40MBDAQ
DUCTED SLIM DUCTLESS SYSTEM
SIZES 09 TO 58

Product Data

A220726

Fig. 1 — Sizes 09K - 48K

NOTE: The 09K-48K unit can be mounted vertically as well as horizontally.

A220727

Fig. 2 — Size 58K

NOTE: Images are for illustration purposes only. Actual models may differ slightly.

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INDUSTRY LEADING FEATURES / BENEFITS

A PERFECT BALANCE BETWEEN BUDGET LIMITS, ENERGY SAVINGS AND COMFORT

The **40MBDAQ** series ducted slim ductless systems are a matched combination of an outdoor condensing unit and an indoor fan coil unit connected only by refrigerant tubing and wires. The fan coil is typically mounted in the ceiling.

This selection of fan coils permits creative solutions to design problems such as:

- **Add-ons to current space (an office or family room addition)**
- **Special space requirements**
- **When changes in the load cannot be handled by the existing system**
- **Historical renovations or any application where preserving the look of the original structure is essential.**

These compact indoor fan coil units take up very little space above the ceiling. Advanced system components incorporate innovative technology to provide reliable cooling performance at low sound levels.

LOW SOUND LEVELS

When noise is a concern, the ductless split systems are the answer. The indoor units are whisper quiet. There are no compressors indoors, either in the conditioned space or directly over it, and there is none of the noise usually generated by air being forced through ductwork.

SECURE OPERATION

If security is an issue, outdoor and indoor units are connected only by refrigerant piping and wiring to prevent intruders from crawling through the ductwork. In addition, since outdoor units can be installed close to an outside wall, coils are protected from vandals and severe weather.

FAST INSTALLATION

This compact ductless system is simple to install. A mounting bracket and duct work is needed for the indoor units, and only wire and piping need run between the indoor and outdoor units. These units are fast and easy to install ensuring minimal disruption to customers in the home or workplace. This makes the ducted style ductless systems the equipment of choice, especially in retrofit situations.

SIMPLE SERVICING AND MAINTENANCE

Removing the top panel on the outdoor units provides immediate access to the control compartment, providing a service technician access to check the unit's operation. In addition, the draw-thru design of the outdoor section means that dirt accumulates on the outside surface of the coil. Coils can be cleaned quickly from the inside using a pressure hose and detergent.

On all indoor units, service and maintenance expense is reduced due to easy accessible service panels. In addition, these ducted systems have extensive self-diagnostics to assist in troubleshooting.

BUILT-IN RELIABILITY

Ducted style ductless system indoor and outdoor units are designed to provide years of trouble-free operation.
The ducted indoor units include protection against freeze-up and high evaporator temperatures on heat pumps.
The condensing units on the heat pumps are protected by a three minute delay that provides over-current protection and high temperature protection prior to the start of the compressor.

INDIVIDUAL ROOM COMFORT

Maximum comfort is provided because each space can be controlled individually based on the usage pattern. The provided air sweep feature permits optimal room air mixing to eliminate hot and cold spots for occupant comfort. In addition, year-round comfort can be provided with heat pumps.

ECONOMICAL OPERATION

The ducted style ductless system design allows individual or multi-room heating or cooling when required. There is no need to run large supply-air fans or chilled water pumps to handle a few spaces with unique load patterns.

EASY-TO-USE CONTROLS

The ducted units have microprocessor-based controls to provide the ultimate in comfort and efficiency. The user-friendly wired and wireless remote control provides the interface between the user and the unit.

BUILT-IN CONDENSATE LIFT PUMP

A factory installed condensate lift pump on the ducted fan coil provides installation flexibility.

VERTICAL OR HORIZONTAL INSTALLATION

Designed for maximum installation flexibility. The secondary drain (built-in) allows the unit to be mounted vertically allowing either a floor or ceiling-concealed installation depending on existing conditions (**sizes 09K-48K only**).

OPTIONAL WIRED CONTROLLER

Timer Function

STANDARD WIRED CONTROLLER

7 Day Programmable

SMART PHONE CONTROL (OPTIONAL)

The unit can be controlled via a smart phone with the addition of the Wi-Fi® Kit **KSAIF0401AAA** (sold separately).

24V INTERFACE (OPTIONAL)

The 24V Interface allows users to control the ductless system with a third party thermostat.

AGENCY LISTINGS

All systems are listed with AHRI (Air Conditioning, Heating & Refrigeration Institute), and ETL.

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

MODEL NUMBER NOMENCLATURE

INDOOR UNIT

40 M B D A Q 09 X H 3

40 = FAN COIL UNIT

M = ALL

MODEL = B

INDOOR FAN COIL UNIT TYPE
D = DUCTED

MAJOR SERIES

UNIT TYPE
C = COOLING
Q = HEAT PUMP

ELECTRICAL CHARACTERISTICS
3 = 208-230/1/60

VARIATIONS
A = STANDARD
H = HIGH STATIC

MAXIMUM NUMBER OF FAN COIL UNITS CONNECTED TO THE OUTDOOR UNIT

A = 1:1	**F** = 1:6
B = 1:2	**G** = 1:7
C = 1:3	**H** = 1:8
D = 1:4	**J** = 1:9
E = 1:5	**X** = INDOOR UNIT

NOMINAL CAPACITY
09 - 3/4 TON
12 - 1 TON
24 - 2 TONS
36 - 3 TONS
48 - 4 TONS
58 - 5 TONS

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Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

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STANDARD FEATURES AND ACCESSORIES

Ease Of Installation	
Mounting Brackets	S
Low Voltage Controls	S
Comfort Features	
Rear or Bottom Return **(Bottom Return only sizes 09K-48K)**	S
Vertical (Up flow) or horizontal installation **(Vertical only sizes 09K-48K)**	S
Microprocessor Controls	S
Wired Remote Controller (7 Day Programmable KSACN0701AAA)	S
Wireless Remote Controller	S
Auto Restart Function	S
Cold Blow Protection on Heat Pumps	S
Freeze Protection Mode on Heat Pumps	S
Turbo Mode	S
Auto Changeover on Heat Pumps	S
Follow Me (Sense Temperature at remote)	S
Energy Saving Features	
Outside Air Intake	S
Sleep Mode	S
Stop/Start Timer	S
46° F Heating Mode (Heating Setback)	S
Safety And Reliability	
Indoor Coil Freeze Protection	S
Aluminum Golden Hydrophilic pre-coated fins	S
Indoor Coil High Temp Protection in Heating Mode	S
Ease Of Service And Maintenance	
Cleanable Filters	S
Diagnostics	S
Liquid Line Pressure Taps	S
Application Flexibility	
External Condensate Lift Pump shipped with the unit (size 9K)	S
Built-in Condensate Lift Pump **(sizes 12K-58K)**	S

Legend

S - Standard
A - Accessory

ACCESSORIES

ORDERING NO.	DESCRIPTION	FOR MODELS
KSAIF0401AAA	Optional Wi-Fi Kit	All Sizes
17401204A00001	Optional Return Temperature Harness Extension (sold separately)	All Sizes

HORIZONTAL OR VERTICAL (UP FLOW) INSTALLATION

Designed for maximum installation flexibility. The secondary drain (built-in) allows the unit to be mounted horizontally (**sizes 09K-58K**) or vertically (up flow) (**sizes 09K-48K**).

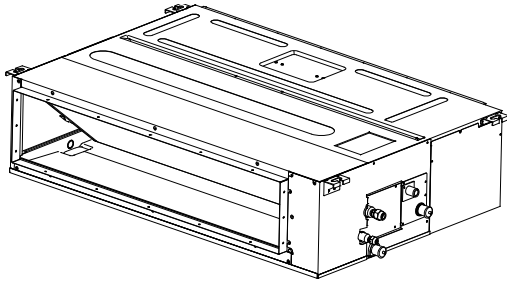

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Fig. 3 — Unit mounted horizontally

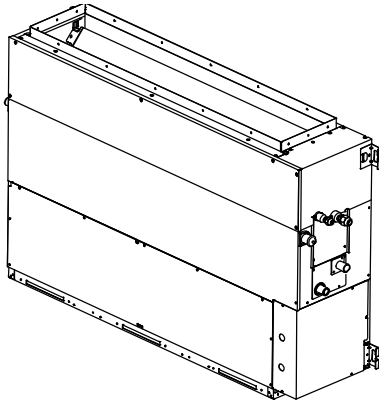

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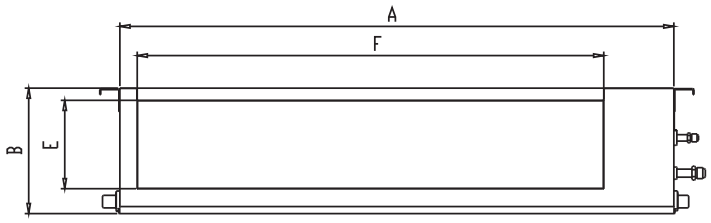
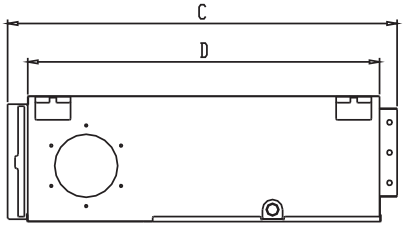
Fig. 4 — Unit mounted vertically (upflow)

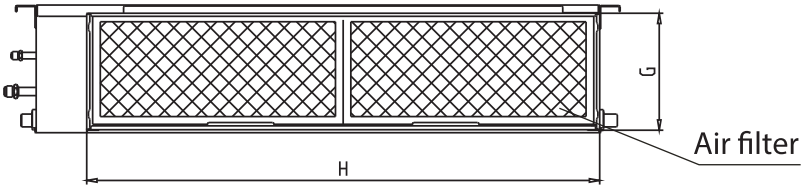
DIMENSIONS

Air outlet dimensions

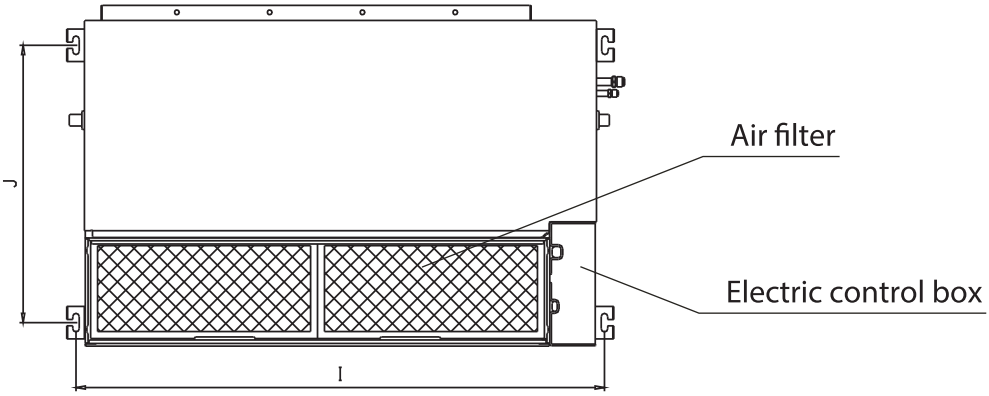




Air inlet dimensions



Descending ventilation opening and mounted hook



(Unit: Inch/mm)

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Fig. 5 — Indoor Unit Sizes 9K - 48K

MODEL (BTHU/H	OUTLINE DIMENSIONS				AIR OUTLET OPENING SIZE		AIR RETURN OPENING SIZE		MOUNTED LUG SIZE	
	A	B	C	D	E	F	G	H	I	J
9K	34.6/880	8.3/210	26.5/674	23.6/600	5.4/136	27.8/706	7.5/190	30.8/782	36.2/920	20/508
18K - 24K	43.3/1100	9.8/249	30.5/774	27.6/700	6.9/175	36.5/926	8.9/228	39.4/1001	44.9/1140	23.5/598
36K - 48K	47.2/1200	11.8/300	34.4/874	31.5/800	8.9/227	41.1/1044	11/280	43.3/1101	48.8/1240	27.4/697

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

ADDITIONAL DIMENSIONS (SIZE 9K)

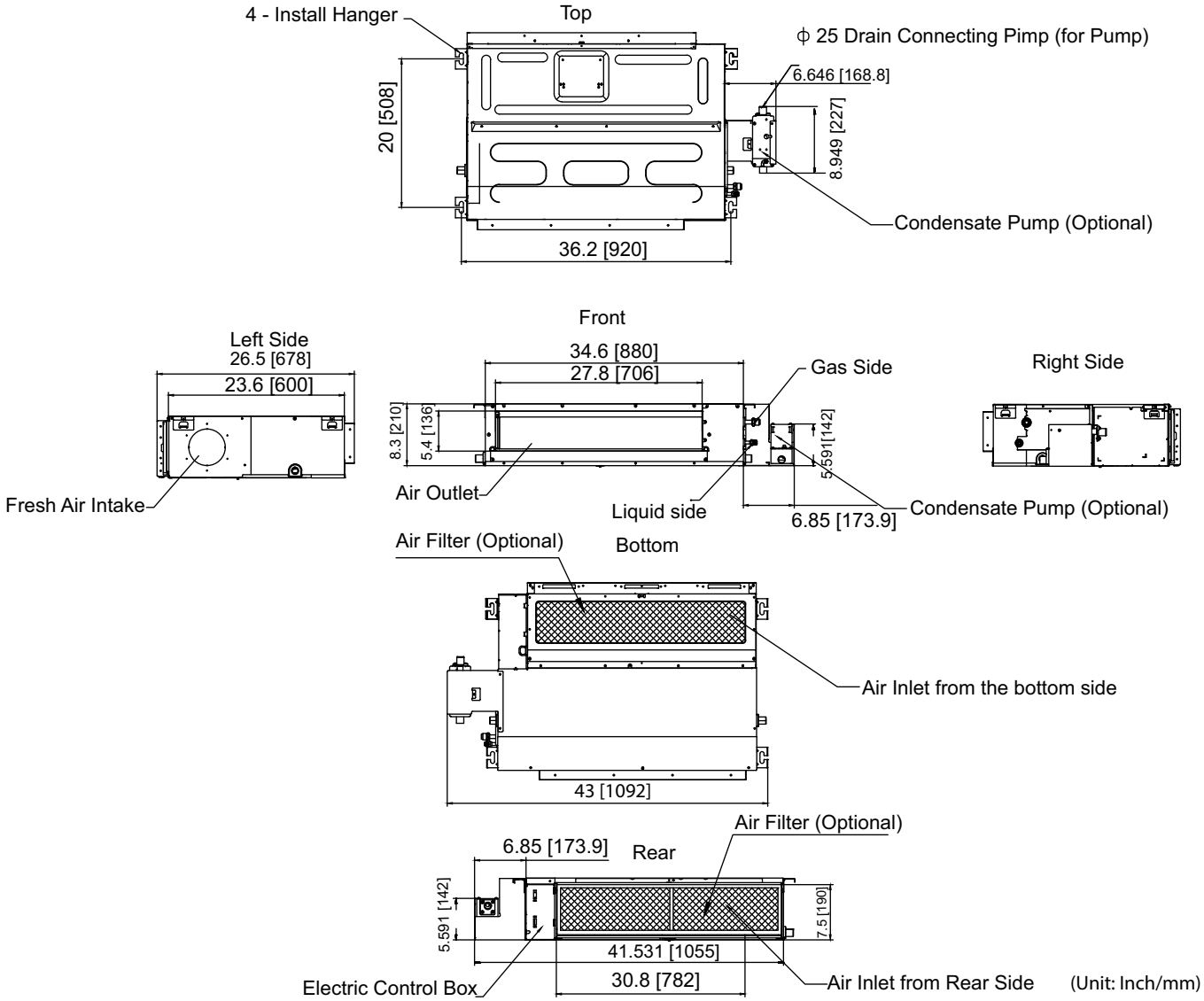

Fig. 6 — Additional Dimensions - Size 9K

DIMENSIONS (CONT)

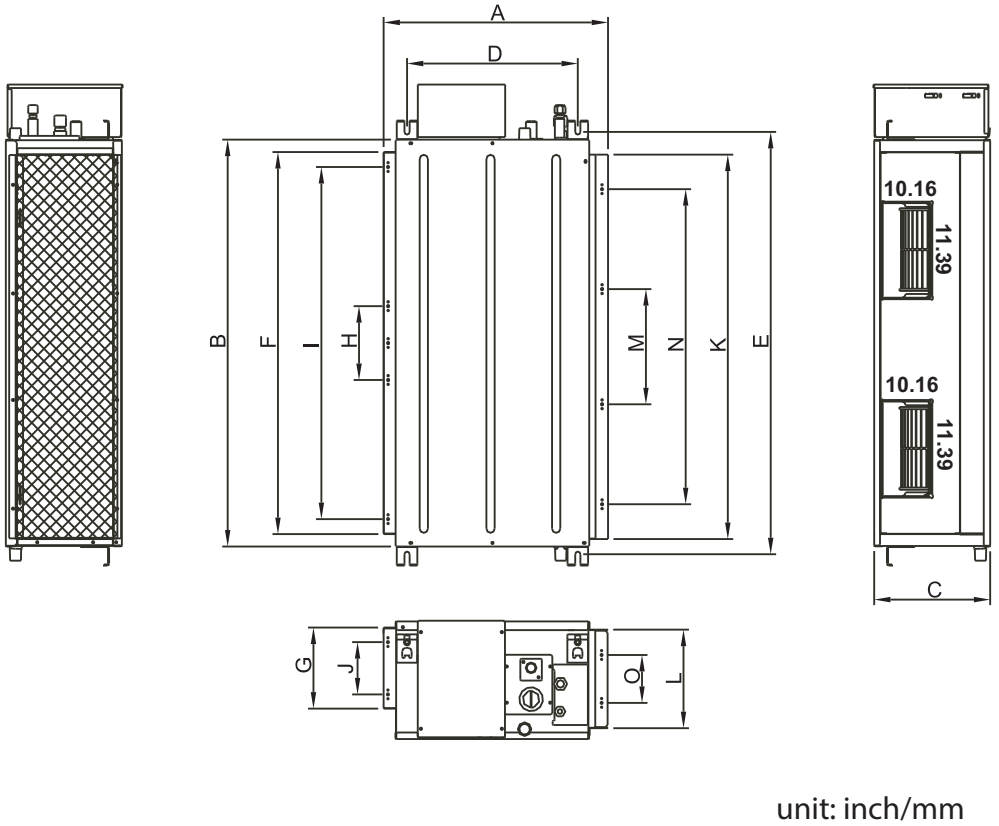

Fig. 7 — Indoor Unit Size 58K

MODEL (BTU/H)	OUTLINE DIMENSION			MOUNTED LUG SIZE		AIR OUTLET OPENING SIZE (SYMMETRY OF AIR OUTLET OPENING)					AIR INLET OPENING SIZE (SYMMETRY OF AIR INLET OPENING)				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
58K	33.8/858	55.1/1400	18.1/460	27.5/700	56.5/1436	46.7/1188	15/385	20/500	39.3/1000	11/280	46.7/1188	15/385	20/500	39.3/1000	11/280

MAINTENANCE CLEARANCES

Maintenance clearances provide access for system inspections.

