45VMM---3
Sizes 7K-48K
Medium Static Ducted for Variable Refrigerant Flow (VRF)

Engineering Databook

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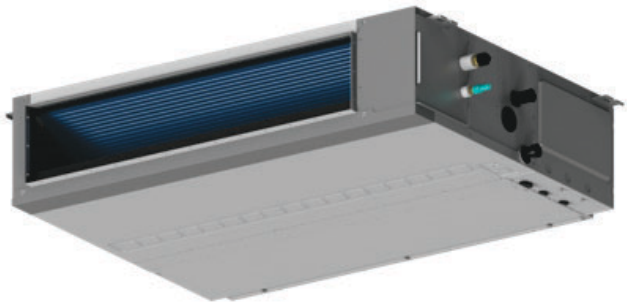

Fig. 1 —Unit Image

NOTE: Carrier is committed to continuously improving its products to ensure the highest quality and reliability standards, and to meet local regulations and market requirements. All features and specifications are subject to change without prior notice.

SPECIFICATIONS

Table 1 — Specifications (Sizes 7K-12K)

Model			45VMM07	45VMM09	45VMM12
Power supply			1-phase, 208/230V, 60Hz		
Cooling[1]	Capacity	kW	2.1	2.6	3.5
		kBtu/h	7	9	12
	Power input	W	58	89	86
Heating[2]	Capacity	kW	2.3	2.9	4
		kBtu/h	8	10	13.5
	Power input	W	58	89	86
Fan motor type			DC		
Indoor coil	Number of rows[3]		2	3	3
	Tube pitch[3]	In.	11/16×7/16		
	Fin spacing and type	fins/in.	19 Hydrophilic aluminum		
	Tube OD and type	In.	Φ3/16 Inner-groove		
	Dimensions (L×H×W)	In.	15-3/4×13/16×14-3/16	15-3/4×1-1/4×14-3/16	23-5/8×1-1/4×14-3/16
	Number of circuits		5	5	10
Air flow rate[4]		cfm	291/276/261/246/231/216/201	372/350/329/307/285/264/242	502/475/447/420/393/365/338
External static pressure[5]		in.wg	0.2(0-0.64)		
Sound pressure level[6]		dB(A)	31.3/30.2/29.3/28.5/28.3/27.8/26.9	36.1/35.2/33.7/32.5/31/29.4/29	36.1/34.1/33.9/32.1/31/30.1/29.4
Unit	Net dimensions[7] (W×H×D)	In.	27×9-5/8×31-7/8		34-13/16×9-5/8×31-7/8
	Packed dimensions (W×H×D)	In.	33-7/8×12-13/16×38-3/4		41-3/4×12-13/16×38-3/4
	Net/Gross weight	Lbs	54/69.4		75/93.9
Refrigerant type			R454B		
Throttle type			Electronic expansion valve		
Design pressure (H/L)		MPa	4.4/2.6		
Pipe connections	Liquid/Gas pipe	In.	Φ1/4/Φ1/2		Φ3/8/Φ5/8
	Drain pipe	In.	OD Φ1		

NOTES:

1. Indoor temperature 80 ℉ DB, 67 ℉ WB; outdoor temperature 95 ℉ DB, 75 ℉ WB; equivalent refrigerant piping length 295-1/4in. with zero level difference.
2. Indoor temperature 70℉DB, 60℉WB; outdoor temperature 47℉DB, 43℉WB; equivalent refrigerant piping length 295-1/4in. with zero level difference.
3. Arc Duct adopts a brand-new special-shaped heat exchanger with different number of rows and different Tube pitch at different positions.
4. Fan motor speed and air flow rate are from the highest speed to the lowest speed, total 7 rates for each model.
5. Stable operation external static pressure range. (Note: setting external static pressure outside the unit's optimal static pressure range may lead to higher noise levels and lower airflow rate. For the optimal external static pressure range refer to the unit's installation manual.)
6. Sound pressure level is from highest level to lowest level, total 7 levels for each model. Sound pressure level is measured 59-1/16in. below the unit in an anechoic chamber.
7. The dimension is only the body size, excluding the size of the installation lug, connecting copper pipe, etc. For detailed dimensions, please refer to the installation manual.

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Table 2 — Specifications (Sizes 15K-24K)

Model			45VMM15	45VMM18	45VMM24
Power supply			1-phase, 208/230V, 60Hz		
Cooling[1]	Capacity	kW	4.4	5.6	7
		kBtu/h	15	19	24
	Power input	W	92	101	114
Heating[2]	Capacity	kW	5	6.2	7.9
		kBtu/h	17	21	27
	Power input	W	92	101	114
Fan motor type			DC		
Indoor coil	Number of rows[3]		3	3	3
	Tube pitch[3]	In.	11/16×7/16		
	Fin spacing and type	fins/in.	19 Hydrophilic aluminum		
	Tube OD and type	In.	Φ3/16 Inner-groove		
	Dimensions (L×H×W)	In.	33-7/16×1-1/4×14-3/16	33-7/16×1-1/4×14-3/16	33-7/16×1-1/4×14-3/16
	Number of circuits		10	10	10
Air flow rate[4]		cfm	525/499/472/446/420/393/367	624/592/560/528/496/464/432	667/634/600/567/534/500/467
External static pressure[5]		in.wg	0.2(0-0.64)		
Sound pressure level[6]		dB(A)	37.1/36.1/35.1/34/32.8/31.8/30.7	40.5/39.7/38.6/37.3/36/34.9/33.7	41/40.1/39.3/38.5/37.8/37.1/36.3
Unit	Net dimensions[7] (W×H×D)	In.	44-11/16×9-5/8×31-7/8		
	Packed dimensions (W×H×D)	In.	51-9/16×12-13/16×38-3/4		
	Net/Gross weight	Lbs	94.8/114.2		
Refrigerant type			R454B		
Throttle type			Electronic expansion valve		
Design pressure (H/L)		MPa	4.4/2.6		
Pipe connections	Liquid/Gas pipe	In.	Φ3/8/Φ5/8		
	Drain pipe	In.	OD Φ1		

NOTES:

1. Indoor temperature 80 ℉ DB, 67 ℉ WB; outdoor temperature 95 ℉ DB, 75 ℉ WB; equivalent refrigerant piping length 295-1/4in. with zero level difference.
2. Indoor temperature 70℉ DB, 60℉ WB; outdoor temperature 47℉ DB, 43℉ WB; equivalent refrigerant piping length 295-1/4in. with zero level difference.
3. Arc Duct adopts a brand-new special-shaped heat exchanger with different number of rows and different Tube pitch at different positions.
4. Fan motor speed and air flow rate are from the highest speed to the lowest speed, total 7 rates for each model.
5. Stable operation external static pressure range. (Note: setting external static pressure outside the unit's optimal static pressure range may lead to higher noise levels and lower airflow rate. For the optimal external static pressure range refer to the unit's installation manual.)
6. Sound pressure level is from highest level to lowest level, total 7 levels for each model. Sound pressure level is measured 59-1/16in. below the unit in an anechoic chamber.
7. The dimension is only the body size, excluding the size of the installation lug, connecting copper pipe, etc. For detailed dimensions, please refer to the installation manual.

