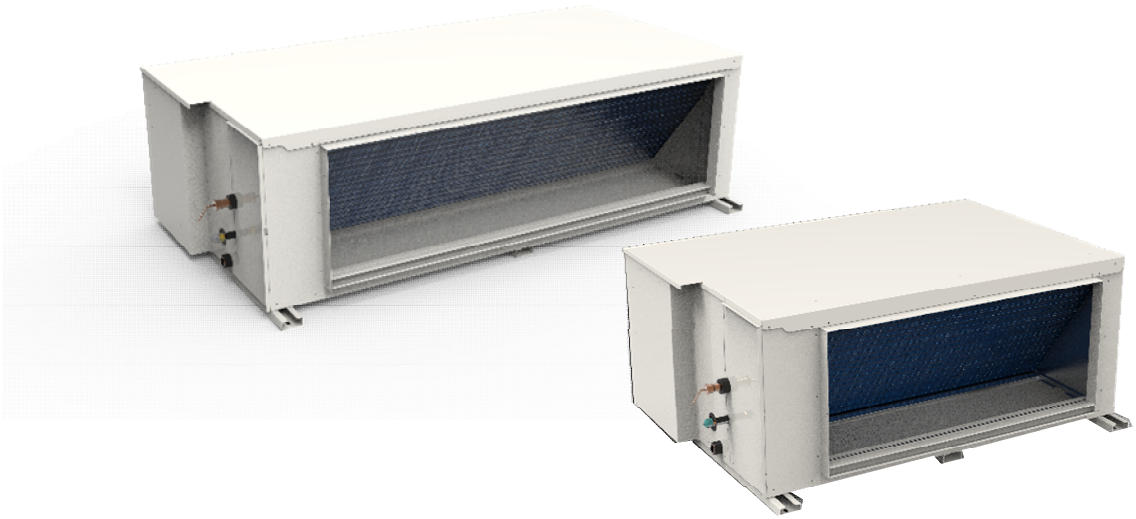
Engineering Data

TVR 7G Series

Rooftop AHU

70 - 190MBH



Models:

4TVOD070AB07WAA
4TVOD076AB07WAA
4TVOD085AB07WAA
4TVOD096AB07WAA
4TVOD115AB07WAA
4TVOD140AB07WAA
4TVOD155AB07WAA
4TVOD190AB07WAA

Sep. 2023 **TVR-EM-014A**

Rooftop AHU

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1 Specifications

4TVOD070AB07WAA / 4TVOD076AB07WAA / 4TVOD085AB07WAA/ 4TVOD096AB07WAA

Table 1.3: MIH200(224,252,280)T1HN18 specifications

Model name			4TVOD070AB07WAA	4TVOD076AB07WAA	4TVOD085AB07WAA	4TVOD096AB07WAA
Power supply			1-phase, 220-240V, 50/60Hz			
Cooling[1]	Capacity	kW	20.0	22.4	25.2	28.0
		kBut/h	68.3	76.5	86.0	95.6
	Input	W	780	780	780	780
Heating[2]	Capacity	kW	22.5	25.0	26.0	31.5
		kBut/h	76.8	85.3	88.7	107.5
	Input	W	780	780	780	780
Fan motor	Type		DC			
	Number		1			
Coil	Number of rows		3	3	3	3
	Tube pitch × row pitch	mm	21×13.37			
	Fin spacing	mm	1.5	1.5	1.5	1.5
	Fin type		Hydrophilic aluminum			
	Tube OD and type	mm	Φ7 Inner groove			
	Dimensions (L×H ×W)	mm	1050×588×40.1	1050×588×40.1	1050×588×40.1	1050×588×40.1
	Number of circuits		14	14	14	14
Airflow rate[3]		m^3/h	4700/4387/4073/3760/3447/3133/2820	4700/4387/4073/3760/3447/3133/2820	4700/4387/4073/3760/3447/3133/2820	4700/4387/4073/3760/3447/3133/2820
External static pressure[4]		Pa	200(0-360)			
Unit	Net dimensions[6] (W×H×D)	mm	1365×580×900			
	Packed dimensions (W×H×D)	mm	1530×730×1060			
	Net/Gross weight	kg	125/150	125/150	125/150	125/150
Refrigerant type			R410A/R32			
Design pressure (H/L)		MPa	4.4/2.6			
Pipe connections	Liquid/Gas pipe	mm	Φ9.52/Φ19.1		Φ12.7/Φ22.2	
	Drain pipe	mm	OD Φ32			

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 7 rates for each model.
4. 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.)
5. Sound pressure level is from highest level to lowest level, total 7 levels for each model. Sound pressure level is measured 1.4m below the unit in an anechoic chamber.
6. 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.

All specifications are measured at standard external static pressure

4TVOD115AB07WAA / 4TVOD140AB07WAA/ 4TVOD155AB07WAA / 4TVOD190AB07WAA

Table 1.4: MIH335 (400,450,560)T1HN18 specifications

Model name			4TVOD115AB07WAA	4TVOD140AB07WAA	4TVOD155AB07WAA	4TVOD190AB07WAA
Power supply			1-phase, 220-240V, 50/60Hz			
Cooling[1]	Capacity	kW	33.5	40.0	45.0	56.0
		kBut/h	114.3	136.5	153.6	191.1
	Input	W	810	1850	1850	2030
Heating[2]	Capacity	kW	38.0	45.0	56.0	63.0
		kBut/h	129.7	153.6	191.1	215.0
	Input	W	810	1850	1850	2030
Fan motor	Type		DC			
	Number		1			
Coil	Number of rows		4	3	3	4
	Tube pitch × row pitch	mm	21×13.37			
	Fin spacing	mm	1.5	1.5	1.5	1.5
	Fin type		Hydrophilic aluminum			
	Tube OD and type	mm	Φ7 Inner groove			
	Dimensions (L×H ×W)	mm	1050×588×42.7	1600×588×40.1	1600×588×40.1	1600×588×42.7
	Number of circuits		14	14	14	14
Airflow rate[3]		m^3/h	4700/4387/4073/3760/3447/3133/2820	7500/7000/6500/6000/5500/5000/4500	7500/7000/6500/6000/5500/5000/4500	8400/7840/7280/6720/6160/5600/5040
External static pressure[4]		Pa	200 (0-360)	300 (0-360)		
Unit	Net dimensions[6] (W×H×D)	mm	1365×580×900	1915×580×900		
	Packed dimensions (W×H×D)	mm	1530×730×1060	2080×730×1060		
	Net/Gross weight	kg	128/153	166/204	166/204	170/208
Refrigerant type			R410A/R32			
Design pressure (H/L)		MPa	4.4/2.6			
Pipe connections	Liquid/Gas pipe	mm	Φ12.7/Φ25.4		Φ15.9/Φ28.6	
	Drain pipe	mm	OD Φ32			