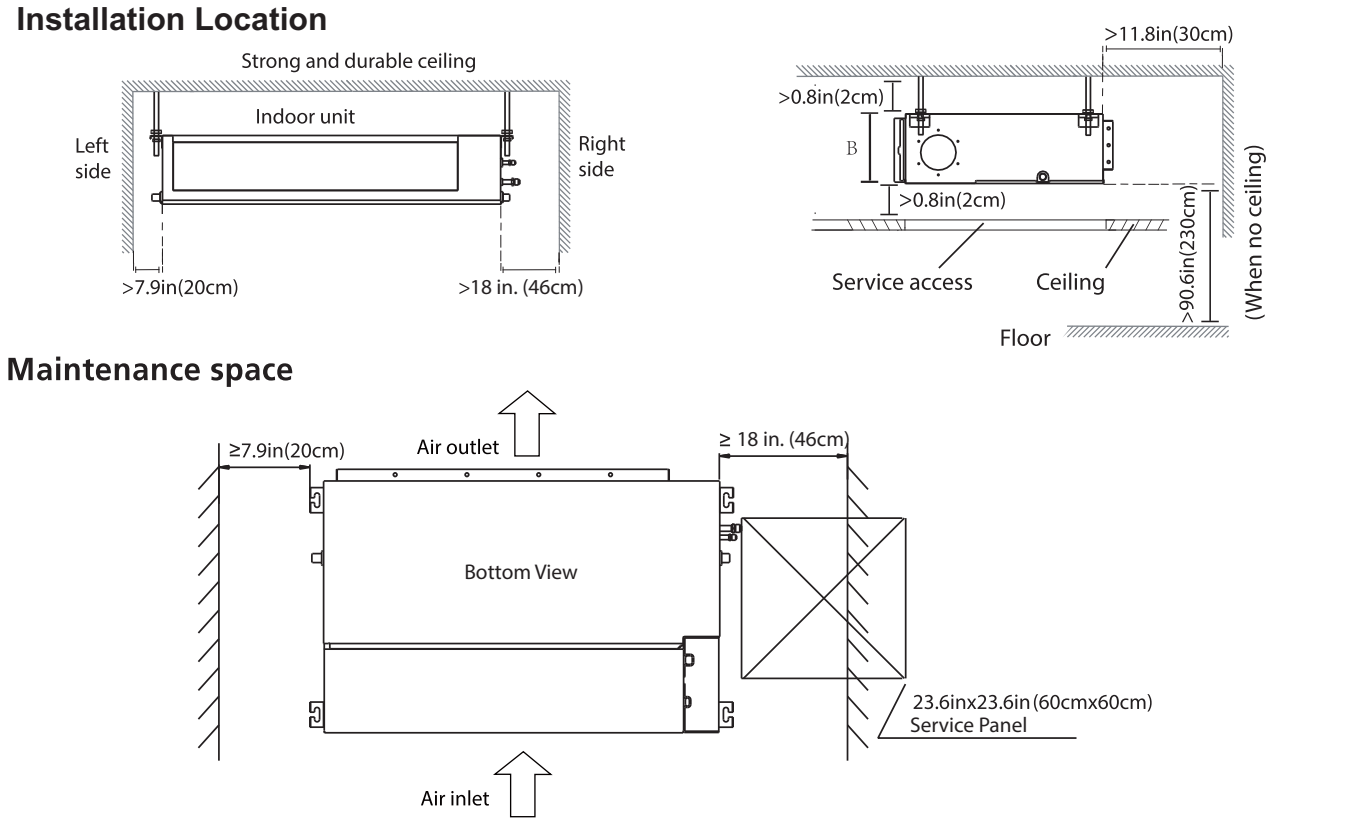

Fig. 8 — Maintenance Clearance

NOTE: If installed above a fixed ceiling, utilize a ceiling access panel the length and width of the unit, otherwise the blower components and/or the entire unit cannot be removed.

If a single access panel is desired, the minimum dimensions should be:

- **Single Access Panel Width: The width of the unit plus 2-inches on both sides**
- **Single Access Panel Length: The length of the unit plus 18-inches on the connection end and 2-inches on the opposite end.**

SPECIFICATIONS

System	Size		09	12	18	24	36	48	58
	Indoor Model		**40MBDAQ09XH3**	**40MBDAQ12XH3**	**40MBDAQ18XH3**	**40MBDAQ24XH3**	**40MBDAQ36XH3**	**40MBDAQ48XH3**	**40MBDAQ58XH3**
Electrical	Voltage, Phase, Cycle	V/Ph/Hz	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60
	Power Supply		Indoor unit powered from outdoor unit	Indoor unit powered from outdoor unit	Indoor unit powered from outdoor unit	Indoor unit powered from outdoor unit	Indoor unit powered from outdoor unit	Indoor unit powered from outdoor unit	Indoor unit powered from outdoor unit
	MCA		3.0	3.0	3.0	3.0	3.0	4.0	5.0
Controls	Wireless Remote Controller (°F/°C Convertible)		Standard	Standard	Standard	Standard	Standard	Standard	Standard
	Wired Remote Controller (°F/°C Convertible)		Standard	Standard	Standard	Standard	Standard	Standard	Standard
	24V Interface for 3rd Part Thermostat Control		Optional	Optional	Optional	Optional	Optional	Optional	Optional
	Wi-Fi Control for Phone App Control		Optional	Optional	Optional	Optional	Optional	Optional	Optional
Operating Range	Cooling Indoor DB Min - Max	°F(°C)	62~90 (16~32)	62~90 (16~32)	62~90 (16~32)	62~90 (16~32)	62~90 (16~32)	62~90 (16~32)	62~90 (16~32)
	Heating Indoor DB Min - Max	°F(°C)	59~84 (15~29)	59~84 (15~29)	59~84 (15~29)	59~84 (15~29)	59~84 (15~29)	59~84 (15~29)	59~84 (15~29)
Piping	Pipe Connection Size - Liquid	in (mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)
	Pipe Connection Size - Suction	in (mm)	3/8 (9.52)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	5/8 (15.9)	7/8 (22)
Indoor Coil	Face Area	Sq. Ft.	1.88	2.89	2.89	2.89	4.19	4.19	5.88
	No. Rows		3	2	3	3	4	4	4
	Fins per inch		18	18	18	18	16	16	16
	Circuits		4	4	7	7	8	8	9
Indoor	Unit Width	in (mm)	34.65(880)	43.31(1,100)	43.31(1,100)	43.31(1,100)	47.24(1,200)	47.24(1,200)	55.12(1,400)
	Unit Height	in (mm)	8.27(210)	9.8(249)	9.8(249)	9.8(249)	11.81(300)	11.81(300)	18.11(460)
	Unit Depth	in (mm)	26.54(674)	30.47(774)	30.47(774)	30.47(774)	34.41(874)	34.41(874)	33.78(858)
	Net Weight	lbs (kg)	55.34(25.1)	83.11(37.7)	88.18(40)	87.52(39.7)	119.71(54.3)	119.71(54.3)	174.60(79.2)
	Fan Speeds		3	3	3	3	3	3	3
	Airflow (low to high)	CFM	176/235/300	176/294/400	619/812/949	642/861/1045	1000/1235/1588	1059/1588/1882	1262/1709/2156
	Sound Pressure (low to high)	dB(A)	30/32/38	36/37/39	29/33/36	33/36/38	36/41/45	45/51/54	50/53/57
	Max Static Pressure	In.WG.	0.64	0.64	0.68	0.8	0.8	0.8	0.8
	Field Drain Pipe Size O.D.	in (mm)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)	1.0 (25.4)

*Performance may vary based on the outdoor unit matched to. See the compatible outdoor units product data for Performance Data.

NOTE: Backward compatible with single zone systems 38MAQ sizes 09K-24K, 38MBQ sizes 36K-48K and multi-zone systems 38MGQ.
NOTE: See the current compatibility chart for list of indoor unit and outdoor unit match ups.

APPLICATION DATA

UNIT SELECTION

Select equipment to either match or that can handle slightly less than the anticipated peak load. This provides better humidity control, fewer unit cycles, and less part-load operation.

For units used in spaces with high sensible loads, base equipment selection on unit sensible load, not on a total anticipated load. Adjust for anticipated room wet bulb temperature to avoid undersizing equipment.

UNIT MOUNTING (INDOOR)

Refer to the unit's installation instructions for further details.

Unit leveling - For reliable operation, units should be level in all planes.

Clearance - Provide adequate clearance for airflow (see figures 5 and 7).

Unit location - Select a location which provides the best air circulation for the room.

These units should be positioned as accessible as possible above the ceiling. The unit return and discharge should not be obstructed by furniture, curtains, or anything which may cause unit short cycling or air recirculation.

Duct the unit in the middle of the selected wall (if possible). Duct towards an outside wall, if available, to make piping easier, and position the unit so it faces the normal location of room occupants.

UNIT MOUNTING (OUTDOOR)

Refer to the unit's installation instructions for further details.

Do not install the indoor or outdoor units in a location with special environmental conditions. For those applications, contact your ductless representative.

Mounting Template

Refer to the unit's installation instructions for further details.

SUPPORT

Adequate support must be provided to support the weight of all fan coils. Refer to the "SPECIFICATIONS" on page 9 for fan coil weights. Refer to "DIMENSIONS" on page 5 for the base unit dimensional drawings which contain the location of the mounting brackets.

SYSTEM OPERATING CONDITIONS

OPERATING RANGE Min/Max °F (°C)		
	Cooling	Heating
Indoor DB	32 / 86 (0 / 30)	32 / 86 (0 / 30)
Indoor WB	59 / 84 (15 / 29)	

NOTE: Reference the unit's installation instructions for more information.

DRAIN CONNECTIONS

Install the drains in compliance with the local sanitation codes. The standard ducted fan coil unit condensate lift pump has a maximum lift of 29.5 in. (750mm).

WIRING

Size all wires per the NEC (National Electrical Code) or CEC (Canadian Electrical Code) and local codes. Use the electrical data from the outdoor unit (MCA - minimum circuit amps and MOCP - maximum over current protection), to correctly size the wires and the disconnect fuse or breakers respectively.

SIZES 09-24 RECOMMENDED CONNECTION METHOD FOR POWER AND COMMUNICATION WIRING

Power and Communication Wiring: The main power is supplied to the outdoor unit. The field supplied 14/3 power/communication wiring, from the outdoor unit to the indoor unit, consists of four (4) wires and provides the power for the indoor unit. Two wires are high voltage AC power, one is communication wiring and the other is a ground wire.

To minimize communication interference: If installed in a high Electromagnetic field (EMF) area and communication issues arise, a 14/2 stranded shielded wire can be used to replace L2 and (S) between the outdoor and indoor units - landing the shield onto the ground in the outdoor unit only.

WIRING SIZES 09-24

CABLE	CABLE SIZE	REMARKS
Connection Cable	14AWG	3 wire + Ground 1Φ 208/230 V (Stranded wire is recommended)

SIZES 36-58 RECOMMENDED CONNECTION METHOD FOR POWER AND COMMUNICATION WIRING

Power and Communication Wiring: The main power is supplied to the outdoor unit. The field supplied power wiring from the outdoor unit to the indoor unit consists of three (3) wires and provides the power for the indoor unit. Two wires are high voltage AC power and one is a ground wire. To minimize voltage drop, the factory recommended wire size is 14/2 stranded with a ground.

Communication Wiring: A separate shielded stranded copper conductor only, with a 600 volt rating and double insulated copper wire, must be used as the communication wire from the outdoor unit to the indoor unit. Please use a separate shielded 16GA stranded control wire.

WIRING SIZES 36-58

CABLE	CABLE SIZE	REMARKS
Power Connection Cable	14AWG	2 wire + Ground 1Φ 208/230V
Communication Cable	16AWG	2 wire stranded shielded control wire

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation. Wires should be sized based on NEC and local codes.

CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation. Be sure to comply with local codes while running wire from the indoor unit to the outdoor unit. Every wire must be connected firmly. Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Ensure all wiring is tightly connected. No wire should touch the refrigerant tubing, compressor or any moving parts.

Disconnecting means must be provided and must be located within sight and readily accessible from the system. Connecting cable with conduit must be routed through the hole in the conduit panel.

CONTROL SYSTEM

The indoor unit is equipped with a microprocessor control to perform two functions:

1. Provide safety for the system
2. Control the system and provide optimum levels of comfort and efficiency.

The main microprocessor is located on the control board of the fan coil unit (outdoor units have a microprocessor also) with thermistors located in the fan coil air inlet and on the indoor coil. Heat pump units have a thermistor on the outdoor coil. These thermistors monitor the system's operation to keep the unit within acceptable parameters and control the operating mode.

WIRELESS REMOTE CONTROLLER

1. A wireless remote controller is supplied for system operation of all ducted units.
2. Each battery operated wireless (infrared) remote controller may be used to control more than one unit.

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Fig. 9 —Wireless Remote Controller

WIRED REMOTE CONTROLLER

- **P/N KSACN0101AAA (optional available as an accessory)**
- **P/N KSACN0701AAA (included with the Unit)**

1. Wired remote controller used for system operation of all ducted units.
2. Kit includes a wired remote controller and a connecting cable.

NOTE: Extension wire available through **RCD (KSACN0101AAA Part Number: 17401204001601**; **KSACN0701AAA Part Number: 17401204000769**).

3. Connect the wire terminal between the remote controller and the indoor unit.
4. Display in °F or °C and temperature increments every 1°F or every 1°C.

A220745

Fig. 10 —KSACN0101AAA (Timer Function)

A220746

Fig. 11 —KSACN0701AAA (7 Day Programmable)

24 INTERFACE (OPTIONAL)

Allows the ductless system to be controlled using a third party thermostat (**P/N KSAIC0301230)** (option available as an accessory).

SMART PHONE CONTROL (OPTIONAL)

A Wi-Fi® Kit, used for system operation of all ducted units through a smart phone (**P/N KSAIF0401AAA**), is available (option available as an accessory).

AIR FLOW DATA

SYSTEM SIZE		9K	12K	18K	24K	36K	48K	58K
Indoor **(CFM)	High	300	400	949	1,045	1,588	1,882	2,156
	Medium	235	294	812	861	1,235	1,588	1,709
	Low	176	176	619	642	1,000	1,059	1,262

SOUND PRESSURE

SYSTEM SIZE		9K(208/230V)	12K(208/230V)	18K(208/230V)	24K(208/230V)	36K(208/230V)	48K(208/230V)	58K(208/230V)
Cooling Operation Indoor Sound Pressure	dBA at (H/M/L CFM)	38.6/32.5/30.2	39.1/37.3/36.1	36.5/33.1/29.3	38.9/36.8/33.1	45.5/41.3/36.6	54.7/51.5/45.7	57.0/53.5/50.1
Heating Operation Indoor Sound Pressure	dBA at (H/M/L CFM)	37.5/32/29.8	39.5/37.5/34.3	36.7/33.0/28.9	40.0/37.3/34.3	45.6/40.8/35.7	54.8/52.0/44.5	55.6/53.4/49.8

WEIGHTED SOUND POWER (dBA)

TYPICAL OCTAVE BAND SPECTRUM									
SIZE	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
9K	Cooling dB(A)	42.1	40.5	33.7	42.3	30.4	21.8	15.4	15.5
	Heating dB(A)	40.3	35	35	40.4	30.9	21.5	15.5	15
12K	Cooling dB(A)	41.5	39.3	37.8	32.5	35.5	26.5	21.4	30.4
	Heating dB(A)	42.1	36.9	38.6	32.3	40	26.2	20.1	16.2
18K	Cooling dB(A)	41	37.6	37.8	32.8	33.4	26	21.5	19.1
	Heating dB(A)	39.6	37.8	37.6	33.1	34.1	25.2	20.9	16.6
24K	Cooling dB(A)	41.1	37.8	35	34.9	30.8	26	23.9	41.1
	Heating dB(A)	41.3	39.8	37.1	36.2	30.4	27.4	21.2	41.3
36K	Cooling dB(A)	50.1	45.9	44.5	43.4	40	36.1	32	31.1
	Heating dB(A)	46.8	45.3	44	43.4	41	35.6	32.6	26.6
48K	Cooling dB(A)	32.6	37.4	44.6	48.7	48.3	45	41.4	35.6
	Heating dB(A)	33.9	36.5	42.8	49.8	49.9	44.4	40	32.7
58K	Cooling dB(A)	58.5	60	52	53.4	53.7	47.6	43.9	38.8
	Heating dB(A)	62.6	60.2	49.4	53.1	52.1	46.2	41.5	37.3

SOUND PRESSURE TESTING METHOD

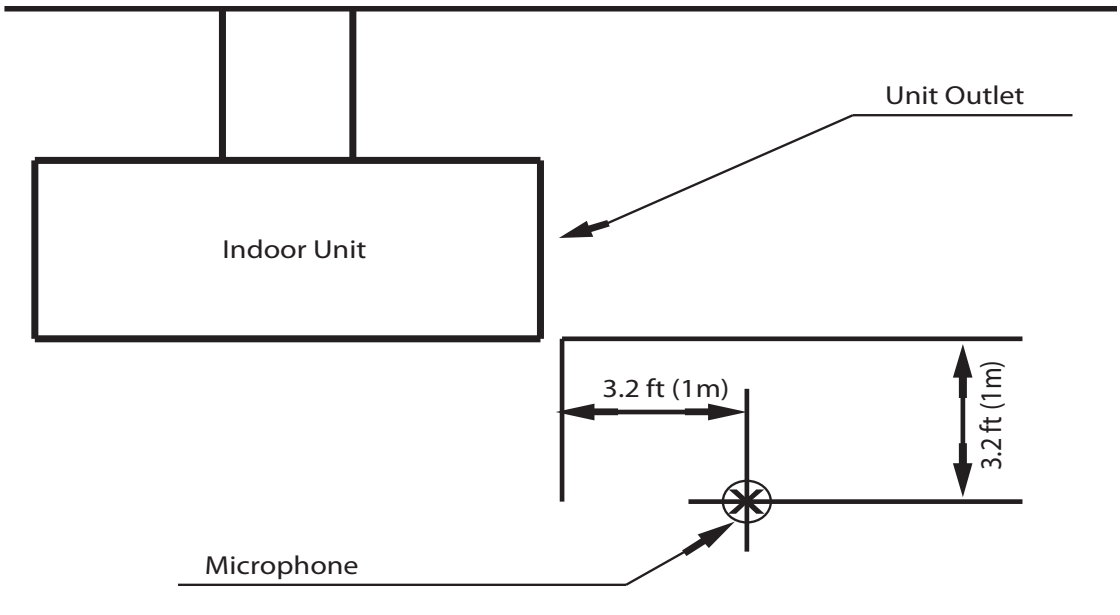

Fig. 12 —Sound Pressure Testing Method

SOUND POWER

SYSTEM SIZE		9K (208/230V)	12K (208/230V)	18K (208/230V)	24K (208/230V)	36K (208/230V)	48K (208/230V)	58K (208/230V)
Cooling Operation Indoor Sound Power	dBA (@ High CFM)	55.4	59.5	64	66.9	69.6	70.4	76.2
Heating Operation Indoor Sound Power	dBA (@ High CFM)	60.2	63.3	62.6	68.2	70.8	71.6	74.1
Cooling Operation Indoor Sound Power (Turbo Mode)	dBA (@ High CFM)	54.4	58.5	63	65.9	68.6	69.4	75.2
Heating Operation Indoor Sound Power (Turbo Mode)	dBA (@ High CFM)	59.2	62.3	61.6	67.2	69.8	70.6	73.1