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Table 3 — Specifications (Sizes 30K-48K)

Model			45VMM30	45VMM36	45VMM48
Power supply			1-phase, 208/230V, 60Hz		
Cooling[1]	Capacity	kW	8.8	11.1	14.1
		kBtu/h	30	38	48
	Power input	W	231	285	326
Heating[2]	Capacity	kW	10	12.3	15.8
		kBtu/h	34	42	54
	Power input	W	231	285	326
Fan motor type			DC		
Indoor coil	Number of rows[3]		3	3	3
	Tube pitch[3]	In.	11/16×7/16		
	Fin spacing and type	fins/in.	19 Hydrophilic aluminum		
	Tube OD and type	In.	Φ3/16 Inner-groove		
	Dimensions (L×H×W)	In.	47-1/4×1-1/4×14-3/16		47-1/4×1-1/4×14-3/16
	Number of circuits		10	10	10
Air flow rate[4]		cfm	1063/1008/953/898/843/788/733	1195/1130/1065/1000/934/869/804	1280/1216/1151/1087/1023/958/894
External static pressure[5]		in.wg	0.32(0-0.64)		
Sound pressure level[6]		dB(A)	45.1/43.6/42.2/40.8/39.4/37.8/36.6	45.9/45/43.6/41.9/40.5/38.8/37.1	49.7/48.5/47/45.3/43.8/42/40.2
Unit	Net dimensions[7] (W×H×D)	In.	58-7/16×9-5/8×31-7/8		
	Packed dimensions (W×H×D)	In.	65-3/8×12-13/16×38-3/4		
	Net/Gross weight	Lbs	116.8/142.4		
Refrigerant type			R454B		
Throttle type			Electronic expansion valve		
Design pressure (H/L)		MPa	4.4/2.6		
Pipe connections	Liquid/Gas pipe	In.	Φ3/8/Φ5/8		
	Drain pipe	In.	OD Φ1		

NOTES:

1. Indoor temperature 80 ℉ DB, 67 ℉ WB; outdoor temperature 95 ℉ DB, 75 ℉ WB; equivalent refrigerant piping length 295-1/4in. with zero level difference.
2. Indoor temperature 70℉ DB, 60℉ WB; outdoor temperature 47℉ DB, 43℉ WB; equivalent refrigerant piping length 295-1/4in. with zero level difference.
3. Arc Duct adopts a brand-new special-shaped heat exchanger with different number of rows and different Tube pitch at different positions.
4. Fan motor speed and air flow rate are from the highest speed to the lowest speed, total 7 rates for each model.
5. Stable operation external static pressure range. (Note: setting external static pressure outside the unit's optimal static pressure range may lead to higher noise levels and lower airflow rate. For the optimal external static pressure range refer to the unit's installation manual.)
6. Sound pressure level is from highest level to lowest level, total 7 levels for each model. Sound pressure level is measured 59-1/16in. below the unit in an anechoic chamber.
7. The dimension is only the body size, excluding the size of the installation lug, connecting copper pipe, etc. For detailed dimensions, please refer to the installation manual.

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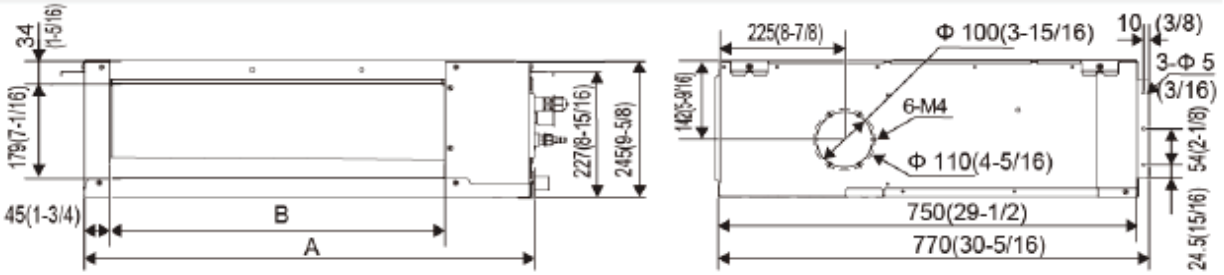
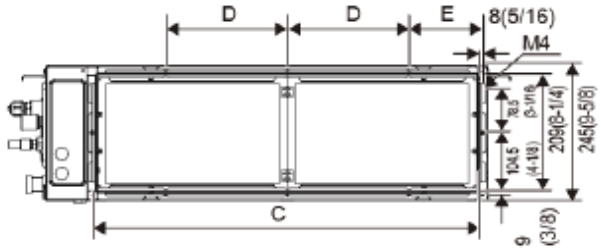
DIMENSIONS

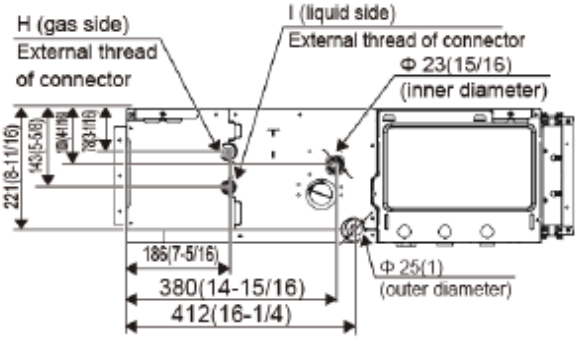
External dimension, air outlet size, and size of fresh air outlet:



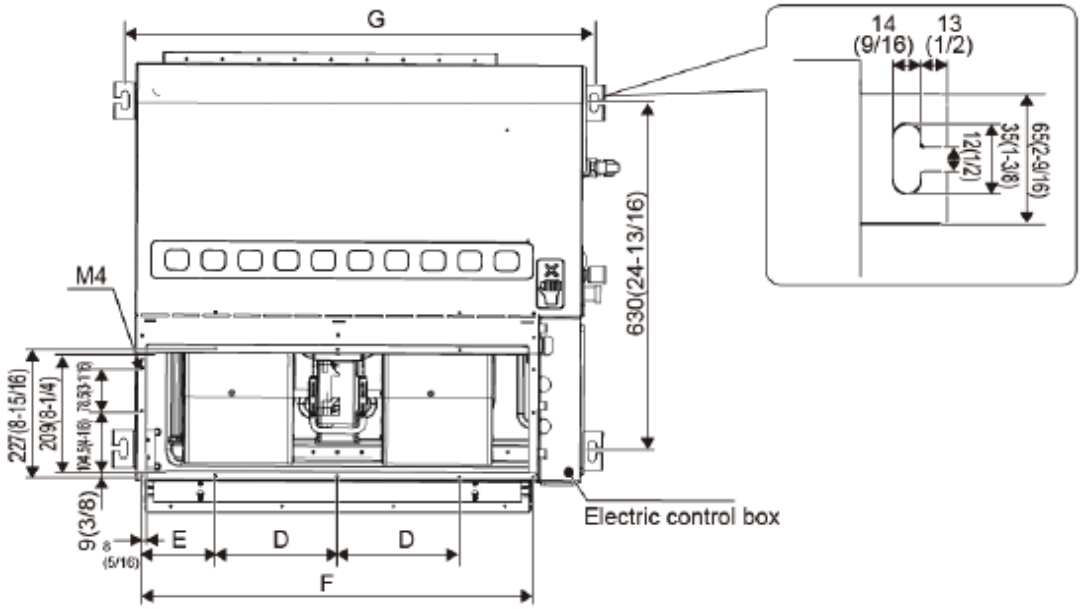
Size of return air inlet (back return air mode):



Dimension of pipe and water pipe:



Size of return air inlet (bottom return air mode), and the distance between the lugs:



Capacity (kBtu/h)	A	B	C	D	E	F	G	H	I
kBtu/h ≤ 9	600(23-5/8)	400(15-3/4)	490(19-5/16)	87.5(3-7/16)	165(6-1/2)	506(19-15/16)	645(25-3/8)	3/4-16 UNF	7/16-20 UNF
9 < kBtu/h ≤ 12	800(31-1/2)	600(23-5/8)	690(27-3/16)	220(8-11/16)	134(5-1/4)	706(27-13/16)	845(33-1/4)	7/8-14 UNF	5/8-18 UNF
12 < kBtu/h ≤ 24	1 050(41-5/16)	850(33-7/16)	940(37)	220(8-11/16)	146(5-3/4)	956(37-5/8)	1 095(43-1/8)	7/8-14 UNF	5/8-18 UNF
24 < kBtu/h ≤ 48	1 400(55-1/8)	1 200(47-1/4)	1 290(50-13/16)	220(8-11/16)	213(8-3/8)	1 306(51-7/16)	1 445(56-7/8)	7/8-14 UNF	5/8-18 UNF

Fig. 2 —Dimensions - All Sizes

UNIT PLACEMENT

PLACEMENT CONSIDERATION

Unit placement should take account of the following considerations:

Units should not be installed in the following locations:

- A place filled with mineral oil, fumes or mist, like a kitchen.
- A place where there are corrosive gases, such as acid or alkaline gases.
- A place exposed to combustible gases and using volatile combustible gases such as diluent or gasoline.
- A place where there is equipment emitting electromagnetic radiation.
- A place where there is a high salt content in the air like a coast.
- Do not use the air conditioner in an environment where an explosion may occur.
- Places like in vehicles or cabin rooms.
- Factories with major voltage fluctuations in the power supplies.
- Other special environmental conditions.

Units should be installed in positions where:

- Ensure that the airflow in and out of the IDU is reasonably organized to form an air circulation in the room.
- Ensure IDU maintenance space.
- The nearer the drainage pipe and copper pipe are to the ODU, the lower the pipe cost is.
- Prevent the air conditioner from blowing directly to the human body.
- The closer the wiring to the power cabinet, the lower the wiring cost is.
- Keep the air-conditioning return air away from the setting sun of the room.
- Be careful not to interfere with the light tank, fire pipe, gas pipe and other facilities.
- The IDU should not be lifted in the places like load-bearing beam and columns that affect the structural safety of the house.
- Wired controller and IDU should be in same installation space; otherwise, the sampling point setting of wired controller will need to be changed.

SPACE REQUIREMENTS

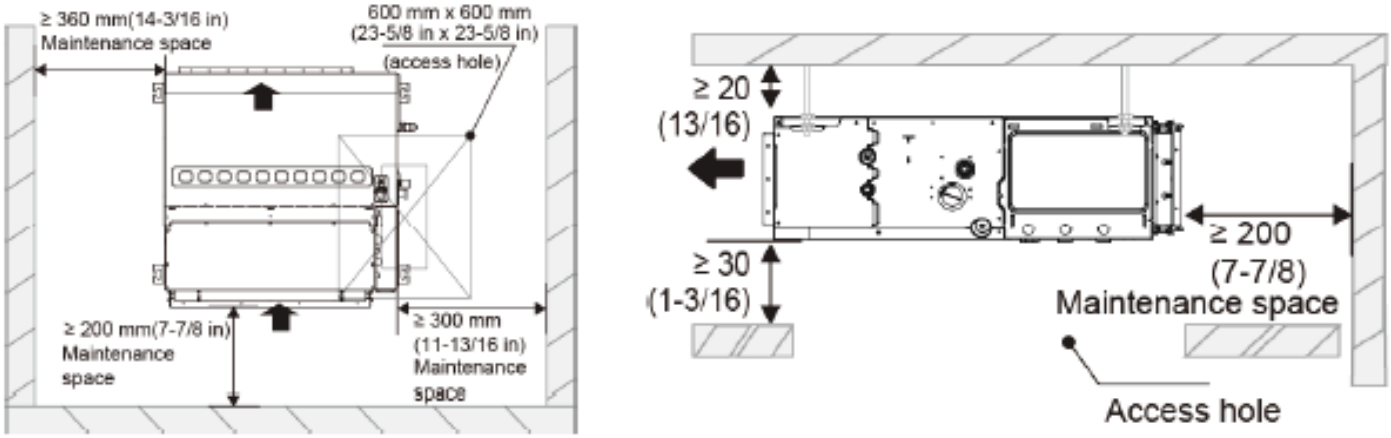


Fig. 3 —Medium Static Space Requirements (unit: in.)

NOTE: The centerline of the maintenance hole should be in the same position as the centerline of the indoor unit.