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 7 rates for each model.
4. 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.)
5. Sound pressure level is from highest level to lowest level, total 7 levels for each model. Sound pressure level is measured 1.4m below the unit in an anechoic chamber.
6. 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.

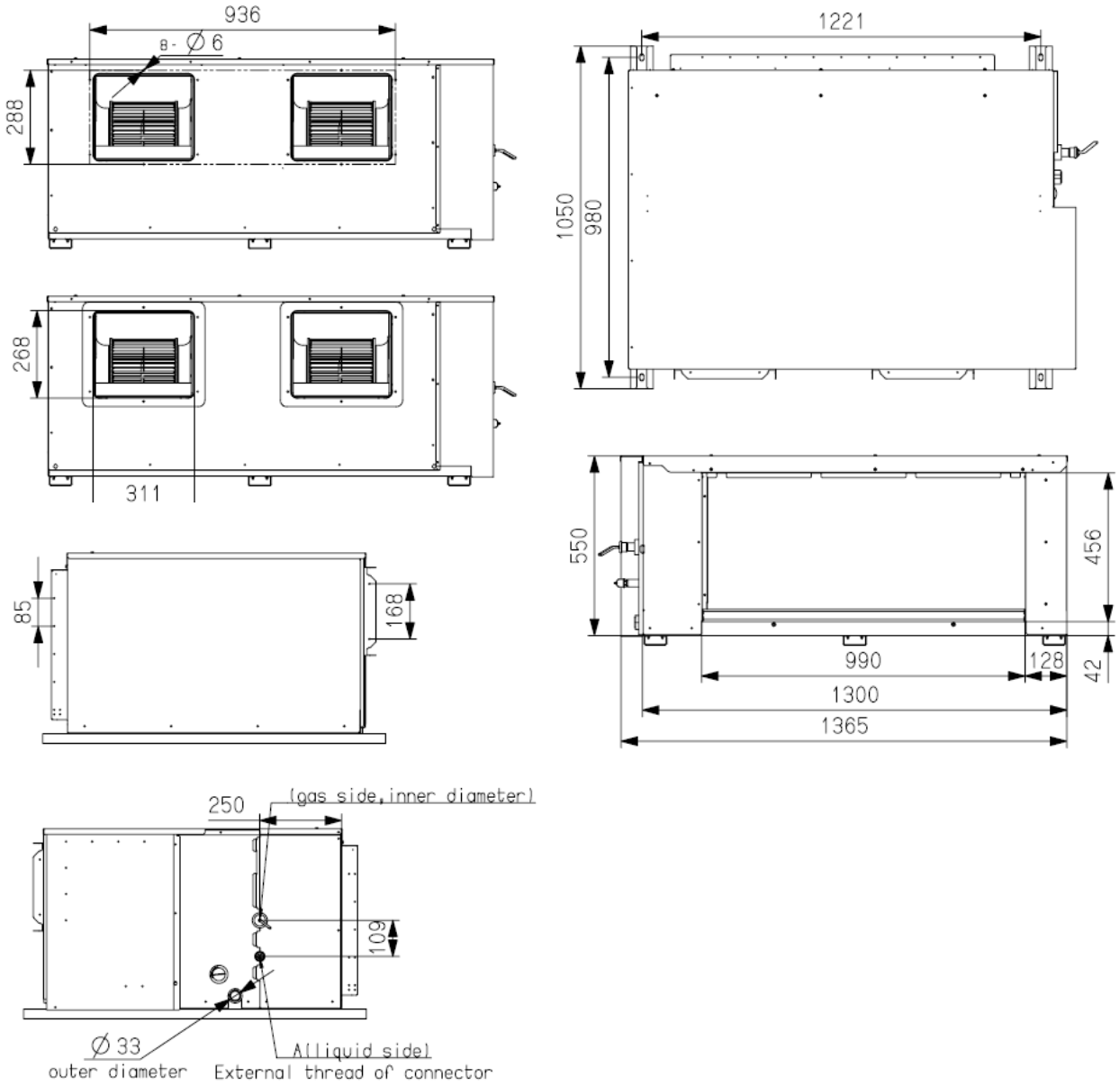
All specifications are measured at standard external static pressure