FAN AND MOTOR SPECIFICATIONS

DUCTED SIZE			9K	12K	18K	24K	36K	48K	58K
			(208/230 V)	(208/230 V)	(208/230 V)	(208/230 V)	(208/230 V)	(208/230 V)	(208/230 V)
INDOOR FAN	Material		Metal	Metal	Metal	Metal	Metal	Metal	Metal
	Diameter	inch(mm)	6.1(154)	7.87(200)	7.87(200)	7.87(200)	9.06(230)	9.06(230)	8.94(227)
	Height	inch(mm)	6.22(158)	7.8(198)	7.8(198)	7.8(198)	10.39(264)	10.39(264)	9.21 (234)
	Model		ZKFN-160-8-1-2	ZKFN-160-8-1-2	ZKFN-160-8-1-2	ZKFN-160-8-1-2	ZKFN-560-8-1-1	ZKFN-560-8-1-1	ZKFN-700-8-1
INDOOR FAN MOTOR	Volts	V	310	310	310	310	310	310	310
	Type		DC	DC	DC	DC	DC	DC	DC
	Phase		3	3	3	3	3	3	3
	FLA		0.61	0.64	0.53	2.16	2.2	2.9	2.5
	Insulation Class		B	B	B	B	E	E	B
	Safe Class		IP40	IP40)	IP40	IP40	IPX0	IPX0	IPX0
	Input	W	176	176	176	176	240	240	420
	Output	W	160	160	160	160	560	560	700
	Range of Current	Amps	1.65±10%	1.65±10%	1.65±10%	1.65±10%	4.1±10%	4.1±10%	3.65±20%
	Rated Current	Amps	1.48	1.48	1.48	1.48	1.9	1.9	3.3
	Rated HP	HP	1/5	1/5	1/5	1/5	3/4	3/4	15/16
	Speed	rev/min	930/880/820	720/680/640	900/850/780	1000/900/810	900/800/700	1060/900/740	1060/910/790
	Rated RPM	rev/min	930	720	900	1000	900	1060	1060
	Max. Input	W	200	200	200	200	560	560	460

SETTING STATIC PRESSURE OR AUTOMATIC AIRFLOW

The indoor ducted units can be programmed for different static pressures settings or airflows; the factory default setting is SP1. Use the following steps to set the static pressure or Automatic Airflow using the Wired Remote Controller or the Wireless Remote Controller according to the installation conditions.

WHEN USING THE KSACN0701AAA WIRED CONTROLLER:

- **The external static pressure can be manually changed to the fan curves SP2, SP3, SP4.**
- **Choose the Automatic Airflow "AF" adjustment function to automatically identify the static pressure and regulate the airflow amount.**

Follow these instructions to configure:

1. Ensure the test run is done with a dry coil. If the coil is not dry, run the unit for 2 hours in the **FAN ONLY** mode to dry the coil.
2. Check that both the power supply wiring and the duct installation have been completed. Ensure the dampers are properly positioned. Check that the air filter is properly attached to the unit's air return side passage.
3. If there is more than one air inlet and/or outlet, adjust the dampers so that the airflow rate of each air inlet and outlet conforms to the designed airflow rate. Ensure the unit is in **FAN ONLY** mode. Press and set the Airflow Adjustment **"AF"** on the remote controller to adjust the airflow rate from **H** to **L**. Turn the indoor unit **OFF** with the Wired Controller.
4. Set the parameters for airflow adjustment.

   When the system is **OFF**, perform the following steps:

   a. Press and hold **COPY** for approximately 4 seconds
   b. Press "+" or "-" to scroll through the menu to select either **SP** or **AF**.

NOTE: T1, T2, T2b, T3, T4 are sub-menus for thermistors. DO NOT select to set the external static pressure.

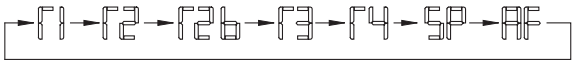

Fig. 13 — Wired Controller Menu Selection

1. If setting the external static pressure manually, select **SP** and press **CONFIRM**. Select the **SP** number (SP1, SP2, SP3, SP4 − see Table "FAN PERFORMANCES AT VARYING STATIC PRESSURES" on page 15 and curves (Figs. 15 through 42)). Power down the unit to lock in the selection.
2. If choosing the **AUTOMATIC AIRFLOW ADJUSTMENT** function, select **AF** and press **CONFIRM**. The system starts the fan for the **AUTOMATIC AIRFLOW ADJUSTMENT**. The **ON** indicator flashes when the fan runs during the **AUTOMATIC AIRFLOW ADJUSTMENT**. After 3 to 6 minutes, the system stops operating once the **AUTOMATIC AIRFLOW ADJUSTMENT** is complete.

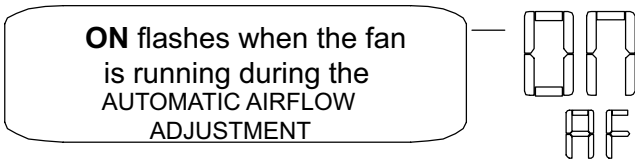

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Fig. 14 —Automatic Airflow ON signal

NOTE: The external static pressure can also be selected using the wireless remote controller RG10B(B1)/BGEFU1), included with the indoor unit, by pointing it toward the indoor unit's Infrared Receiver typically located inside the control box. Refer to the wireless remote controller service manual for further instructions.

CAUTION

Do not use the **AUTOMATIC AIRFLOW ADJUSTMENT** with the remote control if using booster fans, an outdoor air processing unit, or a HRV via duct. If the ductwork or static pressure have been changed, review "SETTING STATIC PRESSURE OR AUTOMATIC AIRFLOW" on page 14 and follow steps 3 and 4.

WHEN USING THE 24V INTERFACE KSAIC**

The wireless remote controller, wired controllers KSACN** and Wi-Fi kits are disabled. Since a wired controller is required to setup the static pressure of the indoor ducted units, the 24V interface must be temporarily bypassed using the steps below:

1. Turn off the power to the unit
2. On the 24V interface, disconnect the plugs from the CN11 (to Outdoor) and CN12 (to Indoor) connections.
3. **Sizes:**
   a. **For sizes 9K-24K only:** Add a jumper between the indoor S terminal to the outdoor S terminal.
   b. **For sizes 36K-58K only:** Disconnect S1 and S2 from the 24V interface (CN8 and CN9) and splice together **S1** from outdoor to **S1** from indoor and **S2** from outdoor to **S2** from indoor.
4. Connect the Wired Controller (**KSACN0701AAA**) and follow the external static pressure setup.
5. Once the static pressure is adjusted, disconnect the wired controller
6. **Sizes**:
   a. **For sizes 9K-24K only:** Remove the S jumper from the terminal block.
   b. **For sizes 36K-58K only:** Remove the splice and reconnect **S1** and **S2** back to the 24V interface accordingly.
7. Reconnect the plugs back to CN11 (to outdoor) and CN12 (to indoor) accordingly.
8. Restore power to the unit.

NOTE: When a system is using the 24V interface, the indoor unit's fan speed defaults to AUTO with the indoor unit's default logic.

FAN PERFORMANCES AT VARYING STATIC PRESSURES

SIZE		STATIC PRESSURE AT RATED POINT				STATIC PRESSURE RANGE
	UNITS	SP1	SP2	SP3	SP4	
9	In.WG	0.076	0.224	0.376	0.524	0-0.6
	Pa	19	56	94	131	0-150
12	In.WG	0.076	0.224	0.376	0.524	0-0.6
	Pa	19	56	94	131	0-150
18	In.WG	0.1	0.3	0.5	0.7	0-0.8
	Pa	25	75	125	175	0-200
24	In.WG	0.1	0.3	0.5	0.7s	0-0.8
	Pa	25	75	125	175	0-200
36	In.WG	0.1	0.3	0.5	0.7	0-0.8
	Pa	25	75	125	175	0-200
48	In.WG	0.1	0.3	0.5	0.7	0-0.8
	Pa	25	75	125	175	0-200
58	In.WG	0.1	0.3	0.5	0.7	0-0.8
	Pa	25	75	125	175	0-200
Factory Setting		√				

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

FAN PERFORMANCES AT VARYING STATIC PRESSURES (CONT)

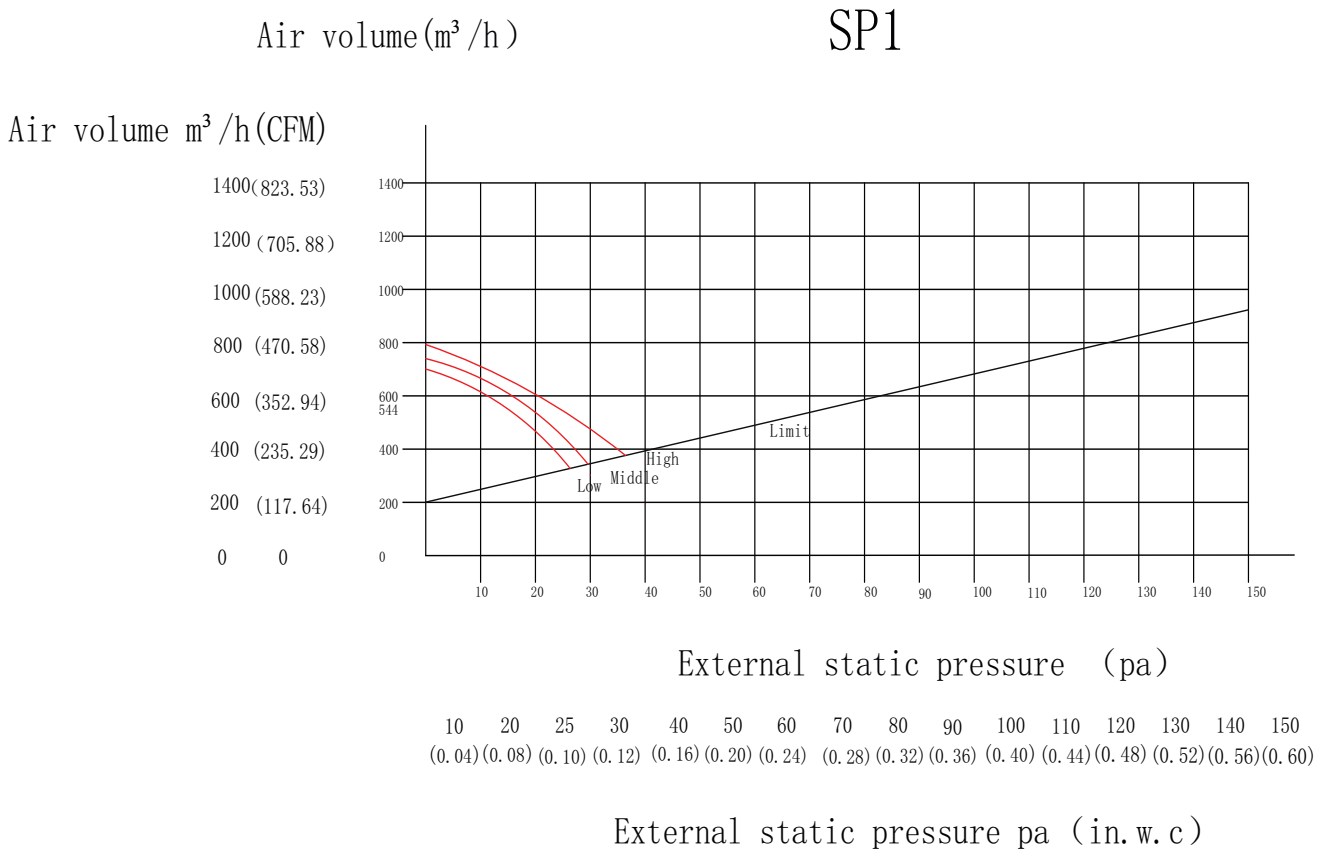


Fig. 15 —Size 9 (SP1)

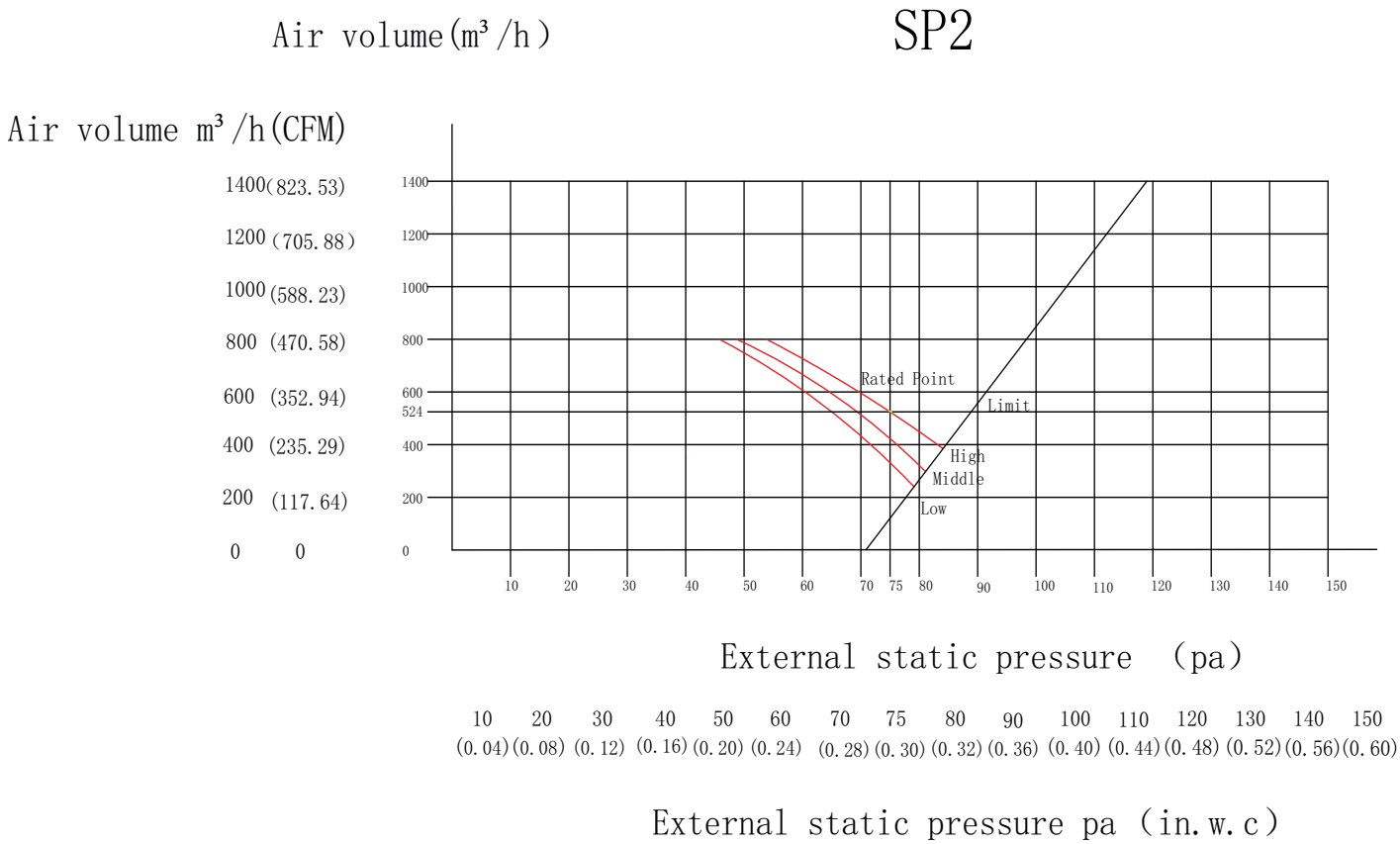


Fig. 16 — Size 9 (SP2)

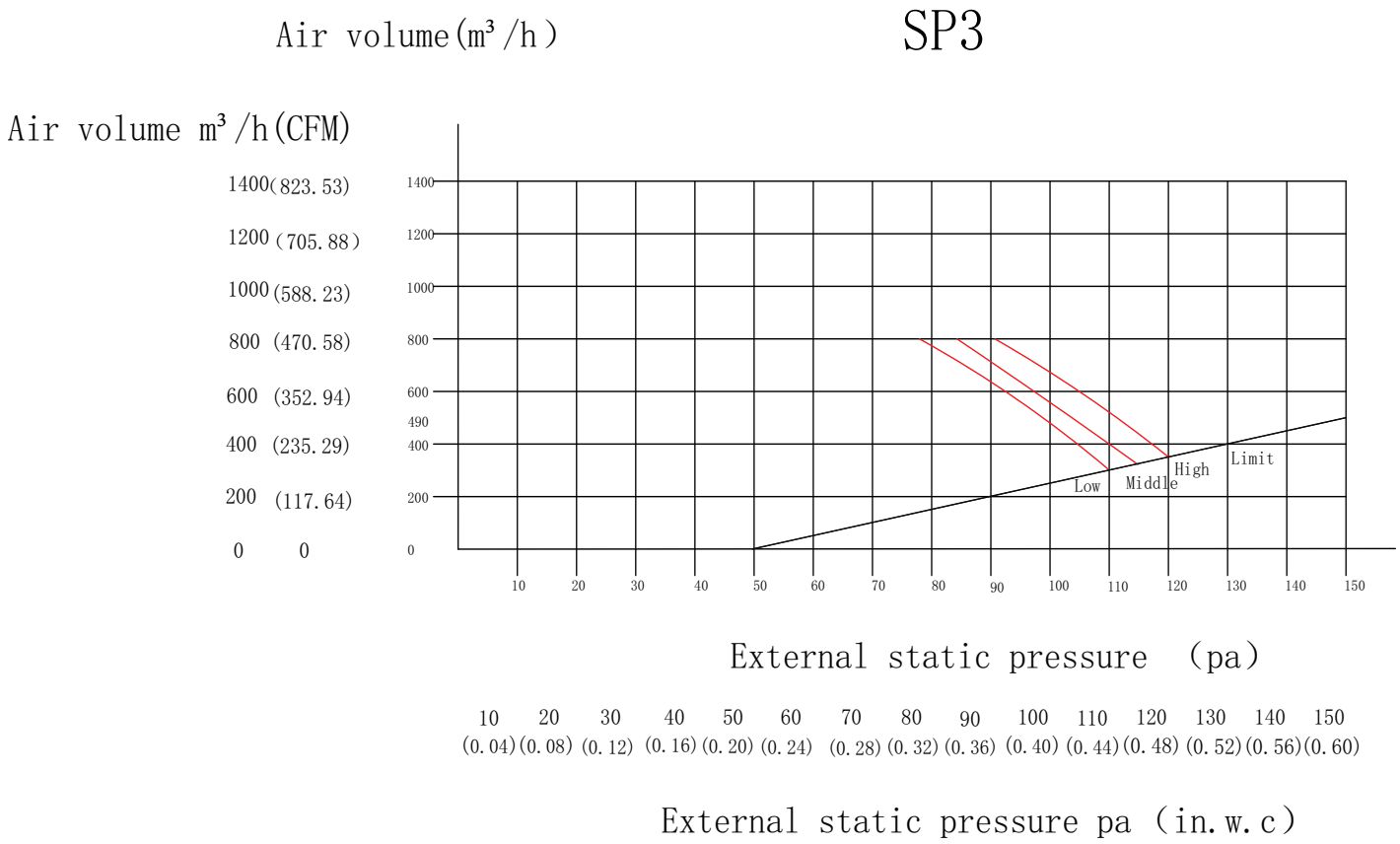


Fig. 17 — Size 9 (SP3)