PIPING DIAGRAM

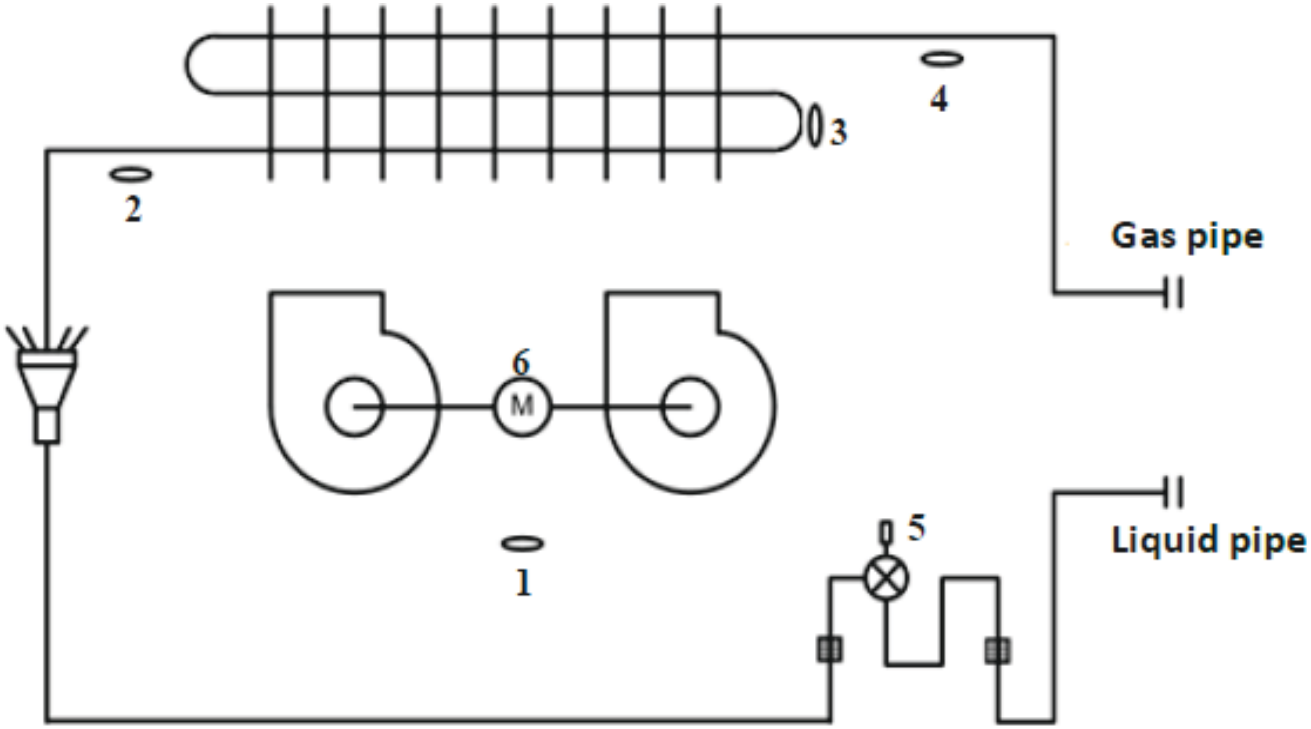


Fig. 4 —Low Static Pressure Duct Piping Diagram

Table 4 — Legend

Legend	Code	Description
1	T1	Inlet Air Temp. Sensor
2	T2A	Liquid Pipe Temp. Sensor
3	T2	Middle Pipe Temp. Sensor
4	T2B	Gas Pipe Temp. Sensor
5	EEV	Electronic Expansion Valve
6	FAN	DC Fan Motor

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WIRING DIAGRAM

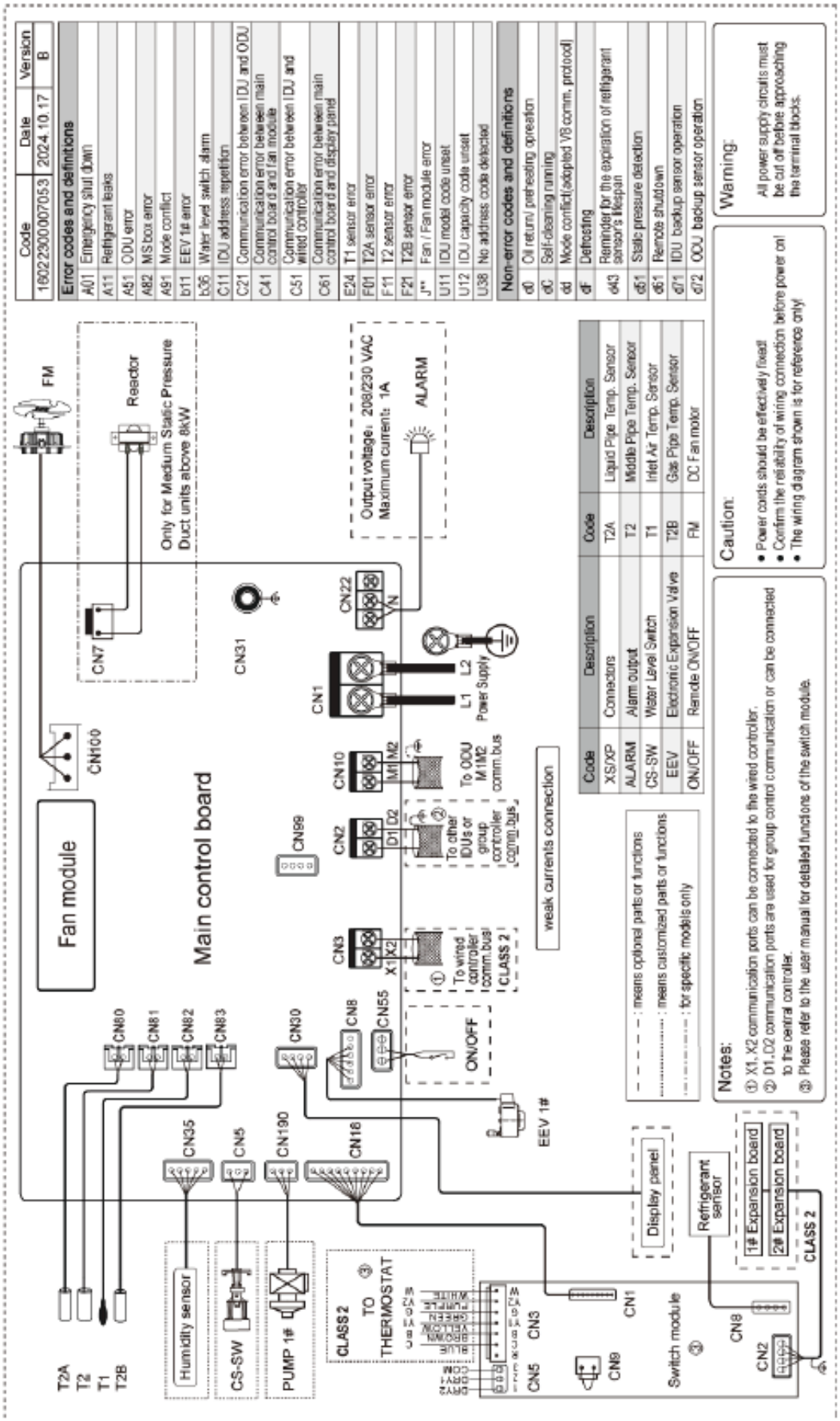

Fig. 5 —Wiring Diagram

⚠ 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.