2 Dimensions

2.1 Unit Dimensions

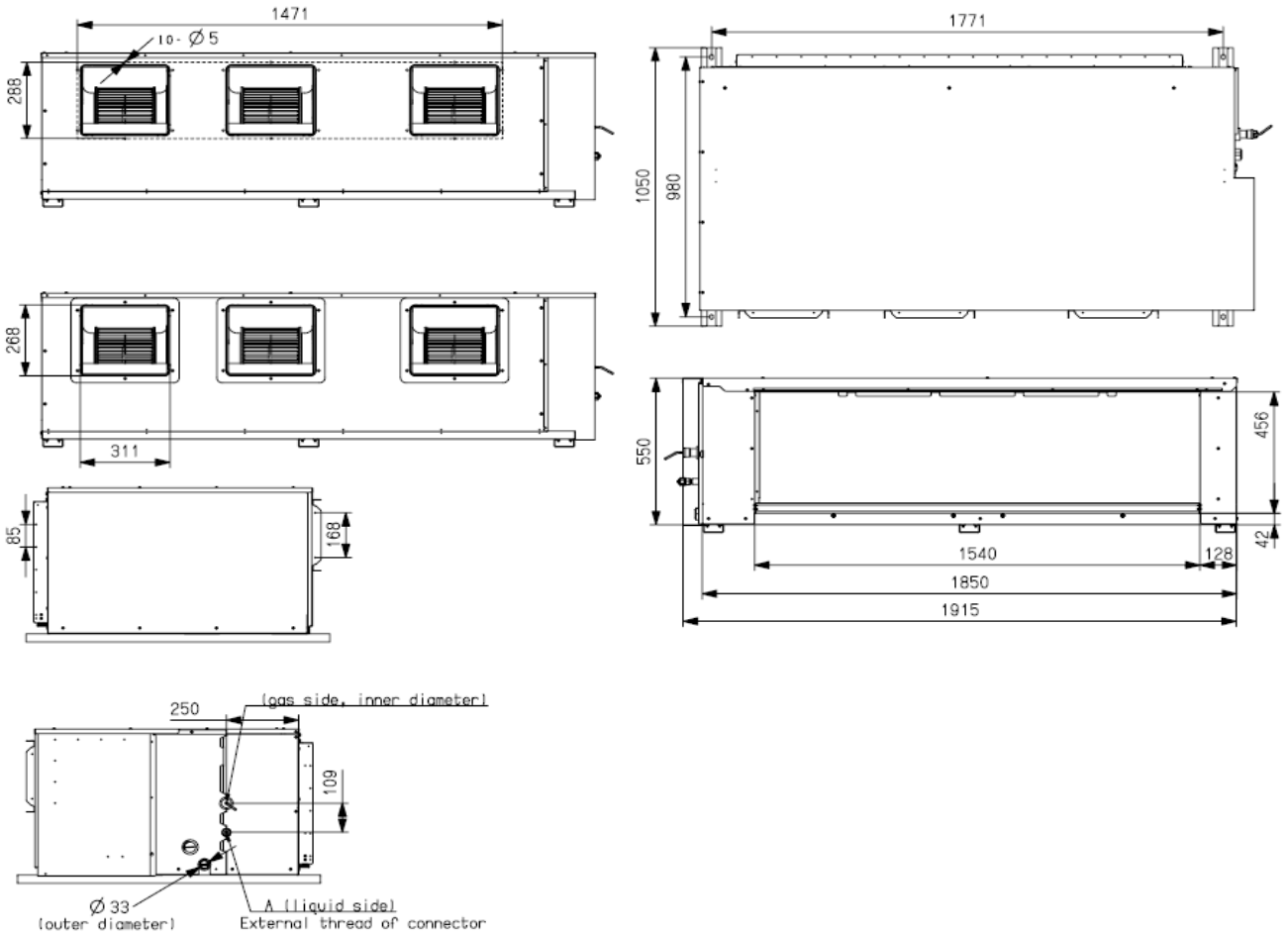
4TVOD070AB07WAA / 4TVOD076AB07WAA / 4TVOD085AB07WAA/ 4TVOD096AB07WAA/4TVOD115AB07WAA

Figure 2.1: 4TVOD070(076,085,096,115)AB07WAA dimensions (unit: mm)



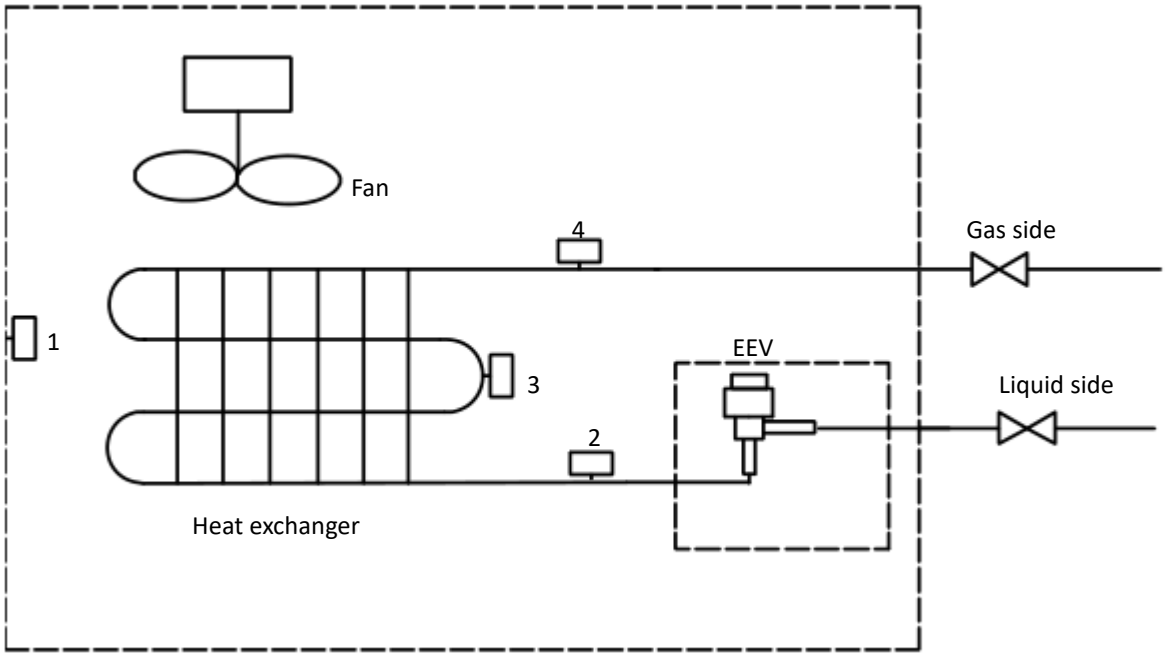
4TVOD140AB07WAA / 4TVOD155AB07WAA / 4TVOD190AB07WAA

Figure 2.3: 4TVOD140(155,190)AB07WAA dimensions (unit: mm)