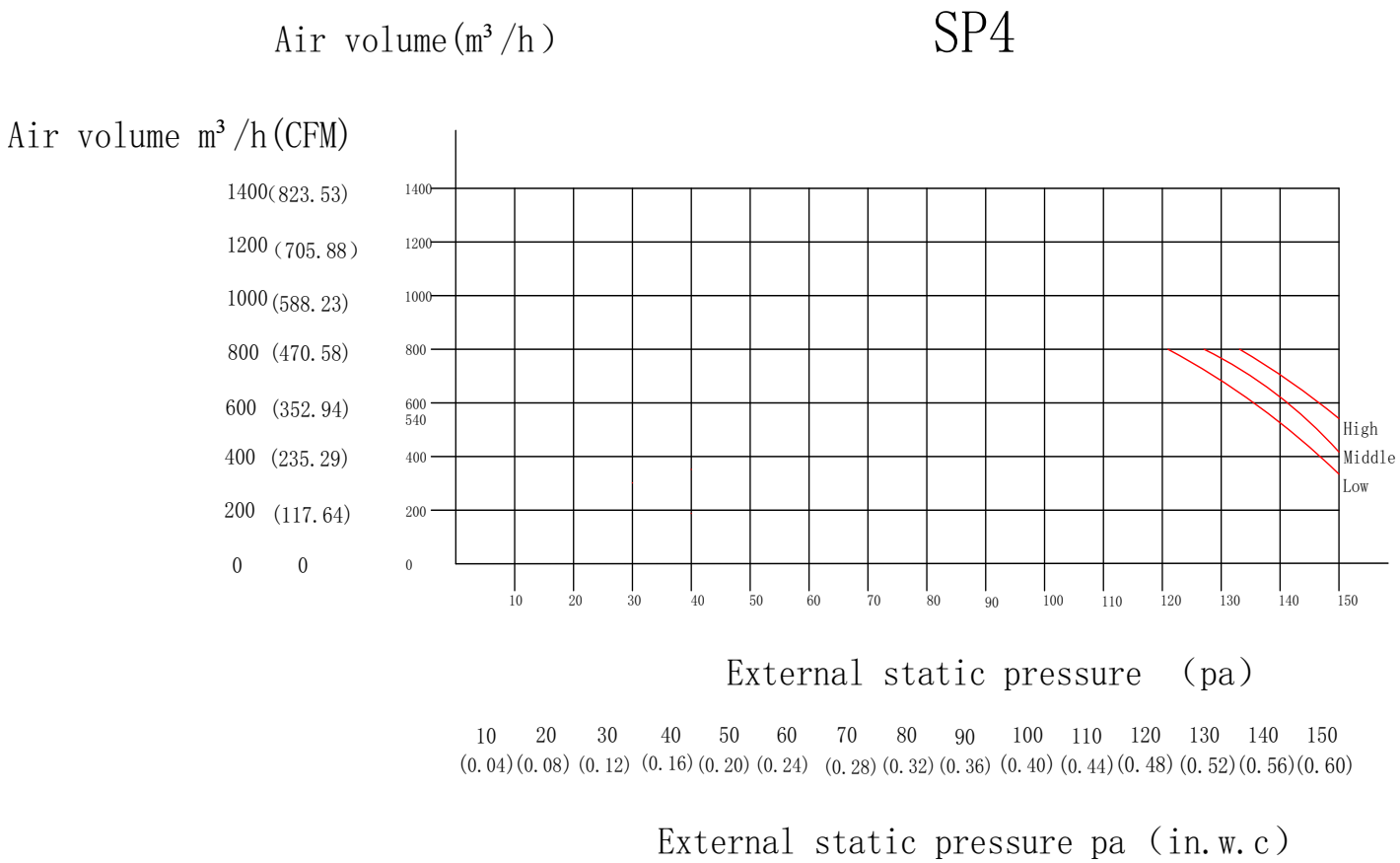


Fig. 18 —Size 9 (SP4)

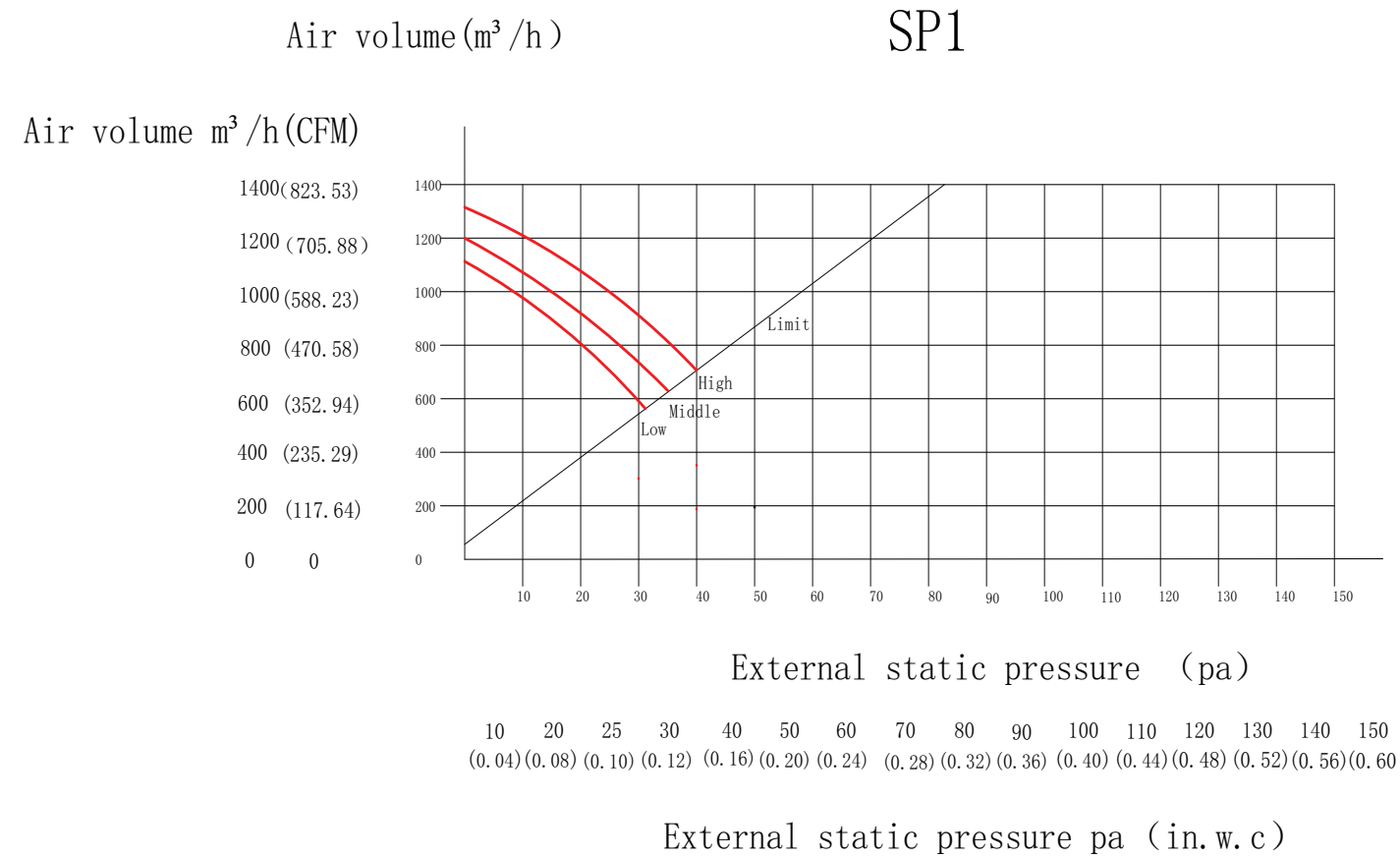


Fig. 19 —Size 12 (SP1)

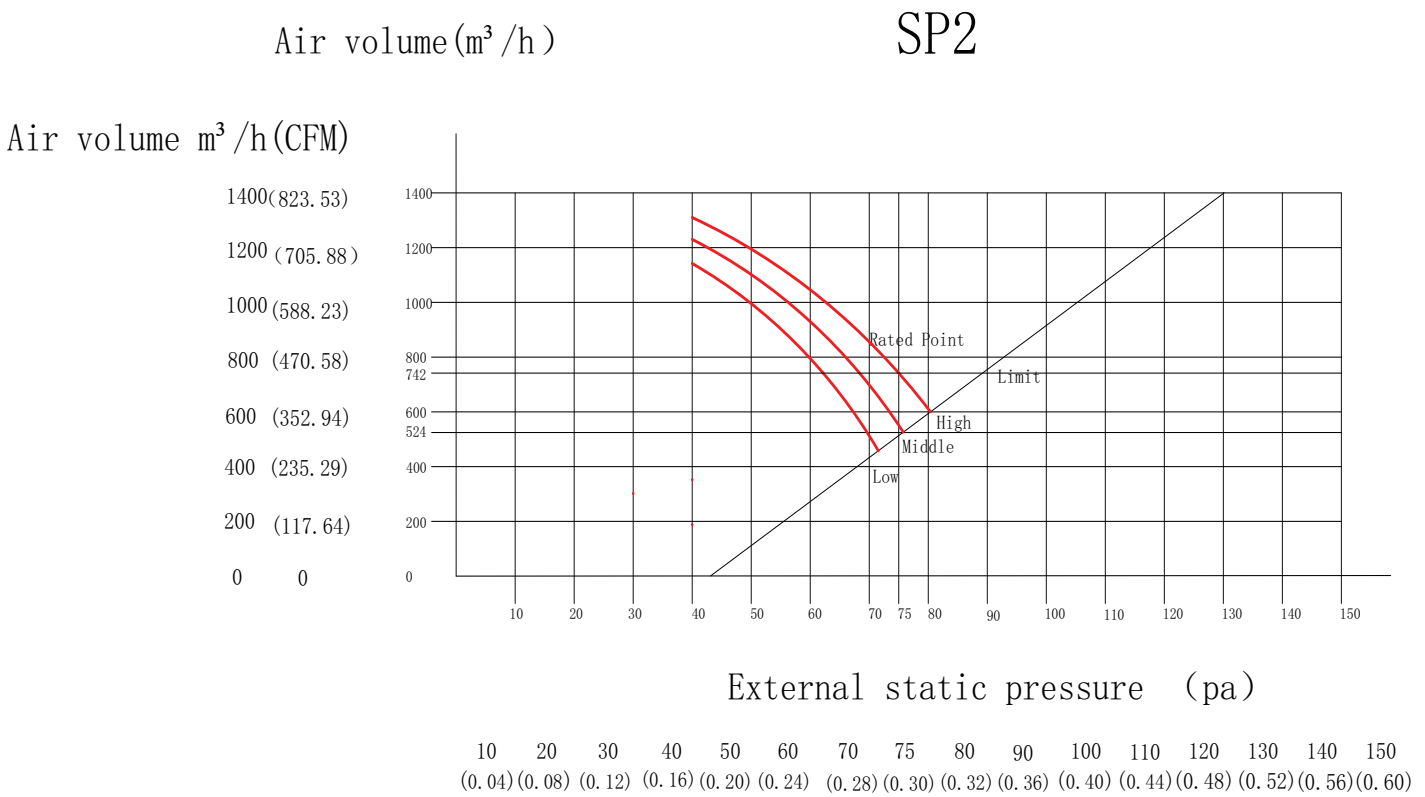


Fig. 20 —Size 12 (SP2)

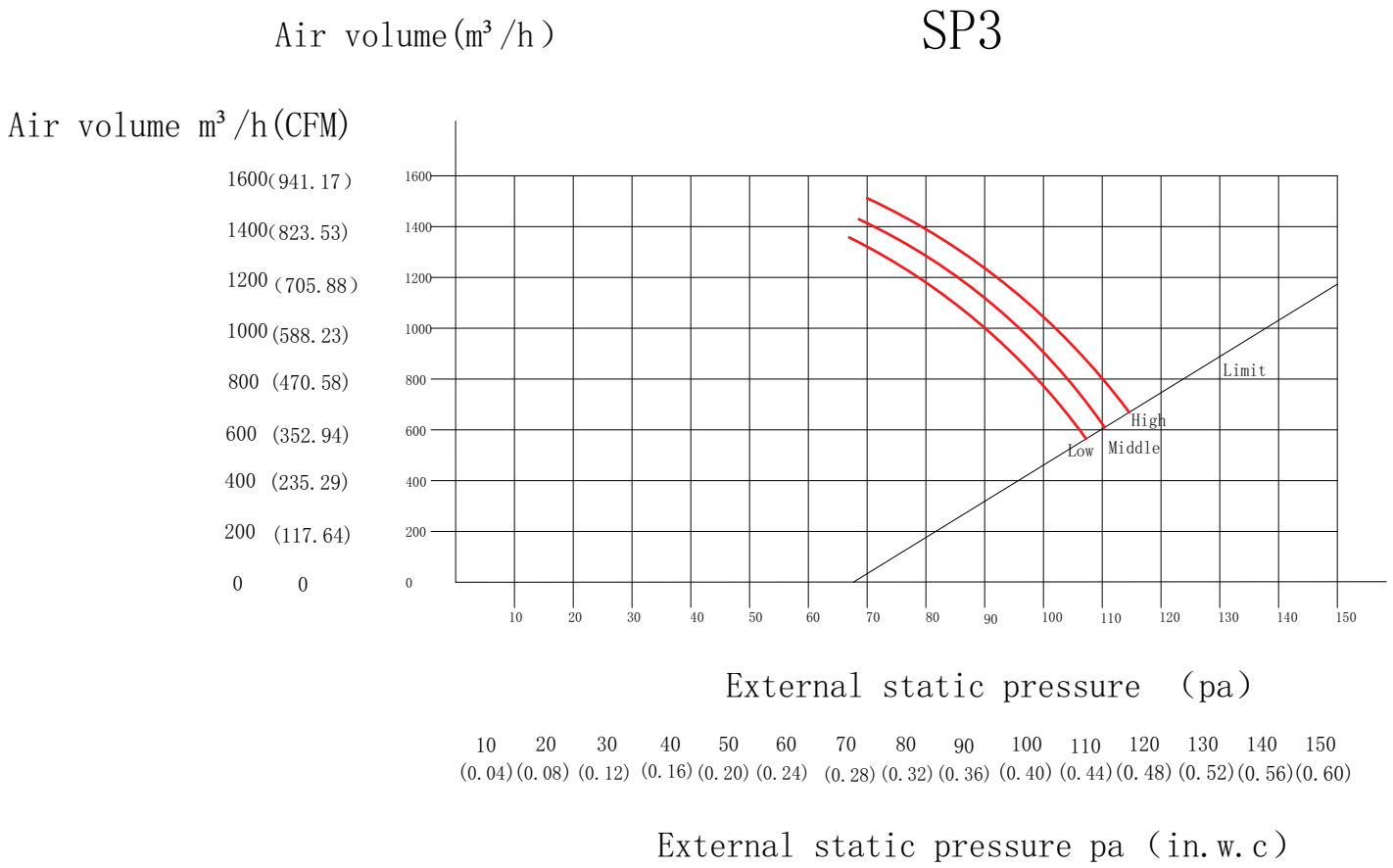


Fig. 21 —Size 12 (SP3)

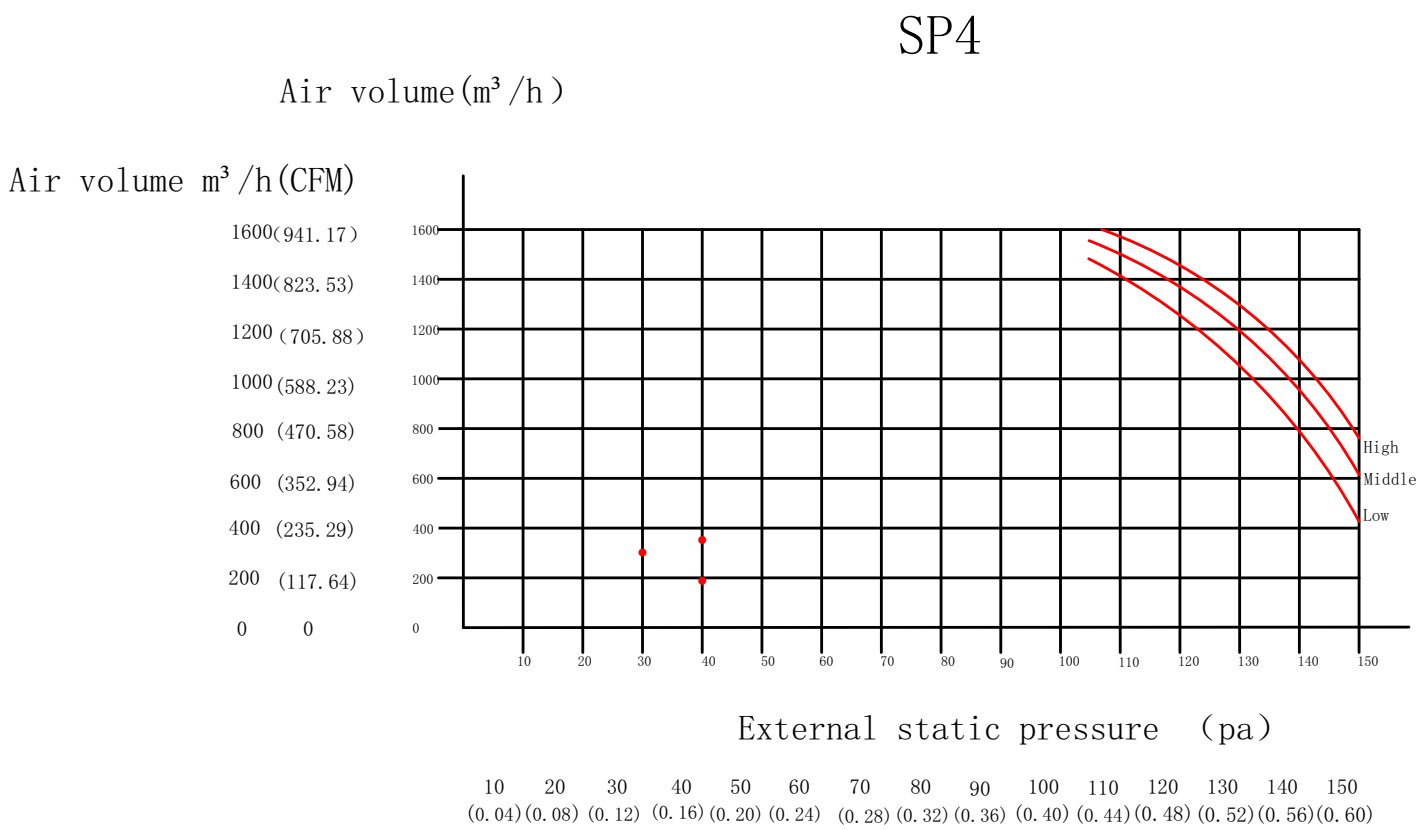


Fig. 22 —Size 12 (SP4)

