**45MBDA**

**Slim Ductless System**
**Sizes 6 to 58**

# Product Data

**Fig. 1 – Sizes 06K-18K (Low Static)**

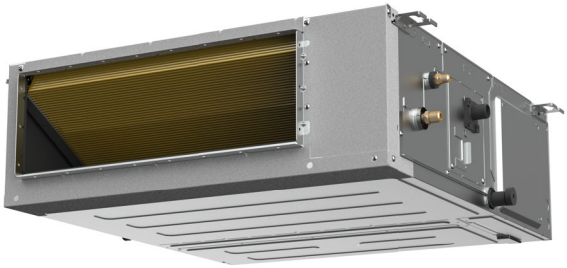

**Fig. 2 – Sizes 9K-58K (High Static)**

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

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## SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should install, start- up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as coil cleaning. All other operations should be performed by trained service personnel only.

When working on the equipment, observe the precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes.Wear safety glasses and work gloves. Keep a quenching cloth and a fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

Read these instructions thoroughly and follow all warnings or cautions included in the literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements. Recognize safety information.

This is the safety - alert symbol ⚠.

When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety- alert symbol.

**DANGER** identifies the most serious hazards which will result in severe personal injury or death.

**WARNING** signifies hazards which could result in personal injury or death.

**CAUTION** is used to identify unsafe practices which may result in minor personal injury or product and property damage.

**NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.**

## ⚠ WARNING

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, the main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

## ⚠ WARNING

**EXPLOSION HAZARD**

Failure to follow this warning could result in death, serious personal injury, and/or property damage.

Never use air or gases containing oxygen for leak testing or operating refrigerant compressors. Pressurized mixtures of air or gases containing oxygen can lead to an explosion.

## ⚠ WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

## ⚠ WARNING

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury, death, and/or property damage.

Only use the specified wire. If the wire is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. The product must be properly grounded at the time of installation, or electric shock may occur.

For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. Connect the cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.

All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.

Disconnection must be incorporated in the fixed wiring in accordance with NEC, CSA and Local Codes. Do not share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electric shock.

If connecting power to fixed wiring, an all-pole disconnection device which has at least 3mm clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with NEC, CSA and Local Codes.

## ⚠ WARNING

**EQUIPMENT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

Do not bury more than 36 in. (914 mm) of refrigerant pipe in the ground. If any section of pipe is buried, there must be a 6 in. (152 mm) vertical rise to the valve connections on the outdoor units. If more than the recommended length is buried, refrigerant may migrate to the cooler buried section during extended periods of system shutdown. This causes refrigerant slugging and could possibly damage the compressor at start-up.

## ⚠ WARNING

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury, death, and/or property damage.

Turn off the air conditioner and disconnect the power before performing any installation or repairing. Failure to do so can cause electric shock.

Installation must be performed by an authorized dealer or specialist. Defective installation can cause water leakage, electrical shock, or fire. Installation must be according to the installation instructions.

Improper installation can cause water leakage, electrical shock, or fire. Contact an authorized service technician for repair or maintenance of this unit. This appliance shall be installed in accordance with national wiring regulations.

Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.

Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage. Install drainage piping according to the instructions in this manual. Improper drainage may cause water damage to your home and property. For units that have an auxiliary electric heater, do not install the unit within 3 feet (1 meter) of any combustible materials.

If combustible gas accumulates around the unit, it may cause fire.

Do not turn on the power until all work has been completed.

When moving or relocating the air conditioner, consult experienced service technicians for disconnection and re-installation of the unit.

Read the information for details in "indoor unit installation" and "outdoor unit installation" sections.

**NOTE:** The air conditioner's circuit board (PCB) is designed with a fuse to provide over-current protection. The specifications of the fuse are printed on the circuit board, for example: T3.15AL/250VAC, T5AL/250VAC, T3.15A/250VAC, T5A/250VAC, T20A/250VAC, T30A/250VAC,etc.

**NOTE:** Only a blast-proof ceramic fuse can be used.

## ⚠ WARNING

**PERSONAL INJURY AND PROPERTY DAMAGE HAZARD**

For continued performance, reliability, and safety, the only approved accessories and replacement parts are those specified by the equipment manufacturer. The use of non-manufacturer approved parts and accessories could invalidate the equipment limited warranty and result in a fire risk, equipment malfunction, and failure.

Please review the manufacturer's instructions and replacement parts catalogs available from your equipment supplier.

**Table 1 – Symbols Displayed on the Indoor or Outdoor Unit**

| | | |
|---|---|---|
| A2L | WARNING | This symbol shows that this appliance used a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire. |
| | CAUTION | This symbol shows that the operation manual should be read carefully. |
| | CAUTION | This symbol shows that a service personnel should be handling this equipment with reference to the installation manual. |
| | CAUTION | |
| | CAUTION | This symbol shows that information is available such as the operating manual or installation manual. |

## ⚠ WARNING

**FOR FLAMMABLE REFRIGERANTS**

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn. Be aware that refrigerants may not contain an odor.

R-454B

Refrigerant Safety Group A2L

R-454B

WARNING – Risk of Fire due to Flammable Refrigerant Used. Follow Handling Instructions Carefully in Compliance with National Regulations

**NOTE: Risk of Fire. Flammable refrigerant used. To be repaired only by trained service personnel. Do not puncture refrigerant tubing.**

# INDUSTRY LEADING FEATURES / BENEFITS

## A PERFECT BALANCE BETWEEN BUDGET LIMITS, ENERGY SAVINGS AND COMFORT

The **45MBDA** series 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 in-ceiling cassette fan coils are ideal for retrofit or modernization projects where a false ceiling is available. This selection of fan coils permits inexpensive and 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.**

The ideal complement to your ducted system when it is impractical or prohibitively expensive to use ductwork. These compact indoor fan coil units take up very little space in the room and do not obstruct windows. The fan coils are attractively styled to blend with most room decors. Advanced system components incorporate innovative technology to provide reliable cooling performance at low sound levels.

### ECCENTRIC FAN DESIGN

New eccentric fan design improves the airflow at the air outlet, resulting better performance.

### SLIM DESIGN

The industry lowest height is designed to be fitted into tight roof spaces.

### FLEXIBLE AIR INTAKE

The frame size of air inlet in rear and bottom is the same. It's very easy to switch to match different applications.

### BUILT-IN DRAIN PUMP(OPTIONAL)

The built-in drain pump can lift condensing water up to 29.5" (750mm).

### EASY TO CLEAN

You can pull out the filter from left, right, or from the bottom for easy cleaning.

### LOW SOUND LEVELS

When noise is a concern, the ductless 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 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 is standard with the indoor units and only wire and piping needs to run between 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 ductless systems the equipment of choice, especially in retrofit situations.

## BUILT-IN RELIABILITY

Ductless system indoor and outdoor units are designed to provide years of trouble-free operation.

The in-ceiling cassette units include protection against freeze-up and high evaporator temperatures on heat pumps.

The condensing units on heat pumps are protected by a three minute time delay before the compressor starts the over-current protection and the high temperature protection.

## ECONOMICAL OPERATION

The ductless system design allows individual 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. In addition, because air is moved only in the space required, no energy is wasted moving air through ducts.

## EASY-TO-USE CONTROLS

The in-ceiling cassette has microprocessor-based controls to provide the ultimate in comfort and efficiency. The user friendly wireless remote control provides the interface between user and the unit.

## SIMPLE SERVICING AND MAINTENANCE

Removing the top panel on outdoor units provides immediate access to the control compartment, providing a service technician access to check unit 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 inside using a pressure hose and detergent.

On all indoor units, service and maintenance expense is reduced due to easy-to-use cleanable filters. In addition, these cassette systems have extensive self-diagnostics to assist in troubleshooting.

## INDIVIDUAL ROOM COMFORT

Maximum comfort is provided because each space can be controlled individually based on usage pattern. The air sweep feature provided 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.

## FACTORY INSTALLED CONDENSATE LIFT PUMP

Customizing these ductless systems to your application is easily accomplished. The factory installed condensate lift pump on the cassette fan coil unit provides installation flexibility.

## OPTIONAL WIRED CONTROLLER

## AGENCY LISTINGS

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

## FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## FOR CLASS B DIGITAL DEVICE

**NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try t o correct the interference by one or more of the following measures:**

- **Reorient or relocate the receiving antenna**
- **Increase the distance between the equipment and the receiver**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**
- **Consult the dealer or an experienced radio/TV technician for assistance.**

### MODIFICATION

**Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate this device.**

# MODEL NUMBER NOMENCLATURE

**INDOOR UNIT**

| 4 | 5 | MB | DA | Q | 36 | X | H | 3 |
|---|---|---|---|---|---|---|---|---|

**4 =** INDOOR UNIT

**5 =** PURON ADVANCE

**MB =** MODEL TYPE

**D =** DUCTED SLIM
**A =** MAJOR SERIES

**Q =** HEAT PUMP

**NOMINAL CAPACITY**

**06** - 0.5 TON
**09** - 0.75 TON
**12** - 1 TON
**18** - 1.5 TON
**24** - 2 TONS
**36** - 3 TONS
**48** - 4 TONS
**58** - 5 TONS

# OF INDOOR UNIT
**X = 0**

**H =** HIGH STATIC

**VOLTAGE**
**3 =** 208/230-1-60

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.

# STANDARD FEATURES AND ACCESSORIES

## FEATURES

| |
|---|
| **Ease Of Installation** |
| Mounting Brackets |
| Low Voltage Controls |
| **Comfort Features** |
| Rear or Bottom Return (Bottom Return only sizes 06K-48K) |
| Vertical (Up flow) or horizontal installation (Vertical only sizes 06K-48K) |
| Microprocessor Controls |
| Wired Remote Control (7 Day Programmable KSCAN1401AAA) |
| Wireless Remote Control |
| Air Direction Control |
| Auto Restart Function |
| Cold Blow Protection On Heat Pumps |
| Freeze Protection Mode On Heat Pumps |
| Turbo Mode |
| Auto Changeover On Heat Pumps |
| Follow Me (Sense Temperature at remote) |
| **Energy Saving Features** |
| Outside Air Intake |
| Sleep Mode |
| Stop/Start Timer |
| 46°F Heating Mode (Heating Setback) |
| **Safety And Reliability** |
| Indoor Coil Freeze Protection |
| Indoor Coil High Temp Protection in Heating Mode |
| Aluminum Golden Hydrophilic pre-coated fins |
| The unit is equipped with a refrigerant leak detection sensor |
| **Ease Of Service And Maintenance** |
| Cleanable Filters |
| Diagnostics |
| Liquid Line Pressure Taps |
| **Application Flexibility** |
| External Condensate Lift Pump shipped with the unit (sizes 06K-18K) |
| Built-in Condensate Lift Pump (High Static, sizes 09K-58K) |

## OPTIONAL ACCESSORIES

| ORDERING NO. | DESCRIPTION | FOR MODELS |
|---|---|---|
| **KSACN1201AAA** | Wired Controller for basic timer only operation | All Sizes |
| **KSAIC0501230** | 24 volt interface for third party thermostats (GEN 3) | All Sizes |
| **KSAIC0601230** | 24 volt interface for third party thermostats (MINI) | All Sizes |
| **17401204010126** | T1 Ambient Sensor Extension | 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 06K-58K) or vertically (up flow) (sizes 06K-48K).

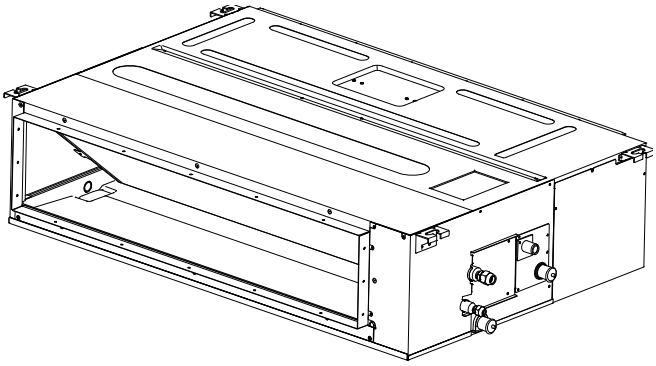

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**Fig. 3 – Unit mounted horizontally**

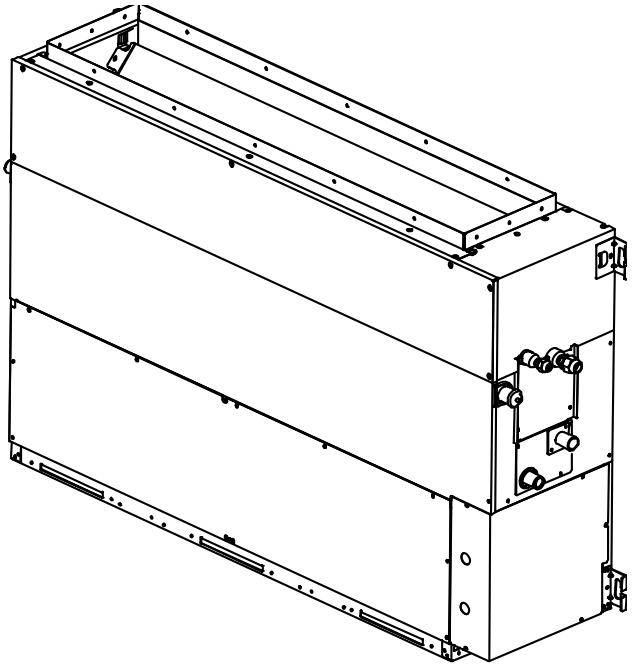

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**Fig. 4 – Unit mounted vertically (upflow)**

# DIMENSIONS

## Low Static

**Table 2 – Low Static**

| MODEL (KBTU/H) | UNIT | A | B | C | C1 | D | E | F | G | H | I | J | K | L | M | H1 | H2 | W1 | W2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06 09 12 | mm | 700 | 200 | 470 | 506 | 450 | 137 | 537 | 30 | 152 | 599 | 186 | 50 | 741 | 360 | 84 | 140 | 84 | 84 |
| | inch | 27.56 | 7.87 | 18.50 | 19.92 | 17.72 | 5.39 | 21.14 | 1.18 | 5.98 | 23.58 | 7.32 | 1.97 | 29.17 | 14.17 | 3.31 | 5.51 | 3.31 | 3.31 |
| 18 | mm | 880 | 210 | 634 | 674 | 600 | 140 | 706 | 50 | 136 | 782 | 190 | 50 | 920 | 508 | 78 | 148 | 88 | 112 |
| | inch | 34.65 | 8.27 | 24.96 | 26.54 | 23.62 | 5.51 | 27.80 | 1.97 | 5.35 | 30.79 | 7.48 | 1.97 | 36.22 | 20.00 | 3.07 | 5.83 | 3.46 | 4.41 |

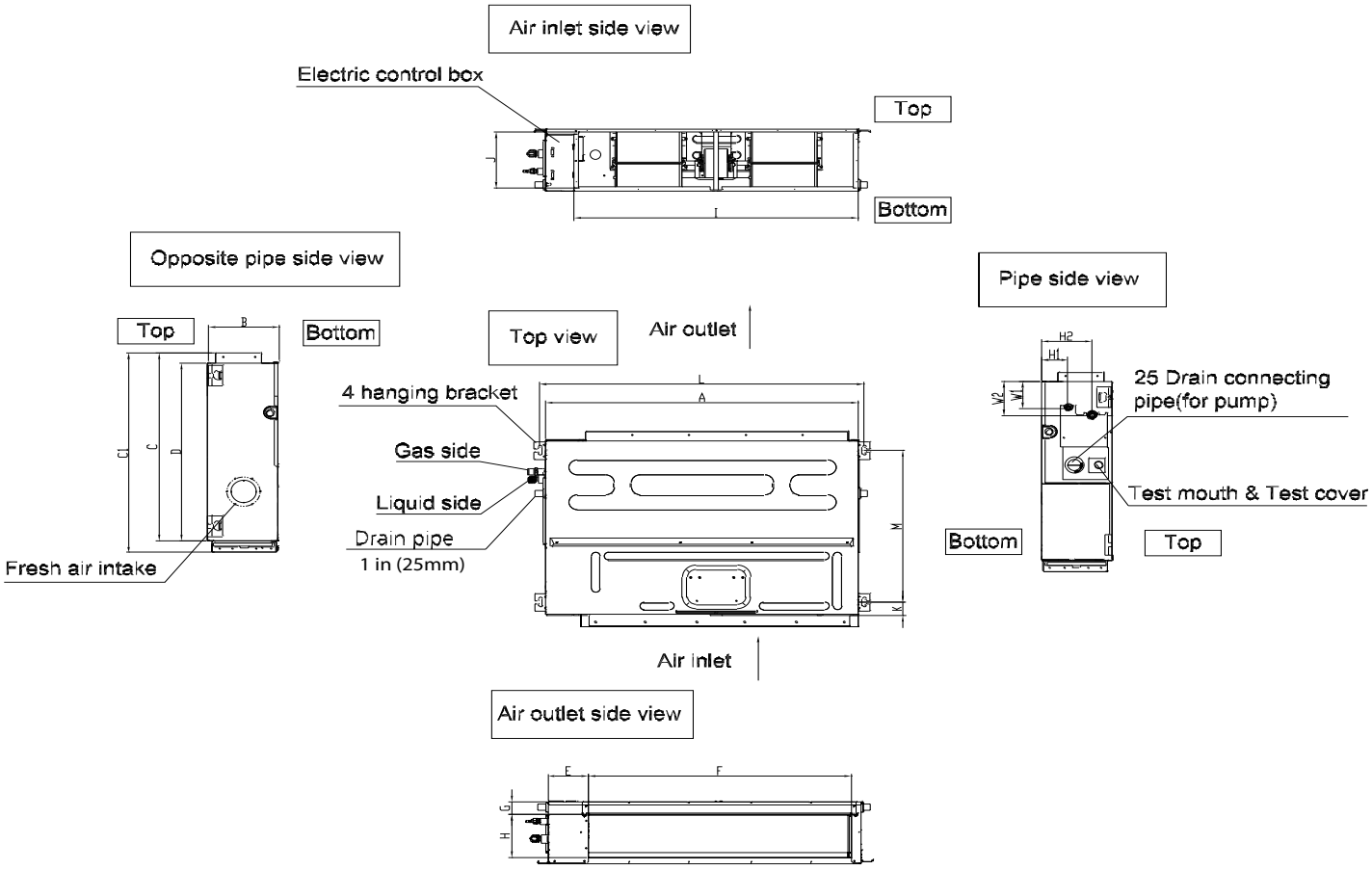



**Fig. 5 – Size 06/09/12K**

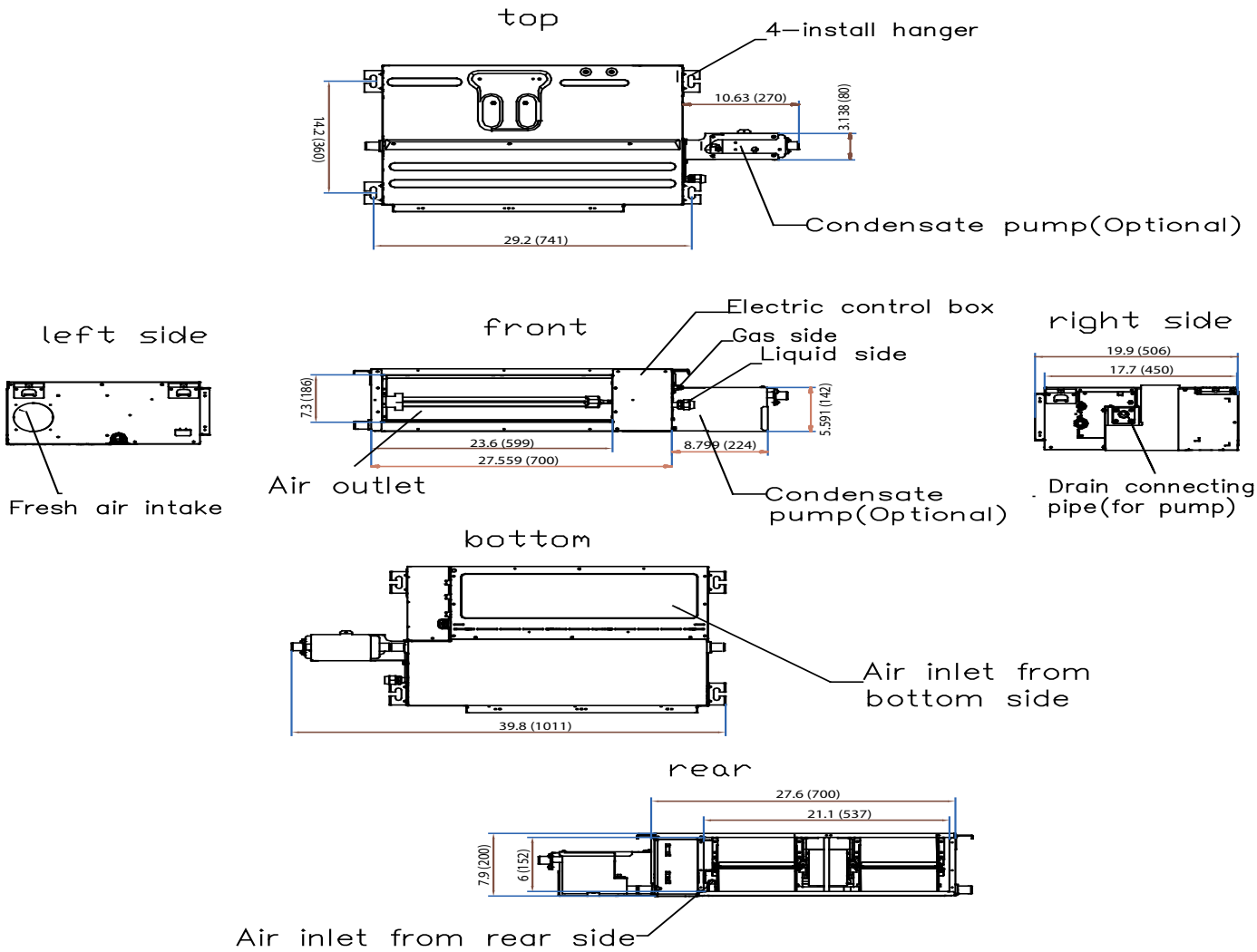



**Fig. 6 – Size 06/09/12K with external condensate pump (optional) Low Static**

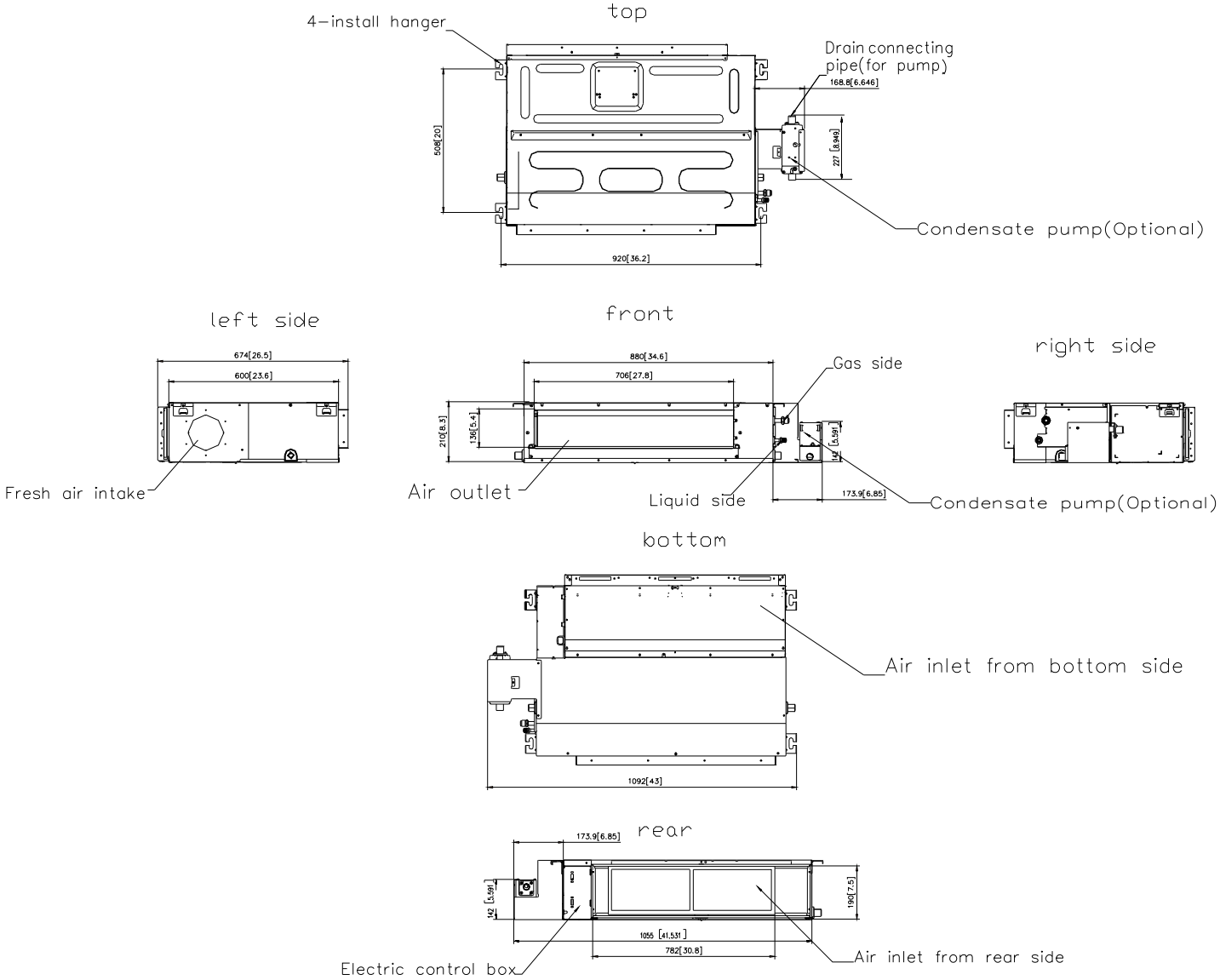



**Fig. 7 – Size 18K with external condensate pump (optional) Low Static**

# High Static

**Table 3 – Dimensions**

| MODEL | UNIT | OUTLINE DIMENSION | | | | AIR OUTLET OPENING SIZE | | AIR RETURN OPENING SIZE | | SIZE OF MOUNTED LUG | | FRESH AIR INTAKE OPENING SIZE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (KBtu/h) | | A | B | C | D | E | F | G | H | I | J | K | L |
| 09 12 | mm | 700 | 245 | 750 | 795 | 527 | 178 | 592 | 212 | 740 | 640 | 100 | 126 |
| | inch | 27.6 | 9.6 | 29.5 | 31.3 | 20.7 | 7.0 | 23.3 | 8.3 | 29.1 | 25.2 | 3.9 | 5.0 |
| 18 | mm | 1000 | 245 | 750 | 795 | 827 | 178 | 892 | 212 | 1040 | 640 | 100 | 126 |
| 24 | inch | 39.4 | 9.6 | 29.5 | 31.3 | 32.6 | 7.0 | 35.1 | 8.3 | 40.9 | 25.2 | 3.9 | 5.0 |
| 36 48 | mm | 1200 | 300 | 750 | 795 | 1027 | 233 | 1092 | 267 | 1240 | 640 | 125 | 160 |
| | inch | 47.2 | 11.8 | 29.5 | 31.3 | 40.4 | 9.2 | 43.0 | 10.5 | 48.8 | 25.2 | 4.9 | 6.3 |
| 58 | mm | 1400 | 380 | 800 | 845 | 1223 | 320 | 1272 | 330 | 1440 | 668 | 125 | 160 |
| | inch | 55.1 | 14.9 | 31.5 | 33.3 | 48.1 | 12.6 | 50.1 | 13.0 | 56.7 | 26.3 | 4.9 | 6.3 |