3 Piping Diagrams

Figure 4.1: Piping diagram



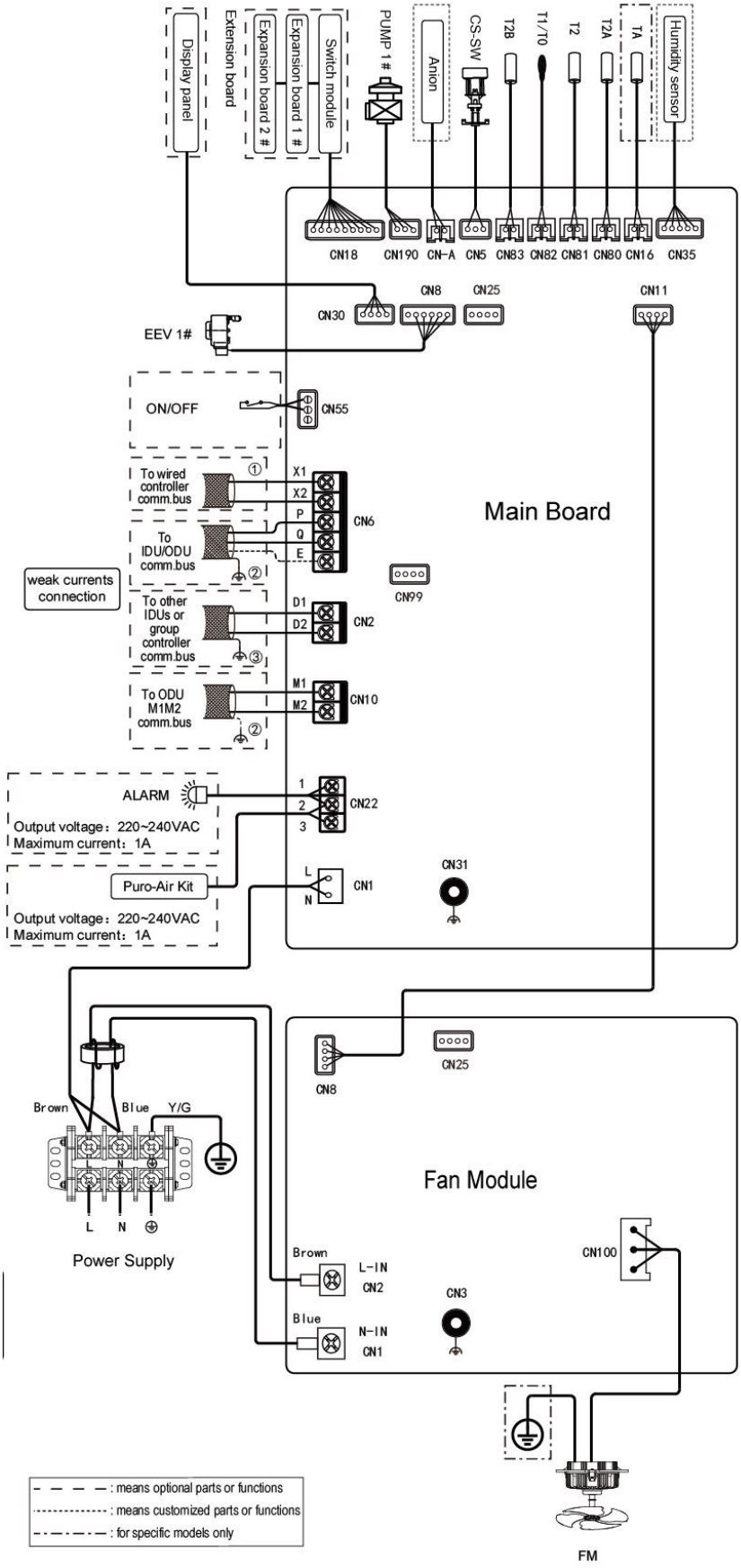
Legend		
1	T1	Inlet Air Temp. Sensor
2	T2A	Liquid Pipe Temp. Sensor
3	T2	Middle Pipe Temp. Sensor
4	T2B	Gas Pipe Temp. Sensor
5	EEV	Electronic expansion valve
6	FAN	Fan motor

4 Wiring Diagrams

4TVOD070AB07WAA / 4TVOD076AB07WAA / 4TVOD085AB07WAA/ 4TVOD096AB07WAA

4TVOD115AB07WAA / 4TVOD140AB07WAA/ 4TVOD155AB07WAA / 4TVOD190AB07WAA

Figure 5.2: MIH200(224,252,280,335,400,450,560)T1HN18 Duct wiring diagram



Legend				
Code	**Name**		**Code**	**Name**
XS XP	connectors		T1	Inlet Air Temp. Sensor
TA	Steam pipe temperature sensor*		T2B	Gas Pipe Temp. Sensor
CS-SW	Water level switch		T0	Fresh air inlet temperature sensor*
EEV	Electronic expansion valve		ALARM	Alarm output
Anion	Sterilization module		FM	DC Fan motor
T2A	Liquid Pipe Temp. Sensor		ON/OFF	Remote on/off
T2	Middle Pipe Temp. Sensor			

*** Indicates that this sensor is only available for Fresh Air Processing Unit**

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.
- The dotted lines indicate the field wiring or optional function.
- X1X2 communication ports can be connected to the wired controller.
- PQ and M1M2 communication ports both are used for indoor and outdoor communication, and only one of them can be used at a time. Meanwhile, be sure to connect the same communication ports (PQ to PQ; M1M2 to M1M2) in case of damage of the main control board.
- 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.