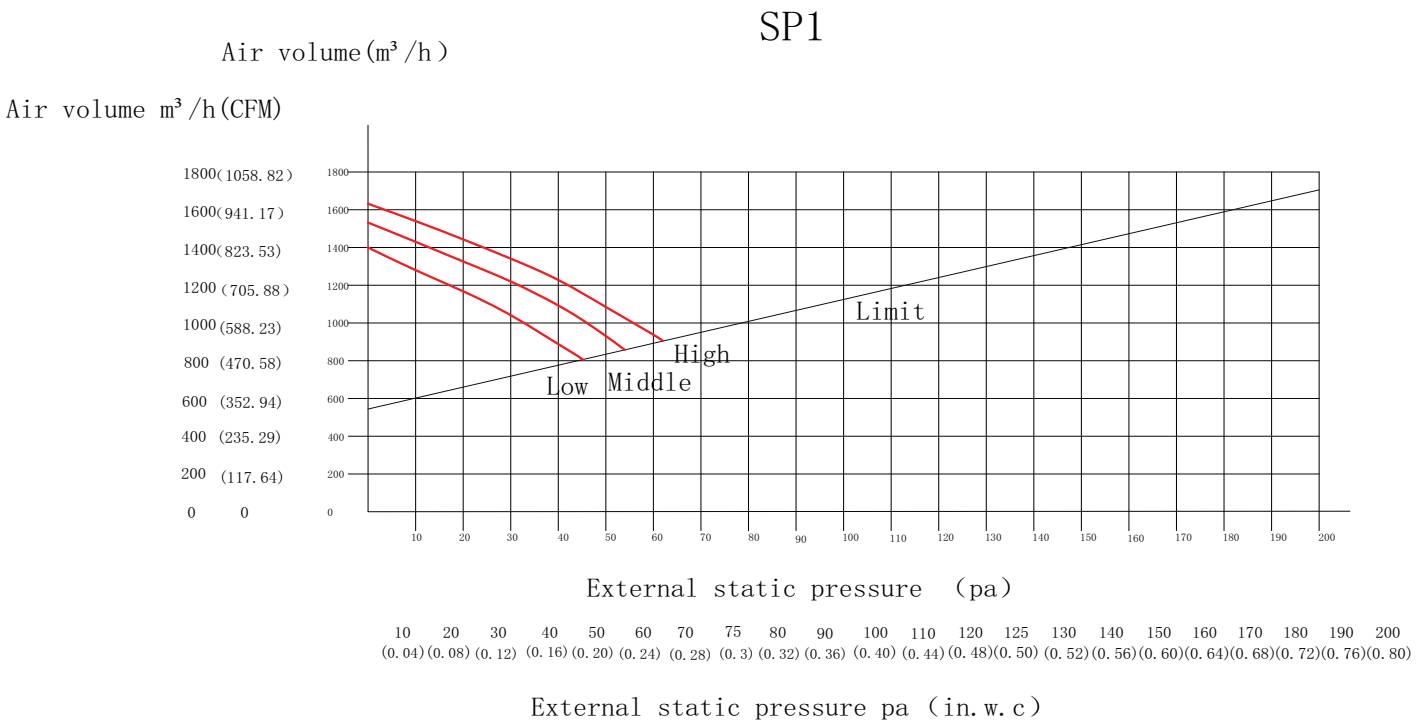


Fig. 23 —Size 18 (SP1)

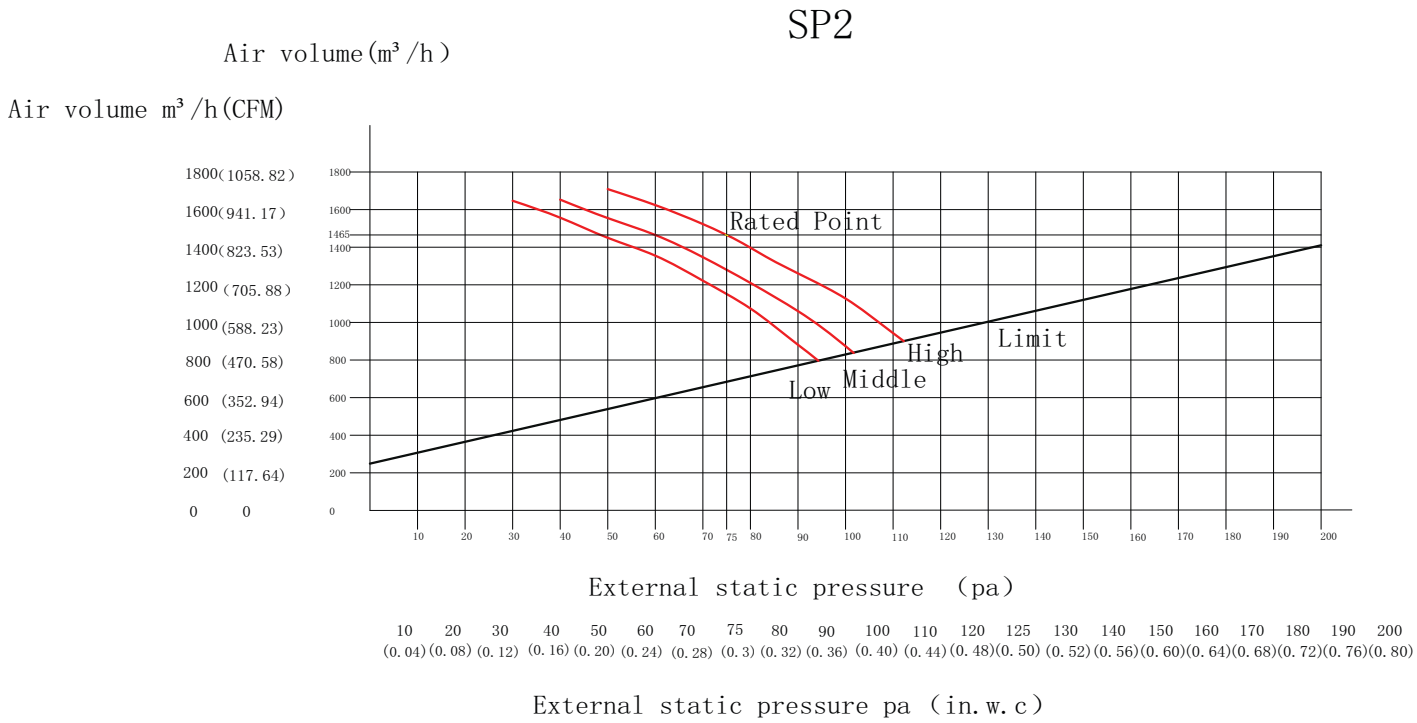


Fig. 24 — Size 18 (SP2)

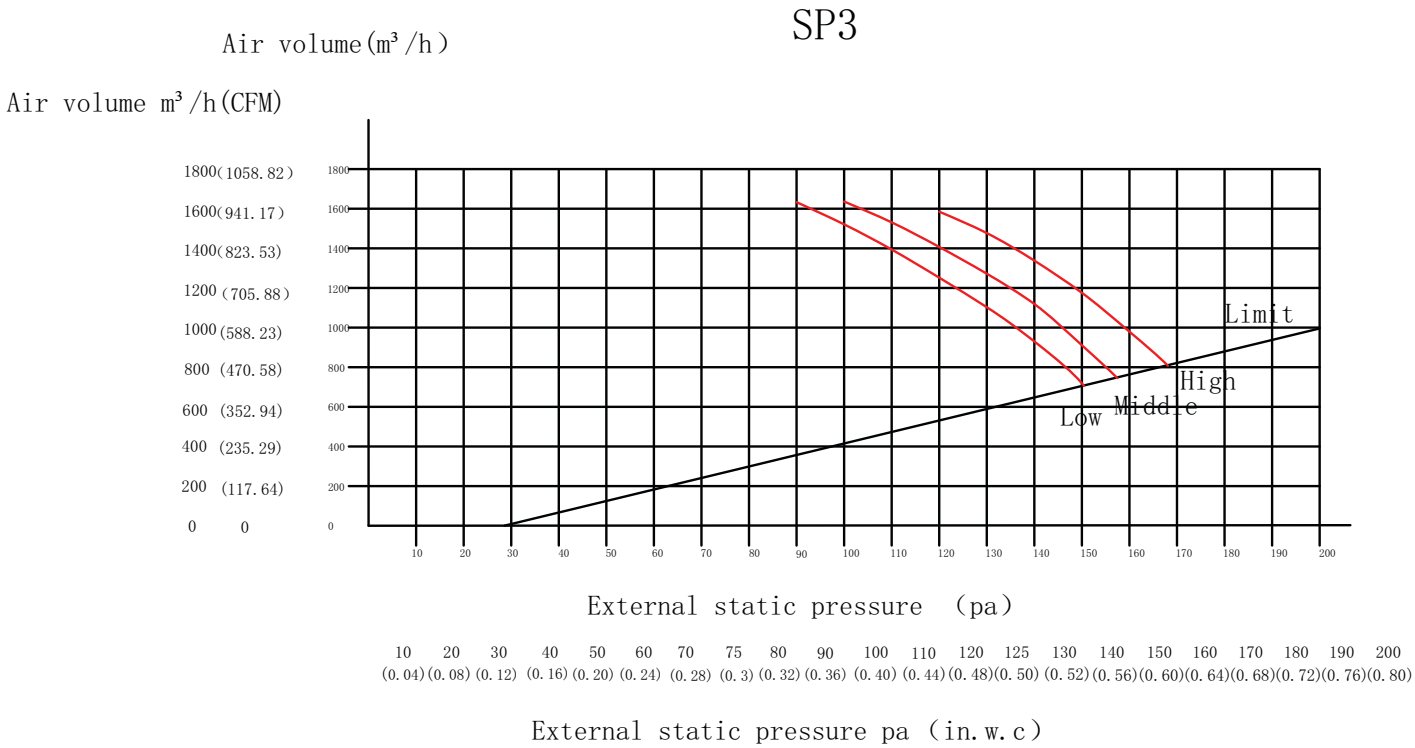


Fig. 25 —Size 18 (SP3)

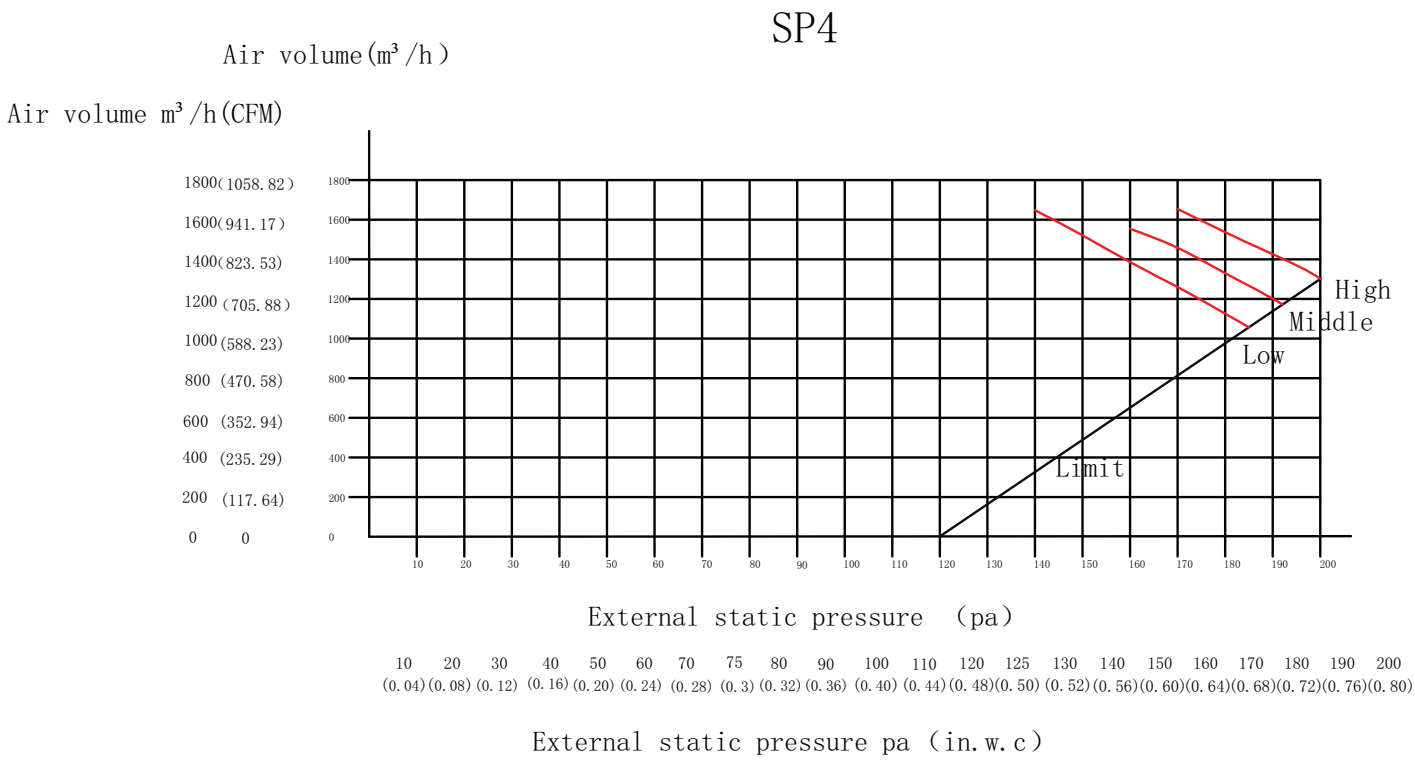


Fig. 26 — Size 18 (SP4)

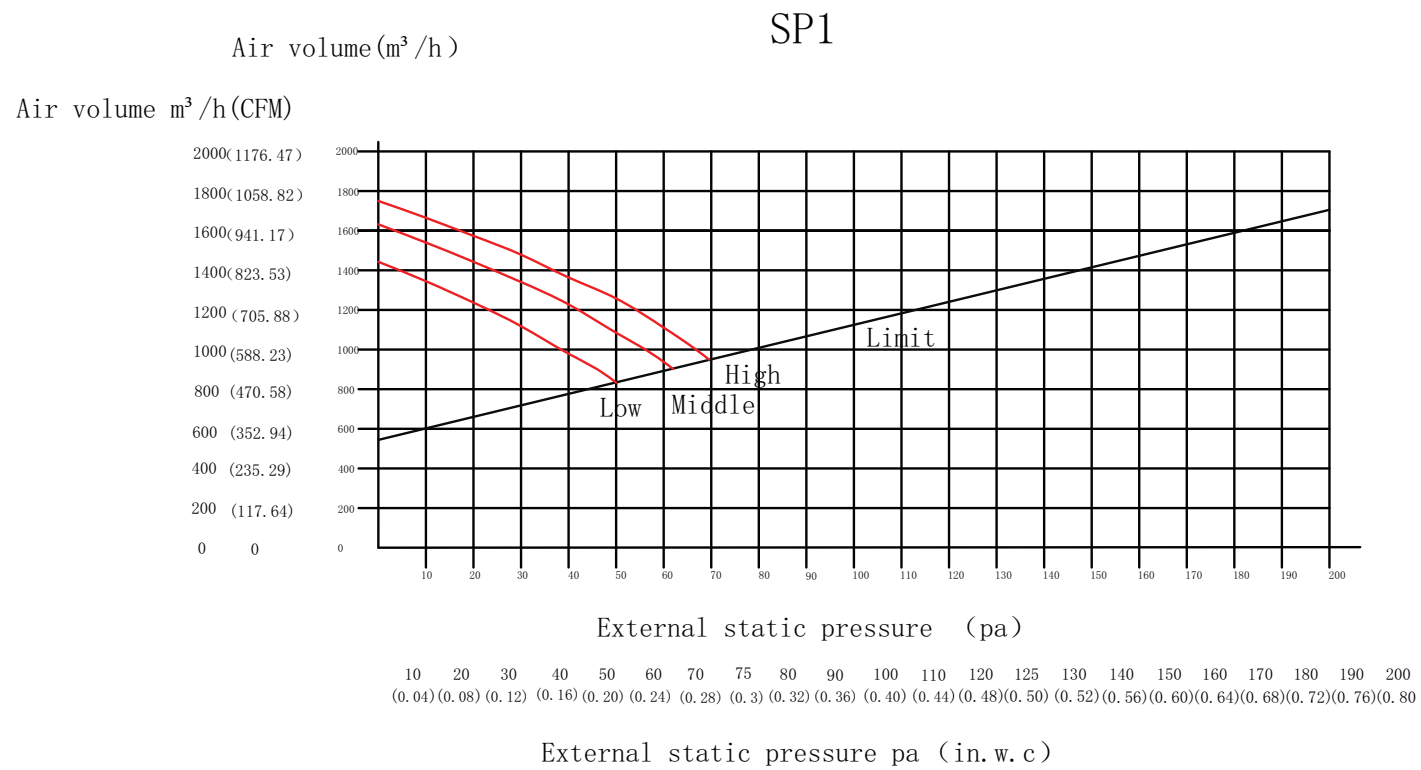


Fig. 27 —Size 24 (SP1)