The dotted lines indicate the field wiring or optional function.

D1D2 communication ports are used for group control communication. When connecting the group controller, the D1D2 port of the indoor units that are to be group controlled must be connected in daisy chain, and the group controller must be connected to the X1X2 port of one of the indoor units in the group control, and set to group control mode. In addition, D1D2 communication ports can also be connected to the central controller.

CAPACITY TABLES

Table 5 — Cooling Capacity Table

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
45VMM07	6.5	6.1	6.8	6.1	7.2	6.1	7.0	6.1	7.5	6.1	7.5	5.5	7.8	5.5
45VMM09	7.8	7.5	8.5	7.5	8.9	7.8	9.0	7.5	9.2	7.5	9.2	6.8	9.6	6.5
45VMM12	10.6	9.9	11.3	10.2	11.9	10.2	12.0	9.9	12.3	9.9	12.6	9.2	13.0	8.9
45VMM15	13.3	12.3	14.3	12.6	15.0	13.0	15.0	12.3	15.4	12.3	15.7	11.6	16.0	10.9
45VMM15	17.1	15.7	18.1	16.0	19.1	16.4	19.0	15.7	19.4	15.4	19.8	14.3	20.5	14.0
45VMM24	21.2	19.4	22.5	19.8	23.5	20.1	24.0	19.4	24.2	19.1	24.9	18.1	25.6	17.4
45VMM30	26.6	24.6	28.3	24.9	29.7	25.2	30.0	24.6	30.4	23.9	31.4	22.9	32.1	22.2
45VMM36	33.8	31.0	35.8	31.7	37.5	32.1	38.0	31.0	38.2	30.0	39.2	28.7	40.3	27.6
45VMM48	42.7	39.2	45.4	39.9	47.4	40.6	48.0	39.6	48.8	38.2	49.8	36.2	51.2	35.1

ABBREVIATIONS:
TC: Total capacity (kBtu/h)
SC: Sensible capacity (kBtu/h)
NOTE: Shaded cells indicate rating condition.

Table 6 — Heating Capacity Table

Model	Indoor air temperature (°C DB)					
	16	18	20	21	22	24
	SHC	SHC	SHC	SHC	SHC	SHC
45VMM07	8.2	8.2	8.0	7.5	7.4	6.9
45VMM09	10.5	10.4	10.0	9.5	9.3	8.7
45VMM12	14.5	14.3	13.5	13.2	12.8	11.9
45VMM15	18.1	17.9	17.0	16.5	16.0	14.9
45VMM15	22.4	22.2	21.0	20.5	19.9	18.5
45VMM24	28.6	28.3	27.0	26.1	25.3	23.6
45VMM30	36.2	35.8	34.0	33.1	32.1	29.7
45VMM36	44.5	44.1	42.0	40.7	39.4	36.5
45VMM48	57.1	56.6	54.0	52.3	50.7	46.9

ABBREVIATIONS:
SHC: Sensible Heat Capacity (kBtu/h)
NOTE: Shaded cells indicate rating condition.

ELECTRICAL CHARACTERISTICS

Table 7 — Electrical Characteristics

Model name	Power supply				Indoor Fan Motor
	Hz	Volts	MCA	MFA	Rated power output (W)
45VMM07	60	208/230	2.20	15	50
45VMM09	60	208/230	2.24	15	50
45VMM12	60	208/230	2.38	15	60
45VMM15	60	208/230	2.72	15	240
45VMM15	60	208/230	2.72	15	240
45VMM24	60	208/230	2.72	15	240
45VMM30	60	208/230	3.27	15	240
45VMM36	60	208/230	3.27	15	240
45VMM48	60	208/230	3.27	15	240

SOUND LEVELS

OVERALL

Table 8 — Sound Pressure Levels

Model name	Sound pressure levels dB						
	SSH	SH	H	M	L	SL	SSL
45VMM07	31.3	30.2	29.3	28.5	28.3	27.8	26.9
45VMM09	36.1	35.2	33.7	32.5	31	29.4	29
45VMM12	36.1	34.1	33.9	32.1	31	30.1	29.4
45VMM15	37.1	36.1	35.1	34	32.8	31.8	30.7
45VMM15	40.5	39.7	38.6	37.3	36	34.9	33.7
45VMM24	41	40.1	39.3	38.5	37.8	37.1	36.3
45VMM30	45.1	43.6	42.2	40.8	39.4	37.8	36.6
45VMM36	45.9	45	43.6	41.9	40.5	38.8	37.1
45VMM48	49.7	48.5	47	45.3	43.8	42	40.2

NOTE: The sound pressure levels are measured 59-1/16in. (1.5m) below the unit in a semi-anechoic chamber. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.

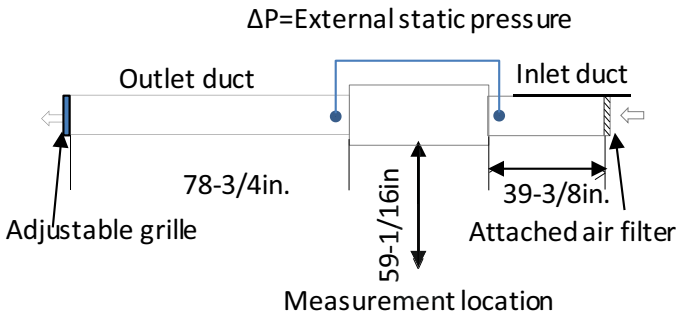

Fig. 6 —Sound Pressure Level Measurement

Connected to a top-discharge outdoor unit and measured in anechoic room. Adjusting the outlet grille to make the ΔP is equal to the rated static pressure, the data was recorded at 5ft (1.5m) below the unit.