5 Capacity Tables

5.1 Cooling Capacity Table

Table 6.1: Rooftop AHU cooling 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
4TVOD070AB07WAA	17.7	16.1	18.9	16.5	19.8	16.8	20.0	16.3	20.2	15.8	20.8	15.1	21.2	14.4
4TVOD076AB07WAA	19.8	18.0	21.1	18.5	22.1	18.7	22.4	18.3	22.6	17.7	23.2	16.8	23.7	16.1
4TVOD085AB07WAA	22.3	20.3	23.8	20.8	24.9	21.1	25.2	20.5	25.5	19.9	26.1	18.9	26.7	18.1
4TVOD096AB07WAA	24.8	22.6	26.4	23.1	27.6	23.4	28.0	22.8	28.3	22.1	29.0	21.0	29.7	20.1
4TVOD115AB07WAA	29.6	26.9	31.6	27.6	33.1	28.0	33.5	27.3	33.8	26.4	34.7	25.1	35.5	24.1
4TVOD140AB07WAA	35.4	32.1	37.7	32.9	39.5	33.4	40.0	32.5	40.4	31.5	41.5	30.0	42.4	28.7
4TVOD155AB07WAA	39.8	36.1	42.4	37.0	44.4	37.5	45.0	36.6	45.4	35.4	46.6	33.7	47.6	32.2
4TVOD190AB07WAA	49.5	45.5	52.8	46.5	55.2	47.0	56.0	45.8	56.5	44.3	58.0	42.1	59.3	40.8

Abbreviations:
TC: Total capacity (kW)
SC: Sensible capacity (kW)

Notes:
1.Shaded cells indicate rating condition

5.2 Heating Capacity Table

Table 7.2: Rooftop AHU heating capacity

Model	Indoor air temperature (°C DB)					
	16	18	20	21	22	24
	SHC	SHC	SHC	SHC	SHC	SHC
4TVOD070AB07WAA	23.9	23.6	22.5	21.8	21.2	19.6
4TVOD076AB07WAA	26.5	26.3	25.0	24.3	23.5	21.8
4TVOD085AB07WAA	27.6	27.3	26.0	25.2	24.4	22.6
4TVOD096AB07WAA	33.4	33.1	31.5	30.6	29.6	27.4
4TVOD115AB07WAA	40.3	39.9	38.0	36.9	35.7	33.1
4TVOD140AB07WAA	47.7	47.3	45.0	43.7	42.3	39.2
4TVOD155AB07WAA	59.4	58.8	56.0	54.3	52.6	48.7
4TVOD190AB07WAA	66.8	66.2	63.0	61.1	59.2	54.8

Abbreviations:
SHC: Sensible Heat Capacity (kW)

Notes:
1.Shaded cells indicate rating condition

6 Electrical Characteristics

Table 8.1: Rooftop AHU electrical characteristics

Model	Power supply						Indoor Fan Motor	
	Hz	Volts (V)	Min. volts	Max. volts	MCA (A)	MFA (A)	Rated power output (W)	FLA (A)
4TVOD076AB07WAA	50/60	220-240	198	264	8.19		920	6.55
4TVOD085AB07WAA	50/60	220-240	198	264	8.19		920	6.55
4TVOD096AB07WAA	50/60	220-240	198	264	8.19		920	6.55
4TVOD115AB07WAA	50/60	220-240	198	264	8.31		920	6.65
4TVOD140AB07WAA	50/60	220-240	198	264	12.98		2300	10.38
4TVOD155AB07WAA	50/60	220-240	198	264	12.98		2300	10.38
4TVOD190AB07WAA	50/60	220-240	198	264	15.49		2300	12.39

Abbreviations:
MCA: Min. Circuit Amps. (A), which is used to select the minimum circuit size to ensure safe operation over a long period of time.
MFA: Max. Fuse Amps. (A), which is used to select the circuit breaker.
FLA: Full Load Amps. (A), which is the full load current of the indoor fan motor (reliable operation at the fastest speed setting).

7 Fan Performance

7.1 How to switch between Constant Airflow mode and Constant Speed mode

①In the main interface, press "☰" +"⧉" for 3 seconds at the same time, and the main interface will display "CC". Press the "▲" and "▼" to select the indoor unit ("n00-n63" is displayed, and the last two digits are the indoor unit addresses). Press the "⧉" to enter the parameter setting interface, and "n00" will be displayed.

②Press the "▲" and "▼" until "N30" is displayed on the page, and then press the "⧉" to enter the mode setting. Use the "▲" and "▼" keys to adjust to the demand mode parameter values, and press the "⧉" to confirm.

③Press the "🕒" button to return to the previous menu and exit the parameter setting. Parameter setting will also exit after 60 s of no operation

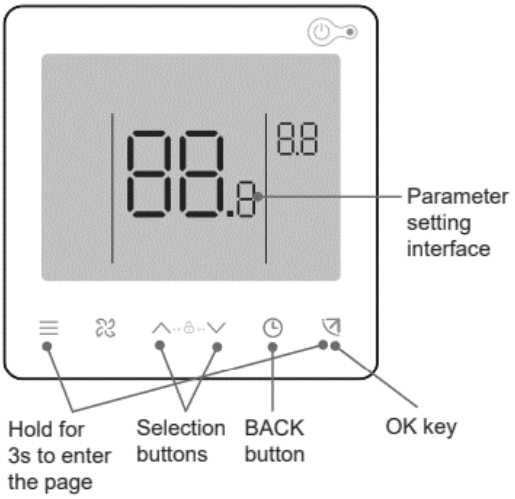


Table 8.1: Mode setting

First level menu	Second level menu	Description	Default
n30	00	Constant Speed	-
	01	Constant Airflow	√

Notes:
1. The above is only an example. If you choose other controllers, please refer to their instructions for setting.