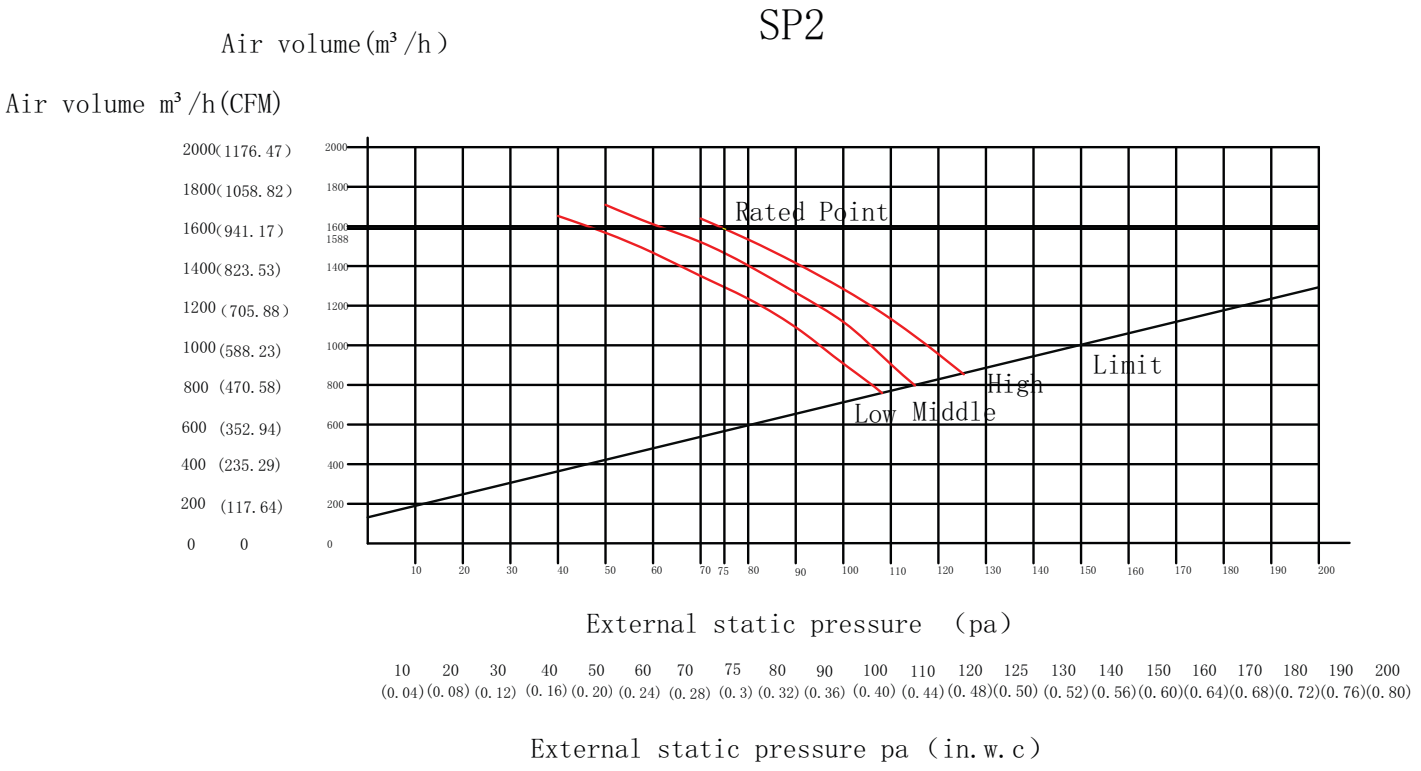


Fig. 28 — Size 24 (SP2)

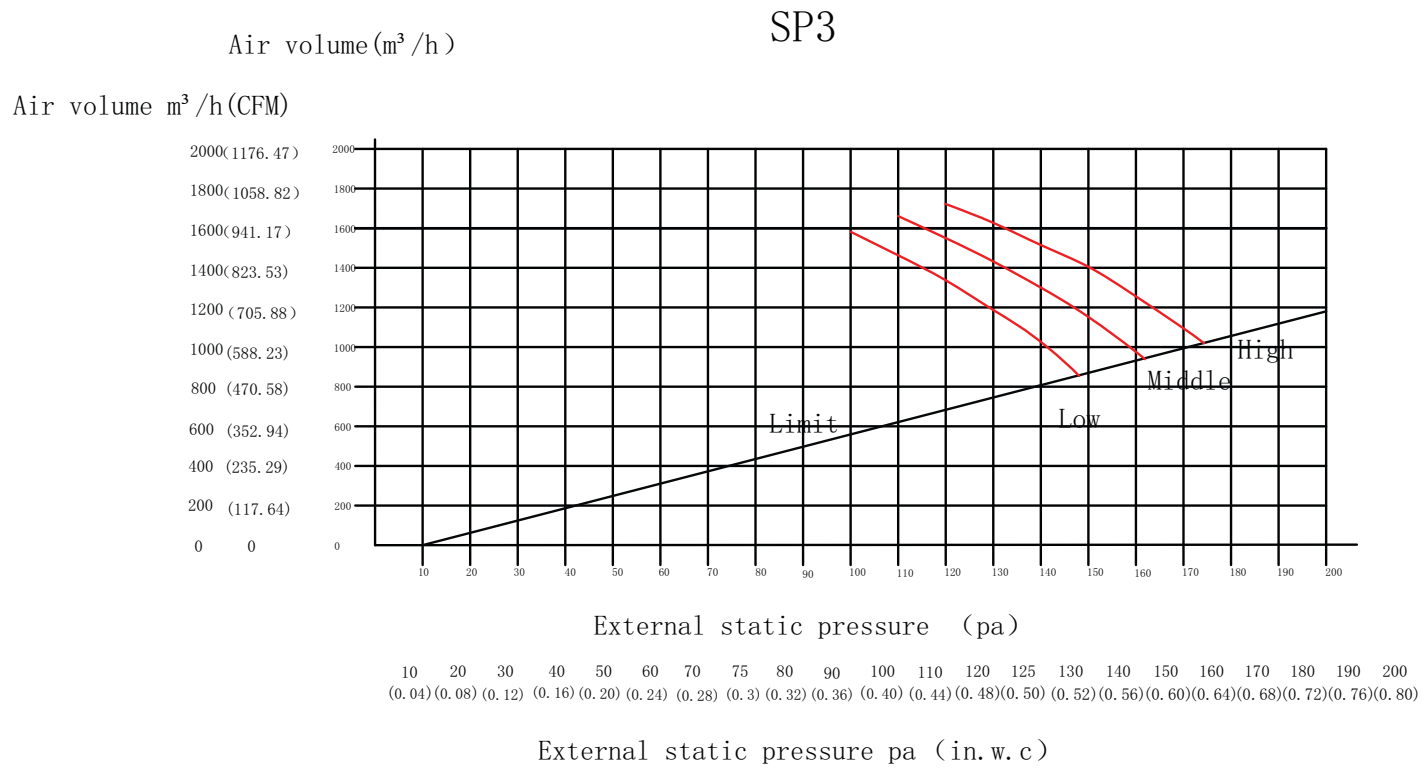


Fig. 29 — Size 24 (SP3)

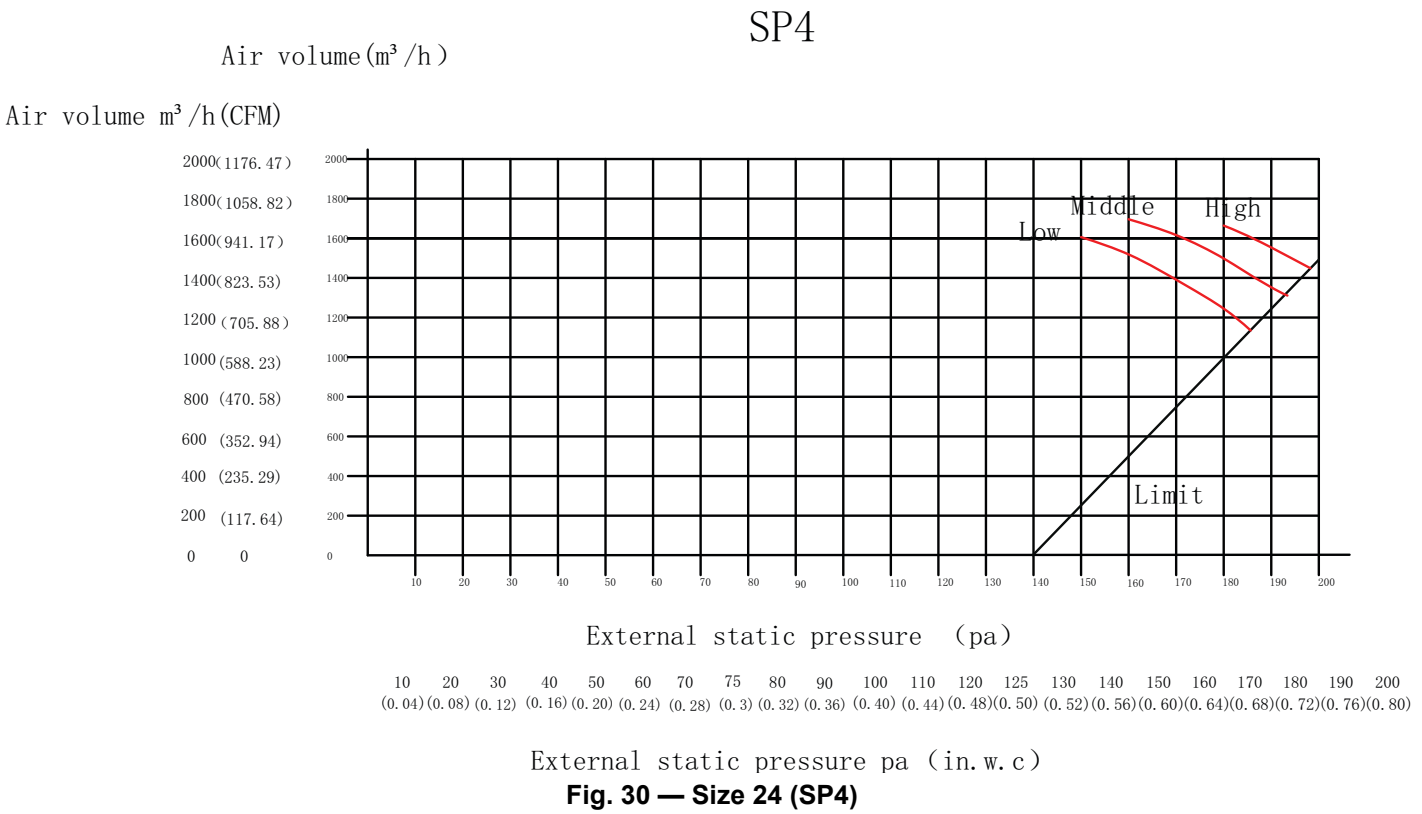


Fig. 30 — Size 24 (SP4)

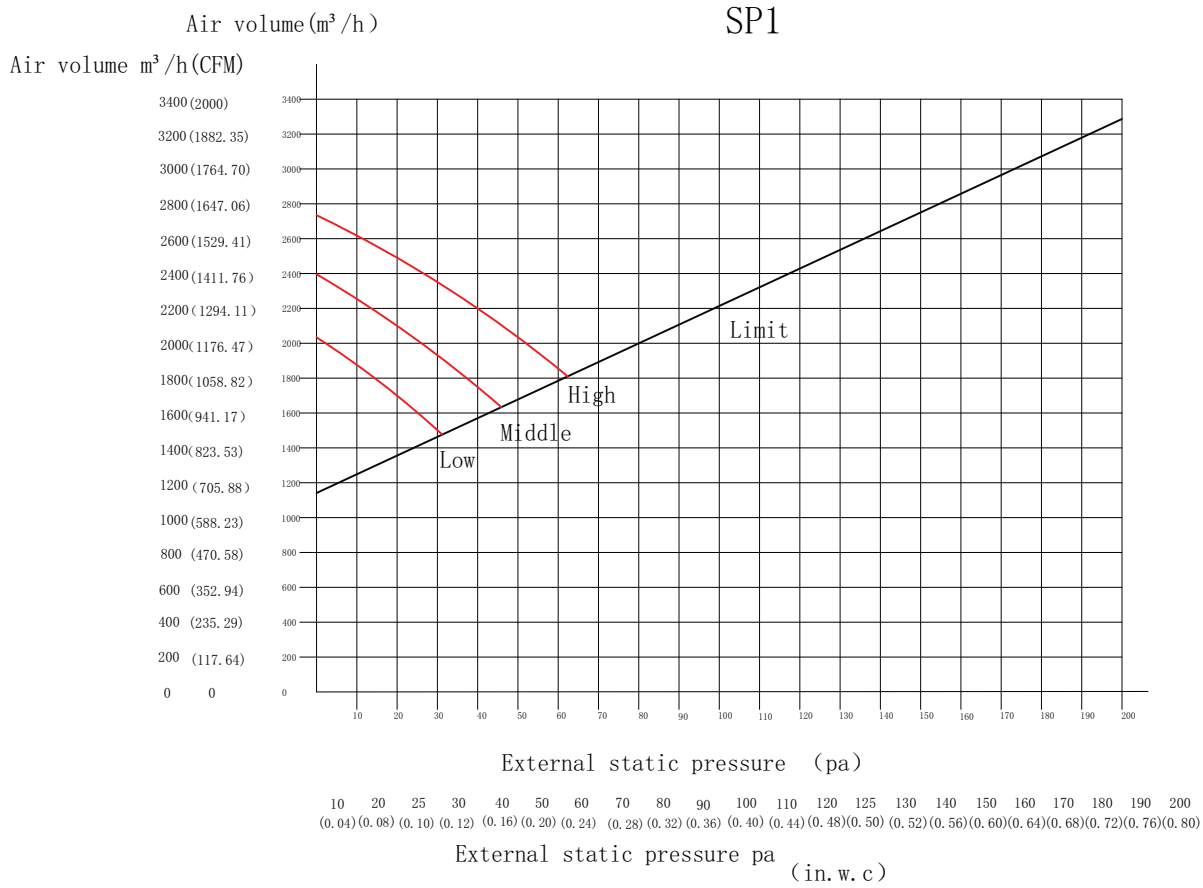


Fig. 31 — Size 36 (SP1)

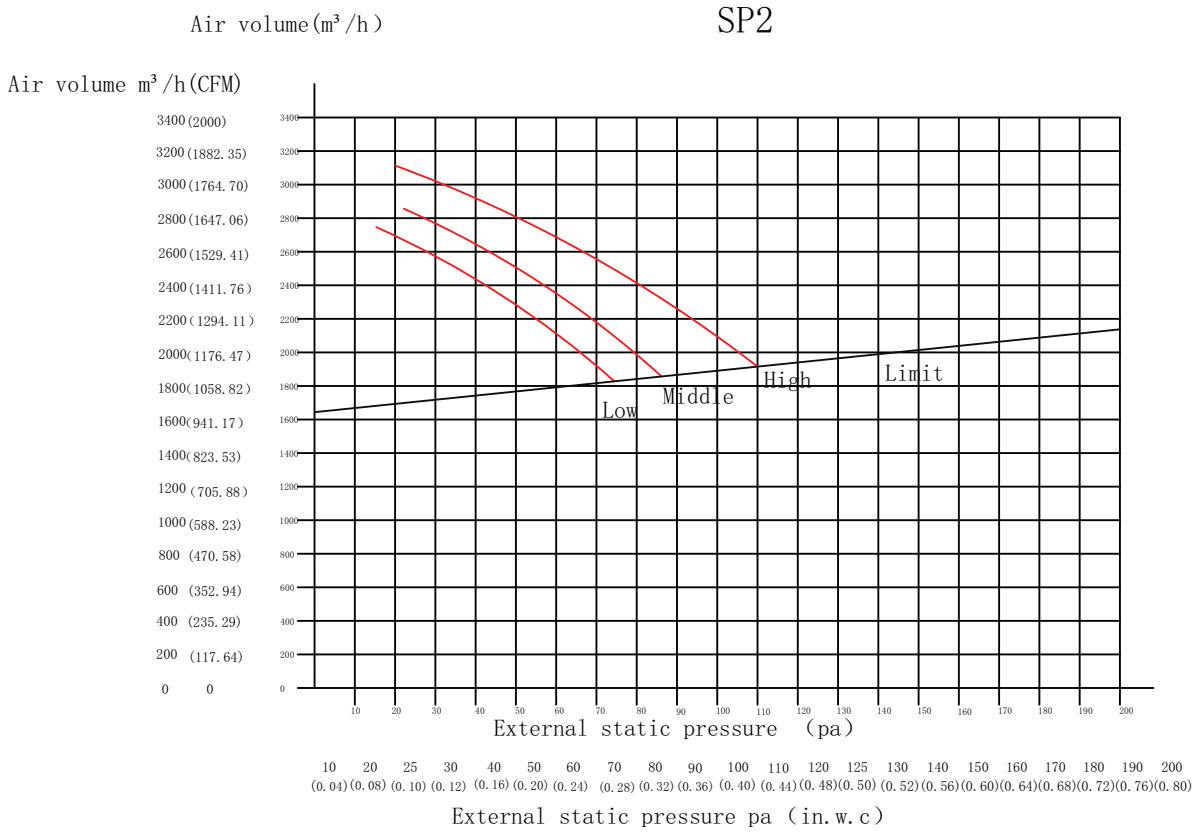


Fig. 32 — Size 36 (SP2)