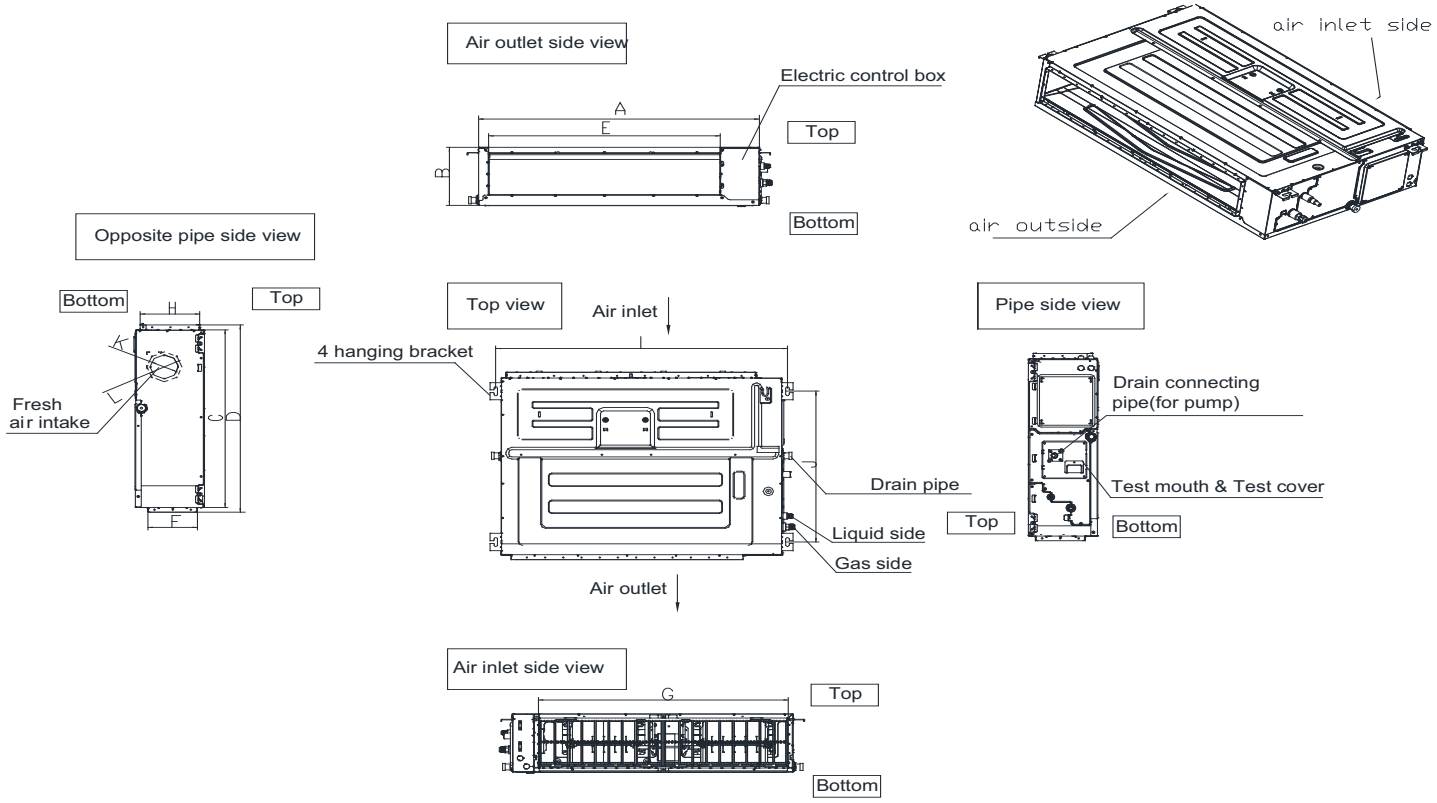



**Fig. 8 – Sizes 9K/12K, 18K, 24K, 36K, 48K, 58K High Static**

# MAINTENANCE CLEARANCES

Maintenance clearances provide access for system inspections.

**NOTE:** Always follow local codes.

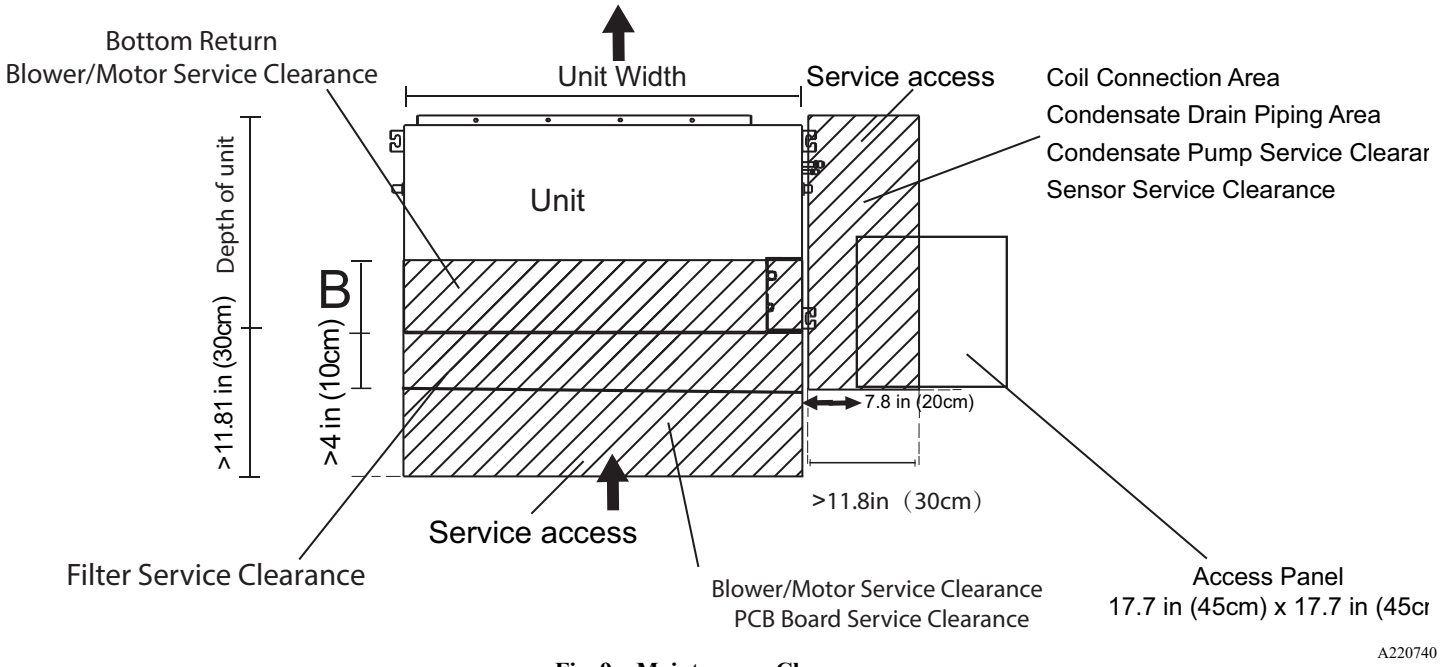



**Fig. 9 – Maintenance Clearance**

| Capacity (Kbtu) | B |
|---|---|
| 6K thru 36K | 11.81in.(30cm) |
| 48K, 58K | 15.75in.(40cm) |

**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 (HIGH STATIC)

**Table 4 – High Static Specifications**

| Size | | | 9K/12K | 18K | 24K | 36K | 48K | 58K |
|---|---|---|---|---|---|---|---|---|
| Indoor Model Number | | | 45MBDAQ12XH3 | 45MBDAQ18XH3 | 45MBDAQ24XH3 | 45MBDAQ36XH3 | 45MBDAQ48XH3 | 45MBDAQ58XH3 |
| Power supply | | V;Ph;Hz | 208/230V;1Ph;60HZ | | | | | |
| INDOOR FAN SPECIFICATIONS | Material | | Galvanized sheet | | | | | |
| | Type | | FLBJ-170*130*15-47 | FLBJ-170*195*15-47 | FLBJ-170*195*15-47 | FLBJ-207*233*15-51 | FLBJ-207*233*15-51 | FLBJ-250*300*15-51 |
| | Diameter | inch | 6.7 | 6.7 | 6.7 | 8.1 | 8.1 | 9.8 |
| | | mm | 170 | 170 | 170 | 207 | 207 | 250 |
| | Height | inch | 5.1 | 7.7 | 7.7 | 9.2 | 9.2 | 11.8 |
| | | mm | 130 | 195 | 195 | 233 | 233 | 300 |
| INDOOR MOTOR SPECIFICATIONS | Model | | ZKFN-165-10-1L | ZKFN-165-10-1L | ZKFN-165-10-1L | ZKFN-400-8-1 | ZKFN-560-8-4 | ZKFN-560-8-4 |
| | Type | | DC | DC | DC | DC | DC | DC |
| | Input | W | 185 | 185 | 185 | 302.8 | 515 | 515 |
| | Max. input | W | 263 | 263 | 263 | 427.3 | 665 | 665 |
| | Output | W | 165 | 165 | 165 | 400 | 560 | 560 |
| | FLA | A | 1.5 | 1.8 | 2.2 | 3.2 | 4 | 4 |
| | Rated HP | HP | 0.22 | 0.22 | 0.22 | 0.54 | 0.75 | 0.75 |
| | Range of current | Amps | 0.63 ±10% | 0.63 ±10% | 0.63 ±10% | 2.45 ±10% | 4 ±10% | 4 ±10% |
| | Rated current | Amps | 0.63 | 0.63 | 0.63 | 2.45 | 4 | 4 |
| | Speed | rev/min | 780 / 744 / 708 | 820 / 760 / 700 | 920 / 835 / 750 | 790 / 730 / 670 | 1000 / 950 / 880 | 853 / 778 / 702 |
| | Rated RPM | rev/min | 780 | 820 | 920 | 790 | 1000 | 853 |
| | Insulation class | | B | | | | | |
| | Safe class | | IP20 | | | | | |
| INDOOR REFRIGERANT COIL SPECIFICATIONS | Number of rows | Rows | 3 | 3 | 3 | 4 | 4 | 4 |
| | Tube outside dia. | inch | 0.197 | 0.197 | 0.197 | 0.276 | 0.276 | 0.276 |
| | | mm | Φ5 | Φ5 | Φ5 | Φ7 | Φ7 | Φ7 |
| | Nominal Tube Wall | Inch (mm) | 0.0079 (0.2) | 0.0079 (0.2) | 0.0079 (0.2) | 0.0091 (0.23) | 0.0091 (0.23) | 0.0091 (0.23) |
| | Tube Enhancement | (Yes/No) | Yes | Yes | Yes | Yes | Yes | Yes |
| | Tube Material | | Copper | Copper | Copper | Copper | Copper | Copper |
| | Tube pitch(a)x row pitch(b) | inch | 0.77 x 0.46 | 0.77 x 0.46 | 0.77 x 0.46 | 0.83 x 0.53 | 0.83 x 0.53 | 0.83 x 0.53 |
| | | mm | 19.5 x 11.6 | 19.5 x 11.6 | 19.5 x 11.6 | 21 x 13.37 | 21 x 13.37 | 21 x 13.37 |
| | Fin Spacing | FPI | 22 | 22 | 22 | 19 | 19 | 20 |
| | | mm | 1.2 | 1.2 | 1.2 | 1.4 | 1.4 | 1.3 |
| | Fin type | | Louvered | | | | | |
| | Fin Material | | Gold hydrophilic aluminum | | | | | |
| | Coil length x height x width | inch | 20.67 x 13.82 x 1.37 | 32.48 x 13.82 x 1.37 | 32.48 x 13.82 x 1.37 | 40.35 x 14.88 x 2.11 | 40.35 x 14.88 x 2.11 | 48.23 x 18.19 x 2.11 |
| | | mm | 525*351*34.8 | 825*351*34.8 | 825*351*34.8 | 1025*53.48*378 | 1025*53.48*378 | 1225*462*53.48 |
| | Face area | ft2 | 1.98 | 3.12 | 3.12 | 4.17 | 4.17 | 6.09 |
| | Number of circuits | # | 6 | 9 | 9 | 9 | 9 | 11 |

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

**Table 4 – High Static Specifications (Continued)**

| Size | | | 9K/12K | 18K | 24K | 36K | 48K | 58K |
|---|---|---|---|---|---|---|---|---|
| **SOUND DATA** Indoor Sound Pressure Level dB(A) | | Turbo | N\A | N\A | N\A | N\A | N\A | N\A |
| | | Hi | 32.5 | 36 | 40.0 | 45 | 51 | 52 |
| | | Med | 30.5 | 34.0 | 37.0 | 40 | 46 | 48 |
| | | Lo | 28.5 | 32.0 | 35 | 34 | 42 | 42 |
| | | Silent | 26 | 28.0 | 29.5 | 31 | 40 | 41 |
| **CFM DATA** Indoor air flow data | | Turbo | 419.08 | 706.32 | 853.47 | 1236.06 | 1648.08 | 2001.24 |
| | | Hi | 350.22 | 618.03 | 706.32 | 1059.48 | 1471.50 | 1706.94 |
| | | Med | 256.04 | 529.74 | 618.03 | 941.76 | 1294.92 | 1412.64 |
| | | Lo | 216.02 | 441.45 | 500.31 | 765.18 | 1059.48 | 1118.34 |
| | | Silent | 135.38 | / / | / / | / / | / / | / / |
| ENVIRONMENTAL SPECIFICATIONS | Cooling Operating Range Indoor Min - Max DB | °F | 60~90 | 60~90 | 60~90 | 60~90 | 60~90 | 60~90 |
| | | (°C) | (16~32) | (16~32) | (16~32) | (16~32) | (16~32) | (16~32) |
| | Cooling Operating Range Indoor Min - Max WB | °F | 59-84 | 59-84 | 59-84 | 59-84 | 59-84 | 59-84 |
| | | (°C) | (15-29) | (15-29) | (15-29) | (15-29) | (15-29) | (15-29) |
| | Heating Operating Range Indoor Min - Max DB | °F | 32~86 | 32~86 | 32~86 | 32~86 | 32~86 | 32~86 |
| | | (°C) | (0~30) | (0~30) | (0~30) | (0~30) | (0~30) | (0~30) |
| | Non-operating environment Storage Temperature range (DB) | °F | -189 | -189 | -189 | -189 | -189 | -189 |
| | | (°C) | (-45-60) | (-45-60) | (-45-60) | (-45-60) | (-45-60) | (-45-60) |
| | Operation Humidity | % | 0-80 | 0-80 | 0-80 | 0-80 | 0-80 | 0-80 |
| | Ambient Humidity | % | 0-80 | 0-80 | 0-80 | 0-80 | 0-80 | 0-80 |

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

# SPECIFICATIONS (LOW STATIC)

**Table 5 – Low Static Specifications**

| SIZE | | | | 6K | 09K/12K | 18K |
|---|---|---|---|---|---|---|
| INDOOR MODEL NUMBER | | | | 45MBDAQ06XA3 | 45MBDAQ12XA3 | 45MBDAQ18XA3 |
| POWER SUPPLY | | | V;Ph;Hz | 208/230V;1Ph;60HZ | 208/230V;1Ph;60HZ | 208/230V;1Ph;60HZ |
| INDOOR FAN SPECIFICATIONS | | Material | | PP+GF28 | PP+GF28 | ABS-GF10 |
| | | Type | | LX-143*107*15-41J | LX-143*107*15-41J | LX-154*158*15-41H |
| | | Diameter | inch | 5.6 | 5.6 | 6.1 |
| | | | mm | 143 | 143 | 154 |
| | | Height | inch | 4.2 | 4.2 | 6.2 |
| | | | mm | 107 | 107 | 158 |
| INDOOR MOTOR SPECIFICATIONS | | Model | | ZKFN-81-8-1 | ZKFN-81-8-1 | ZKFN-165-10-1L |
| | | Type | | DC | DC | DC |
| | | Input | W | 150 | 150 | 185 |
| | | Max. input | W | 171.5 | 171.5 | 263 |
| | | Output | W | 81 | 81 | 165 |
| | | FLA | A | 0.9 | 0.9 | 1.2 |
| | | Rated HP | HP | 0.11 | 0.11 | 0.22 |
| | | Range of current | Amps | 0.35 ±10% | 0.35 ±10% | 0.63 ±10% |
| | | Rated current | Amps | 0.35 | 0.35 | 0.63 |
| | | Speed | rev/min | 1070 / 990 / 910 | 1070 / 990 / 910 | 1100 / 900 / 700 |
| | | Rated RPM | rev/min | 1070 | 1070 | 1100 |
| | | Insulation class | | B | B | B |
| | | Safe class | | IP20 | IP20 | IP20 |
| INDOOR REFRIGERANT COIL SPECIFICATIONS | | Number of rows | Rows | 3 | 3 | 3 |
| | | Tube outside dia. | inch | 0.276 | 0.276 | 0.276 |
| | | | mm | Φ7 | Φ7 | Φ7 |
| | | Nominal Tube Wall | Inch (mm) | 0.00945 (0.24) | 0.00945 (0.24) | 0.00945 (0.24) |
| | | Tube Enhancement | (Yes/No) | Yes | | |
| | | Tube Material | | Copper | | |
| | | Tube pitch (a) x row pitch (b) | inch | 0.83 x 0.53 | 0.83 x 0.53 | 0.83 x 0.53 |
| | | | mm | 21 x 13.37 | 21 x 13.37 | 21 x 13.37 |
| | | Fin Spacing | FPI | 18 | 18 | 18 |
| | | | mm | 1.4 | 1.4 | 1.4 |
| | | Fin type | | Louvered | Louvered | Louvered |
| | | Fin Material | | Gold hydrophilic aluminum | | |
| | | Coil length x height x width | inch | 20.67 x 8.27 x 1.58 | 20.67 x 8.27 x 1.58 | 27.36 x 9.92 x 1.58 |
| | | | mm | 525 x 210 x 40.11 | 525 x 210 x 40.11 | 695 x 252 x 40.11 |
| | | Face area | ft2 | 1.19 | 1.19 | 1.89 |
| | | Number of circuits | # | 3 | 3 | 4 |
| ENVIRONMENTAL SPECIFICATIONS | Cooling Operating Range | Indoor Min - Max DB | °F | 60~90 | 60~90 | 60~90 |
| | | | (°C) | (16?32) | (16?32) | (16?32) |
| | | Indoor Min - Max WB | °F | 59-84 | 59-84 | 59-84 |
| | | | (°C) | (15-29) | (15-29) | (15-29) |
| | | Outdoor Min - Max DB | °F | -22~122 | -22~122 | -22~122 |
| | | | (°C) | (-30~50) | (-30~50) | (-30~50) |
| | Heating Operating Range | Indoor Min - Max DB | °F | 32~86 | 32~86 | 32~86 |
| | | | (°C) | (0?30) | (0?30) | (0?30) |
| | | Outdoor Min - Max DB | °F | -22~75 | -22~75 | -22~75 |
| | | | (°C) | (-30~24) | (-30~24) | (-30~24) |
| | Non-operating environment Storage Temperature range (DB) | | °F | -189 | -189 | -189 |
| | | | (°C) | (-45-60) | (-45-60) | (-45-60) |
| | Operation Humidity | | % | 0-80 | 0-80 | 0-80 |
| | Ambient Humidity | | % | 0-80 | 0-80 | 0-80 |

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

# APPLICATION DATA

## UNIT SELECTION

Select equipment to either match or 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 the unit sensible load, not on the total anticipated load. Adjust for anticipated room wet bulb temperature to avoid undersizing the equipment.

## UNIT MOUNTING (INDOOR)

**NOTE:** Follow local codes.

Refer to unit Installation Instructions for further details.

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

**Clearance** - Provide adequate clearance for airflow (Fig. 9).

**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 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 | 63 / 90 (17 / 32) | 32 / 86 (0 / 30) |
| Indoor WB | 59 / 84 (15 / 29) | - |

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

## DRAIN CONNECTIONS

Install drains to meet the local sanitation codes. The in-ceiling cassette is supplied with a condensate lift pump that is capable of lifting the water 29.5in (750mm) above the top of the unit. A downward sloped condensate drain pipe can be used to dispose of water.

# WIRING

All wires must be sized per NEC (National Electrical Code) or CEC (Canadian Electrical Code) and local codes. Use the Electrical Data table MCA (minimum circuit amps) and MOCP (maximum over current protection) to correctly size the wires and the disconnect fuse or breakers respectively.

## SIZES 06-24 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 06-24

| 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 |
|---|---|---|
| Connection Cable | 14AWG | 2 wire + Ground 1Φ 208/230V |
| Communication Cable | 16AWG | 2 wire stranded shielded control wire |

## CONNECTION LABELS - HIGH STATIC

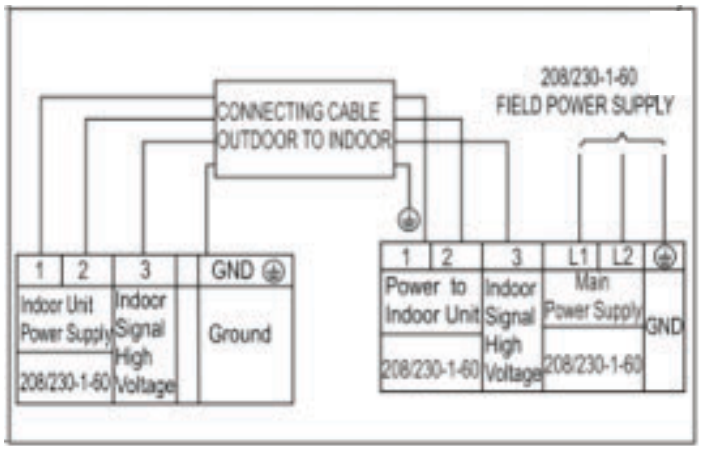



**Fig. 10 – 9K/12K, 18K, 24K Connection Label**

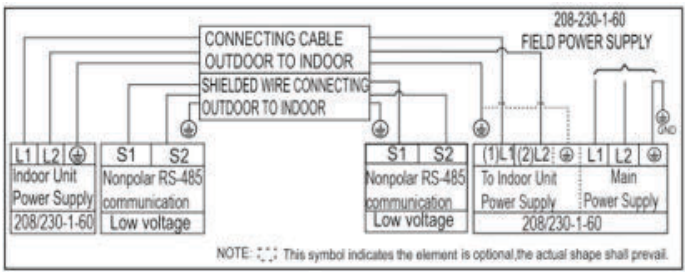



**Fig. 11 – 36K Connection Label**

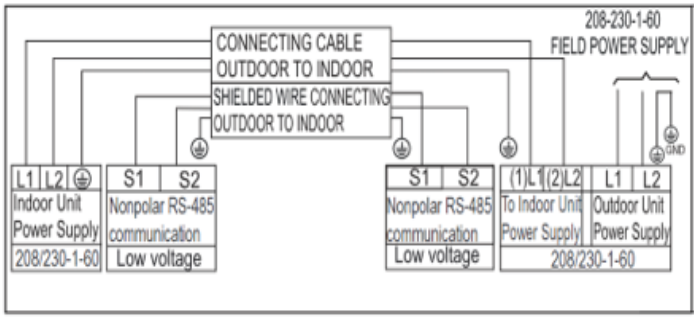



**Fig. 12 – 48K, 60K Connection Label**

## CONNECTION LABELS - LOW STATIC

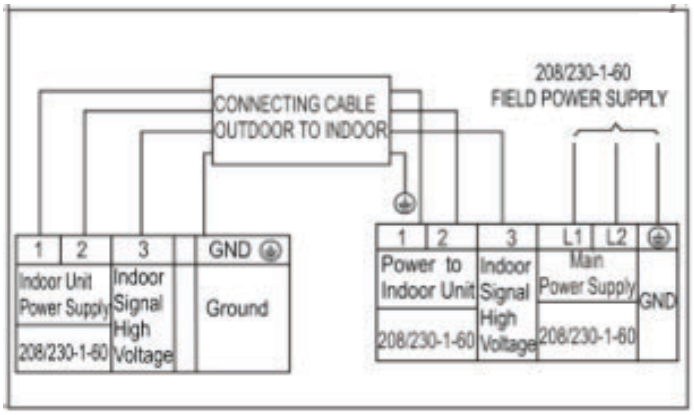



**Fig. 13 – 6K, 9K/12K, 18K Connection Label**

## ⚠ 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 shall be located within sight and readily accessible from the air conditioner.

Connecting cable with conduit shall be routed through the hole in the conduit panel.