7.2 Constant Airflow mode

7.2.1 Fan performance diagram

Figure 8.1: 4TVOD070AB07WAA

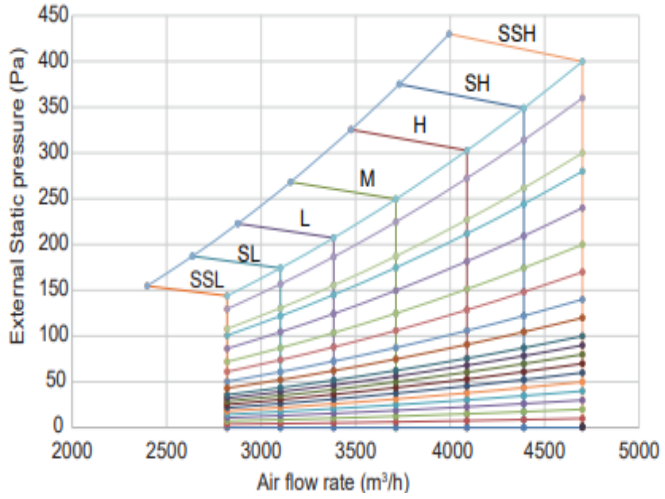


Figure 8.2: 4TVOD076AB07WAA

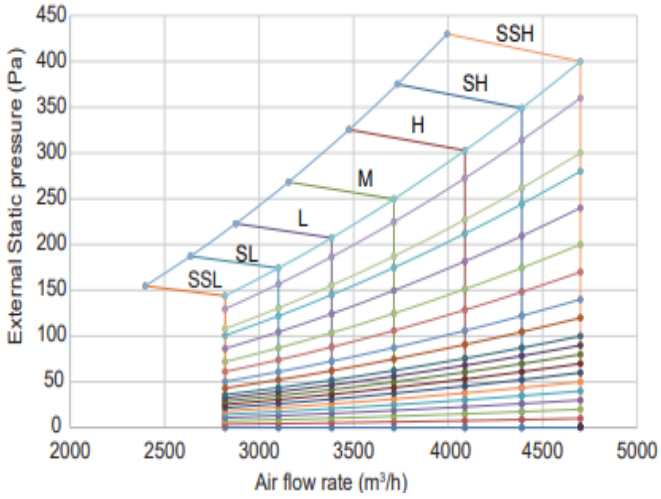


Figure 8.3: 4TVOD085AB07WAA

Figure 8.4: 4TVOD096AB07WAA

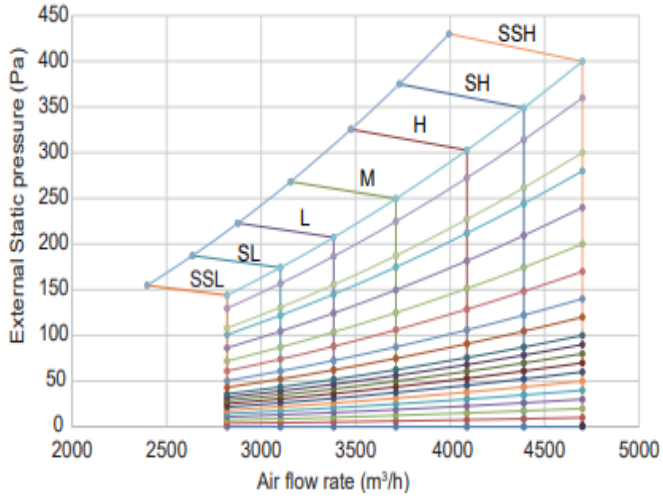


Figure 8.5: 4TVOD115AB07WAA

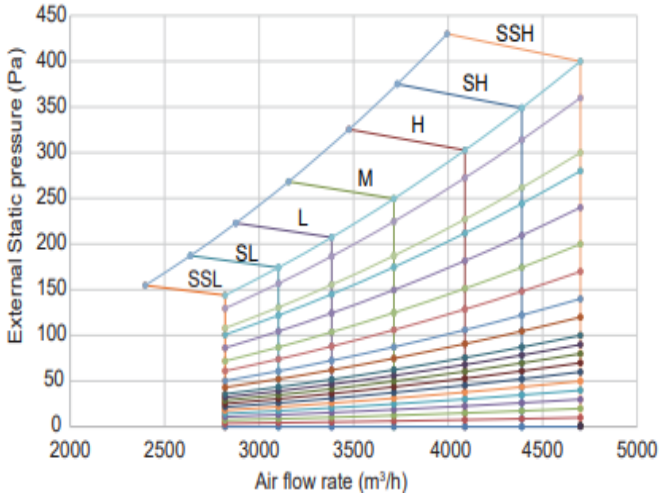


Figure 8.6: 4TVOD140AB07WAA

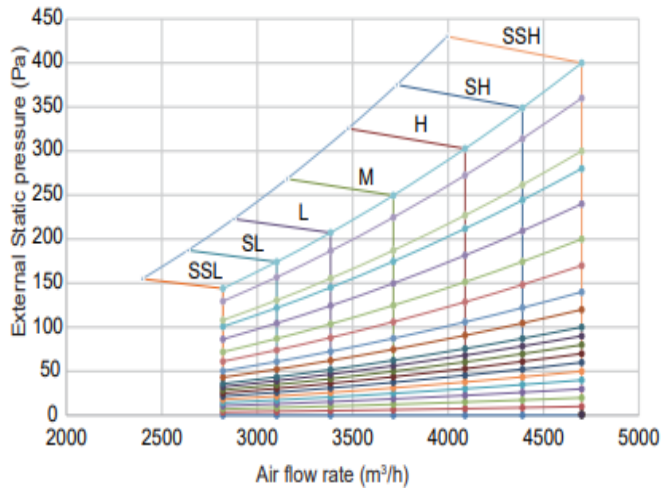


Figure 8.7: 4TVOD155AB07WAA

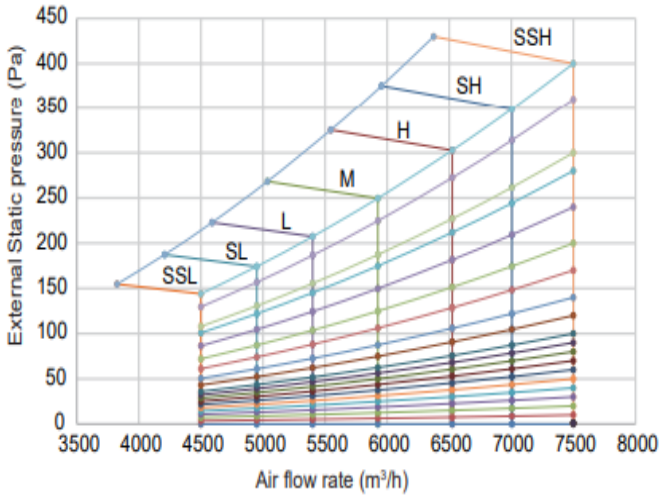
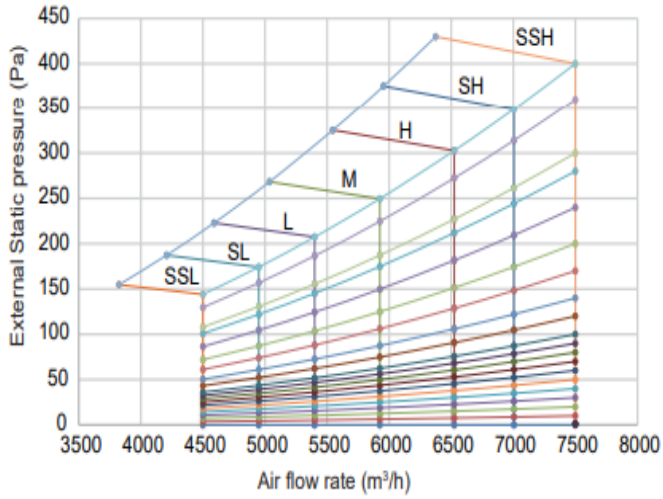
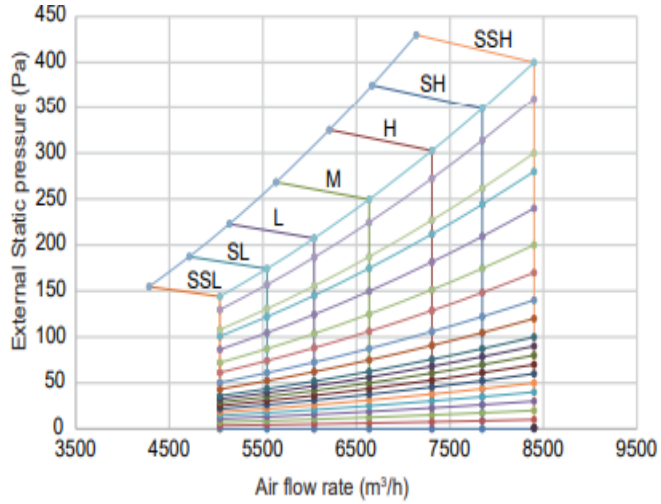


Figure 8.8: 4TVOD190AB07WAA





7.2.2 How to Read the Diagram (Constant Airflow mode)

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 4TVOD070AB07WAA, in “H” windshield, when the external static pressure is less than 300 Pa, the air flow keeps 4000 m3/h, but when the externa static pressure is greater than 300 Pa, the air flow begins to decline, and the allowable maximum external static pressure is 325 Pa.

7.3 Constant Speed mode

7.3.1 Set external static pressure parameters