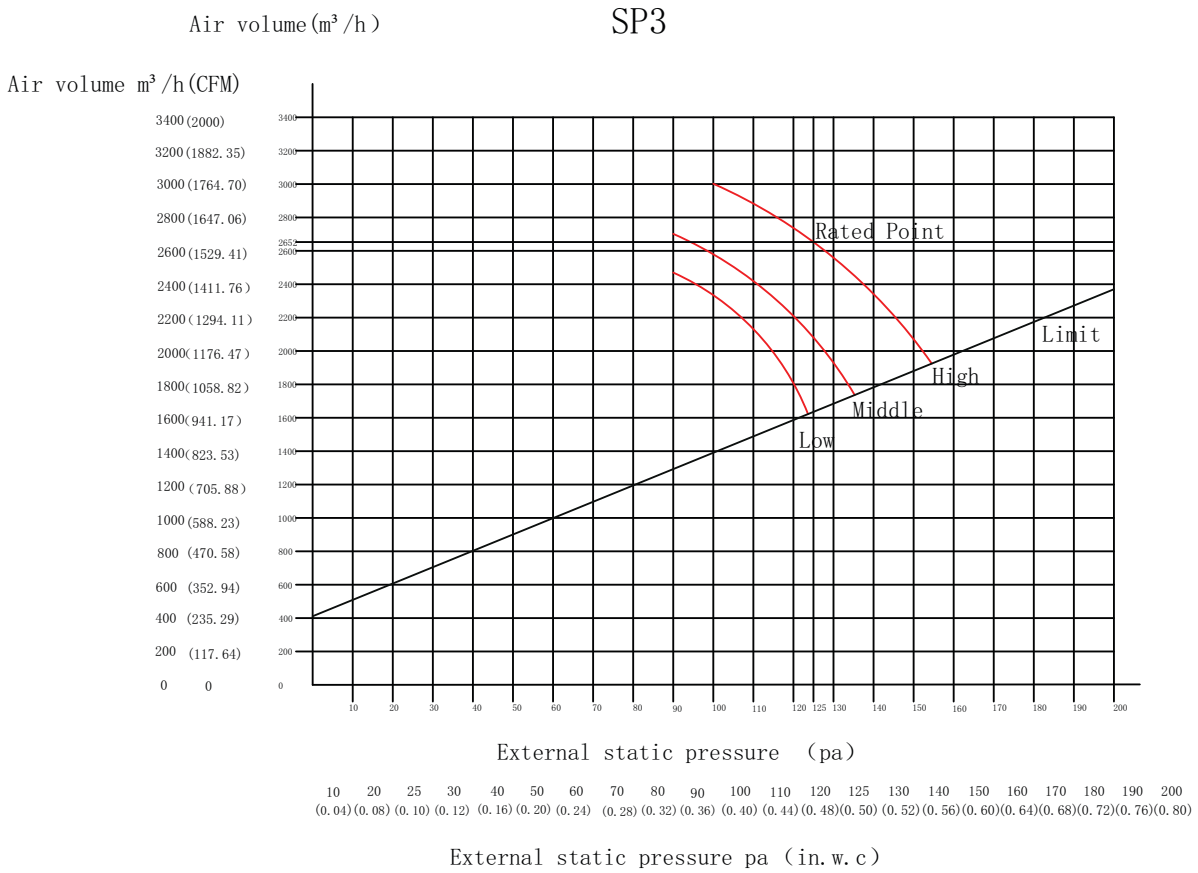
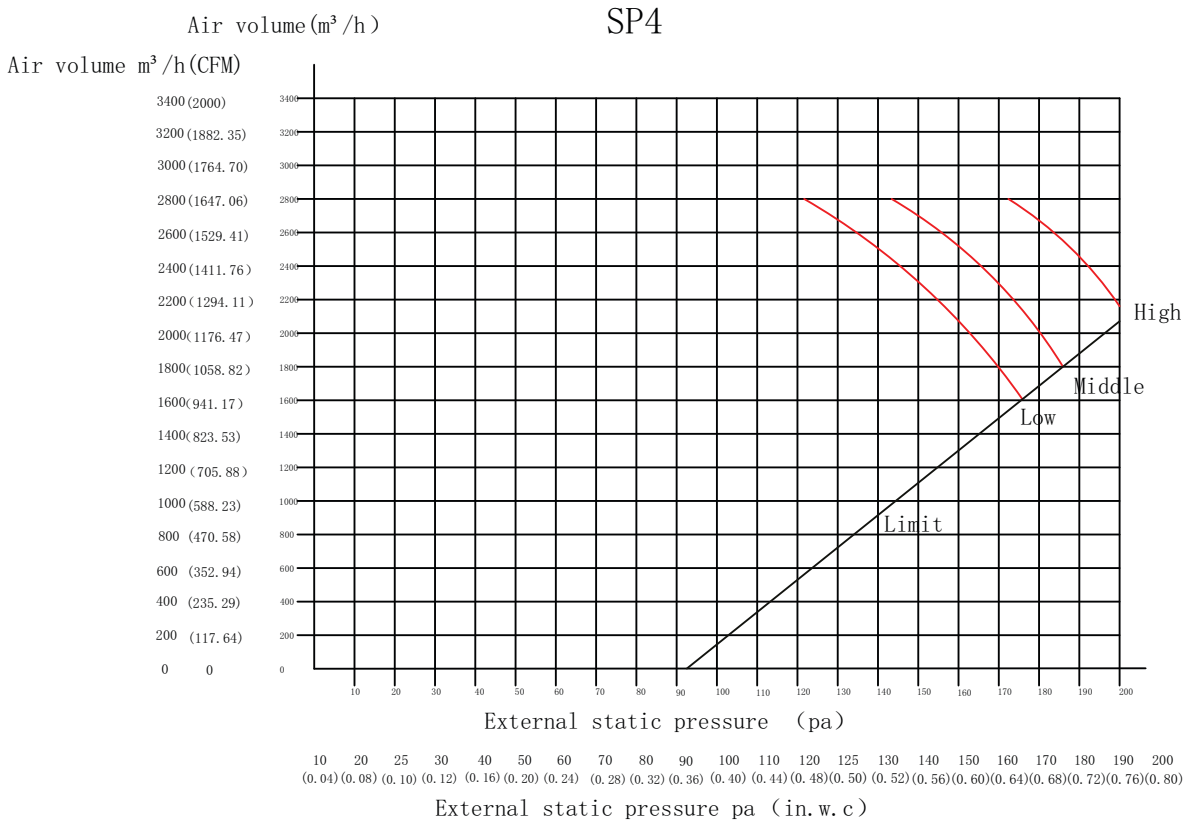


Fig. 33 — Size 36 (SP3)



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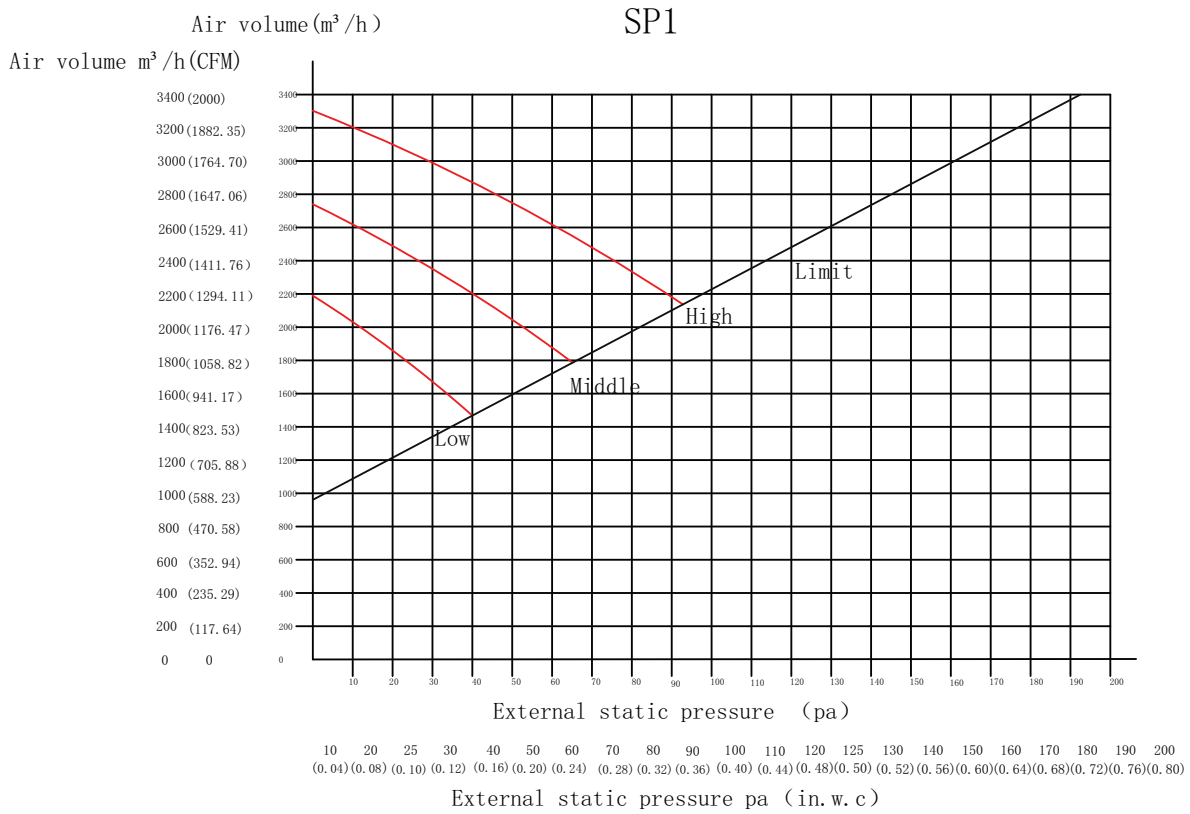

Fig. 35 — Size 48 (SP1)

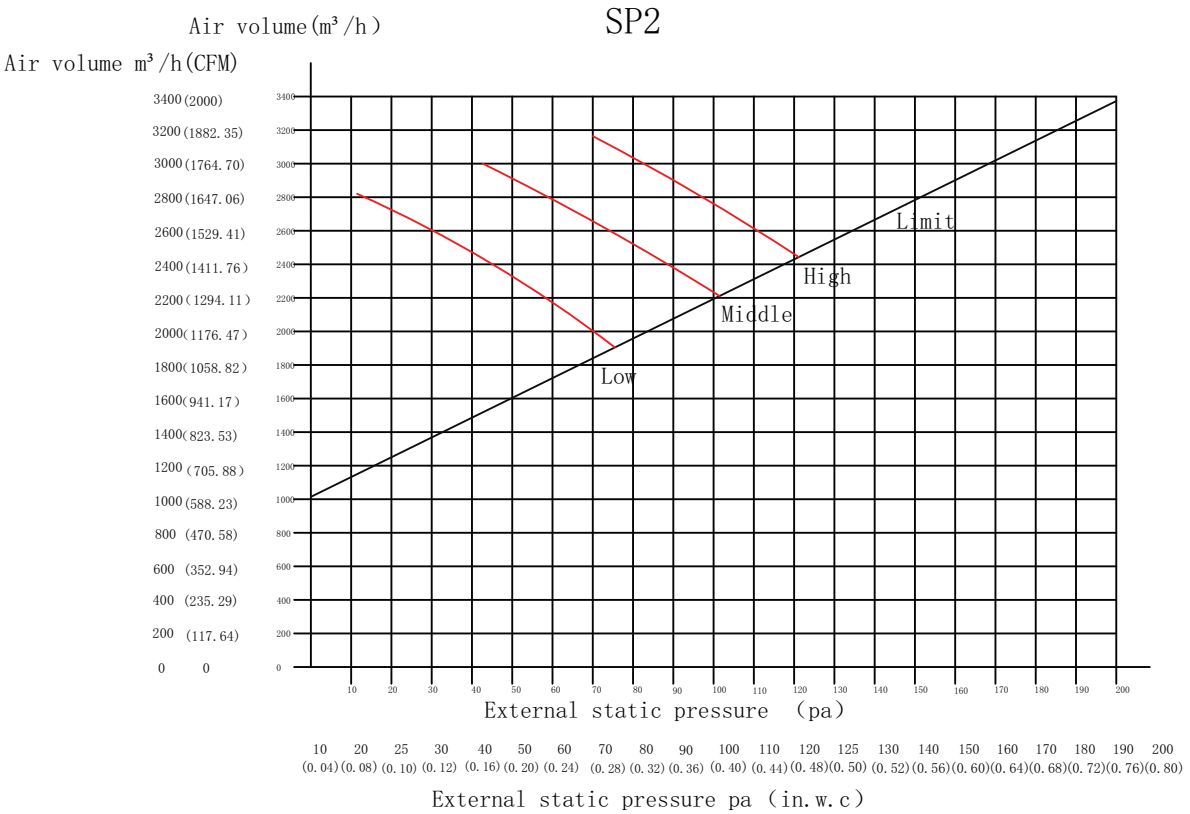

Fig. 36 — Size 48 (SP2)

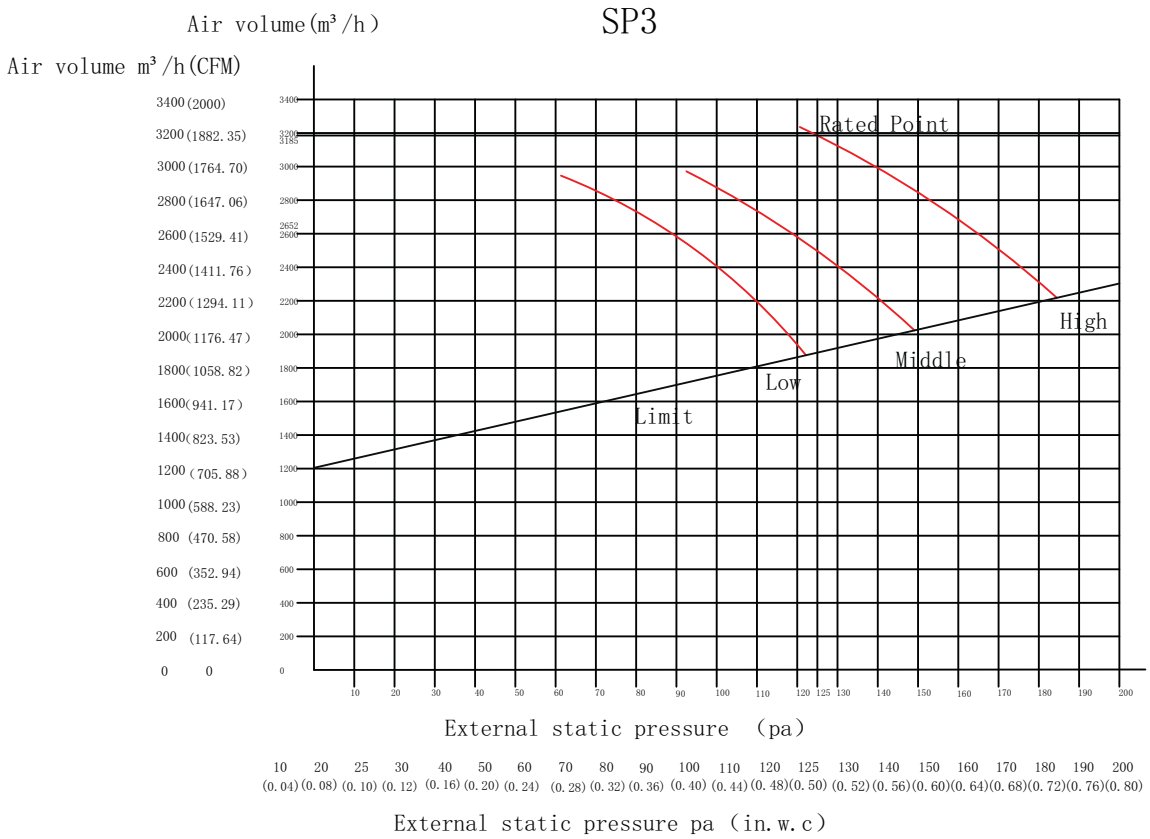

Fig. 37 — Size 48 (SP3)

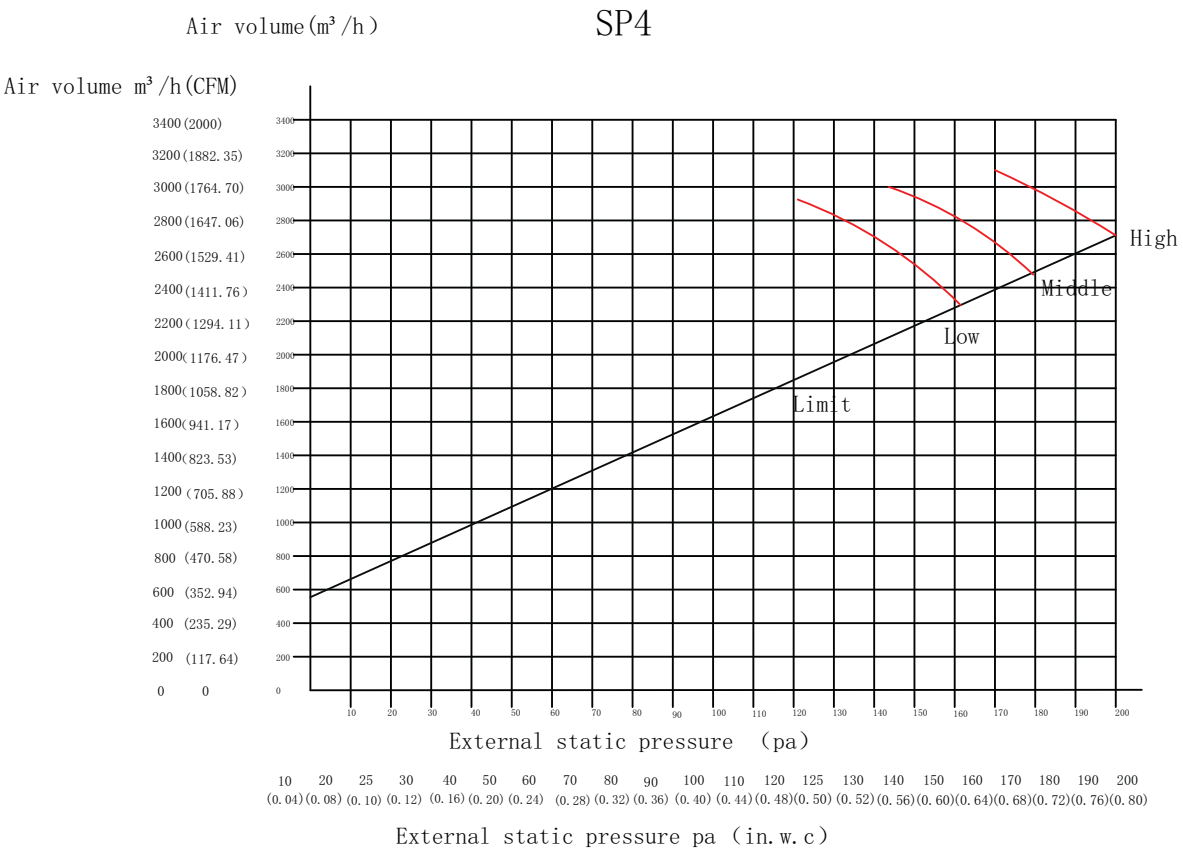

Fig. 38 — Size 48 (SP4)

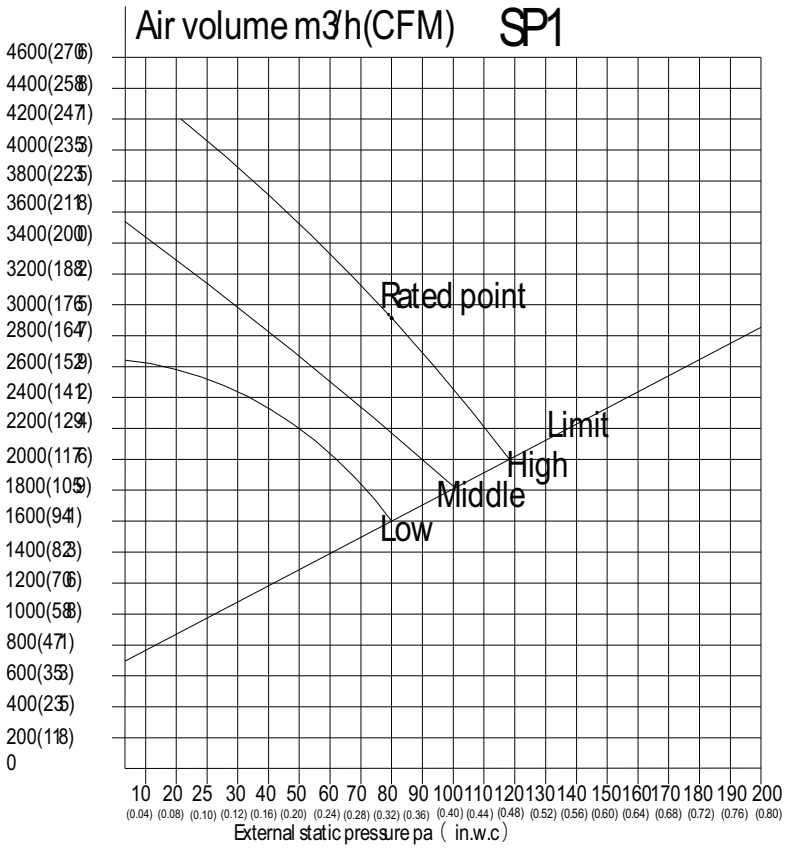

Fig. 39 — Size 58 (SP1)