# WIRING CONNECTIONS

| System Size | 9K/12K | 18K | 24K | 36K | 48K | 58K |
|---|---|---|---|---|---|---|
| V-Ph-Hz | 208/230-1-60 | | | | | |
| Power Supply | 3Wires: includes ground wire (Outdoor); 208/230V-1Ph-60Hz | | | | | |
| Interconnection to Indoor Unit | Yes | | | | | |
| Shielded Wire (Yes/No) | Optional | | | Yes | | |

# ELECTRICAL DATA

| System Size | | 9K/12K | 18K | 24K | 36K | 48K | 58K |
|---|---|---|---|---|---|---|---|
| Power Supply | V-Ph-Hz | 208/230-1-60 | | | | | |
| Minimum Circuit Ampacity (MCA) | A | 3 | 3 | 3 | 3 | 3 | 3 |
| Maximum Overcurrent Protection Ampacity (MOPA) | A | 15 | 15 | 15 | 15 | 15 | 15 |

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

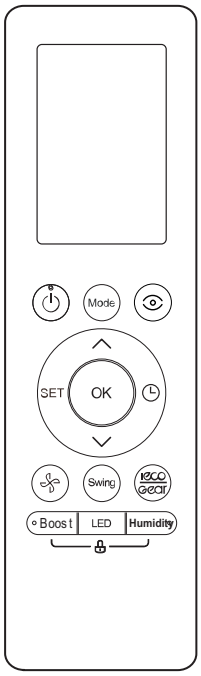



**Fig. 14 – Wireless Remote Controller**

# WIRED REMOTE CONTROLLER

**P/N KSACN1401AAA (included with the Unit)**

1. Wired remote controller used for system operation of all ducted units.
2. Kit includes a wired remote controller but requires 16AWG or 18AWG stranded/shielded cable (field provided) for connecting the wired controller to this product. Refer to the KSACN1401AAA installation manual for complete instructions.
3. Connect the Ha/Hb wire terminals between the remote controller and the indoor unit.
4. Display in °F or °C and increments every 1°F or every 1°C.

**Fig. 15 – KSACN1401AAA**

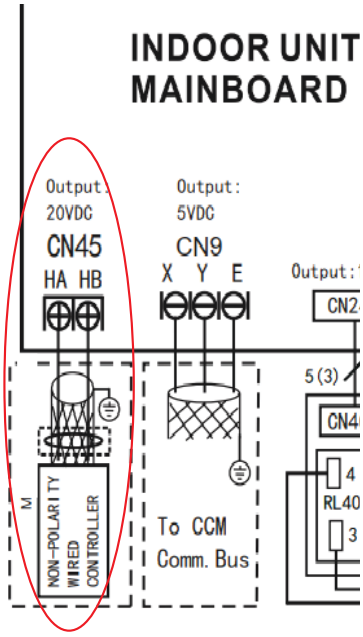



**Fig. 16 —Wired Controller Terminal Port CN45**

## 24V INTERFACE (OPTIONAL)

Allows the ductless system to be controlled using a third-party thermostat:

- KSAIC0501230 (GEN 3)
- KSAIC0601230 (MINI)

# AIR FLOW DATA

Refer to “SPECIFICATIONS (HIGH STATIC)” on page 12 or “SPECIFICATIONS (LOW STATIC)” on page 14.

# SOUND PRESSURE

Refer to “SPECIFICATIONS (HIGH STATIC)” on page 12 or “SPECIFICATIONS (LOW STATIC)” on page 14.

# FAN AND MOTOR SPECIFICATIONS

Refer to “SPECIFICATIONS (HIGH STATIC)” on page 12 or “SPECIFICATIONS (LOW STATIC)” on page 14.

# SOUND PRESSURE TESTING METHOD

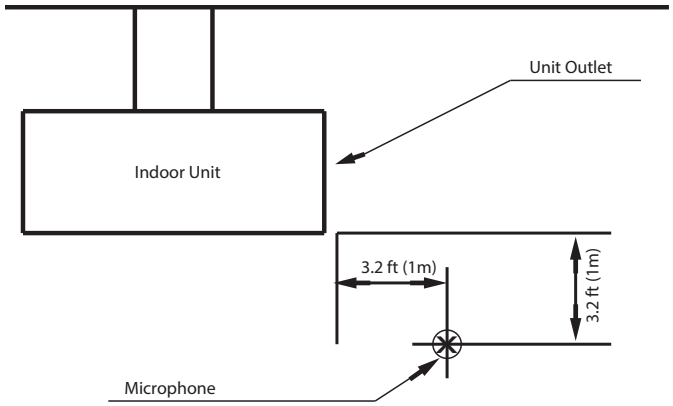



**Fig. 17 – Sound Pressure Testing Method**

# USING THE KSACN1401AAA WIRED CONTROLLER

## To Set Static Pressure Air Flow

The factory default setting is SP1, The external static pressure can be manually changed to the fan curves 1,2,3,4,5,6,7,8.

a. Press and hold **Copy** for approximately 3 seconds. The lower right corner displays **P:00**, Press **OK**.
b. Press “∧” to scroll through the menu. The lower right corner shows **SP**, Press **OK**.
c. Press “∧” or “∨” to scroll through the menu and select 1-8, Press **OK**.
d. Press **“Back”** to exit the test mode.

## To Set Real-Time Constant Air Flow

Use the Automatic Airflow “AF” Adjustment function to realize Real-time constant airflows.

**NOTE: AF Mode does not run a 3-6 minute airflow test as previous models. When enabled, AF mode changes the operation of the indoor fan to constant air volume operation. If this is not preferred, use the SP fan speeds to set static pressure airflow.**

a. Press and hold Copy for approximately 3 seconds. The lower right corner shows P:00, Press “OK”.
b. Press “∧” to scroll through the menu. The lower right corner shows AF. Press “**OK**”.
c. Press “Back” to exit the test mode.

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

**NOTE: Before commissioning, check the power connection of the machine, turn on the power, and keep the machine not working.**

**NOTE: If there is no change after airflow adjustment, perform the setting again.**

**NOTE: Setting Static Pressure or Automatic Airflow need to use the Wired Remote Controller.**

**NOTE: Low static pressure series 06K, 09K, 12K, 18K models, SP options can only be “ 1～4 ”.**

# FAN PERFORMANCES AT VARYING STATIC PRESSURES

The factory default setting is SP1. Airflows and fan curves applicable starting on production of Week 28 Year 2020 (Serial Number 2820V10001). For previous serial numbers refer to previous revision of this document.

## Low Static

**Table 6 – 06K/09K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.1 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06K/09K | SP4 | Turbo | | | | | | | | | | 446 | 421 | 370 | 331 |
| | | H | | | | | | | | | | 404 | 373 | 313 | 260 |
| | | M | | | | | | | | | | 358 | 324 | 265 | 214 |
| | | L | | | | | | | | | | 315 | 278 | 208 | 141 |
| | SP3 | Turbo | | | | | | | 445 | 404 | 361 | 335 | | | |
| | | H | | | | | | | 381 | 339 | 293 | 270 | | | |
| | | M | | | | | | | 333 | 285 | 242 | 218 | | | |
| | | L | | | | | | | 271 | 220 | 170 | 148 | | | |
| | SP2 | Turbo | | | | 430 | 412 | 374 | 340 | | | | | | |
| | | H | | | | 374 | 353 | 311 | 271 | | | | | | |
| | | M | | | | 318 | 297 | 258 | 213 | | | | | | |
| | | L | | | | 267 | 242 | 204 | 153 | | | | | | |
| | SP1 | Turbo | 402 | 365 | 326 | 307 | | | | | | | | | |
| | | H | 365 | 326 | 282 | 262 | | | | | | | | | |
| | | M | 330 | 286 | 241 | 214 | | | | | | | | | |
| | | L | 286 | 238 | 185 | 161 | | | | | | | | | |

**Table 7 – 12K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.1 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12K | SP4 | Turbo | | | | | | | | | | 521 | 489 | 437 | 391 |
| | | H | | | | | | | | | | 466 | 434 | 376 | 318 |
| | | M | | | | | | | | | | 418 | 378 | 312 | 261 |
| | | L | | | | | | | | | | 373 | 325 | 249 | 183 |
| | SP3 | Turbo | | | | | | | 544 | 489 | 431 | 397 | | | |
| | | H | | | | | | | 489 | 431 | 371 | 336 | | | |
| | | M | | | | | | | 450 | 388 | 314 | 268 | | | |
| | | L | | | | | | | 398 | 331 | 245 | 190 | | | |
| | SP2 | Turbo | | | | 527 | 497 | 447 | 393 | | | | | | |
| | | H | | | | 460 | 433 | 380 | 330 | | | | | | |
| | | M | | | | 412 | 378 | 324 | 271 | | | | | | |
| | | L | | | | 358 | 330 | 262 | 181 | | | | | | |
| | SP1 | Turbo | 490 | 461 | 428 | 408 | | | | | | | | | |
| | | H | 426 | 384 | 343 | 318 | | | | | | | | | |
| | | M | 374 | 327 | 285 | 260 | | | | | | | | | |
| | | L | 320 | 260 | 202 | 173 | | | | | | | | | |

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

**Table 8 – 18K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.1 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18K | SP4 | Turbo | | | | | | | | | | 686 | 669 | 638 | 607 |
| | | H | | | | | | | | | | 636 | 618 | 586 | 555 |
| | | M | | | | | | | | | | 580 | 565 | 532 | 498 |
| | | L | | | | | | | | | | 520 | 496 | 462 | 421 |
| | SP3 | Turbo | | | | | | | 678 | 650 | 620 | 612 | | | |
| | | H | | | | | | | 627 | 591 | 563 | 553 | | | |
| | | M | | | | | | | 571 | 537 | 509 | 500 | | | |
| | | L | | | | | | | 513 | 480 | 450 | 438 | | | |
| | SP2 | Turbo | | | | 724 | 690 | 642 | 603 | | | | | | |
| | | H | | | | 662 | 631 | 584 | 556 | | | | | | |
| | | M | | | | 611 | 581 | 536 | 504 | | | | | | |
| | | L | | | | 554 | 525 | 484 | 452 | | | | | | |
| | SP1 | Turbo | 692 | 647 | 603 | 582 | | | | | | | | | |
| | | H | 613 | 566 | 523 | 494 | | | | | | | | | |
| | | M | 550 | 514 | 465 | 443 | | | | | | | | | |
| | | L | 496 | 459 | 418 | 397 | | | | | | | | | |

<300 CFM | >450 CFM - Airflow below 300 CFM or above 450 cfm/ton

# High Static

**Table 9 – 09K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.1 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 | 0.44 | 0.48 | 0.5 | 0.52 | 0.56 | 0.6 | 0.64 | 0.68 | 0.7 | 0.72 | 0.76 | 0.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09K | SP8 | Turbo | | | | | | | | | | | | | | | | | | | | | | 434 | 403 | 368 | 348 |
| | | H | | | | | | | | | | | | | | | | | | | | | | 384 | 360 | 331 | 316 |
| | | M | | | | | | | | | | | | | | | | | | | | | | 334 | 305 | 274 | 254 |
| | | L | | | | | | | | | | | | | | | | | | | | | | 270 | 225 | 178 | 147 |
| | SP7 | Turbo | | | | | | | | | | | | | | | | | | | 460 | 415 | 370 | 346 | | | |
| | | H | | | | | | | | | | | | | | | | | | | 389 | 354 | 322 | 295 | | | |
| | | M | | | | | | | | | | | | | | | | | | | 325 | 298 | 271 | 244 | | | |
| | | L | | | | | | | | | | | | | | | | | | | 277 | 237 | 196 | 149 | | | |
| | SP6 | Turbo | | | | | | | | | | | | | | | | 450 | 427 | 391 | 356 | | | | | | |
| | | H | | | | | | | | | | | | | | | | 398 | 377 | 343 | 305 | | | | | | |
| | | M | | | | | | | | | | | | | | | | 326 | 303 | 262 | 234 | | | | | | |
| | | L | | | | | | | | | | | | | | | | 283 | 254 | 202 | 153 | | | | | | |
| | SP5 | Turbo | | | | | | | | | | | | | 483 | 437 | 391 | 368 | | | | | | | | | |
| | | H | | | | | | | | | | | | | 391 | 357 | 324 | 306 | | | | | | | | | |
| | | M | | | | | | | | | | | | | 337 | 288 | 242 | 214 | | | | | | | | | |
| | | L | | | | | | | | | | | | | 283 | 237 | 190 | 160 | | | | | | | | | |
| | SP4 | Turbo | | | | | | | | | | 478 | 454 | 405 | 361 | | | | | | | | | | | | |
| | | H | | | | | | | | | | 406 | 385 | 348 | 303 | | | | | | | | | | | | |
| | | M | | | | | | | | | | 361 | 342 | 305 | 256 | | | | | | | | | | | | |
| | | L | | | | | | | | | | 300 | 278 | 237 | 174 | | | | | | | | | | | | |
| | SP3 | Turbo | | | | | | | 472 | 418 | 361 | 338 | | | | | | | | | | | | | | | |
| | | H | | | | | | | 404 | 354 | 308 | 287 | | | | | | | | | | | | | | | |
| | | M | | | | | | | 362 | 316 | 273 | 247 | | | | | | | | | | | | | | | |
| | | L | | | | | | | 300 | 266 | 220 | 172 | | | | | | | | | | | | | | | |
| | SP2 | Turbo | | | | 468 | 448 | 409 | 354 | | | | | | | | | | | | | | | | | | |
| | | H | | | | 400 | 381 | 343 | 305 | | | | | | | | | | | | | | | | | | |
| | | M | | | | 348 | 330 | 297 | 260 | | | | | | | | | | | | | | | | | | |
| | | L | | | | 292 | 271 | 234 | 200 | | | | | | | | | | | | | | | | | | |
| | SP1 | Turbo | 441 | 406 | 370 | 353 | | | | | | | | | | | | | | | | | | | | | |
| | | H | 403 | 366 | 327 | 306 | | | | | | | | | | | | | | | | | | | | | |
| | | M | 377 | 330 | 283 | 265 | | | | | | | | | | | | | | | | | | | | | |
| | | L | 338 | 290 | 234 | 206 | | | | | | | | | | | | | | | | | | | | | |

# High Static (CONT)

**Table 10 – 12K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.1 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 | 0.44 | 0.48 | 0.5 | 0.52 | 0.56 | 0.6 | 0.64 | 0.68 | 0.7 | 0.72 | 0.76 | 0.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12K | SP8 | Turbo | | | | | | | | | | | | | | | | | | | | | | 500 | 477 | 445 | 414 |
| | | H | | | | | | | | | | | | | | | | | | | | | | 459 | 432 | 401 | 374 |
| | | M | | | | | | | | | | | | | | | | | | | | | | 407 | 380 | 353 | 334 |
| | | L | | | | | | | | | | | | | | | | | | | | | | 353 | 334 | 290 | 242 |
| | SP7 | Turbo | | | | | | | | | | | | | | | | | | | 624 | 541 | 461 | 426 | | | |
| | | H | | | | | | | | | | | | | | | | | | | 560 | 490 | 418 | 370 | | | |
| | | M | | | | | | | | | | | | | | | | | | | 500 | 436 | 366 | 317 | | | |
| | | L | | | | | | | | | | | | | | | | | | | 421 | 356 | 285 | 243 | | | |
| | SP6 | Turbo | | | | | | | | | | | | | | | | 607 | 574 | 501 | 447 | | | | | | |
| | | H | | | | | | | | | | | | | | | | 484 | 465 | 427 | 383 | | | | | | |
| | | M | | | | | | | | | | | | | | | | 401 | 380 | 350 | 327 | | | | | | |
| | | L | | | | | | | | | | | | | | | | 332 | 307 | 271 | 242 | | | | | | |
| | SP5 | Turbo | | | | | | | | | | | | | 603 | 543 | 483 | 456 | | | | | | | | | |
| | | H | | | | | | | | | | | | | 549 | 485 | 431 | 394 | | | | | | | | | |
| | | M | | | | | | | | | | | | | 484 | 420 | 356 | 322 | | | | | | | | | |
| | | L | | | | | | | | | | | | | 407 | 347 | 284 | 248 | | | | | | | | | |
| | SP4 | Turbo | | | | | | | | | | 615 | 584 | 516 | 456 | | | | | | | | | | | | |
| | | H | | | | | | | | | | 556 | 521 | 456 | 387 | | | | | | | | | | | | |
| | | M | | | | | | | | | | 507 | 472 | 393 | 321 | | | | | | | | | | | | |
| | | L | | | | | | | | | | 454 | 418 | 337 | 278 | | | | | | | | | | | | |
| | SP3 | Turbo | | | | | | | 647 | 562 | 474 | 427 | | | | | | | | | | | | | | | |
| | | H | | | | | | | 559 | 483 | 415 | 380 | | | | | | | | | | | | | | | |
| | | M | | | | | | | 504 | 426 | 347 | 303 | | | | | | | | | | | | | | | |
| | | L | | | | | | | 438 | 376 | 297 | 247 | | | | | | | | | | | | | | | |
| | SP2 | Turbo | | | | 566 | 541 | 489 | 426 | | | | | | | | | | | | | | | | | | |
| | | H | | | | 531 | 509 | 441 | 371 | | | | | | | | | | | | | | | | | | |
| | | M | | | | 490 | 464 | 396 | 307 | | | | | | | | | | | | | | | | | | |
| | | L | | | | 438 | 407 | 339 | 250 | | | | | | | | | | | | | | | | | | |
| | SP1 | Turbo | 489 | 457 | 428 | 411 | | | | | | | | | | | | | | | | | | | | | |
| | | H | 441 | 402 | 360 | 338 | | | | | | | | | | | | | | | | | | | | | |
| | | M | 408 | 356 | 307 | 284 | | | | | | | | | | | | | | | | | | | | | |
| | | L | 372 | 312 | 248 | 230 | | | | | | | | | | | | | | | | | | | | | |

# High Static (CONT)

**Table 11 – 18K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.1 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 | 0.44 | 0.48 | 0.5 | 0.52 | 0.56 | 0.6 | 0.64 | 0.68 | 0.7 | 0.72 | 0.76 | 0.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18K | SP8 | Turbo | | | | | | | | | | | | | | | | | | | | | | 910 | 863 | 782 | 700 |
| | | H | | | | | | | | | | | | | | | | | | | | | | 849 | 808 | 722 | 636 |
| | | M | | | | | | | | | | | | | | | | | | | | | | 763 | 723 | 614 | 486 |
| | | L | | | | | | | | | | | | | | | | | | | | | | 707 | 657 | 543 | 425 |
| | SP7 | Turbo | | | | | | | | | | | | | | | | | | | 918 | 828 | 725 | 677 | | | |
| | | H | | | | | | | | | | | | | | | | | | | 823 | 739 | 653 | 610 | | | |
| | | M | | | | | | | | | | | | | | | | | | | 769 | 684 | 590 | 536 | | | |
| | | L | | | | | | | | | | | | | | | | | | | 669 | 609 | 531 | 463 | | | |
| | SP6 | Turbo | | | | | | | | | | | | | | | | 918 | 881 | 782 | 683 | | | | | | |
| | | H | | | | | | | | | | | | | | | | 825 | 793 | 707 | 609 | | | | | | |
| | | M | | | | | | | | | | | | | | | | 733 | 700 | 621 | 543 | | | | | | |
| | | L | | | | | | | | | | | | | | | | 646 | 614 | 545 | 445 | | | | | | |
| | SP5 | Turbo | | | | | | | | | | | | | 918 | 831 | 735 | 692 | | | | | | | | | |
| | | H | | | | | | | | | | | | | 876 | 768 | 655 | 606 | | | | | | | | | |
| | | M | | | | | | | | | | | | | 813 | 707 | 602 | 534 | | | | | | | | | |
| | | L | | | | | | | | | | | | | 726 | 634 | 546 | 465 | | | | | | | | | |
| | SP4 | Turbo | | | | | | | | | | 926 | 892 | 810 | 735 | | | | | | | | | | | | |
| | | H | | | | | | | | | | 877 | 829 | 723 | 619 | | | | | | | | | | | | |
| | | M | | | | | | | | | | 795 | 744 | 637 | 519 | | | | | | | | | | | | |
| | | L | | | | | | | | | | 696 | 644 | 538 | 424 | | | | | | | | | | | | |
| | SP3 | Turbo | | | | | | | 890 | 842 | 776 | 742 | | | | | | | | | | | | | | | |
| | | H | | | | | | | 838 | 758 | 677 | 639 | | | | | | | | | | | | | | | |
| | | M | | | | | | | 776 | 680 | 586 | 535 | | | | | | | | | | | | | | | |
| | | L | | | | | | | 672 | 578 | 491 | 438 | | | | | | | | | | | | | | | |
| | SP2 | Turbo | | | | 856 | 830 | 783 | 718 | | | | | | | | | | | | | | | | | | |
| | | H | | | | 805 | 778 | 725 | 641 | | | | | | | | | | | | | | | | | | |
| | | M | | | | 738 | 703 | 625 | 534 | | | | | | | | | | | | | | | | | | |
| | | L | | | | 434 | 414 | 368 | 315 | | | | | | | | | | | | | | | | | | |
| | SP1 | Turbo | 820 | 776 | 737 | 707 | | | | | | | | | | | | | | | | | | | | | |
| | | H | 711 | 676 | 616 | 577 | | | | | | | | | | | | | | | | | | | | | |
| | | M | 645 | 600 | 537 | 488 | | | | | | | | | | | | | | | | | | | | | |
| | | L | 574 | 524 | 465 | 426 | | | | | | | | | | | | | | | | | | | | | |

# High Static (CONT)

**Table 12 – 24K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.1 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 | 0.44 | 0.48 | 0.5 | 0.52 | 0.56 | 0.6 | 0.64 | 0.68 | 0.7 | 0.72 | 0.76 | 0.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24K | SP8 | Turbo | | | | | | | | | | | | | | | | | | | | | | 1008 | 975 | 904 | 855 |
| | | H | | | | | | | | | | | | | | | | | | | | | | 866 | 831 | 780 | 716 |
| | | M | | | | | | | | | | | | | | | | | | | | | | 773 | 735 | 673 | 606 |
| | | L | | | | | | | | | | | | | | | | | | | | | | 680 | 639 | 549 | 486 |
| | SP7 | Turbo | | | | | | | | | | | | | | | | | | | 1024 | 968 | 902 | 877 | | | |
| | | H | | | | | | | | | | | | | | | | | | | 889 | 836 | 786 | 759 | | | |
| | | M | | | | | | | | | | | | | | | | | | | 786 | 731 | 678 | 647 | | | |
| | | L | | | | | | | | | | | | | | | | | | | 657 | 609 | 531 | 463 | | | |
| | SP6 | Turbo | | | | | | | | | | | | | | | | 1008 | 972 | 908 | 845 | | | | | | |
| | | H | | | | | | | | | | | | | | | | 890 | 858 | 790 | 735 | | | | | | |
| | | M | | | | | | | | | | | | | | | | 780 | 743 | 686 | 622 | | | | | | |
| | | L | | | | | | | | | | | | | | | | 682 | 661 | 569 | 510 | | | | | | |
| | SP5 | Turbo | | | | | | | | | | | | | 1022 | 952 | 882 | 855 | | | | | | | | | |
| | | H | | | | | | | | | | | | | 935 | 861 | 784 | 729 | | | | | | | | | |
| | | M | | | | | | | | | | | | | 840 | 758 | 678 | 634 | | | | | | | | | |
| | | L | | | | | | | | | | | | | 749 | 650 | 556 | 519 | | | | | | | | | |
| | SP4 | Turbo | | | | | | | | | | 1008 | 965 | 904 | 839 | | | | | | | | | | | | |
| | | H | | | | | | | | | | 916 | 886 | 829 | 753 | | | | | | | | | | | | |
| | | M | | | | | | | | | | 846 | 808 | 724 | 624 | | | | | | | | | | | | |
| | | L | | | | | | | | | | 766 | 720 | 637 | 522 | | | | | | | | | | | | |
| | SP3 | Turbo | | | | | | | 1001 | 909 | 846 | 810 | | | | | | | | | | | | | | | |
| | | H | | | | | | | 898 | 832 | 757 | 731 | | | | | | | | | | | | | | | |
| | | M | | | | | | | 843 | 773 | 691 | 652 | | | | | | | | | | | | | | | |
| | | L | | | | | | | 719 | 660 | 589 | 527 | | | | | | | | | | | | | | | |
| | SP2 | Turbo | | | | 996 | 951 | 883 | 832 | | | | | | | | | | | | | | | | | | |
| | | H | | | | 893 | 863 | 801 | 746 | | | | | | | | | | | | | | | | | | |
| | | M | | | | 801 | 776 | 713 | 644 | | | | | | | | | | | | | | | | | | |
| | | L | | | | 697 | 672 | 593 | 496 | | | | | | | | | | | | | | | | | | |
| | SP1 | Turbo | 998 | 929 | 863 | 827 | | | | | | | | | | | | | | | | | | | | | |
| | | H | 891 | 811 | 742 | 715 | | | | | | | | | | | | | | | | | | | | | |
| | | M | 762 | 692 | 614 | 588 | | | | | | | | | | | | | | | | | | | | | |
| | | L | 633 | 572 | 497 | 461 | | | | | | | | | | | | | | | | | | | | | |