①In the main interface, press "☰" +"⏍" for 3 seconds at the same time, and the main interface will display "CC". Press the "▲" and "▼" to select the indoor unit ("n00-n63" is displayed, and the last two digits are the indoor unit addresses). Press the "⏍" to enter the parameter setting interface, and "n00" will be displayed.

②When "n00" is displayed, press the "⏍" to enter the static pressure setting. Use the "▲" and "▼" keys to adjust to the demand parameter values, and press the "⏍" to confirm.

③Press the "🕒" button to return to the previous menu and exit the parameter setting. Parameter setting will also exit after 60 s of no operation

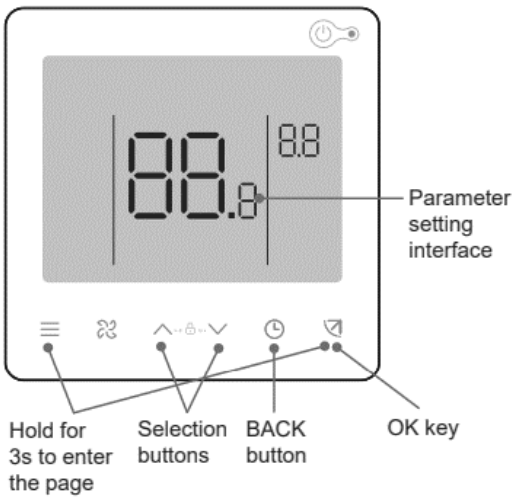


Table 8.1: External static pressure setting (20-56kW)

First level menu	Second level menu	Description	Default
N00	00/01/02/03/04/05/~/19	Static pressure level	14(20-33.5kW) 17(40-56kW)

Level	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
Static pressure(Pa)	0	10	20	30	40	50	60	70	80	90	100	120	140	170	200	240	280	300	360	400

Notes:

1. The above is only an example of 86S wired controller. If you choose other controllers, please refer to their manuals for setting.

