8.5                      | 8.4  | 8.0  | 7.8  | 7.5  | 7.0  |
| MDV-D80DL/N1-C(B)  | 9.5                      | 9.5  | 9.0  | 8.7  | 8.5  | 7.8  |
| MDV-D90DL/N1-C(B)  | 10.6                     | 10.5 | 10.0 | 9.7  | 9.4  | 8.8  |
| MDV-D112DL/N1-C(B) | 13.3                     | 13.1 | 12.5 | 12.1 | 11.8 | 10.9 |
| MDV-D140DL/N1-C(B) | 15.9                     | 15.7 | 15.0 | 14.6 | 14.1 | 13.1 |

## 7 Electrical Characteristics

Table 7.1: Ceiling & floor electrical characteristics

| Model              | Power supply |         |            |            |      |     | Indoor fan motors       |           |
|--------------------|--------------|---------|------------|------------|------|-----|-------------------------|-----------|
|                    | Hz           | Volts   | Min. volts | Max. volts | MCA  | MFA | Rated motor output (kW) | FLA       |
| MDV-D36DL/N1-C(B)  | 50           | 220-240 | 198        | 264        | 0.45 | 15  | 0.10                    | 0.35      |
| MDV-D45DL/N1-C(B)  | 50           | 220-240 | 198        | 264        | 1.20 | 15  | 0.10                    | 0.93      |
| MDV-D56DL/N1-C(B)  | 50           | 220-240 | 198        | 264        | 1.20 | 15  | 0.10                    | 0.95      |
| MDV-D71DL/N1-C(B)  | 50           | 220-240 | 198        | 264        | 1.20 | 15  | 0.10                    | 0.95      |
| MDV-D80DL/N1-C(B)  | 50           | 220-240 | 198        | 264        | 1.30 | 15  | 0.10                    | 1.10      |
| MDV-D90DL/N1-C(B)  | 50           | 220-240 | 198        | 264        | 1.30 | 15  | 0.10                    | 1.10      |
| MDV-D112DL/N1-C(B) | 50           | 220-240 | 198        | 264        | 1.70 | 15  | 0.10+0.10               | 0.65+0.65 |
| MDV-D140DL/N1-C(B) | 50           | 220-240 | 198        | 264        | 1.70 | 15  | 0.10+0.10               | 0.65+0.65 |

Abbreviations:

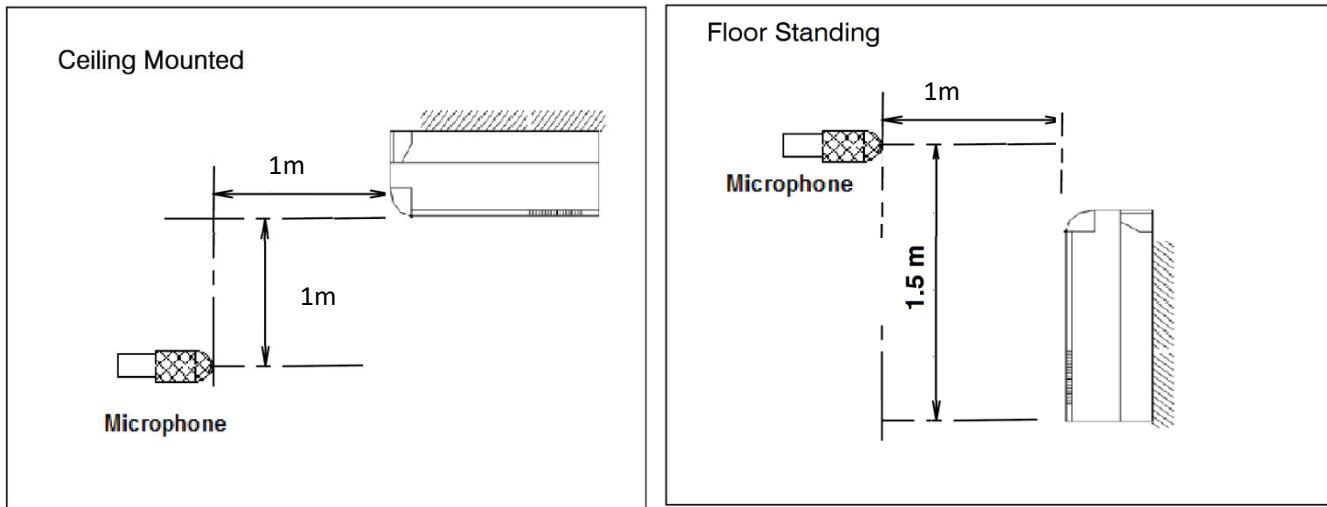
MCA: Minimum Circuit Amps

MFA: Maximum Fuse Amps

FLA: Full Load Amps

## 8 Sound Levels

### 8.1 Test Condition



Note:

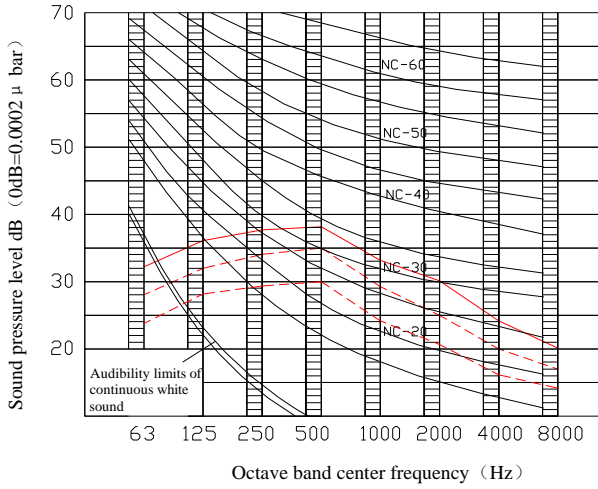
- 1, during actual operation, these values are normally somewhat higher as a result of ambient conditions.
- 2, Anechoic chamber conversion value, measured at a point 1m in front of the unit at a height of 1.5m

### 8.2 Test Data (Sound Pressure Levels)

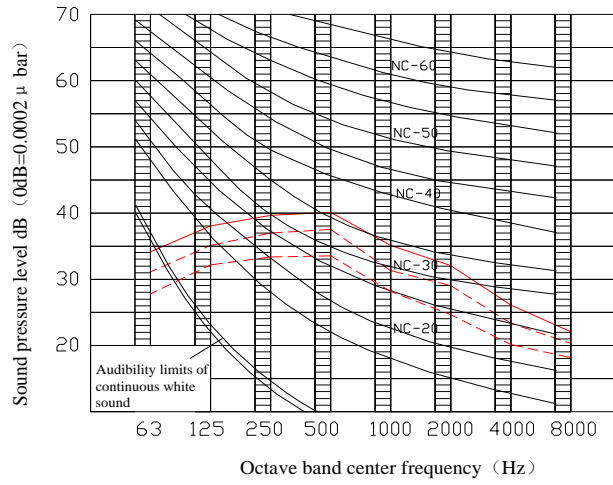
| Model               | Sound level under three speeds of fan (dB(A)) |    |    |
|---------------------|---|----|----|
|                     | H   | M  | L  |
| MDV-D36DL/N1-C (B)  | 40  | 38 | 36 |
| MDV-D45DL/N1-C (B)  | 43  | 41 | 38 |
| MDV-D56DL/N1-C (B)  | 43  | 41 | 38 |
| MDV-D71DL/N1-C (B)  | 43  | 41 | 38 |
| MDV-D80DL/N1-C (B)  | 45  | 43 | 40 |
| MDV-D90DL/N1-C (B)  | 45  | 43 | 40 |
| MDV-D112DL/N1-C (B) | 47  | 45 | 42 |
| MDV-D140DL/N1-C (B) | 47  | 45 | 42 |

## 8.3 Octave Band Levels

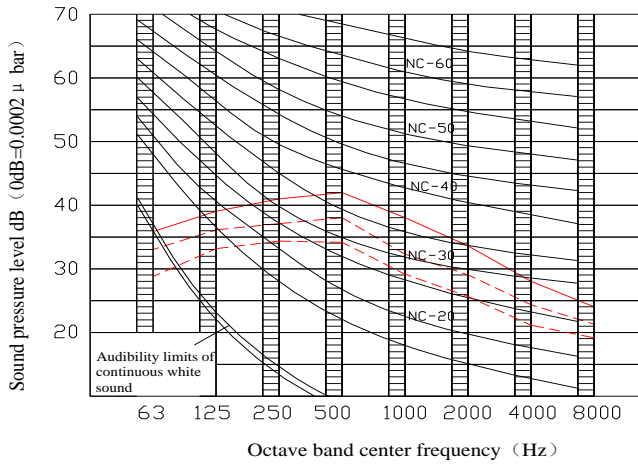
**MDV-D36DL/N1-C (B)**



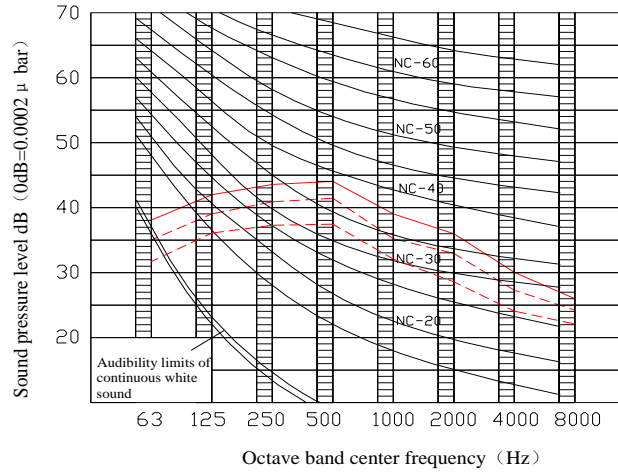
**MDV-D45(56) (71) DL/N1-C (B)**



**MDV-D80(90) DL/N1-C (B)**



**MDV-D112(140) DL/N1-C (B)**



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