# High Static (CONT)

**Table 13 – 36K**

| | | CFM (In.wc) | 0 | 0.06 | 0.12 | 0.148 | 0.16 | 0.2 | 0.22 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 | 0.44 | 0.48 | 0.5 | 0.52 | 0.56 | 0.6 | 0.64 | 0.68 | 0.7 | 0.72 | 0.76 | 0.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36K | SP8 | Turbo | | | | | | | | | | | | | | | | | | | | | | 1699 | 1621 | 1493 | 1370 |
| | | H | | | | | | | | | | | | | | | | | | | | | | 1595 | 1501 | 1374 | 1254 |
| | | M | | | | | | | | | | | | | | | | | | | | | | 1477 | 1383 | 1257 | 1137 |
| | | L | | | | | | | | | | | | | | | | | | | | | | 1342 | 1248 | 1121 | 1004 |
| | SP7 | Turbo | | | | | | | | | | | | | | | | | | | 1642 | 1524 | 1410 | 1333 | | | |
| | | H | | | | | | | | | | | | | | | | | | | 1503 | 1380 | 1248 | 1195 | | | |
| | | M | | | | | | | | | | | | | | | | | | | 1354 | 1225 | 1112 | 1030 | | | |
| | | L | | | | | | | | | | | | | | | | | | | 1237 | 1092 | 926 | 794 | | | |
| | SP6 | Turbo | | | | | | | | | | | | | | | | 1570 | 1506 | 1418 | 1343 | | | | | | |
| | | H | | | | | | | | | | | | | | | | 1442 | 1388 | 1298 | 1226 | | | | | | |
| | | M | | | | | | | | | | | | | | | | 1295 | 1236 | 1151 | 1074 | | | | | | |
| | | L | | | | | | | | | | | | | | | | 1107 | 1031 | 936 | 854 | | | | | | |
| | SP5 | Turbo | | | | | | | | | | | | | 1629 | 1514 | 1387 | 1327 | | | | | | | | | |
| | | H | | | | | | | | | | | | | 1502 | 1398 | 1271 | 1189 | | | | | | | | | |
| | | M | | | | | | | | | | | | | 1413 | 1283 | 1160 | 1071 | | | | | | | | | |
| | | L | | | | | | | | | | | | | 1277 | 1165 | 1018 | 921 | | | | | | | | | |
| | SP4 | Turbo | | | | | | | | | | 1548 | 1480 | 1392 | 1301 | | | | | | | | | | | | |
| | | H | | | | | | | | | | 1413 | 1366 | 1268 | 1185 | | | | | | | | | | | | |
| | | M | | | | | | | | | | 1260 | 1201 | 1112 | 1031 | | | | | | | | | | | | |
| | | L | | | | | | | | | | 1092 | 1030 | 924 | 856 | | | | | | | | | | | | |
| | SP3 | Turbo | | | | | | 1600 | | 1501 | 1377 | 1311 | | | | | | | | | | | | | | | |
| | | H | | | | | | 1453 | | 1363 | 1228 | 1151 | | | | | | | | | | | | | | | |
| | | M | | | | | | 1295 | | 1183 | 1059 | 992 | | | | | | | | | | | | | | | |
| | | L | | | | | | 1183 | | 1071 | 942 | 873 | | | | | | | | | | | | | | | |
| | SP2 | Turbo | | | 1552 | | 1424 | 1308 | 1239 | | | | | | | | | | | | | | | | | | |
| | | H | | | 1436 | | 1305 | 1161 | 1061 | | | | | | | | | | | | | | | | | | |
| | | M | | | 1330 | | 1177 | 999 | 889 | | | | | | | | | | | | | | | | | | |
| | | L | | | 1189 | | 1009 | 809 | 680 | | | | | | | | | | | | | | | | | | |
| | SP1 | Turbo | 1567 | 1464 | 1349 | 1268 | | | | | | | | | | | | | | | | | | | | | |
| | | H | 1304 | 1192 | 1046 | 970 | | | | | | | | | | | | | | | | | | | | | |
| | | M | 1062 | 930 | 798 | 732 | | | | | | | | | | | | | | | | | | | | | |
| | | L | 898 | 727 | 584 | 515 | | | | | | | | | | | | | | | | | | | | | |

# High Static (CONT)

**Table 14 – 48K**

| | | CFM (In.wc) | 0 | 0.06 | 0.12 | 0.18 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 | 0.44 | 0.48 | 0.5 | 0.52 | 0.56 | 0.6 | 0.64 | 0.68 | 0.7 | 0.72 | 0.76 | 0.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48K | SP8 | Turbo | | | | | | | | | | | | | | | | | | | | 2279 | 2161 | 1972 | 1779 |
| | | H | | | | | | | | | | | | | | | | | | | | 2020 | 1948 | 1793 | 1629 |
| | | M | | | | | | | | | | | | | | | | | | | | 1866 | 1751 | 1595 | 1423 |
| | | L | | | | | | | | | | | | | | | | | | | | 1624 | 1569 | 1401 | 1184 |
| | SP7 | Turbo | | | | | | | | | | | | | | | | | 2226 | 2102 | 1913 | 1722 | | | |
| | | H | | | | | | | | | | | | | | | | | 2020 | 1901 | 1746 | 1547 | | | |
| | | M | | | | | | | | | | | | | | | | | 1836 | 1716 | 1566 | 1397 | | | |
| | | L | | | | | | | | | | | | | | | | | 1583 | 1474 | 1248 | 1057 | | | |
| | SP6 | Turbo | | | | | | | | | | | | | | 2126 | 2061 | 1919 | 1745 | | | | | | |
| | | H | | | | | | | | | | | | | | 1932 | 1866 | 1746 | 1590 | | | | | | |
| | | M | | | | | | | | | | | | | | 1713 | 1669 | 1566 | 1423 | | | | | | |
| | | L | | | | | | | | | | | | | | 1507 | 1474 | 1366 | 1230 | | | | | | |
| | SP5 | Turbo | | | | | | | | | | | 2067 | 1978 | 1825 | 1710 | | | | | | | | | |
| | | H | | | | | | | | | | | 1891 | 1807 | 1669 | 1567 | | | | | | | | | |
| | | M | | | | | | | | | | | 1705 | 1651 | 1536 | 1423 | | | | | | | | | |
| | | L | | | | | | | | | | | 1507 | 1457 | 1336 | 1230 | | | | | | | | | |
| | SP4 | Turbo | | | | | | | | 2032 | 1978 | 1856 | 1728 | | | | | | | | | | | | |
| | | H | | | | | | | | 1861 | 1807 | 1699 | 1557 | | | | | | | | | | | | |
| | | M | | | | | | | | 1705 | 1651 | 1554 | 1401 | | | | | | | | | | | | |
| | | L | | | | | | | | 1507 | 1439 | 1324 | 1195 | | | | | | | | | | | | |
| | SP3 | Turbo | | | | | 3332 | 3120 | 2934 | 2828 | | | | | | | | | | | | | | | |
| | | H | | | | | 3050 | 2820 | 2652 | 2521 | | | | | | | | | | | | | | | |
| | | M | | | | | 2700 | 2462 | 2300 | 2170 | | | | | | | | | | | | | | | |
| | | L | | | | | 2416 | 2202 | 2040 | 1951 | | | | | | | | | | | | | | | |
| | SP2 | Turbo | 3410 | 3275 | 3110 | 2925 | 2862 | | | | | | | | | | | | | | | | | | |
| | | H | 3120 | 2985 | 2840 | 2645 | 2547 | | | | | | | | | | | | | | | | | | |
| | | M | 2776 | 2675 | 2510 | 2350 | 2278 | | | | | | | | | | | | | | | | | | |
| | | L | 2482 | 2355 | 2185 | 2020 | 1960 | | | | | | | | | | | | | | | | | | |
| | SP1 | Turbo | 1960 | 1881 | 1783 | 1675 | 1637 | | | | | | | | | | | | | | | | | | |
| | | H | 2820 | 2685 | 2520 | 2335 | 2272 | | | | | | | | | | | | | | | | | | |
| | | M | 2562 | 2425 | 2260 | 2075 | 2010 | | | | | | | | | | | | | | | | | | |
| | | L | 2272 | 2135 | 1970 | 1780 | 1720 | | | | | | | | | | | | | | | | | | |

# High Static (CONT)

**Table 15 – 58K**

| | | CFM (In.wc) | 0 | 0.04 | 0.08 | 0.12 | 0.16 | 0.2 | 0.24 | 0.28 | 0.3 | 0.32 | 0.36 | 0.4 | 0.44 | 0.48 | 0.5 | 0.52 | 0.56 | 0.6 | 0.64 | 0.68 | 0.7 | 0.72 | 0.76 | 0.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58K | SP8 | Turbo | | | | | | | | | | | | | | | | | | | | | 2484 | 2372 | 2107 | 1777 |
| | | H | | | | | | | | | | | | | | | | | | | | | 2203 | 2101 | 1848 | 1580 |
| | | M | | | | | | | | | | | | | | | | | | | | | 1985 | 1868 | 1609 | 1331 |
| | | L | | | | | | | | | | | | | | | | | | | | | 1784 | 1682 | 1420 | 1134 |
| | SP7 | Turbo | | | | | | | | | | | | | | | | | | 2472 | 2295 | 2107 | 1998 | | | |
| | | H | | | | | | | | | | | | | | | | | | 2203 | 2026 | 1832 | 1699 | | | |
| | | M | | | | | | | | | | | | | | | | | | 2038 | 1850 | 1567 | 1325 | | | |
| | | L | | | | | | | | | | | | | | | | | | 1848 | 1599 | 1264 | 1024 | | | |
| | SP6 | Turbo | | | | | | | | | | | | | | | 2472 | 2390 | 2239 | 2069 | | | | | | |
| | | H | | | | | | | | | | | | | | | 2203 | 2134 | 1995 | 1858 | | | | | | |
| | | M | | | | | | | | | | | | | | | 2008 | 1953 | 1775 | 1519 | | | | | | |
| | | L | | | | | | | | | | | | | | | 1848 | 1710 | 1447 | 1279 | | | | | | |
| | SP5 | Turbo | | | | | | | | | | | | 2464 | 2331 | 2205 | 2129 | | | | | | | | | |
| | | H | | | | | | | | | | | | 2284 | 2154 | 2035 | 1958 | | | | | | | | | |
| | | M | | | | | | | | | | | | 2069 | 1952 | 1835 | 1739 | | | | | | | | | |
| | | L | | | | | | | | | | | | 1894 | 1743 | 1546 | 1325 | | | | | | | | | |
| | SP4 | Turbo | | | | | | | | | 2451 | 2390 | 2295 | 2182 | | | | | | | | | | | | |
| | | H | | | | | | | | | 2244 | 2191 | 2060 | 1897 | | | | | | | | | | | | |
| | | M | | | | | | | | | 2037 | 1947 | 1790 | 1650 | | | | | | | | | | | | |
| | | L | | | | | | | | | 1735 | 1655 | 1471 | 1203 | | | | | | | | | | | | |
| | SP3 | Turbo | | | | | | 2353 | 2267 | 2144 | 2067 | | | | | | | | | | | | | | | |
| | | H | | | | | | 2149 | 2042 | 1907 | 1809 | | | | | | | | | | | | | | | |
| | | M | | | | | | 1945 | 1798 | 1660 | 1573 | | | | | | | | | | | | | | | |
| | | L | | | | | | 1696 | 1543 | 1360 | 1188 | | | | | | | | | | | | | | | |
| | SP2 | Turbo | 2536 | 2447 | 2329 | 2225 | 2129 | 2012 | | | | | | | | | | | | | | | | | | |
| | | H | 2370 | 2260 | 2147 | 2036 | 1926 | 1802 | | | | | | | | | | | | | | | | | | |
| | | M | 2171 | 2060 | 1942 | 1825 | 1686 | 1533 | | | | | | | | | | | | | | | | | | |
| | | L | 2014 | 1891 | 1773 | 1630 | 1480 | 1324 | | | | | | | | | | | | | | | | | | |
| | SP1 | Turbo | 2473 | 2367 | 2277 | 2178 | 2070 | 1961 | | | | | | | | | | | | | | | | | | |
| | | H | 2167 | 2058 | 1949 | 1822 | 1709 | 1530 | | | | | | | | | | | | | | | | | | |
| | | M | 2035 | 1912 | 1793 | 1677 | 1516 | 1366 | | | | | | | | | | | | | | | | | | |
| | | L | 1899 | 1772 | 1648 | 1507 | 1338 | 1138 | | | | | | | | | | | | | | | | | | |

<300 CFM | >450 CFM - Airflow below 300 CFM or above 450 cfm/ton

# FAN PERFORMANCES AT VARYING STATIC PRESSURES — LOW STATIC

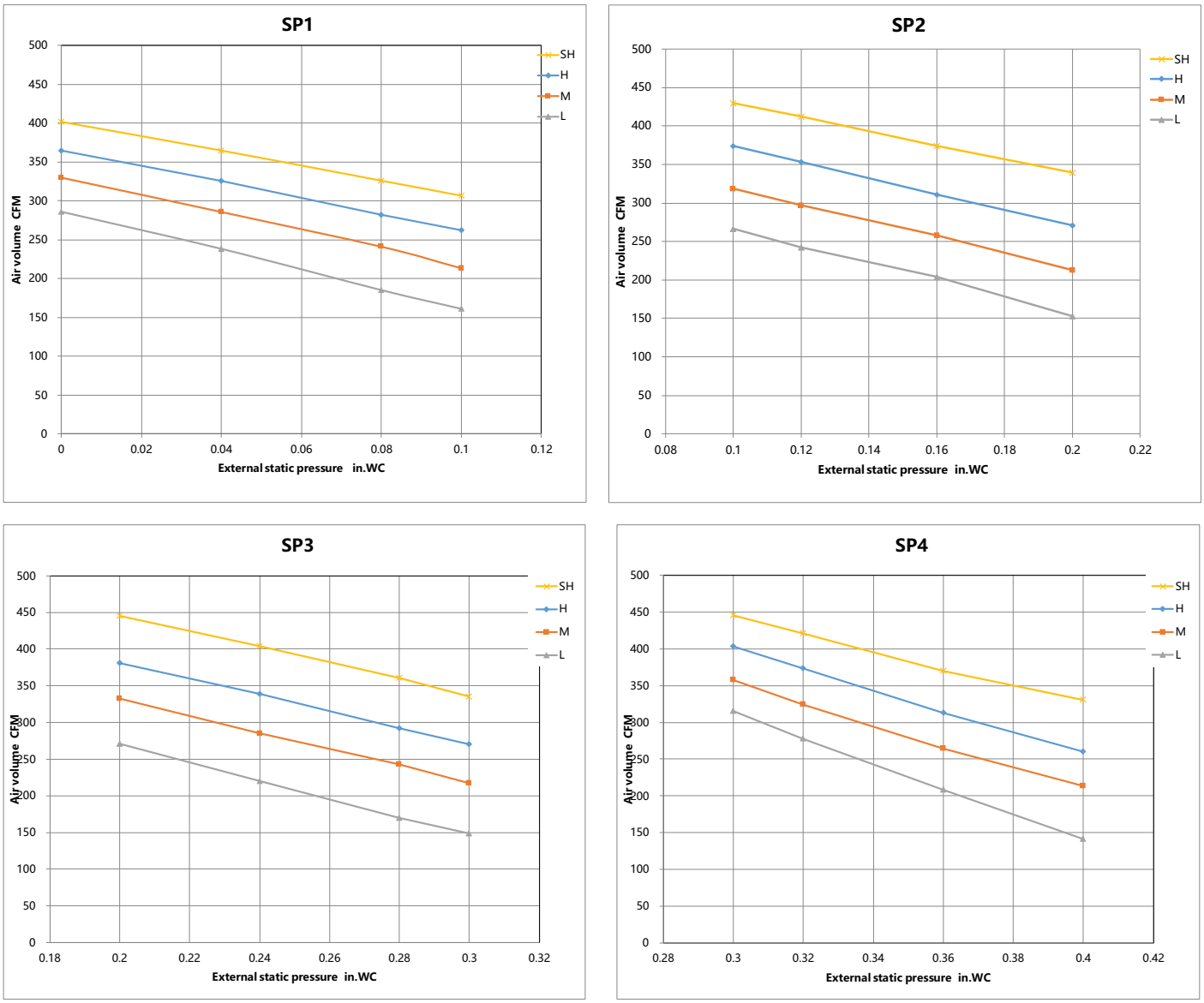



**Fig. 18 – Low Static Pressure Curves – 6/9k**

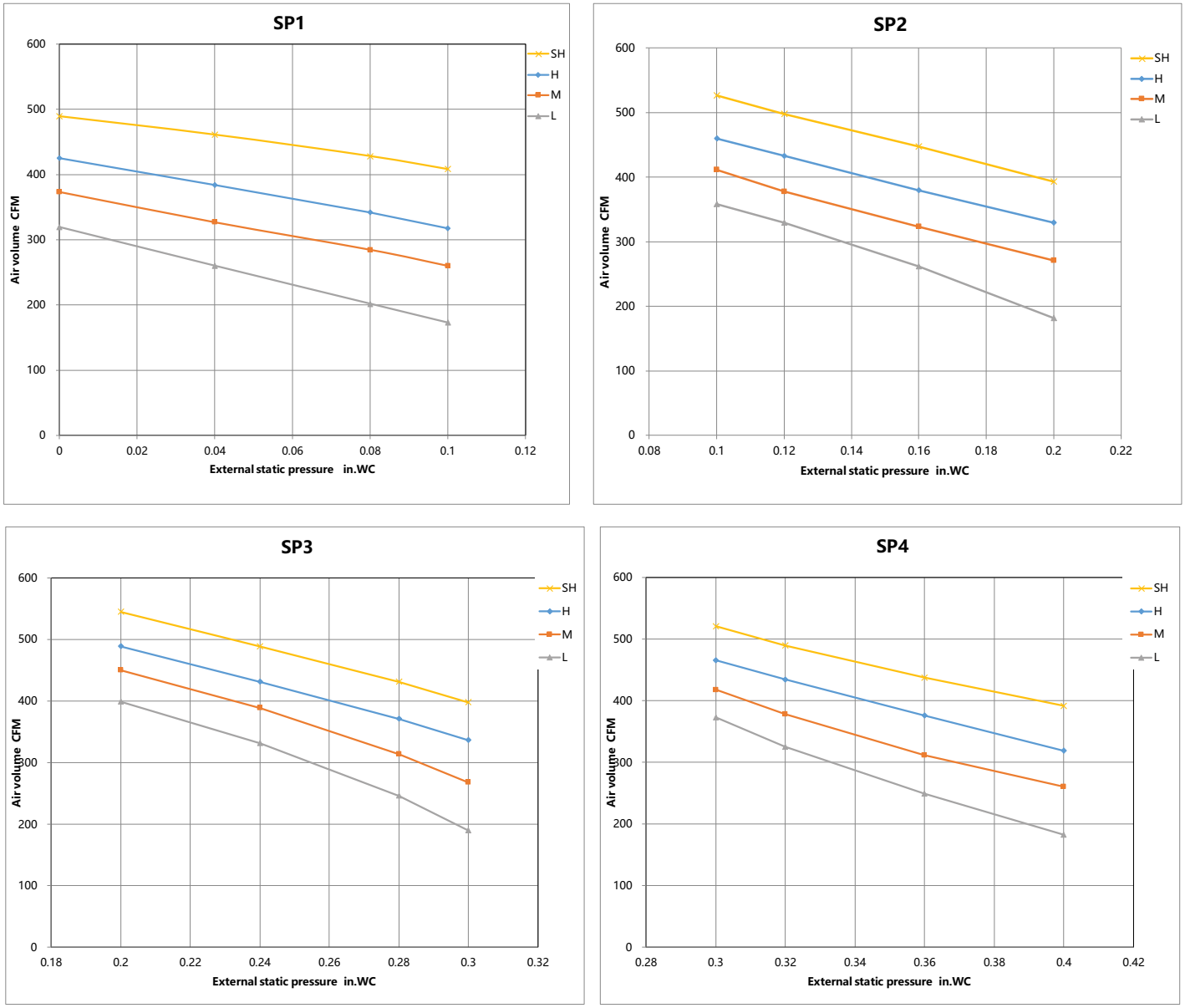



**Fig. 19 – Low Static Pressure Curves – 12k**

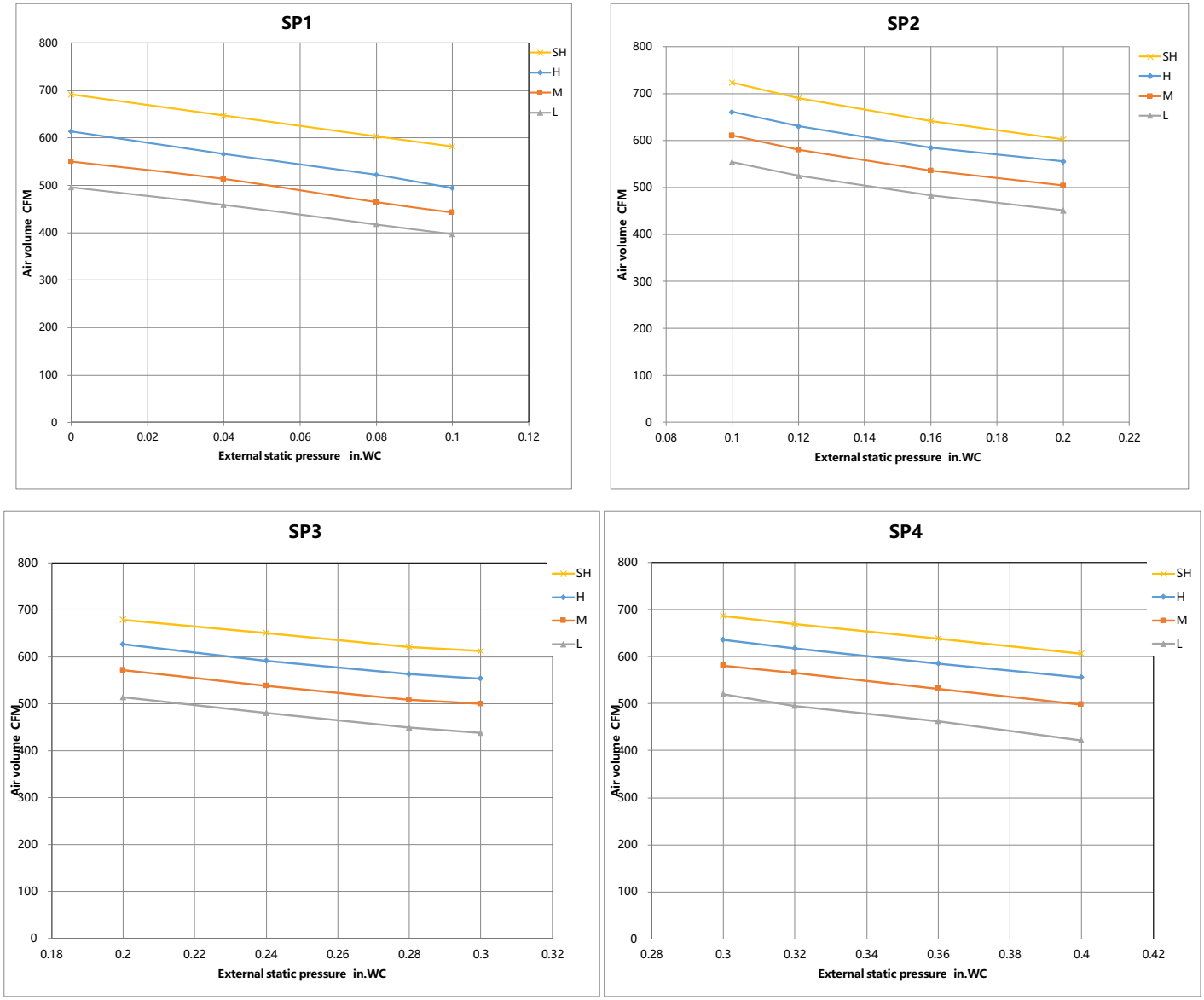
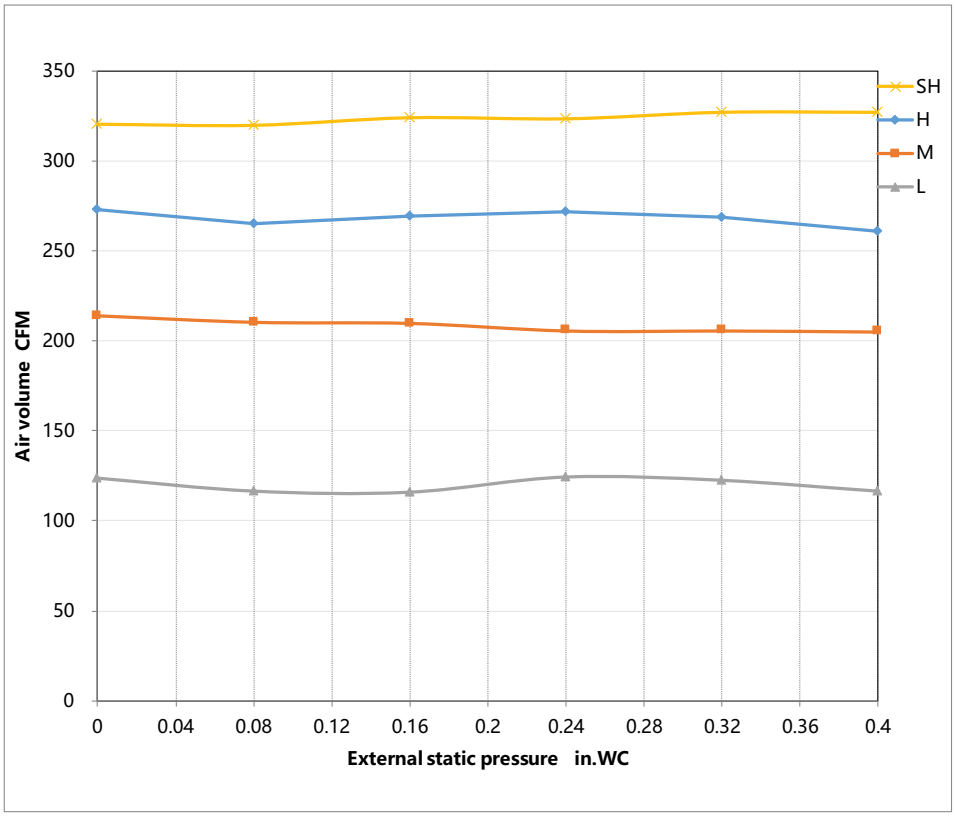