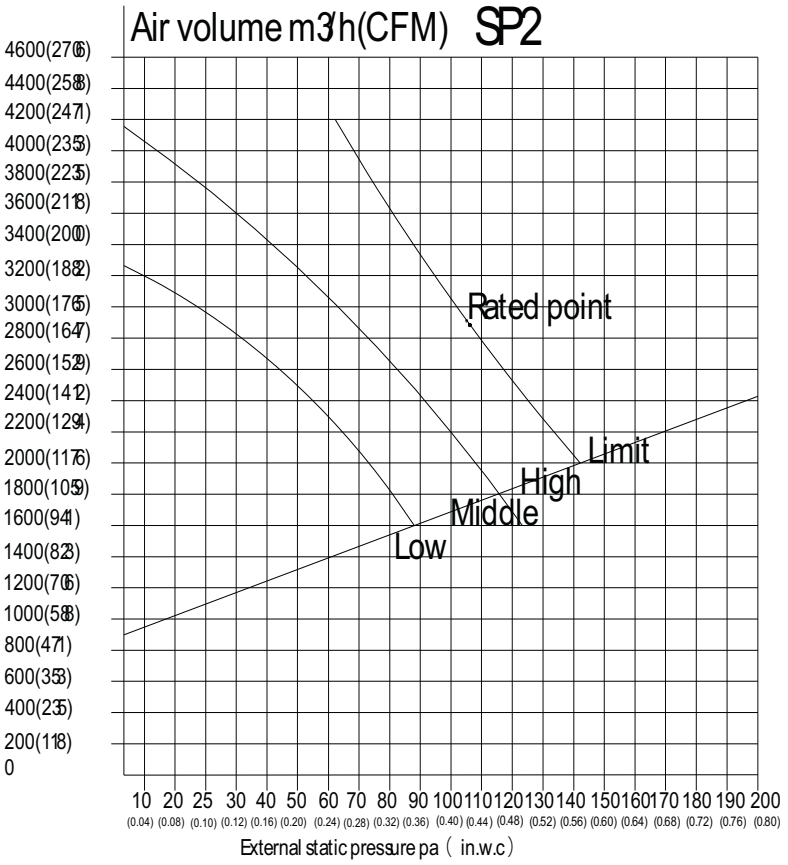

Fig. 40 — Size 58 (SP2)

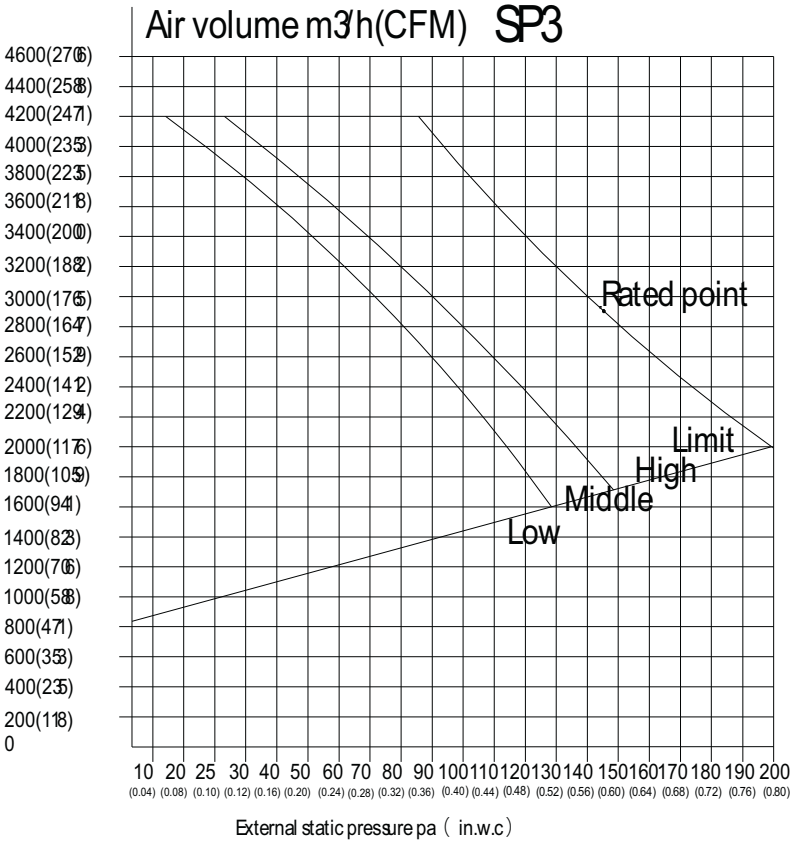

Fig. 41 — Size 58 (SP3)

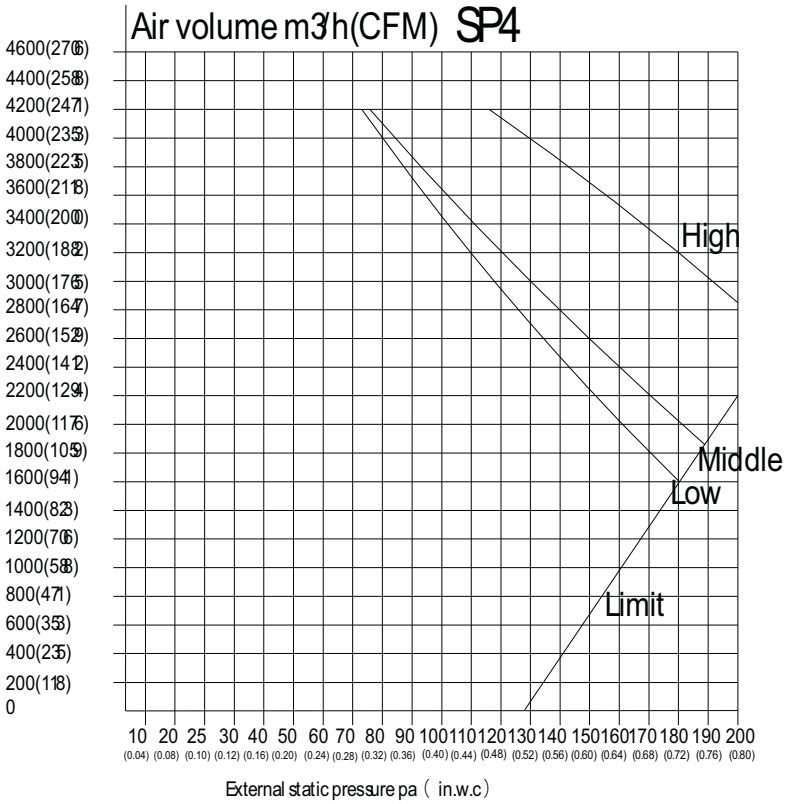

Fig. 42 — Size 58 (SP4)

WIRING DIAGRAMS

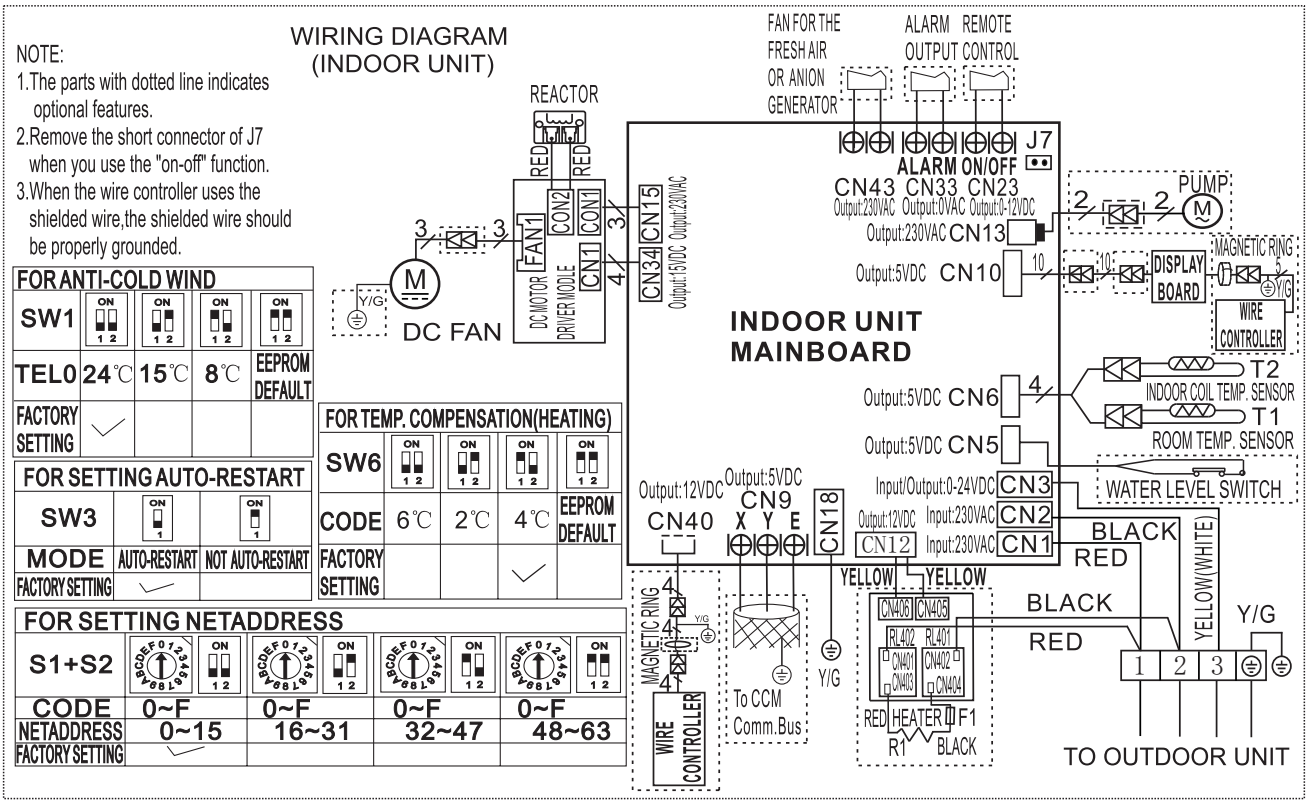

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Fig. 43 —Wiring Diagram Sizes 9K - 24K

INDOOR UNIT	
Code	**Part Name**
CN1	Input: 230VAC High Voltage Connection of the terminal
CN2	Input: 230VAC High Voltage Connection of the terminal
CN3/CN26	Output: 0V Connection to the earth
CN5	Output: 0-5VDC Connection of the water level switch
CN6	Output: 5VDC Connection of the room and pipe temperature
CN8/CN18	Output: 320VDC High Voltage Connection of the reactor
CN9	Output: 5VDC Connection of the CCM
CN10(CN10A)	Output: 12VDC Connection of the display board
CN12	Output: 220VAC High Voltage Connection of the electrical heater
CN13	Output: 220VAC High Voltage Connection of the pump
CN15	Output: 320VDC High Voltage Connection of the fan board
CN23	Output 1 - 12VDC Connection of the remote switch
CN33	Output: 0V Connection of the alarm
CN40	Output: 12VDC Connection of the wire controller
CN43	Output: 220VAC High Voltage Connection of the fresh air suction fan

WIRING DIAGRAMS (CONT)

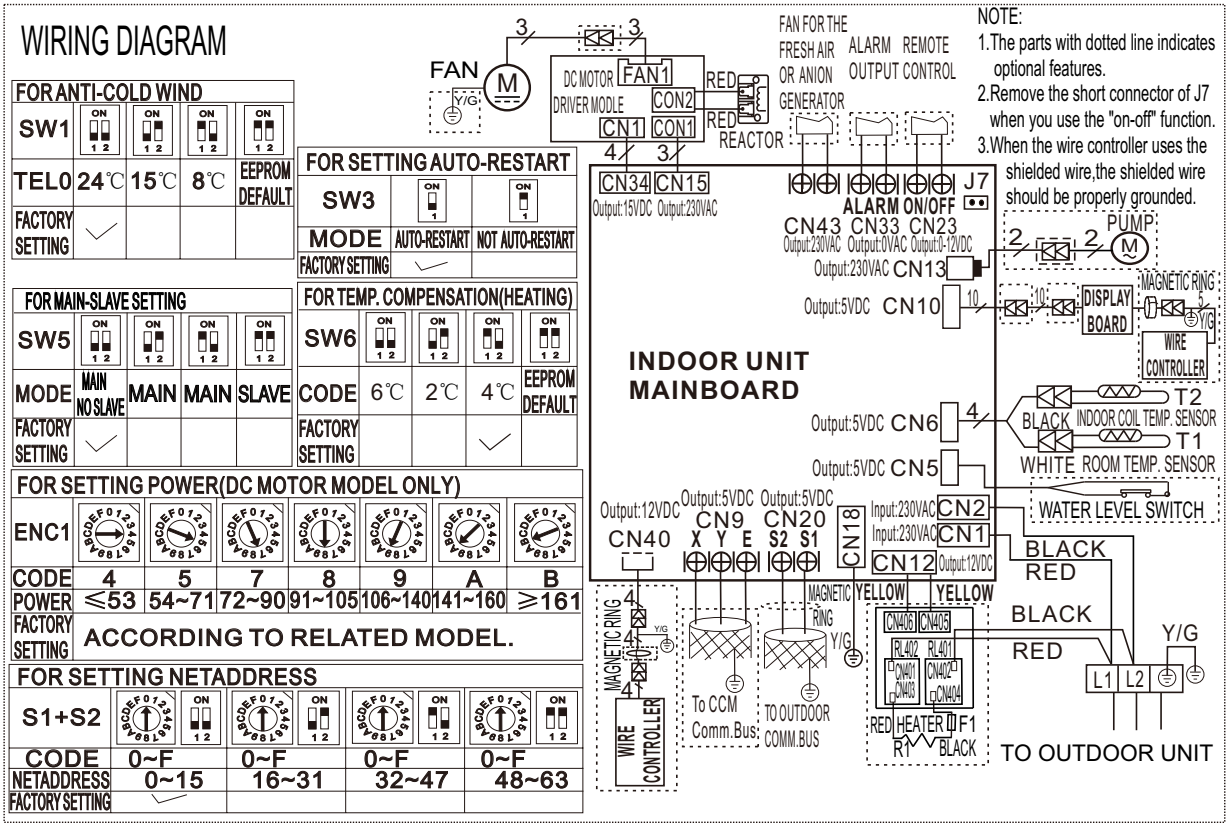

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Fig. 44 —Wiring Diagram Sizes 36K - 58K

INDOOR UNIT	
Code	**Part Name**
CN1	Input: 230VAC High Voltage Connection of the terminal
CN2	Input: 230VAC High Voltage Connection of the terminal
CN5	Output: 0-5VDC Connection of the water level switch
CN6	Output: 5VDC Connection of the room and pipe temperature
CN8/CN18	Output: 320VDC High Voltage Connection of the reactor
CN9	Output: 5VDC Connection of the CCM
CN10(CN10A)	Output: 12VDC Connection of the display board
CN13	Output: 220VAC High Voltage Connection of the pump
CN15	Output: 320VDC High Voltage Connection of the fan board
CN23	Output 1 - 12VDC Connection of the remote switch
CN33	Output: 0V Connection of the alarm
CN40	Output: 12VDC Connection of the wire controller
CN43	Output: 220VAC High Voltage Connection of the fresh air suction fan

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

GUIDE SPECIFICATIONS

INDOOR DUCTED SLIM DUCTLESS UNITS

Size Range: 3/4 to 5 Ton Nominal Cooling and Heating Capacity Model Number: **40MBDAQ**

Part 1 - GENERAL

1.01 System Description

Indoor, slim ducted, direct-expansion fan coils are matched with a heat pump outdoor unit.

1.02 Agency Listings

Unit is rated per AHRI Standards 210/240 and listed in the AHRI directory as a matched system.

1.03 Delivery, Storage, And Handling

Units are stored and handled per the unit manufacturer's recommendations.

1.04 Warranty (For Inclusion By Specifying Engineer)

Part 2 - PRODUCTS

2.01 Equipment

A. General:

Indoor, direct-expansion, ceiling-mounted fan coil. The unit is complete with cooling/heating coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, and integral temperature sensing.

B. Unit Cabinet:

Unit cabinet is constructed of galvanized steel. The cabinet is fully insulated for improved thermal and acoustic performance.

C. Fans:

The fan is the tangential direct-drive blower type with air intake at the rear or bottom of the unit and discharge at the front.

D. Coil:

The coil is a copper tube with aluminum fins and galvanized steel tube sheets. The fins are bonded to the tubes by mechanical expansion and specially golden hydrophilic pre-coated for enhanced wet-ability. A drip pan under the coil has a factory installed condensate pump and drain connection for hose attachment to remove condensate.

E. Motors:

The motors have an open drip-proof, permanently lubricated ball bearing with inherent overload protection. Fan motors are 3-speed.

F. Controls:

The controls consist of a microprocessor-based control system which controls the space temperature, determines optimum fan speed, and runs self diagnostics. The temperature control range is 62°F to 86°F (17°C to 30°C) in increments of 1°F or 1°C, and has a 46°F **HEATING** mode (**HEATING** setback). The wireless remote controller can serve as the temperature sensing location for room comfort.

The unit has the following functions (at a minimum):

1. An automatic restart, after a power failure, which sets the unit back to the same operating conditions it operated under at time of failure.
2. A timer function to provide a minimum 24−hour timer cycle for system Auto Start/Stop.
3. Temperature−sensing controls sense return air temperature.
4. Indoor coil freeze protection.
5. Wireless infrared remote controller to enter set points and operating conditions.
6. **DEHUMIDIFICATION** mode provides increased latent removal capability by modulating system operation and set point temperature.
7. **FAN−ONLY** operation to provide room air circulation when cooling is not required.
8. Diagnostics provide continuous checks of unit operation and warns of possible malfunctions. Error messages appear on the unit.
9. The fan speed control is user−selectable: high, medium, low, or microprocessor controlled automatic operation during all operating modes.
10. Automatic heating−to−cooling changeover in the **HEAT** pump mode. The control includes deadband to prevent rapid mode cycling between heating and cooling.
11. Indoor coil high temperature protection is provided to detect an excessive indoor discharge temperature when the unit is in the **HEAT** pump mode.

G. Electrical Requirements:

The indoor fan motor operates on 208-230V. Power is supplied from the outdoor unit.

H. Operating Characteristics:

The **40MBDAQ** system has a minimum SEER (Seasonal Energy Efficiency Ratio) and HSPF at AHRI conditions, as listed on the specifications table.

I. Refrigerant Lines:

All units have refrigerant lines that can be oriented to connect from the side of the unit. Both refrigerant lines must be insulated.

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