Fan Performance

How to switch between Constant Airflow mode and Constant Speed mode

- Parameters can be set in the power-on or power-off state.
- Hold "☰" and " >" for 3 seconds to enter the parameter setting interface.
- After entering the parameter setting interface, Press " ∨" and " ∧" to switch the parameter. Set parameters according to the Table of Parameter Settings. Press " ○" to enter the parameter setting interface.

Then press "<" and " > " to change parameter value and press " ○ " tosave changes.

- Press the " back " button to return to the previous page until exiting the parameter setting or exiting the parameter setting after 60 s without any operation.
- When it is in the parameter settings page, the wired controller does not respond to any remote control signal.

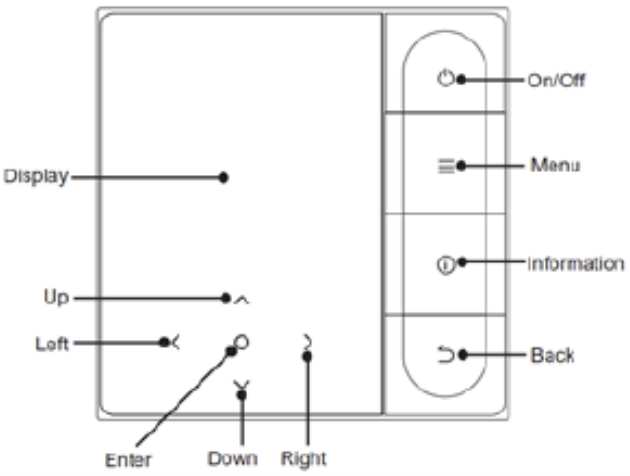

Table 9 — Low Static Pressure Duct Mode Setting

IDU set item	Parameter name	Parameter range	Default value	Remarks
Fan speed setting	Air flow at fan speed 7	00/01	01	00: constant speed; 01: constant air flow