**Fig. 20 – Low Static Pressure Curves – 18k**

6k/9k




12k

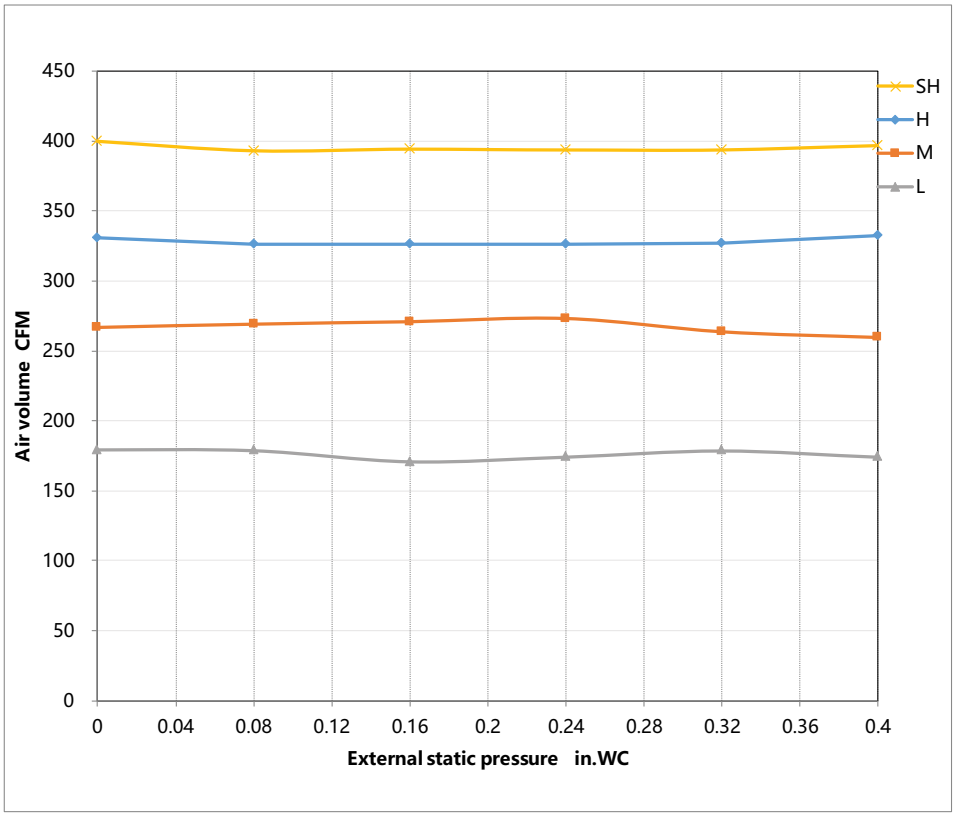



**Fig. 21 – Low Static Pressure Curves – Constant Air Volume**

18k

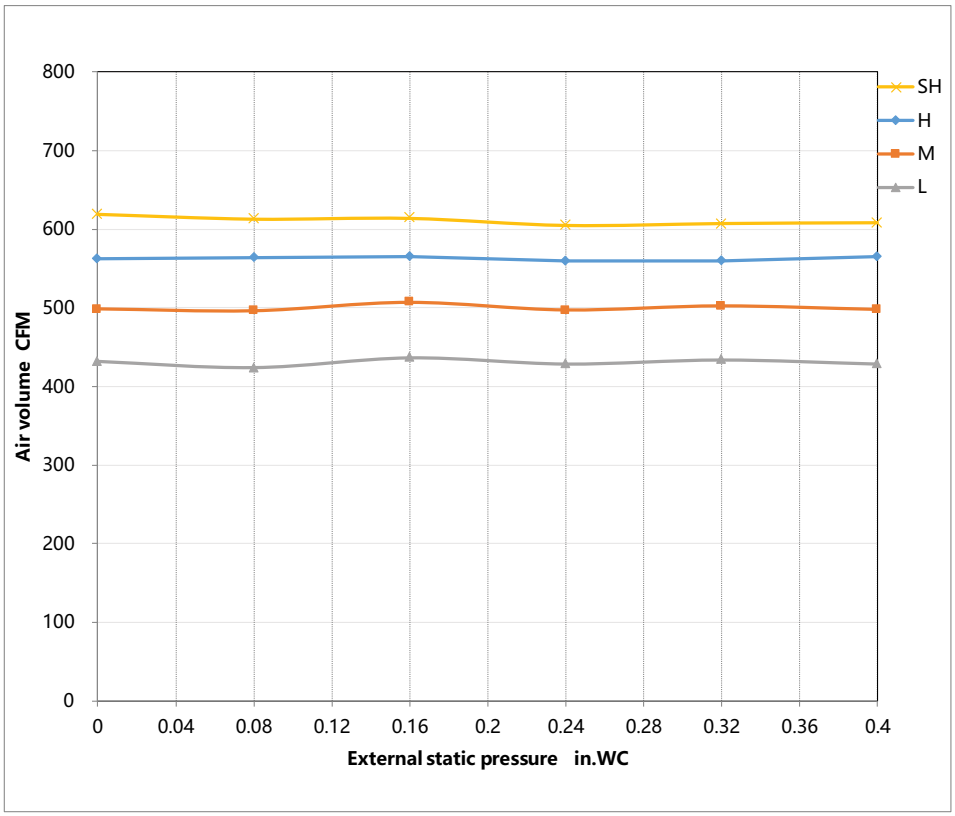



**Fig. 22 – Low Static Pressure Curves – Constant Air Volume**

# FAN PERFORMANCES AT VARYING STATIC PRESSURES — HIGH STATIC

9k

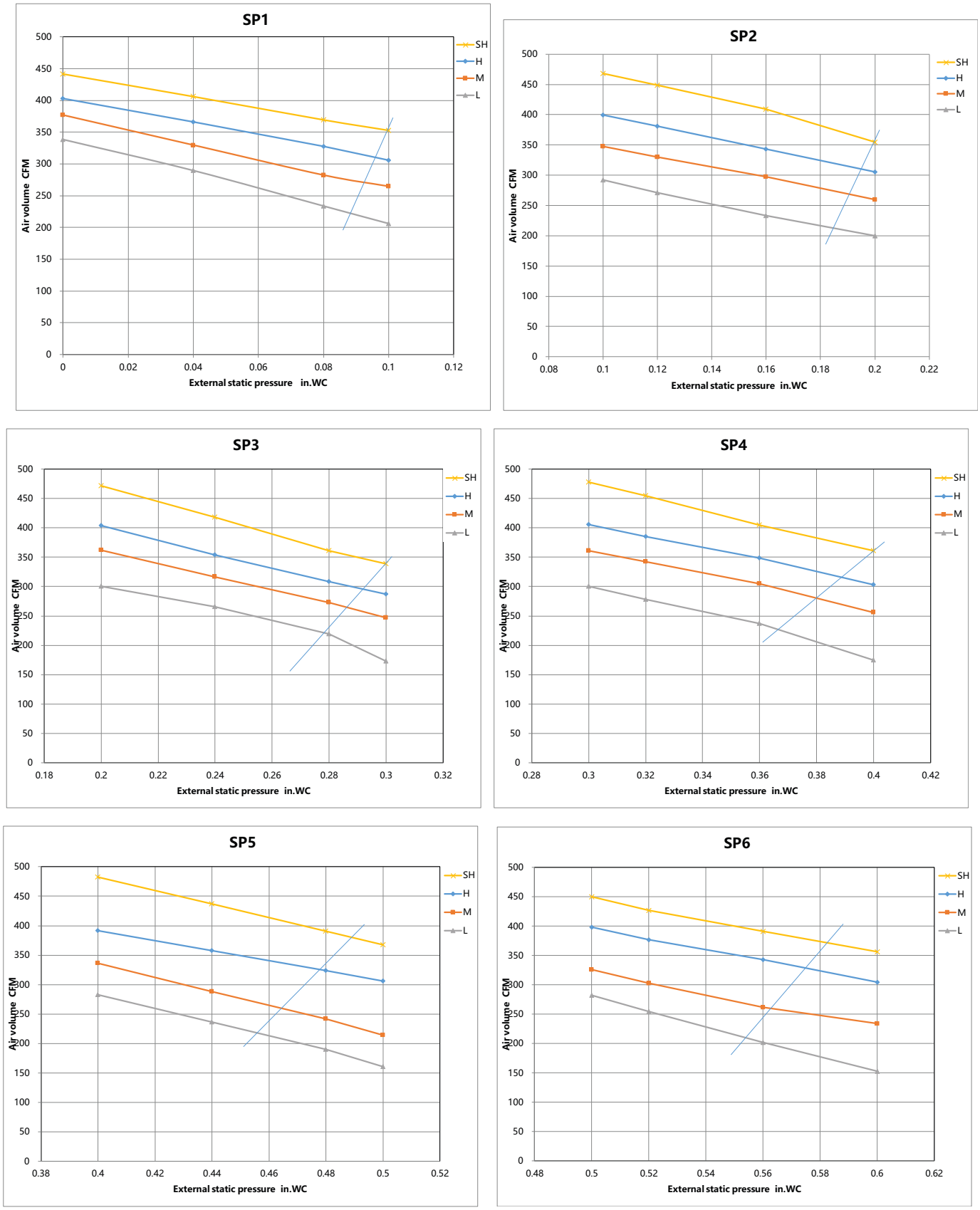
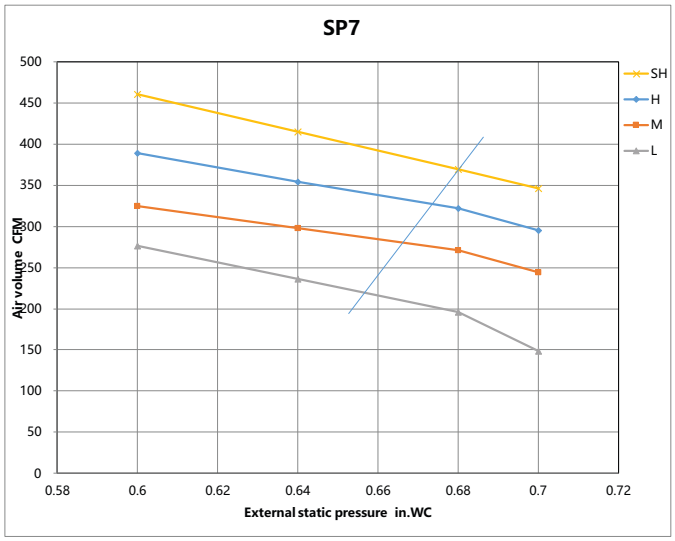
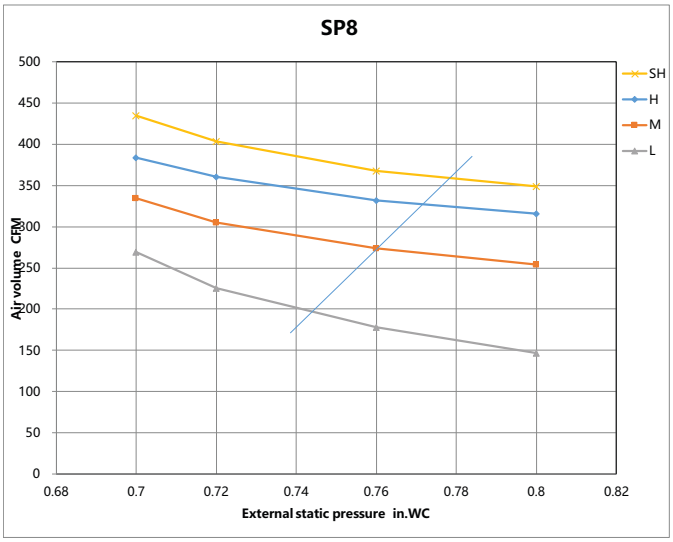



**Fig. 23 – High Static Pressure Curves - 9k**




Constant air volume

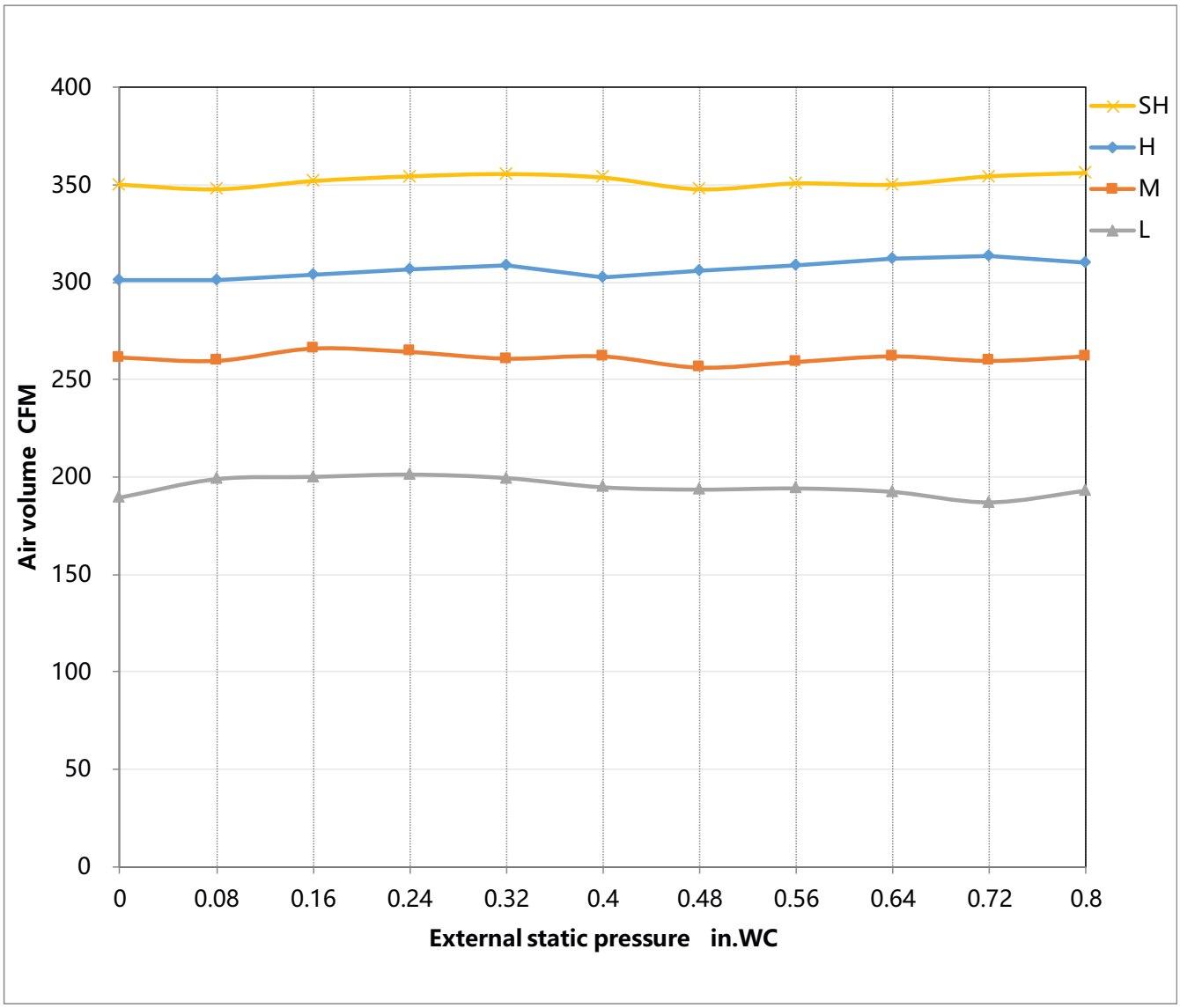



**Fig. 24 – High Static Pressure Curves - 9k, Constant Air Volume**

# 12k

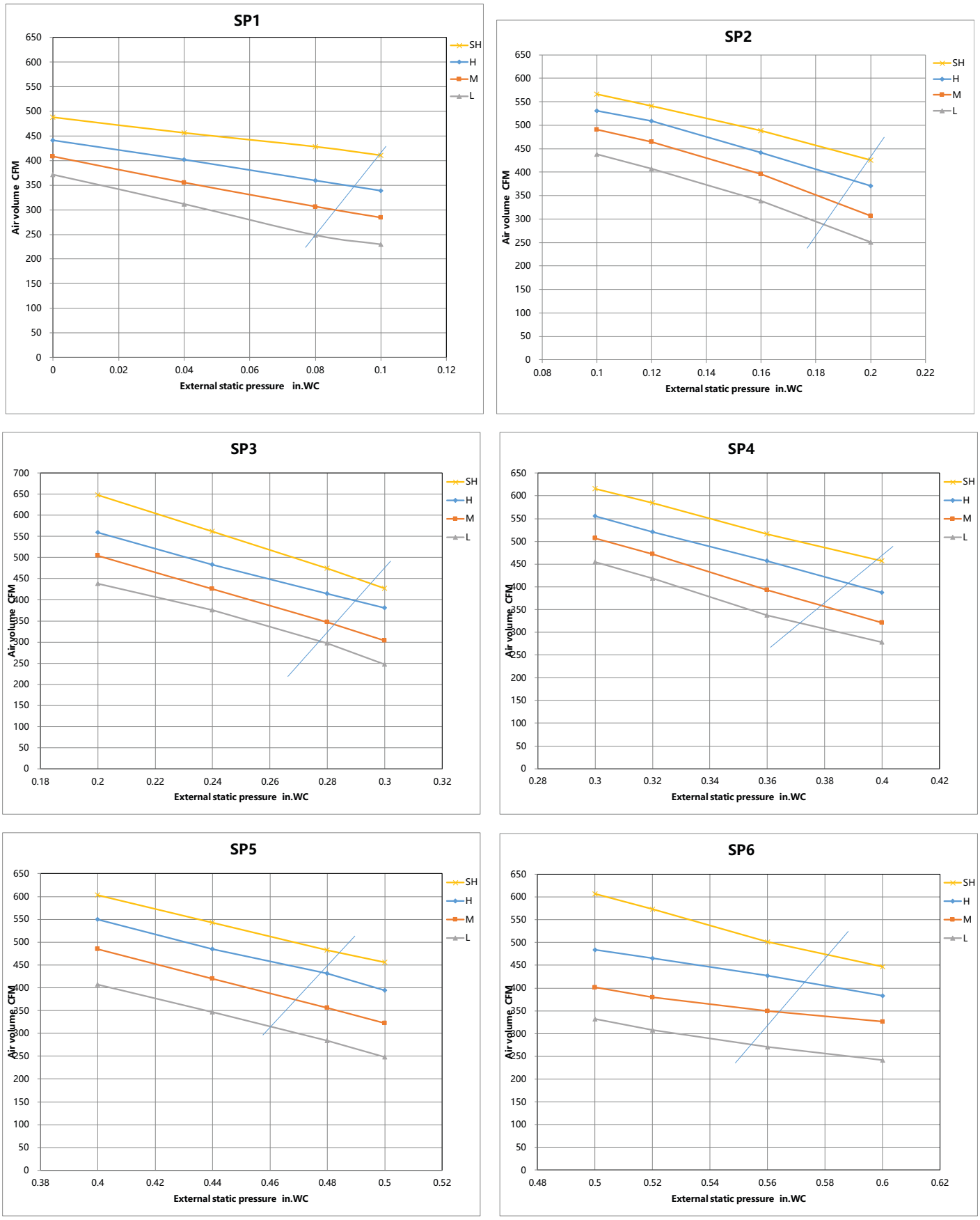
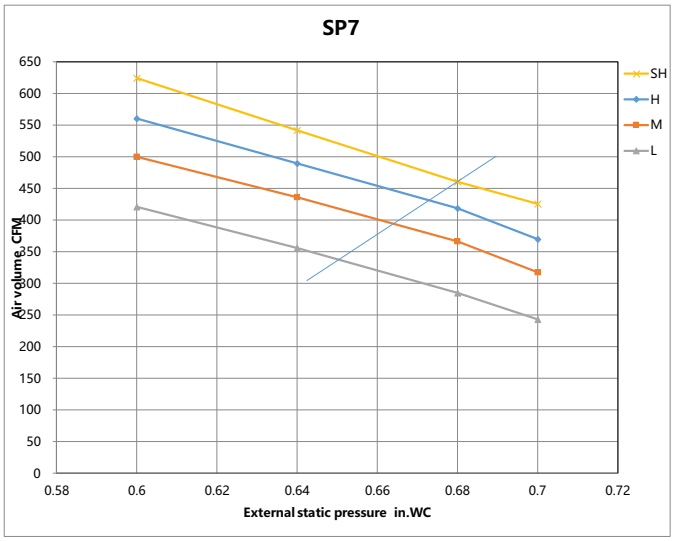
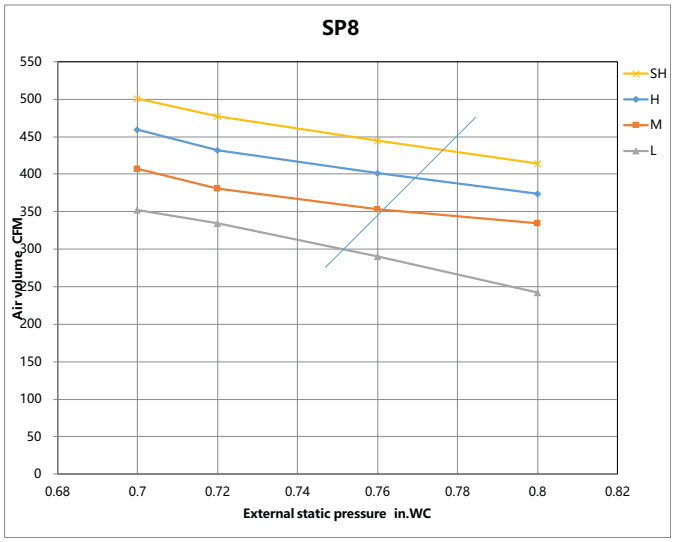



**Fig. 25 – High Static Pressure Curves - 12k**




Constant air volume

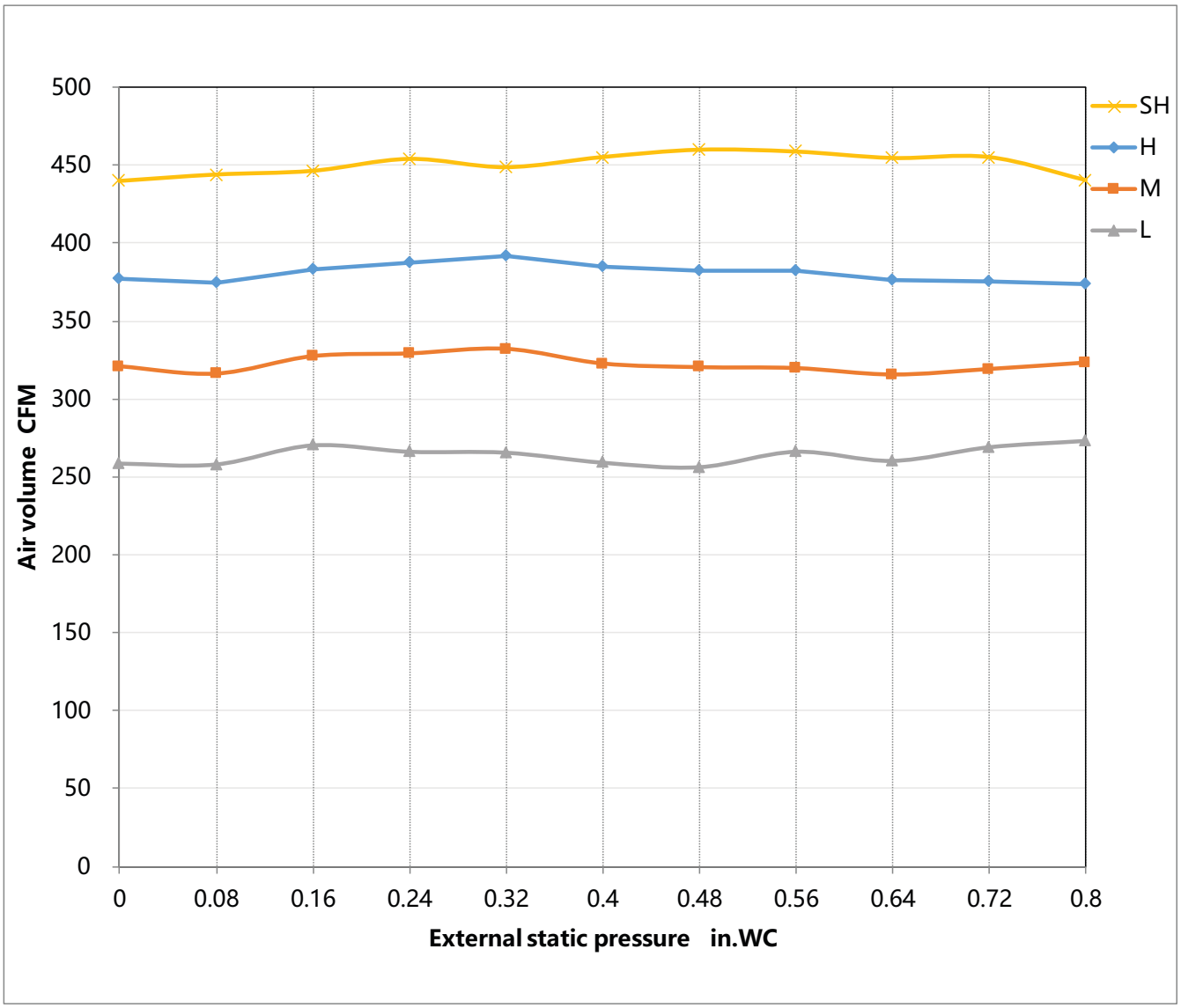
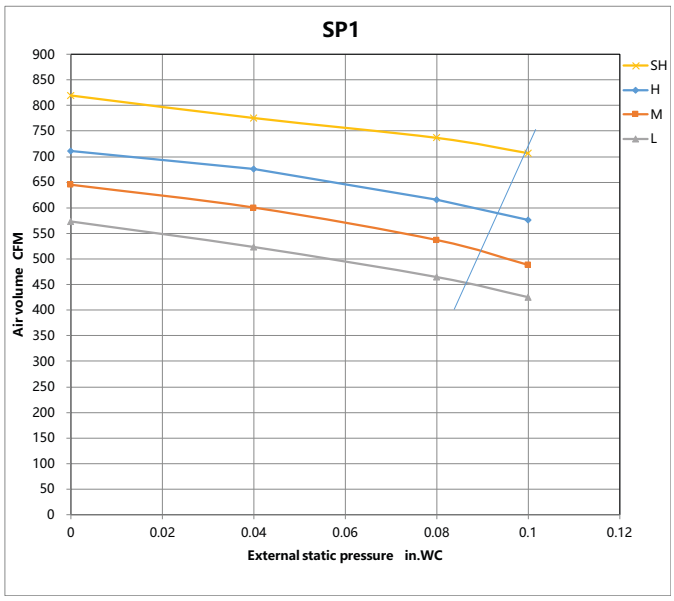
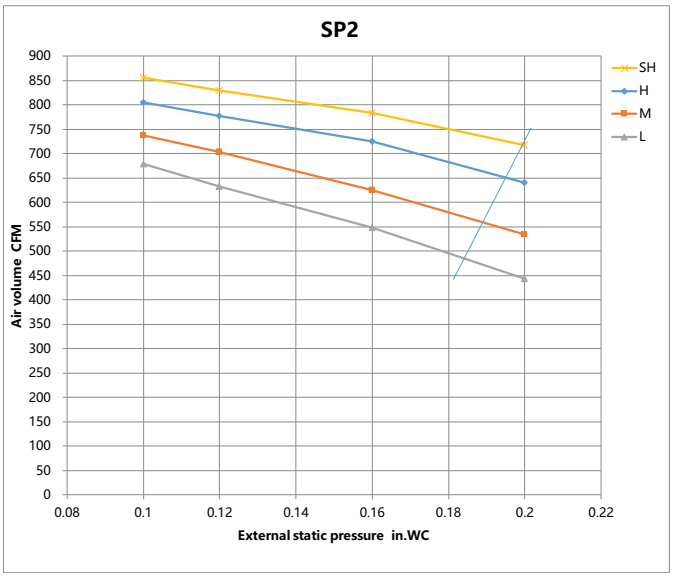
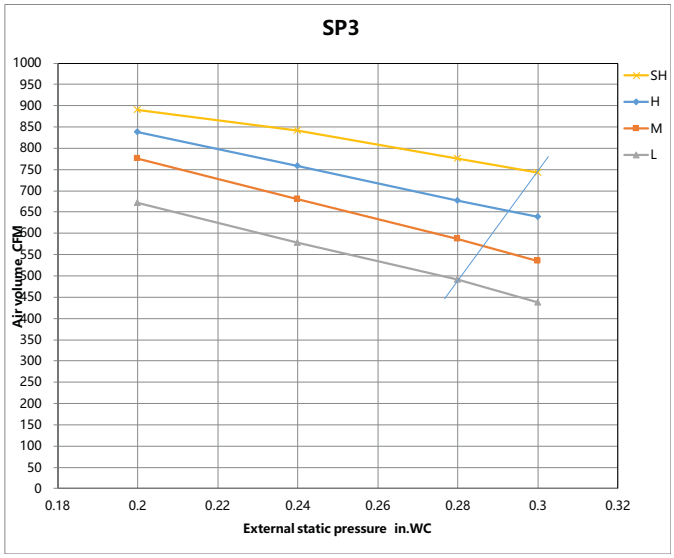