7.3.2 Fan performance diagram

Figure 9.21: 4TVOD070AB07WAA

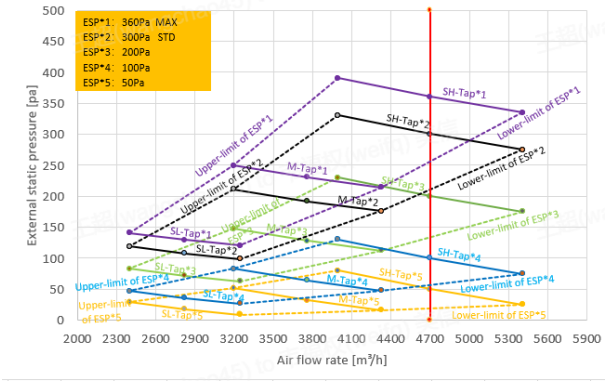


Figure 9.22: 4TVOD076AB07WAA

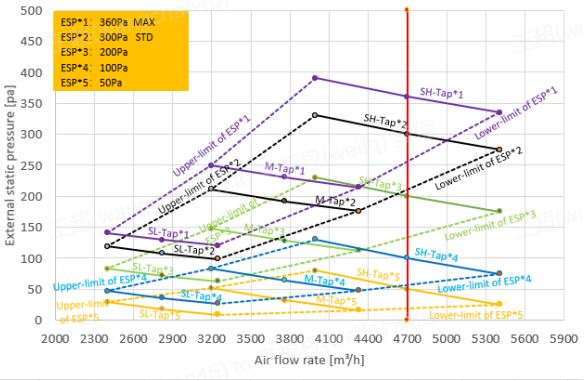


Figure 9.23: 4TVOD085AB07WAA

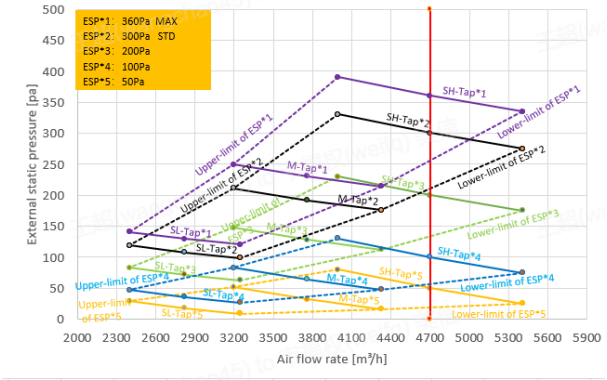


Figure 9.24: 4TVOD096AB07WAA

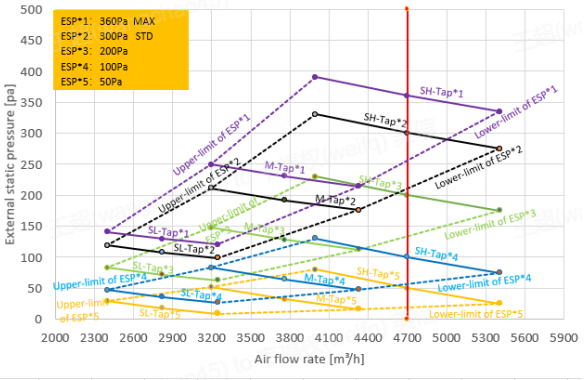


Figure 9.25: 4TVOD115AB07WAA

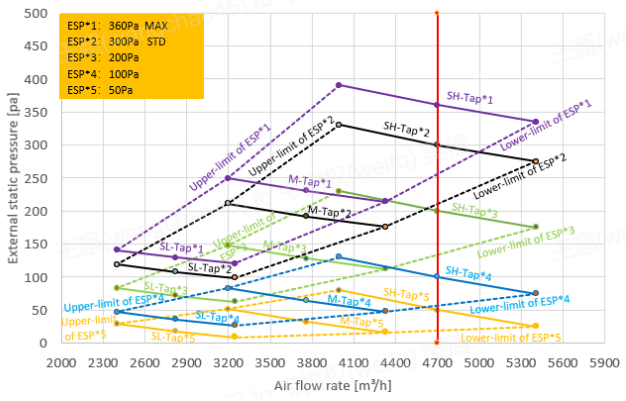


Figure 9.26: 4TVOD140AB07WAA

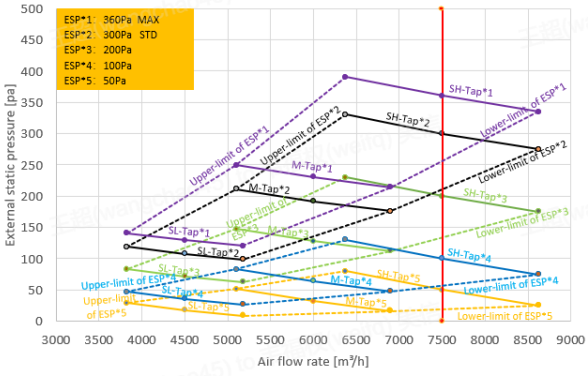
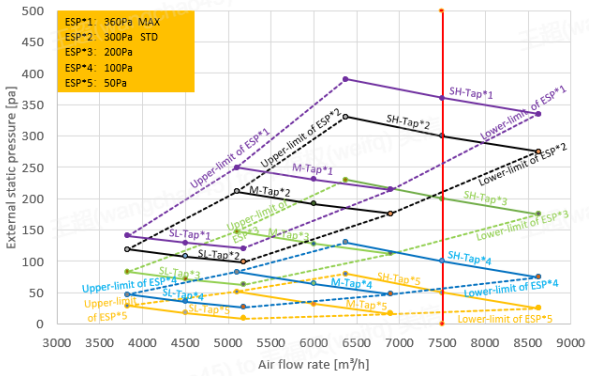
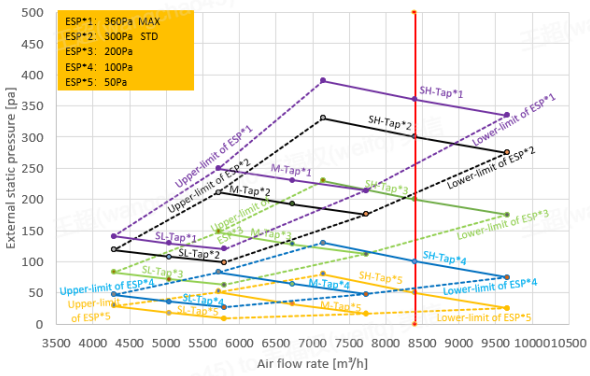


Figure 9.27: 4TVOD155AB07WAA

Figure 9.28: 4TVOD190AB07WAA





7.3.3 How to Read the Diagram (Constant Speed mode)

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”, “M” and “SL” fan speed control.

The Air Flow decreases with the increase of the external static pressure. For 4TVOD070AB07WAA, in “SH” windshield and “100Pa” setting static pressure, when the externa static pressure is 100Pa, the air flow is 4700 m3/h, and the allowable externa static pressure range is 75Pa to 1

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