Constant Airflow Mode

Fan Performance Diagrams

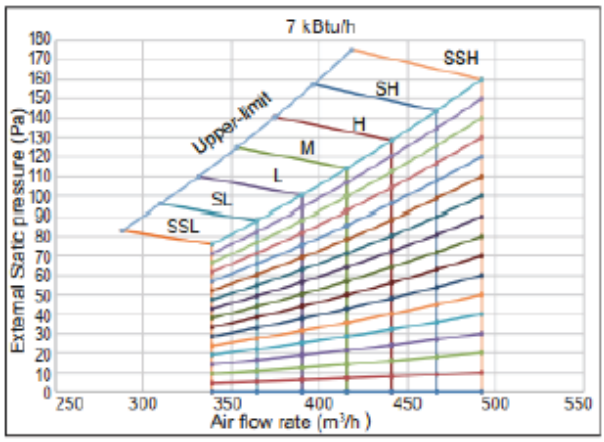

Fig. 7 —45VMM07

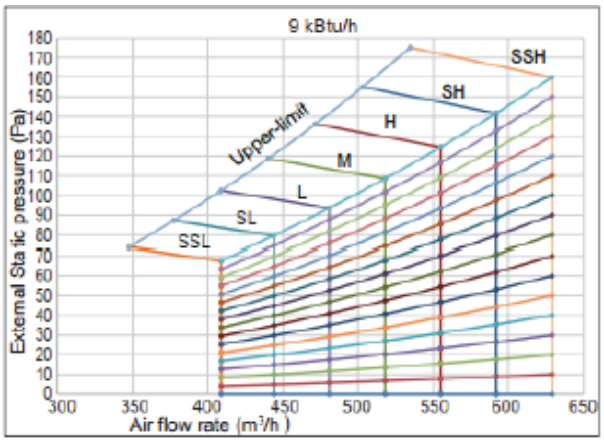

Fig. 8 —45VMM09

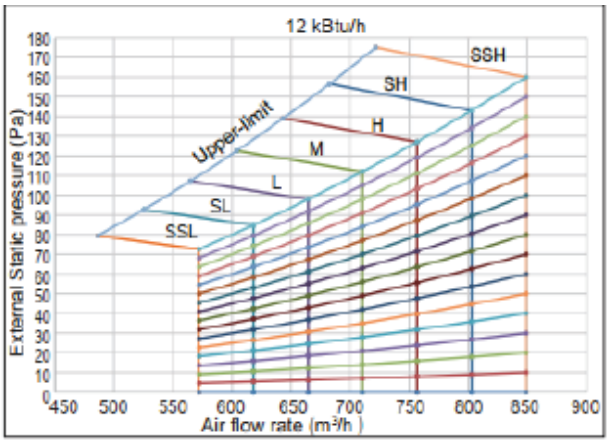

Fig. 9 —45VMM12

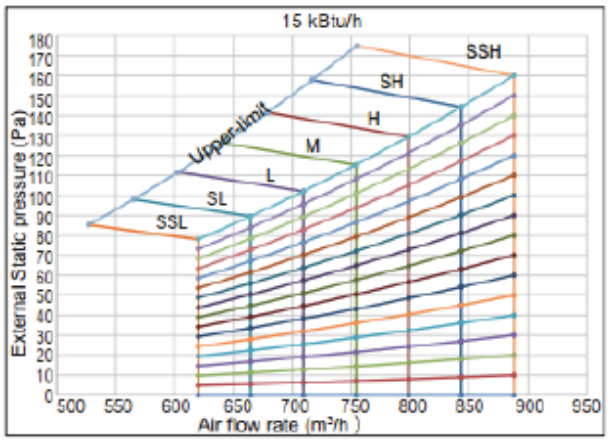

Fig. 12 —45VMM15

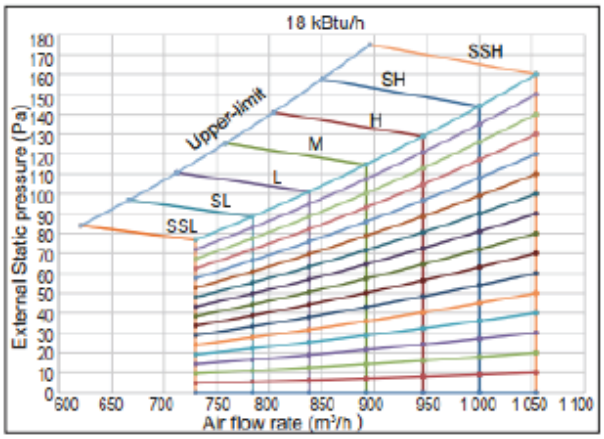

Fig. 10 —45VMM18

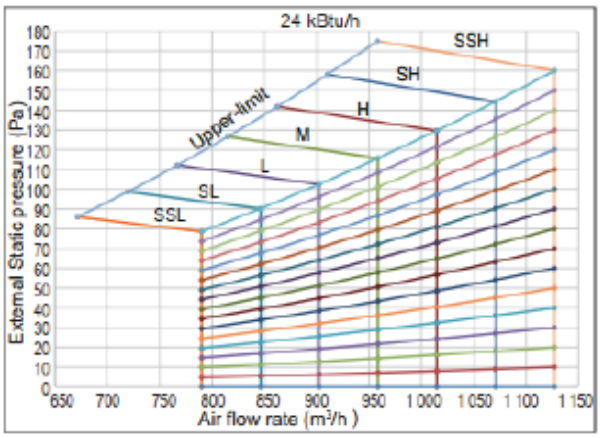

Fig. 13 —45VMM24

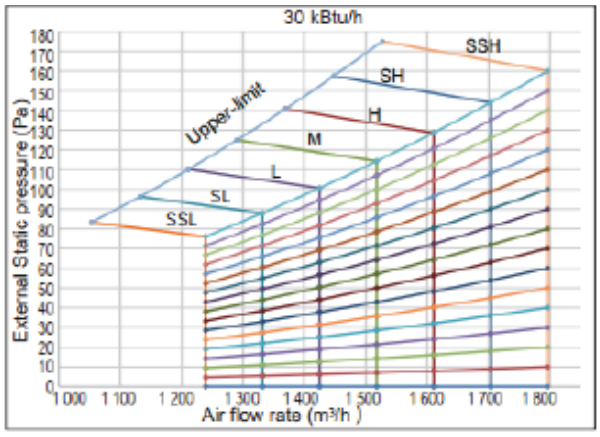

Fig. 11 —45VMM30

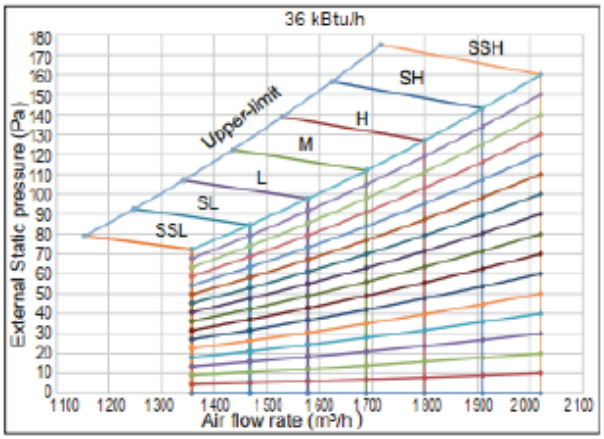

Fig. 14 —45VMM36

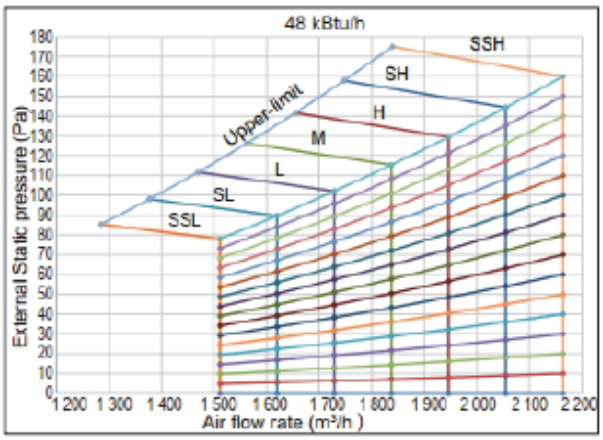

Fig. 15 —45VMM48

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 "SSH","SH", "H", "M", "L","SL" and "SSL" fan speed control.

For MIH24T3MN10, in "H" windshield, when the external static pressure is less than 63.7 Pa, the air flow keeps 1249 m^3/h, but when the external static pressure is greater than 63.7 Pa, the air flow begins to decline, and the allowable maximum external static pressure is 74 Pa.

Constant Speed mode

Table 10 — External Static Pressure Setting

IDU set item	Parameter name	Parameter range	Default value	Remarks
On-site settings	IDU static pressure	00/01-19/FF	FF	IDU static pressure is set based on the parameter value.

Level	00	01	02	03	04	05	06	07	08	09	10
Static pressure Pa((in.wg)	0(0.00)	5(0.02)	10(0.04)	15(0.06)	20(0.08)	25(0.10)	30(0.12)	40(0.16)	50(0.20)	60(0.24)	70(0.28)
Level	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**		
Static pressure Pa((in.wg)	80(0.32)	90(0.36)	100(0.4)	110(0.44)	120(0.48)	130(0.52)	140(0.56)	150(0.6)	160(0.64)		

Note: The above is only an example of WDC3-120T2 wired controller. If you choose other controllers, please refer to their manuals for setting.