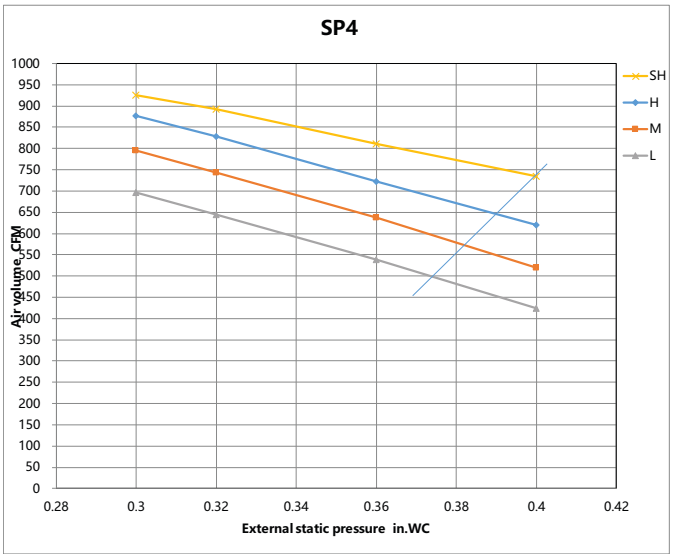

**Fig. 26 – High Static Pressure Curves - 12k, Constant Air Volume**

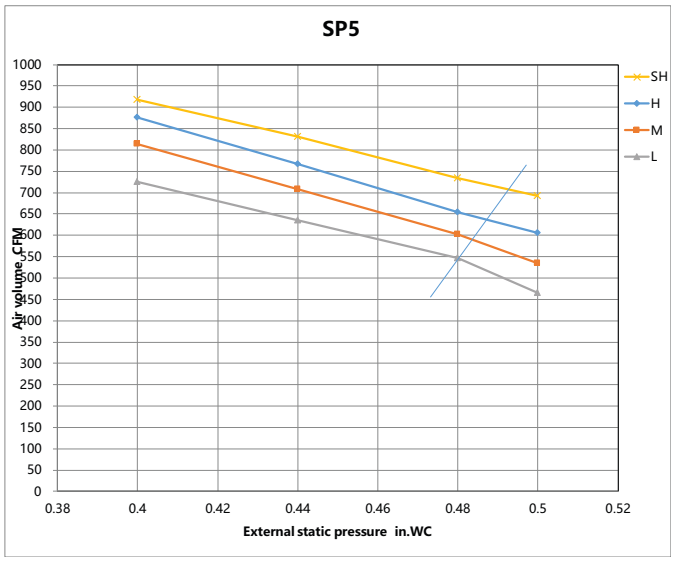
## 18k



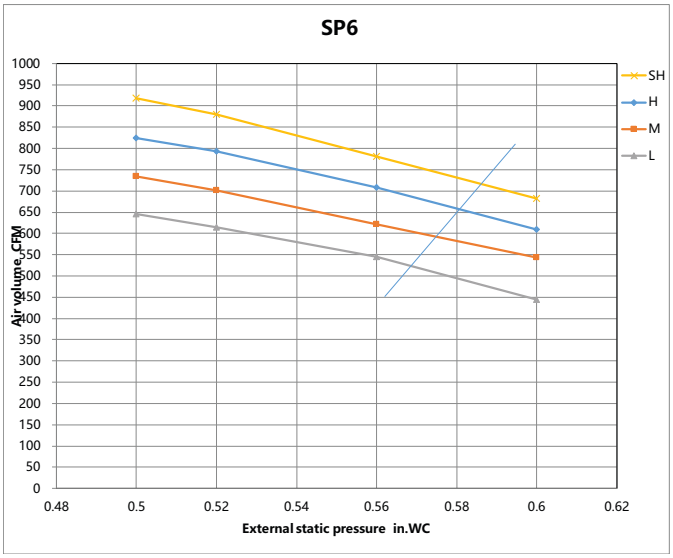
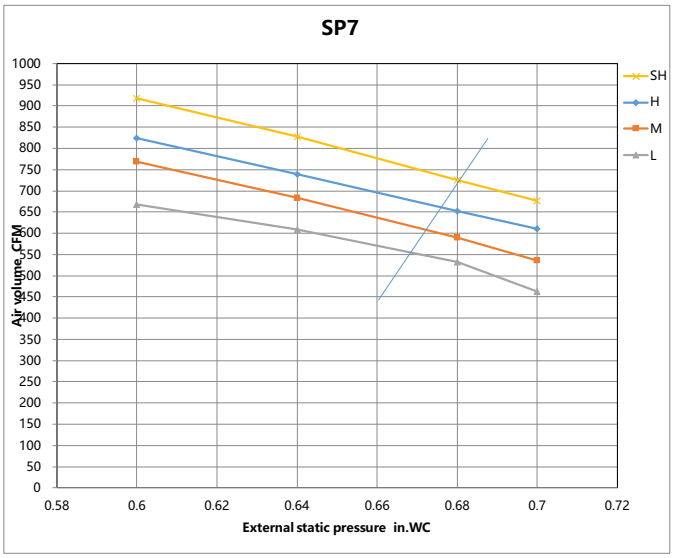
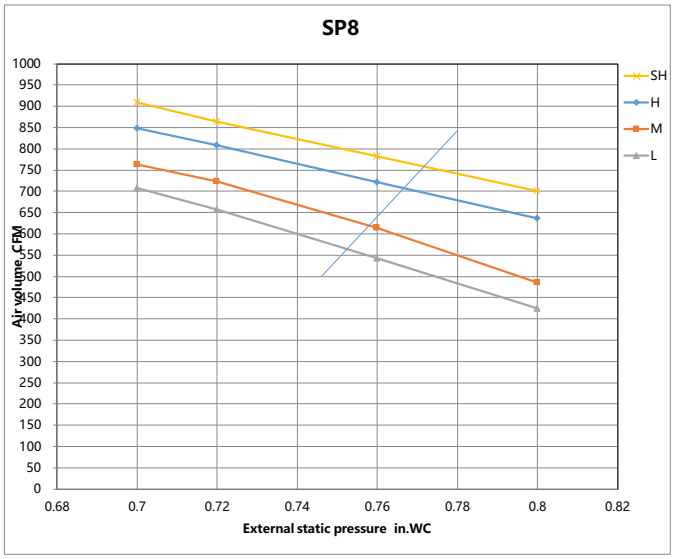




**Fig. 27 – High Static Pressure Curves - 18k**




## Constant air volume

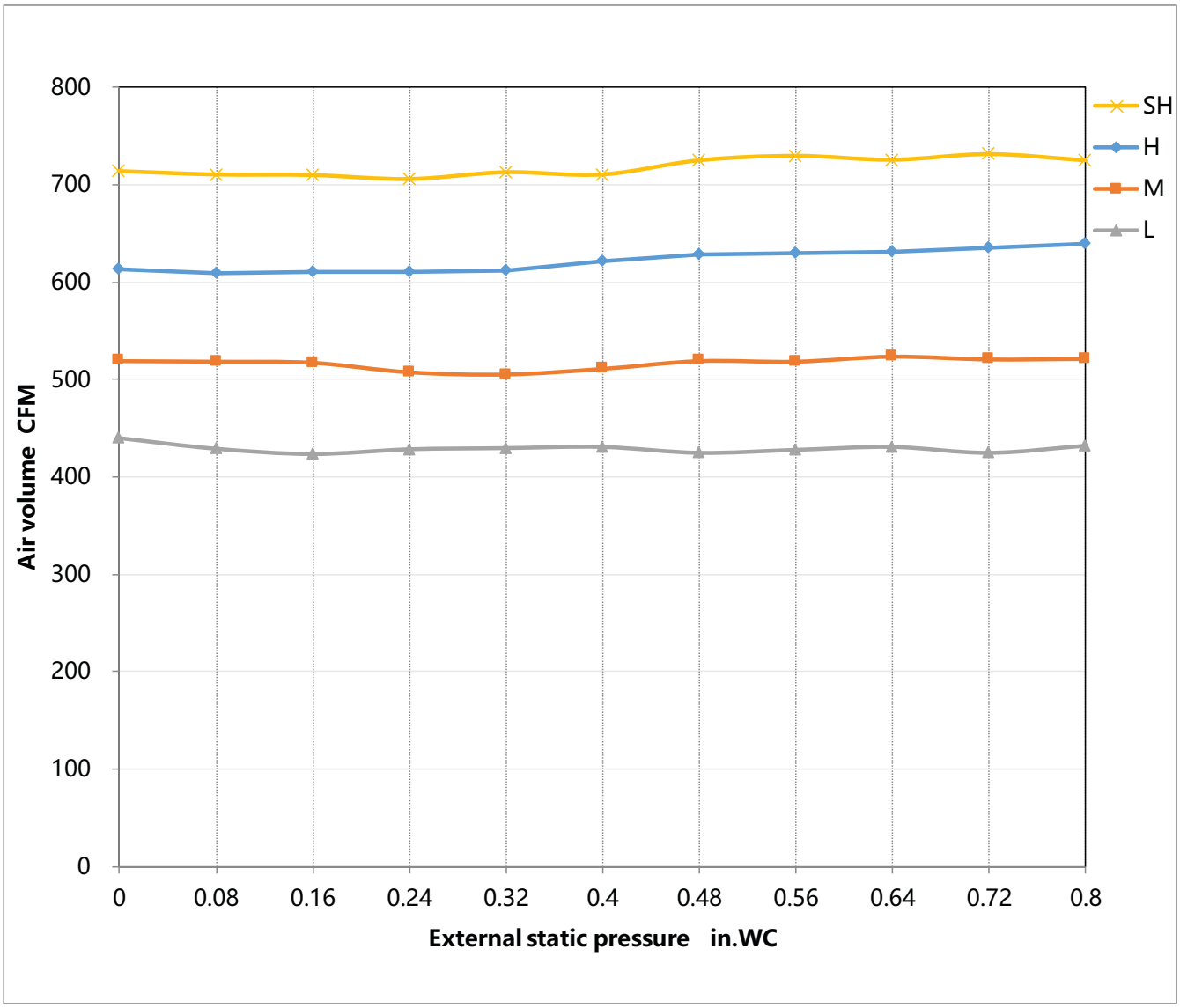
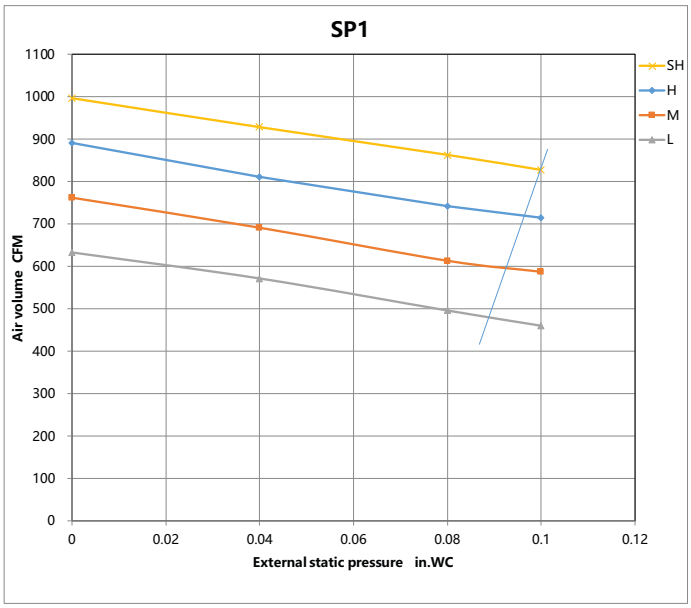
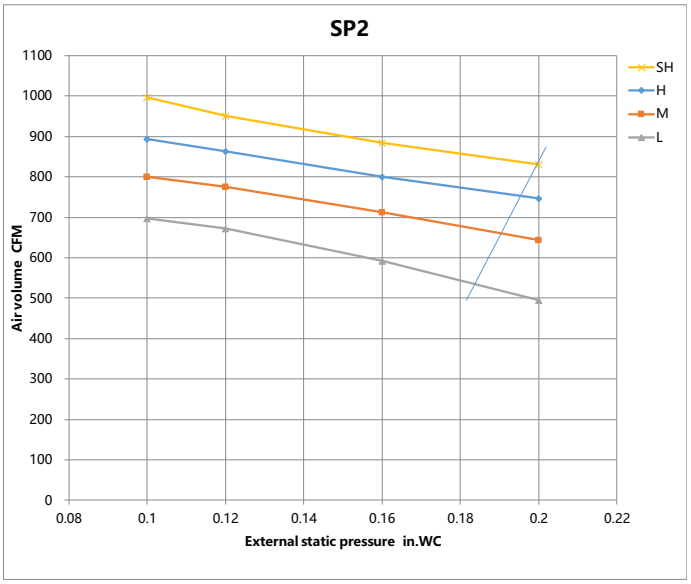
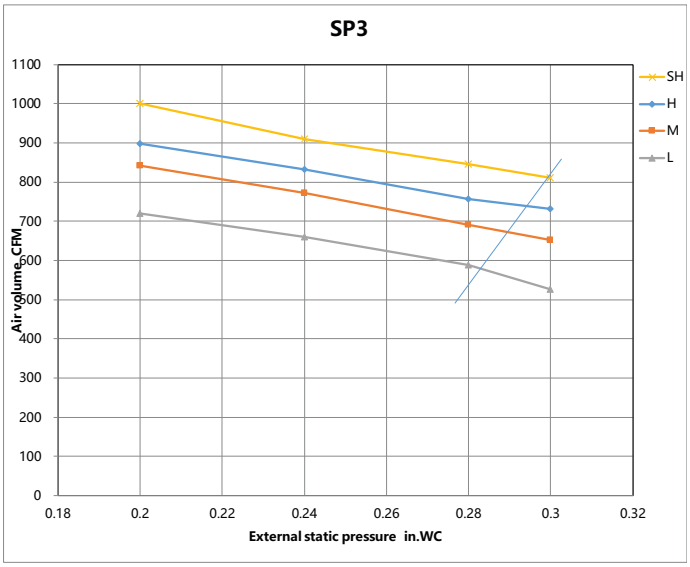


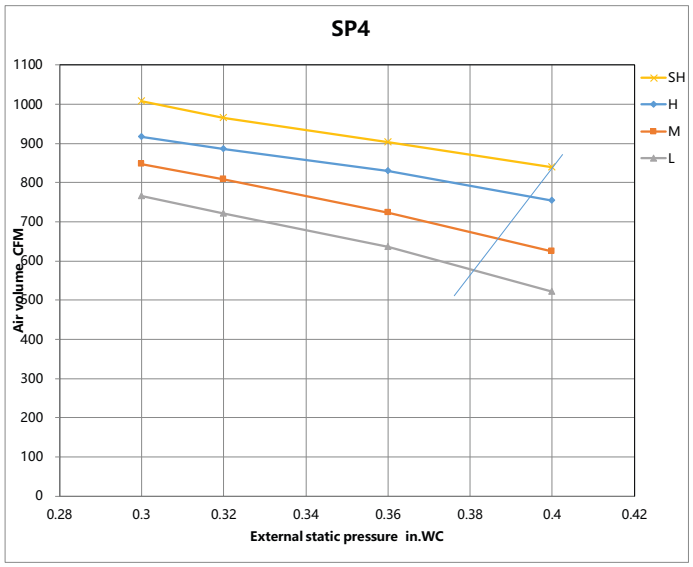

**Fig. 28 – High Static Pressure Curves - 18k, Constant Air Volume**

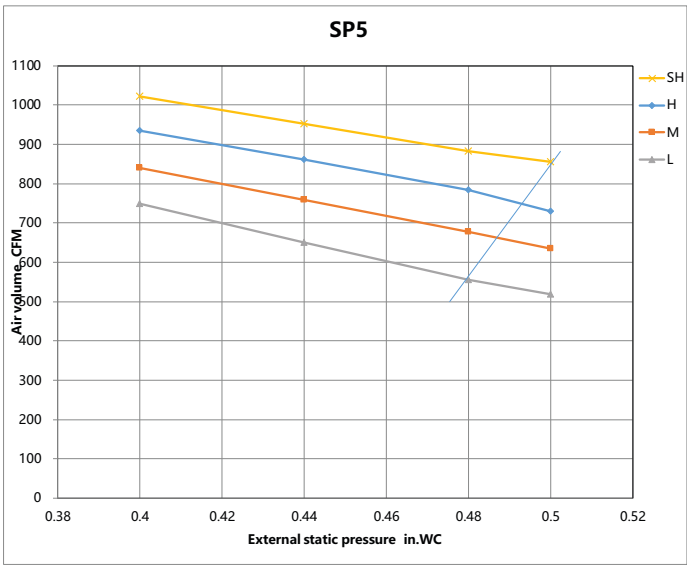
# 24k



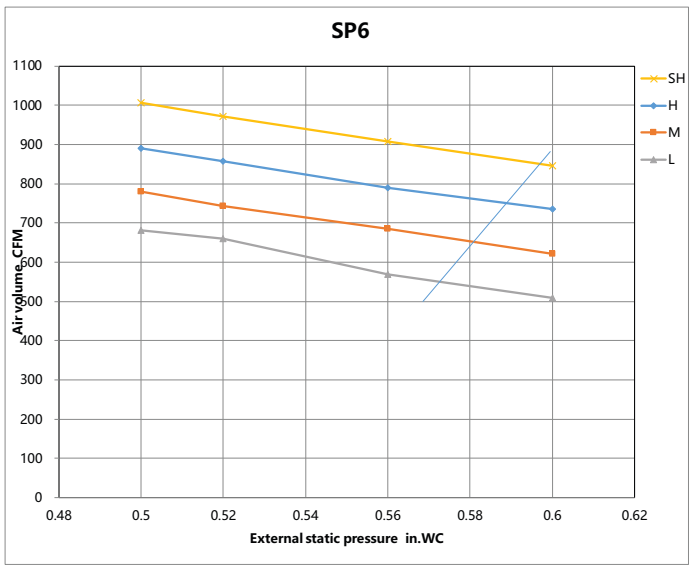
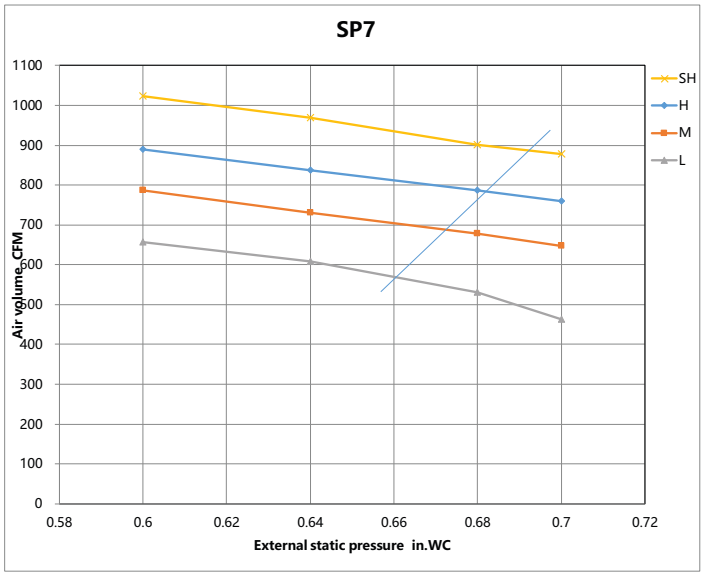
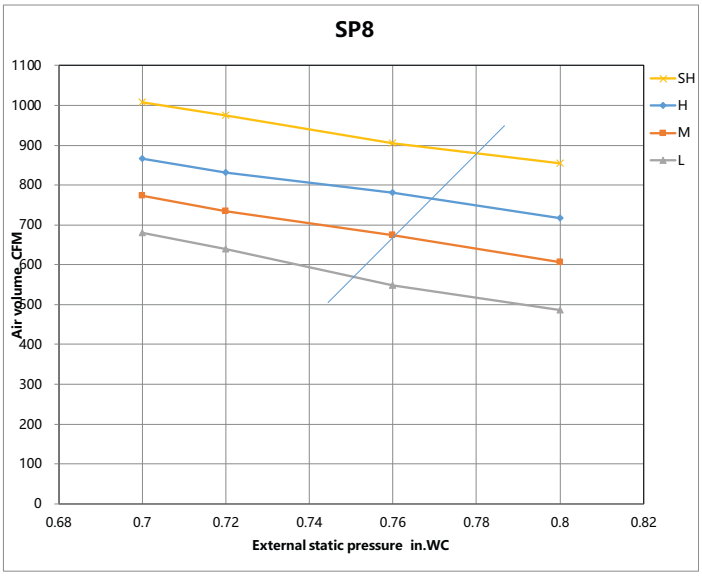




**Fig. 29 – High Static Pressure Curves - 24k**




## Constant air volume

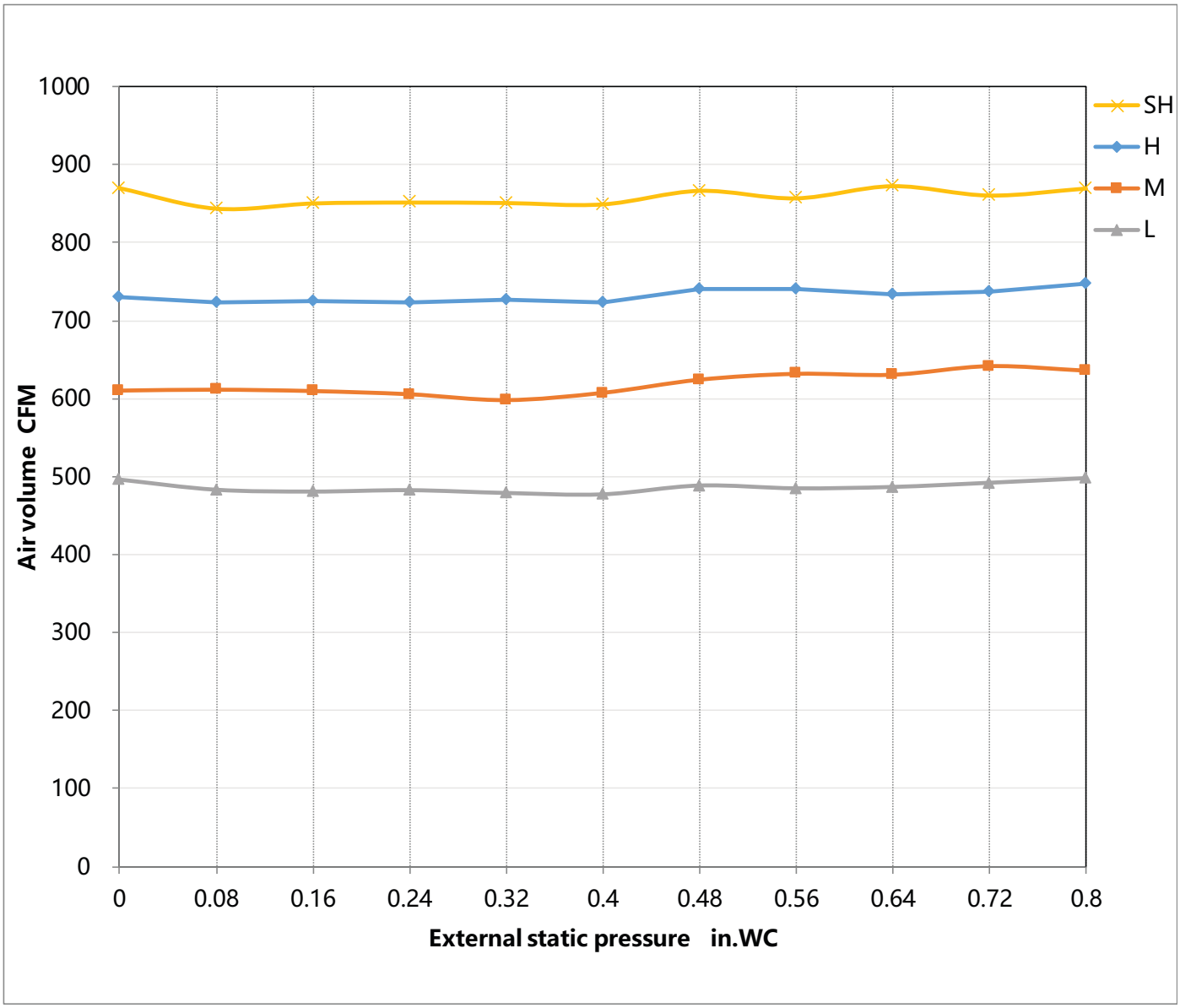
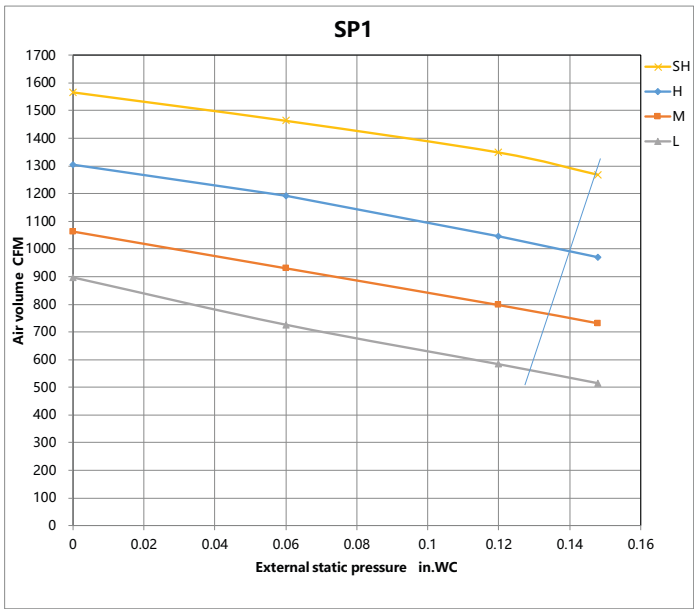
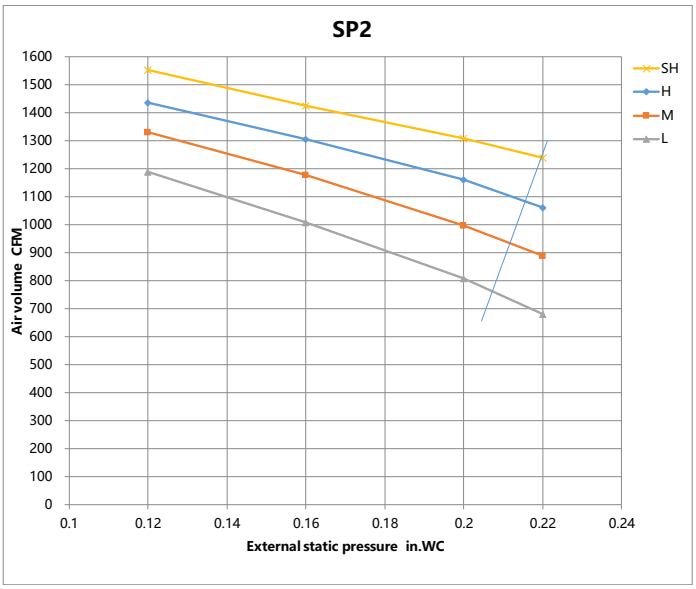
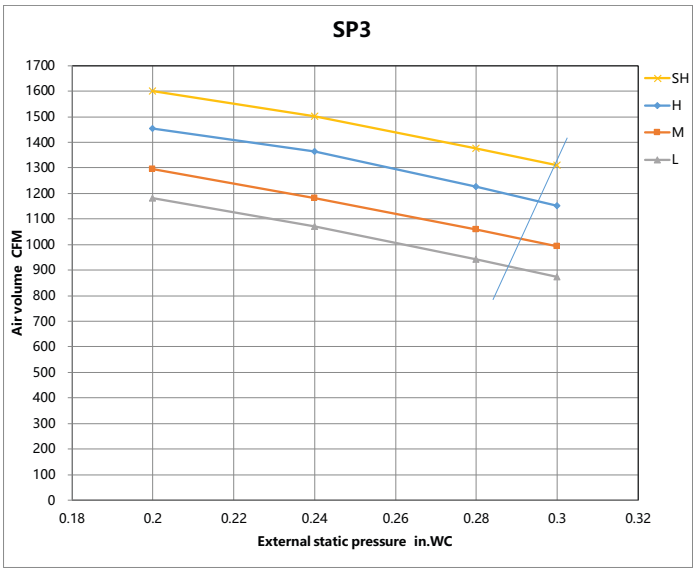


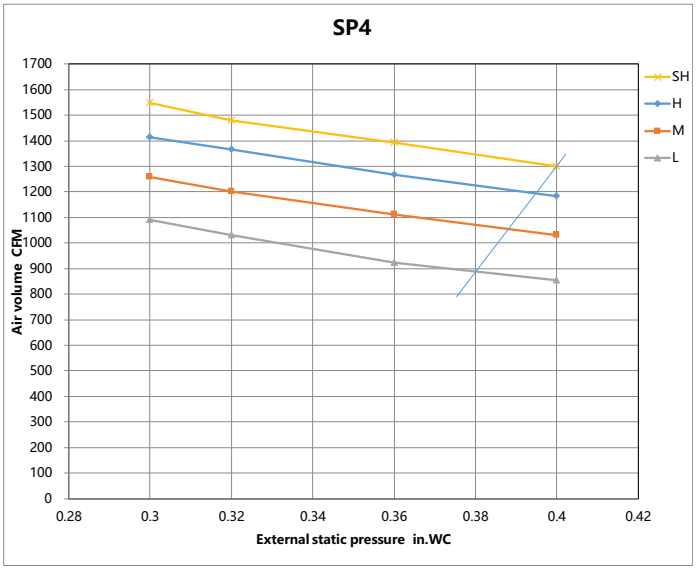

**Fig. 30 – High Static Pressure Curves - 24k, Constant Air Volume**

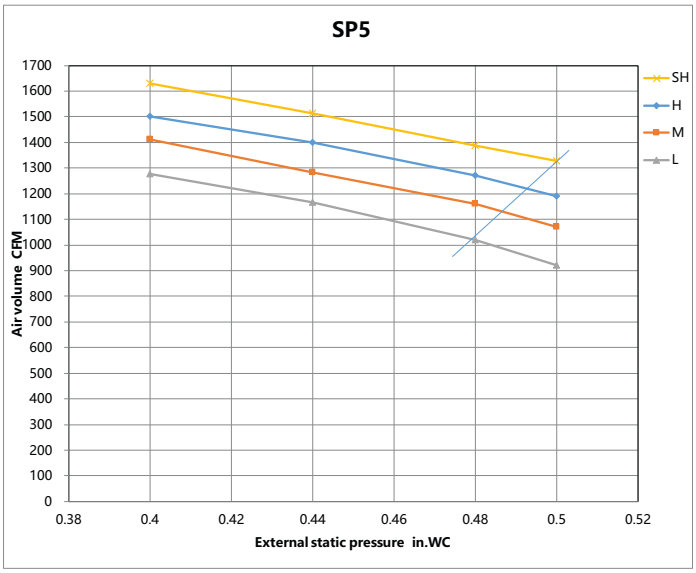
# 36k



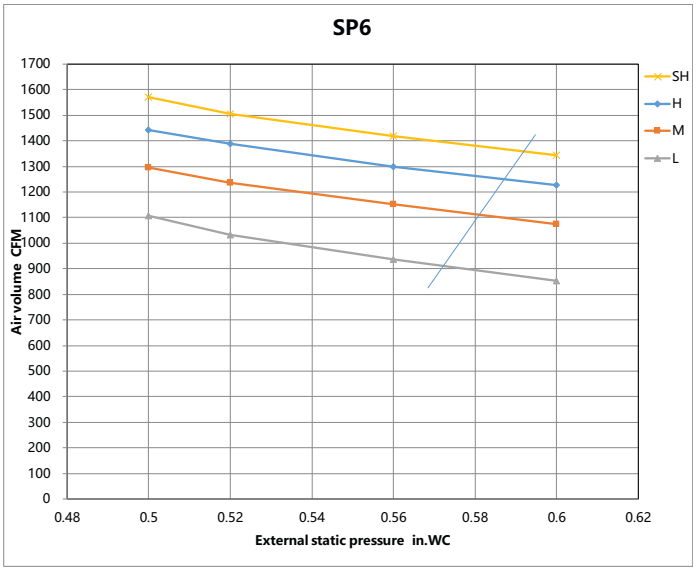
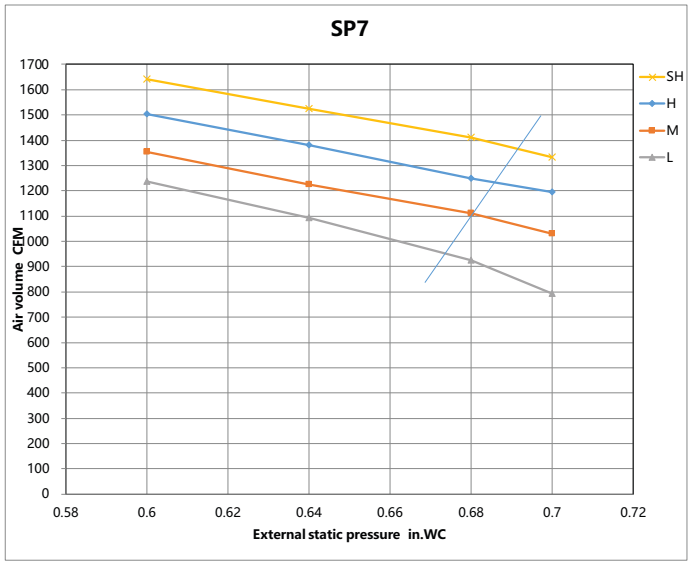
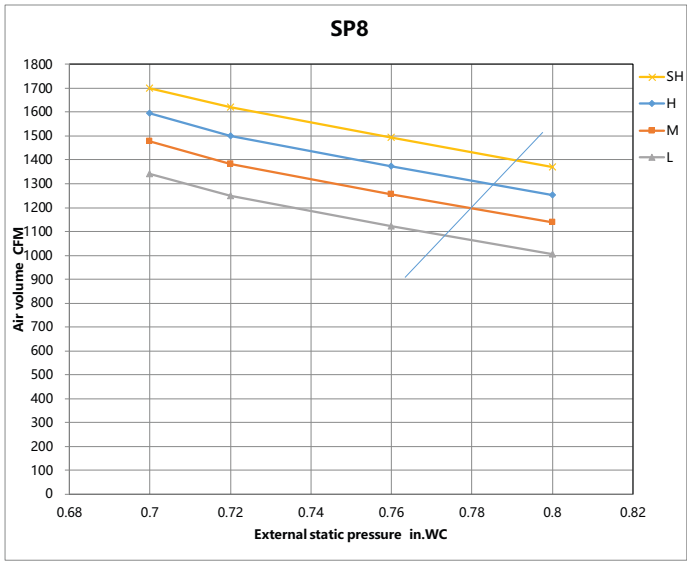




**Fig. 31 – High Static Pressure Curves - 36k**




## Constant air volume

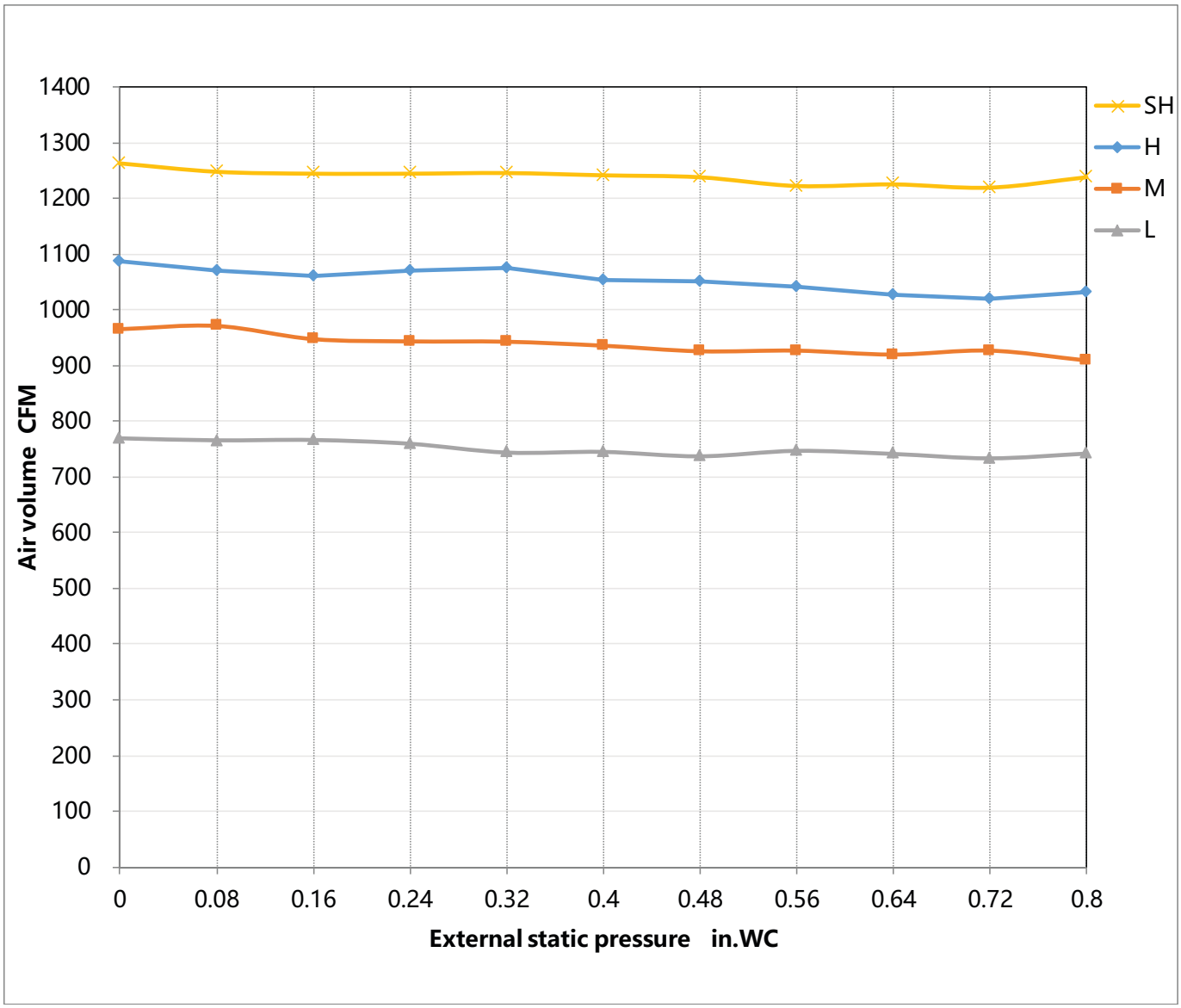
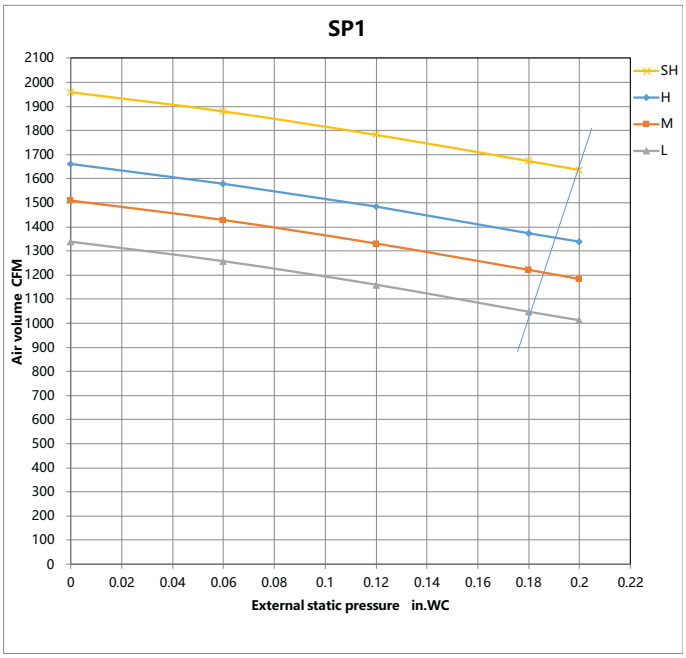
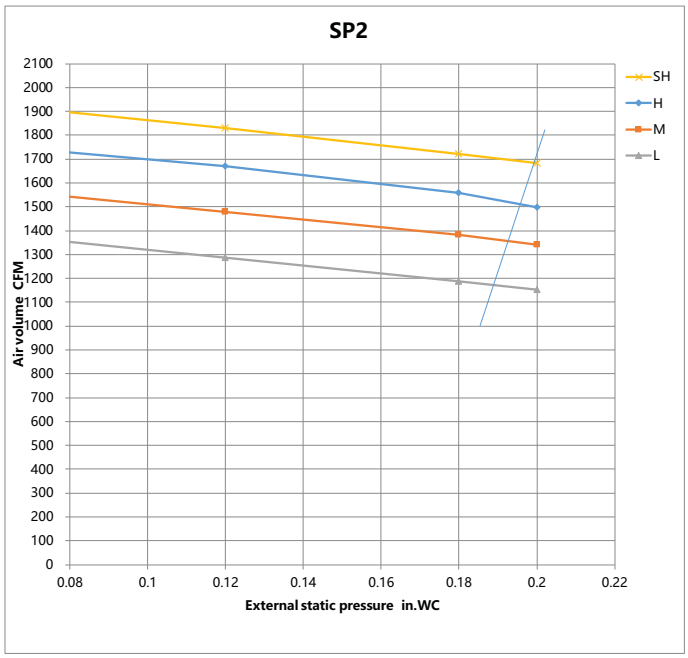
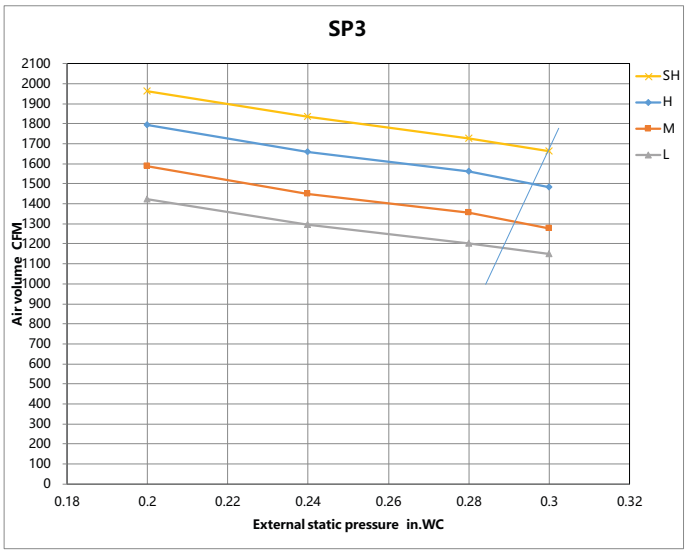


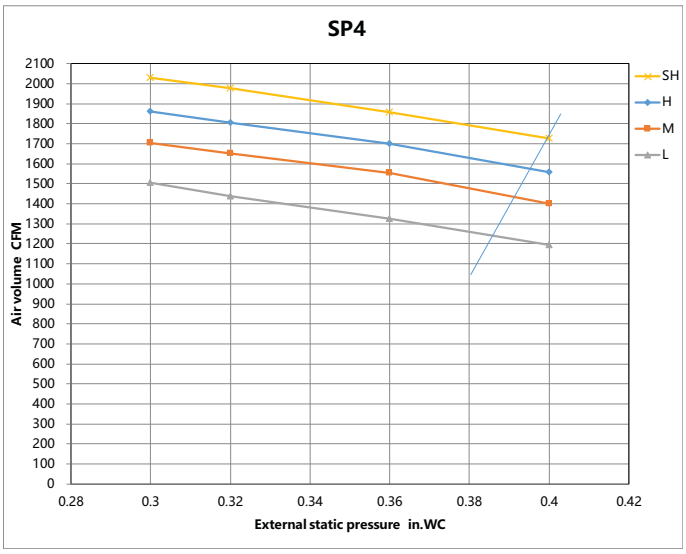

**Fig. 32 – High Static Pressure Curves - 36k, Constant Air Volume**

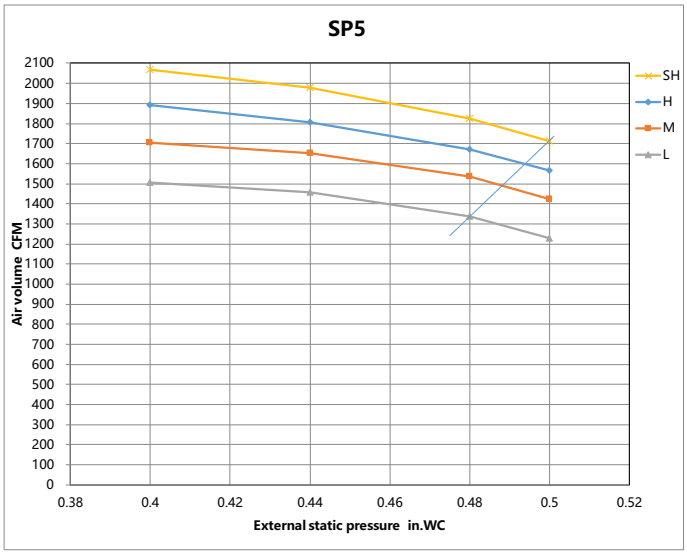
48k



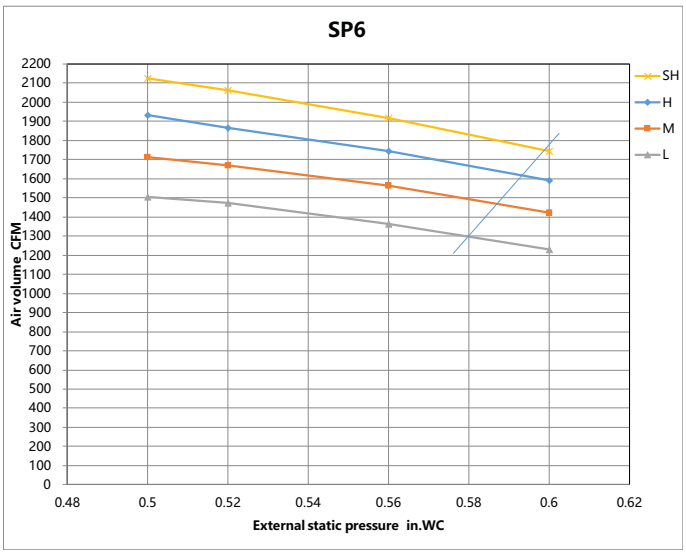
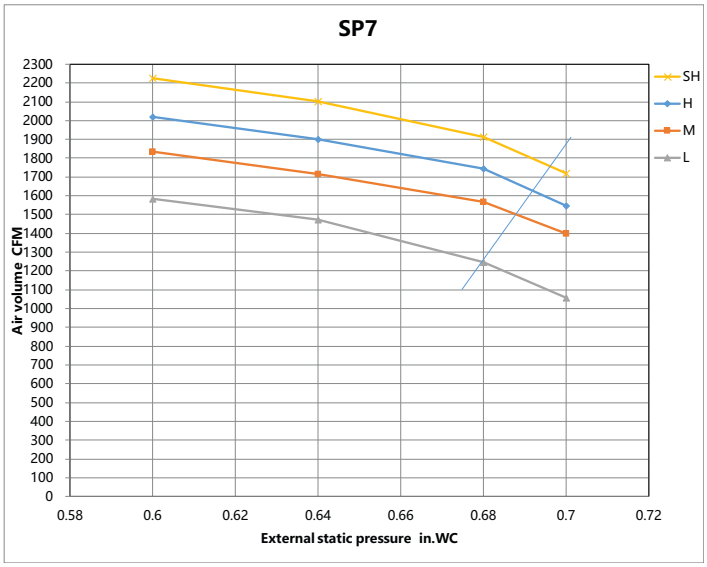
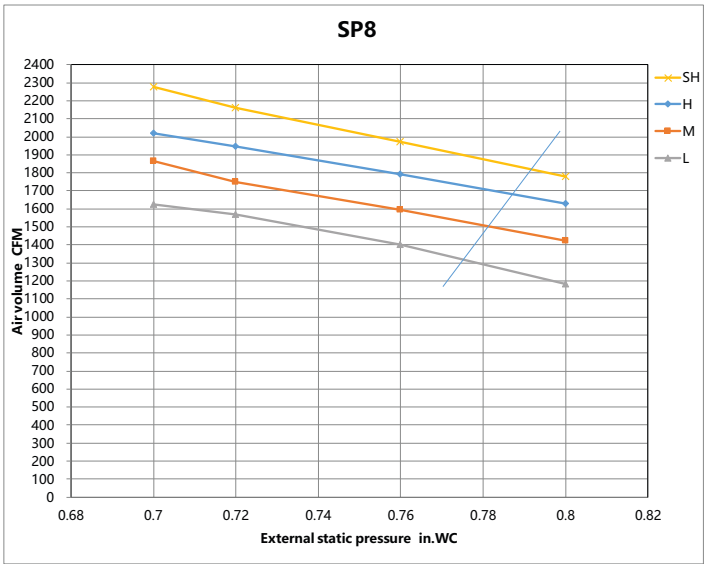