Fan Performance Diagrams

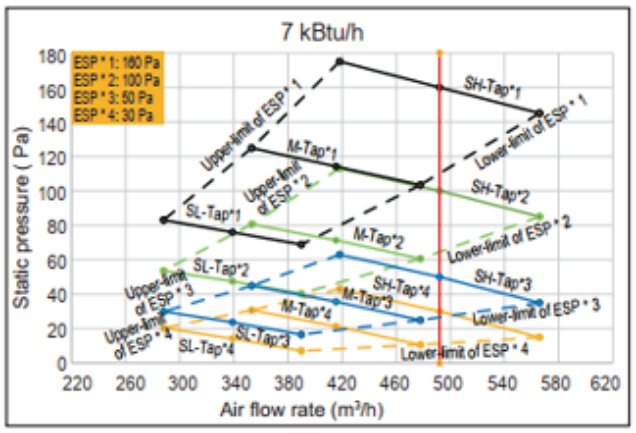

Fig. 16 —45VMM07

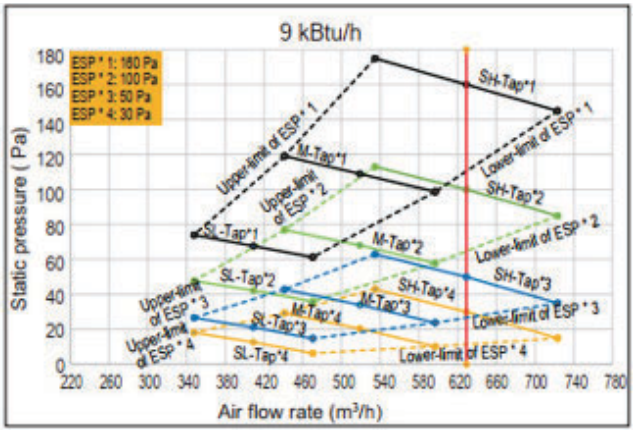

Fig. 18 —45VML09

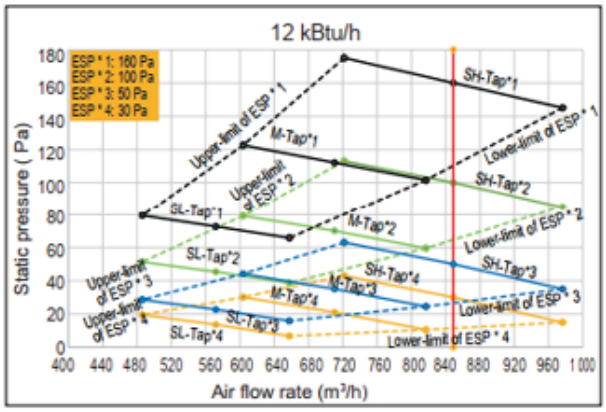

Fig. 17 —45VMM12

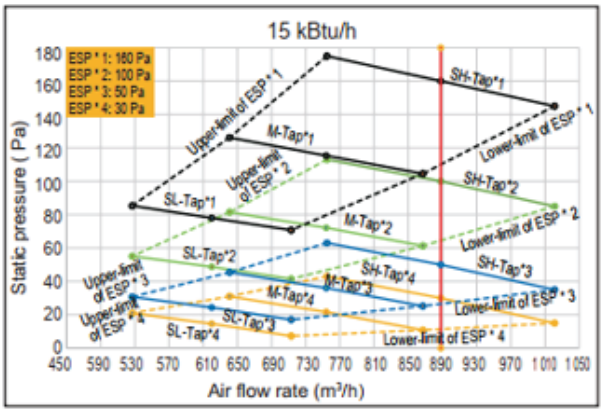

Fig. 19 —45VMM15

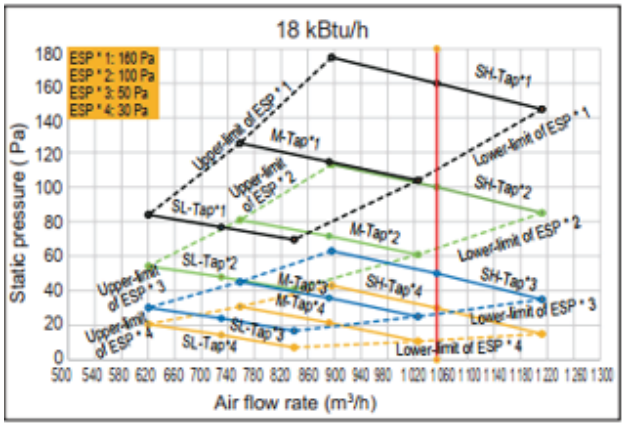

Fig. 20 —45VMM18

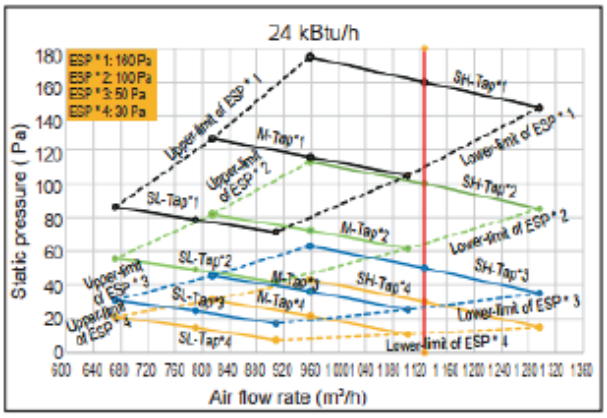

Fig. 22 —45VMM24

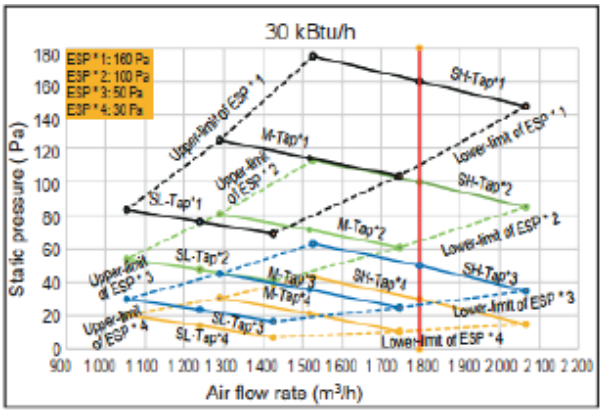

Fig. 21 —45VMM30

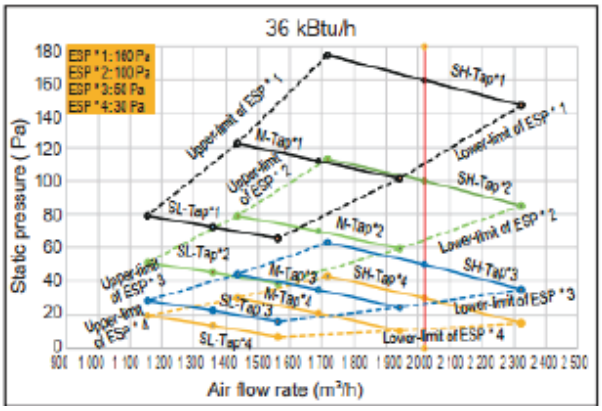

Fig. 23 —45VMM36

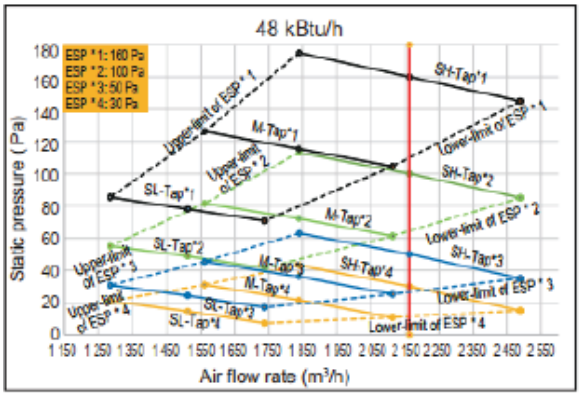

Fig. 24 —45VMM48

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 “SSH”, “M” and “SSL” fan speed control.

The Air Flow decreases with the increase of the external static pressure. For MIH24T3MN10, in “SSH” windshield and “50Pa” setting static pressure, when the external static pressure is 50Pa, the air flow is 1400 m^3/h, and the allowable external static pressure range is 39 to 62.

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