**Fig. 33 – High Static Pressure Curves - 48K**




## Constant air volume

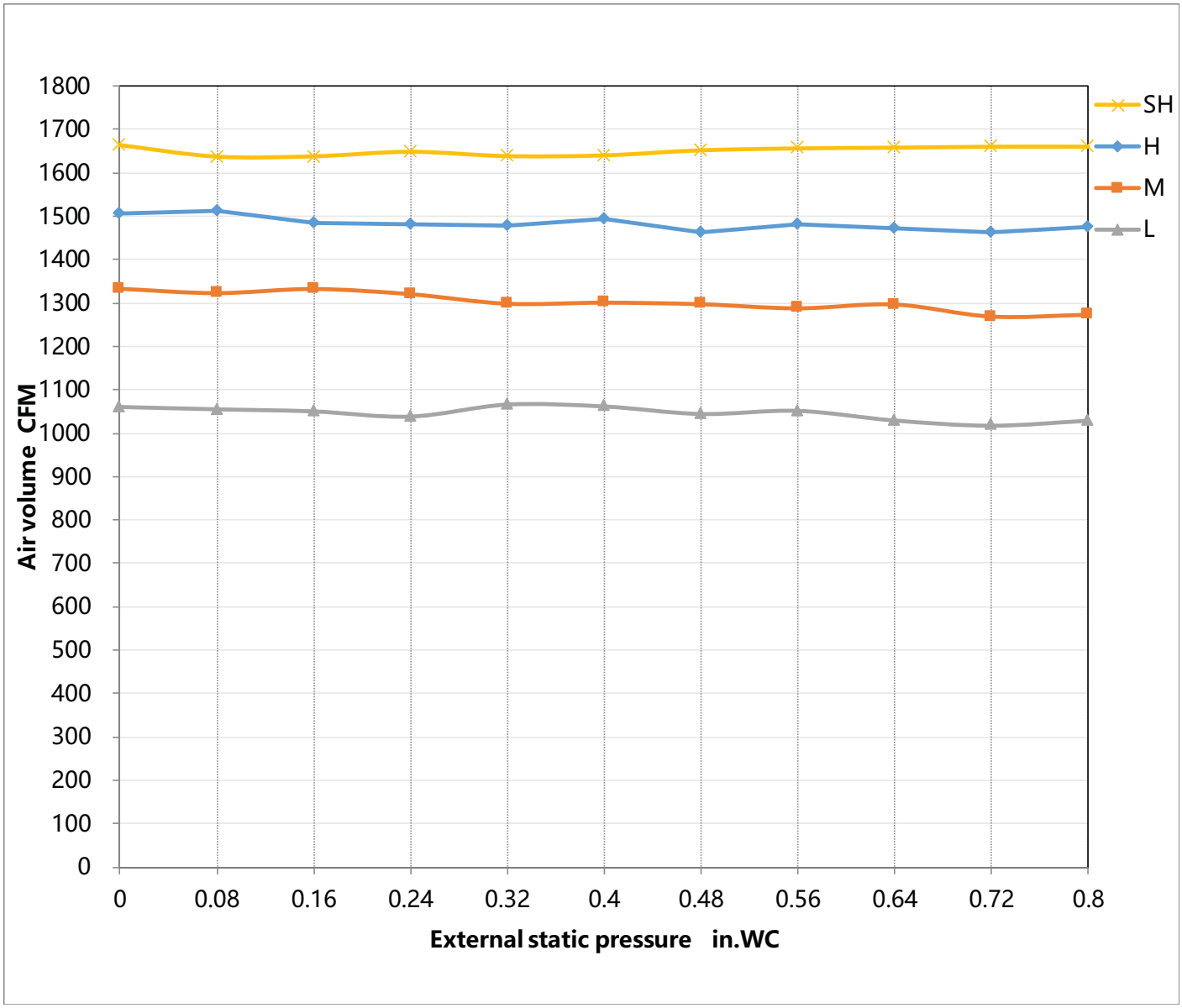
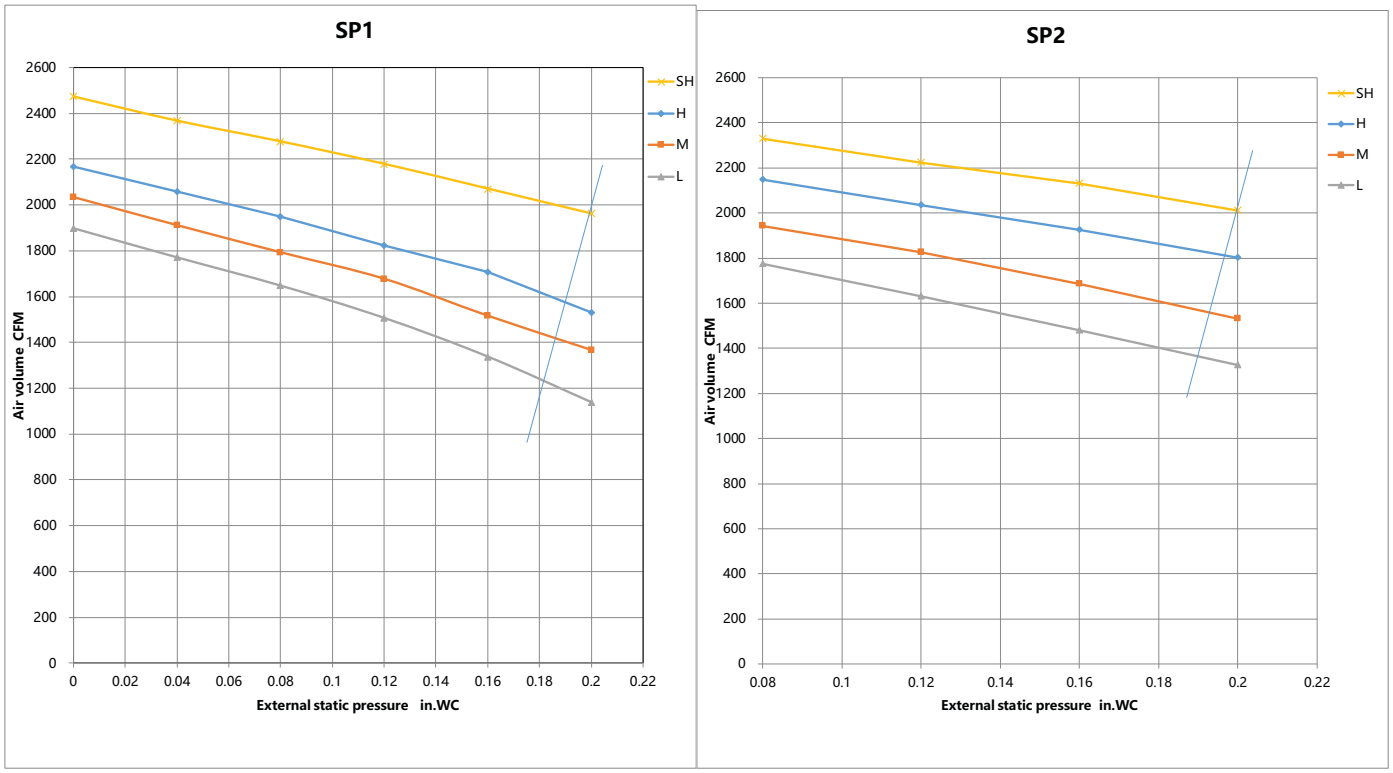



**Fig. 34 – High Static Pressure Curves - 48k, Constant Air Volume**

# 58k



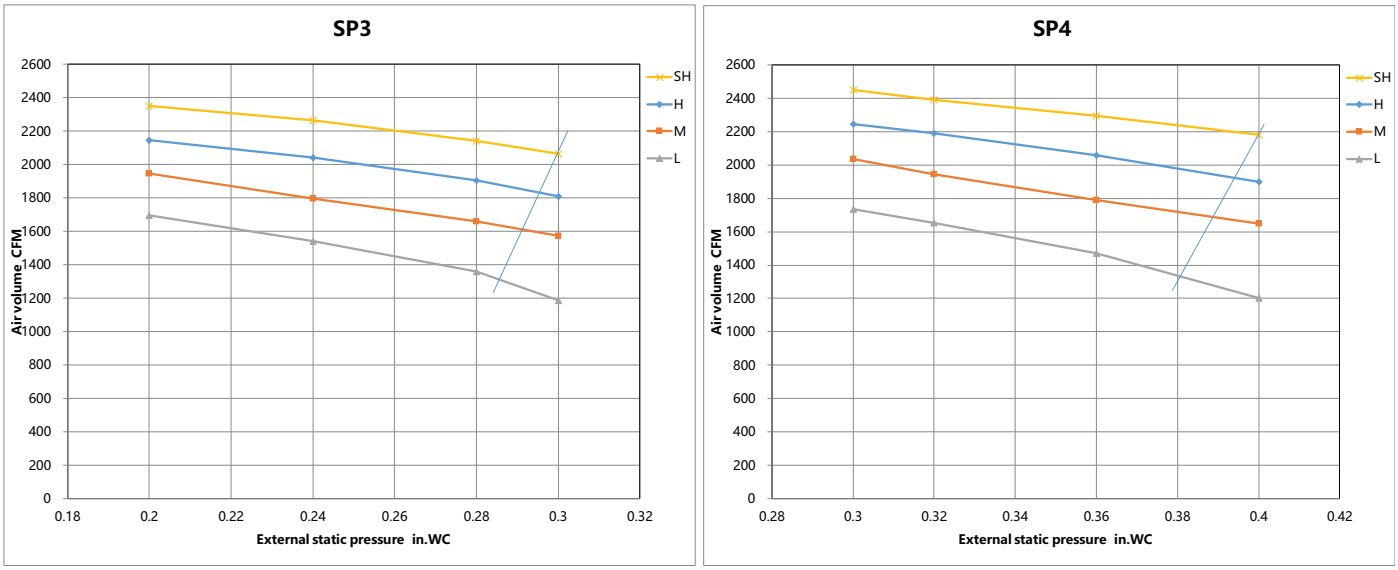




**Fig. 35 – High Static Pressure Curves - 58k**

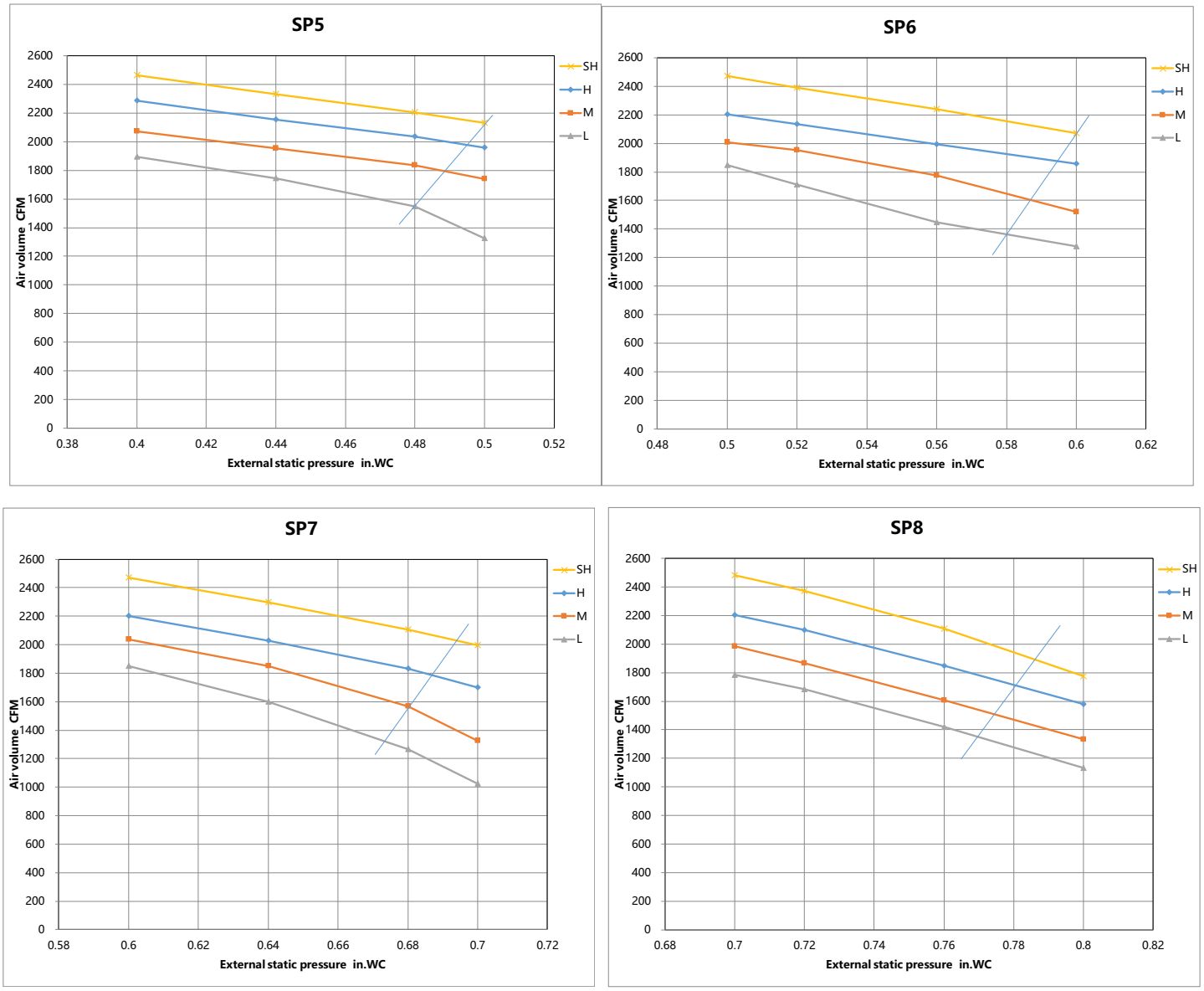



**Fig. 36 – High Static Pressure Curves - 58k**

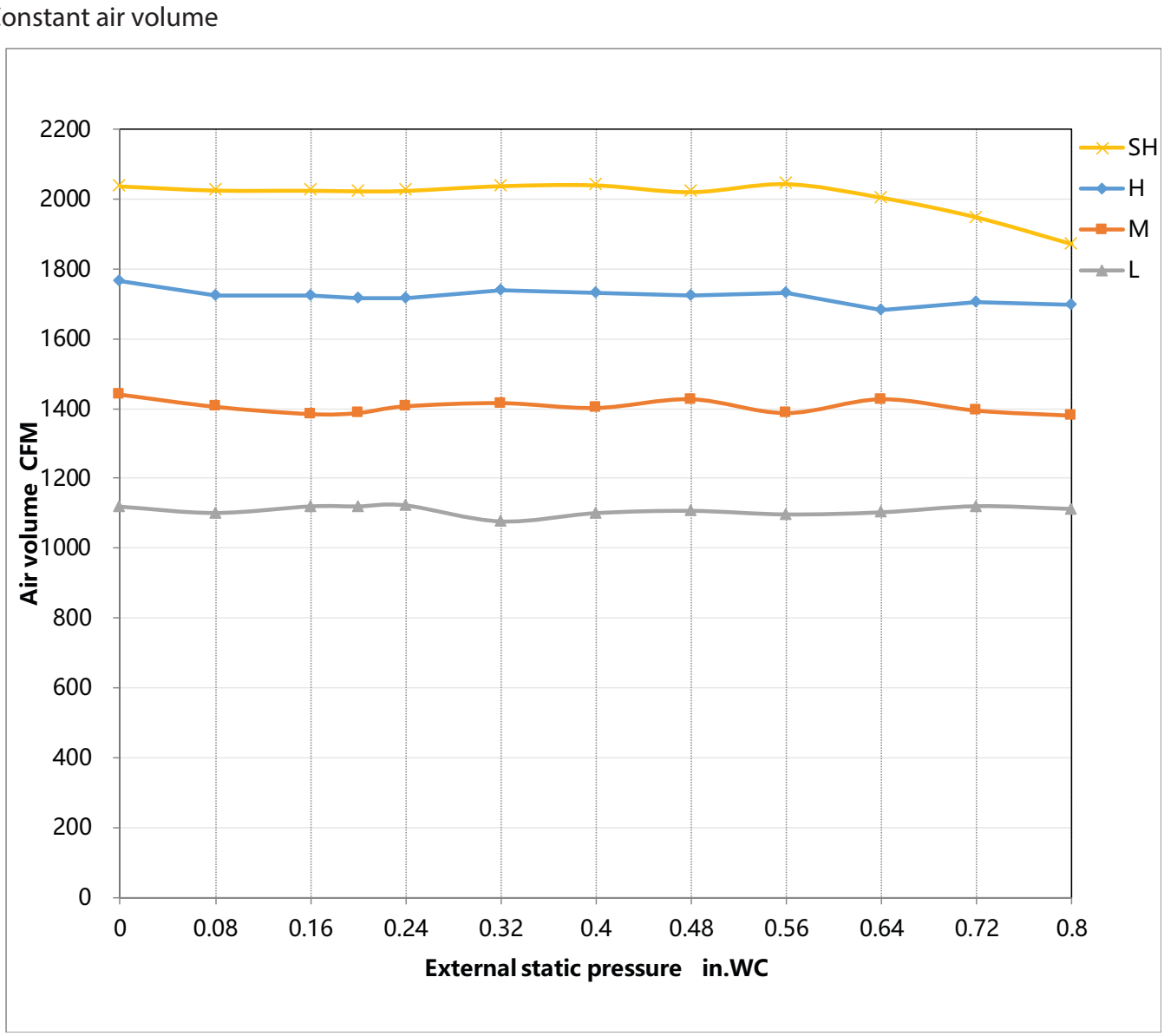



**Fig. 37 – High Static Pressure Curves - 58k, Constant Air Volume**

# MOISTURE REMOVAL

| | | | | | | |
|---|---|---|---|---|---|---|
| Moisture Removal | Liter/Hour | 1.45 | 2 | 2.36 | 4.3 | 6.13 |
| | Gal/Day | 9.2 | 12.7 | 15 | 27.3 | 38.9 |

# PIPING SPECIFICATIONS

| NAME | MODEL | LIQUID SIDE | GAS SIDE | REMARKS |
|---|---|---|---|---|
| **Connecting Pipe Assembly** | 6K, 9K, 12K | Ø1/4in (Ø6.35mm) | Ø3/8in (Ø9.52mm) | Pipes are not included in the accessories so you will need to purchase them from the local dealer. |
| | 18K | Ø1/4in (Ø6.35mm) | Ø1/2in (Ø12.7mm) | |
| | 24K | Ø3/8in (Ø9.52mm) | Ø5/8in (Ø16mm) | |
| | 36K, 48K, 58K | Ø3/8in (Ø9.52mm) | Ø3/4in (Ø19mm) | |

# REFRIGERANT SYSTEM DIAGRAM

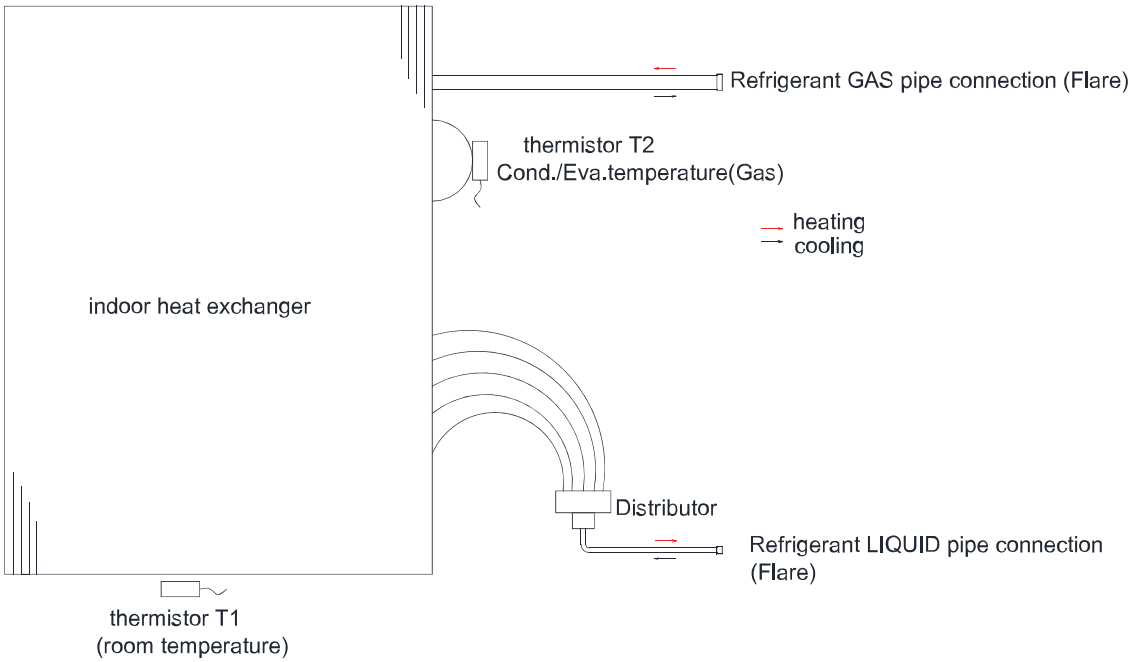



**Fig. 38 – Refrigerant System Diagram**

# WIRING DIAGRAMS

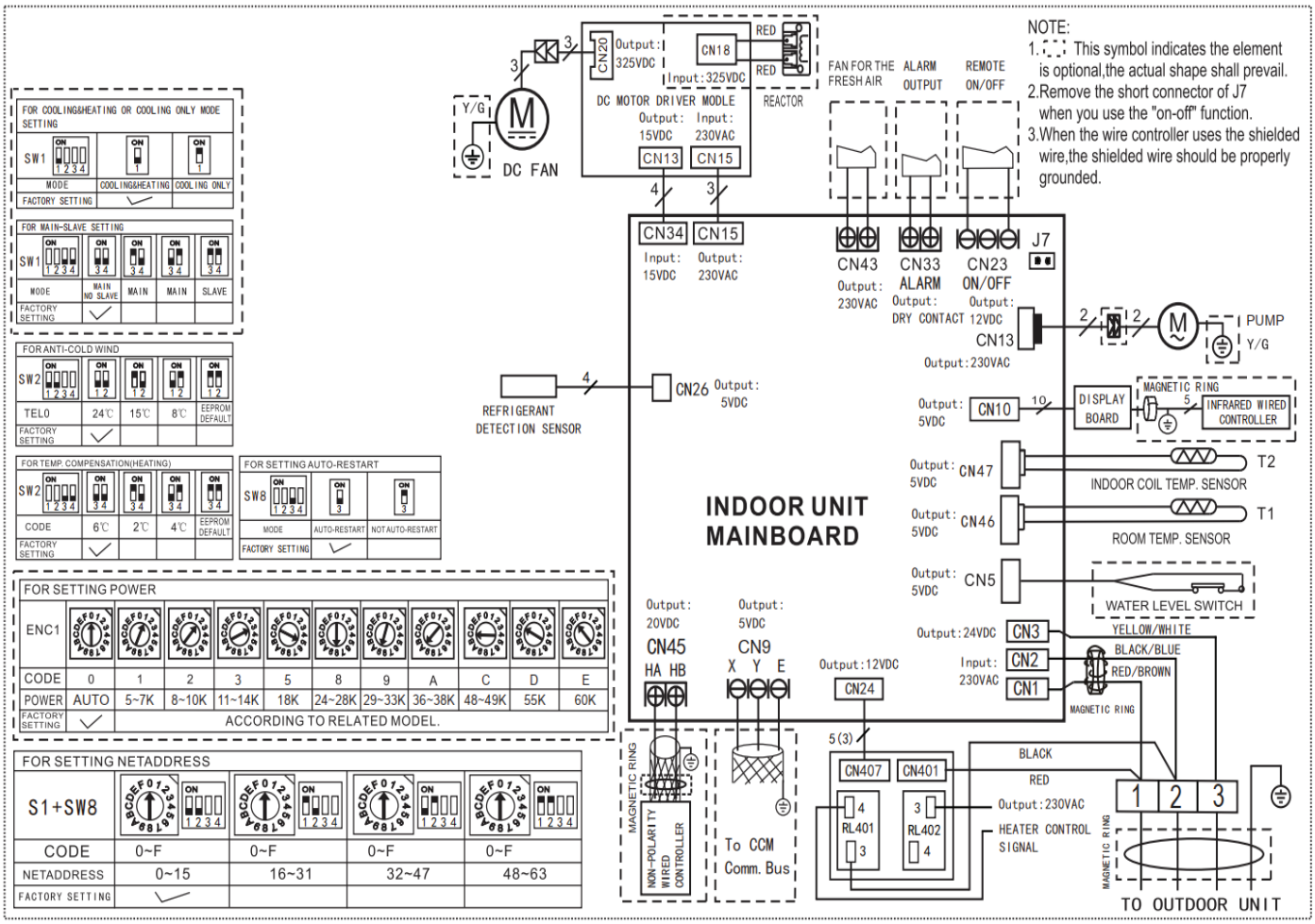



**Fig. 39 – Size 06K**

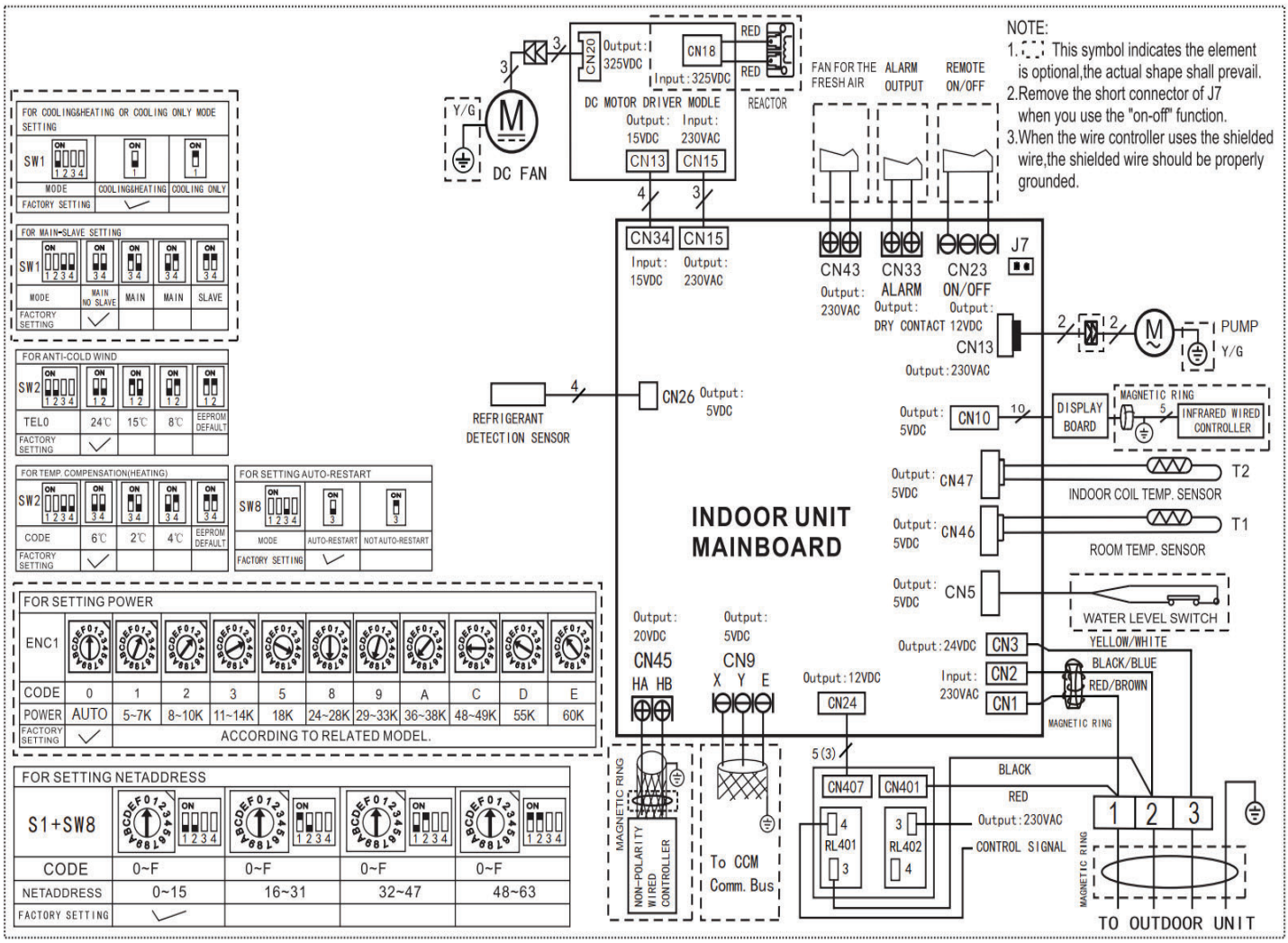



**Fig. 40 – Size 09/12/18/24K**

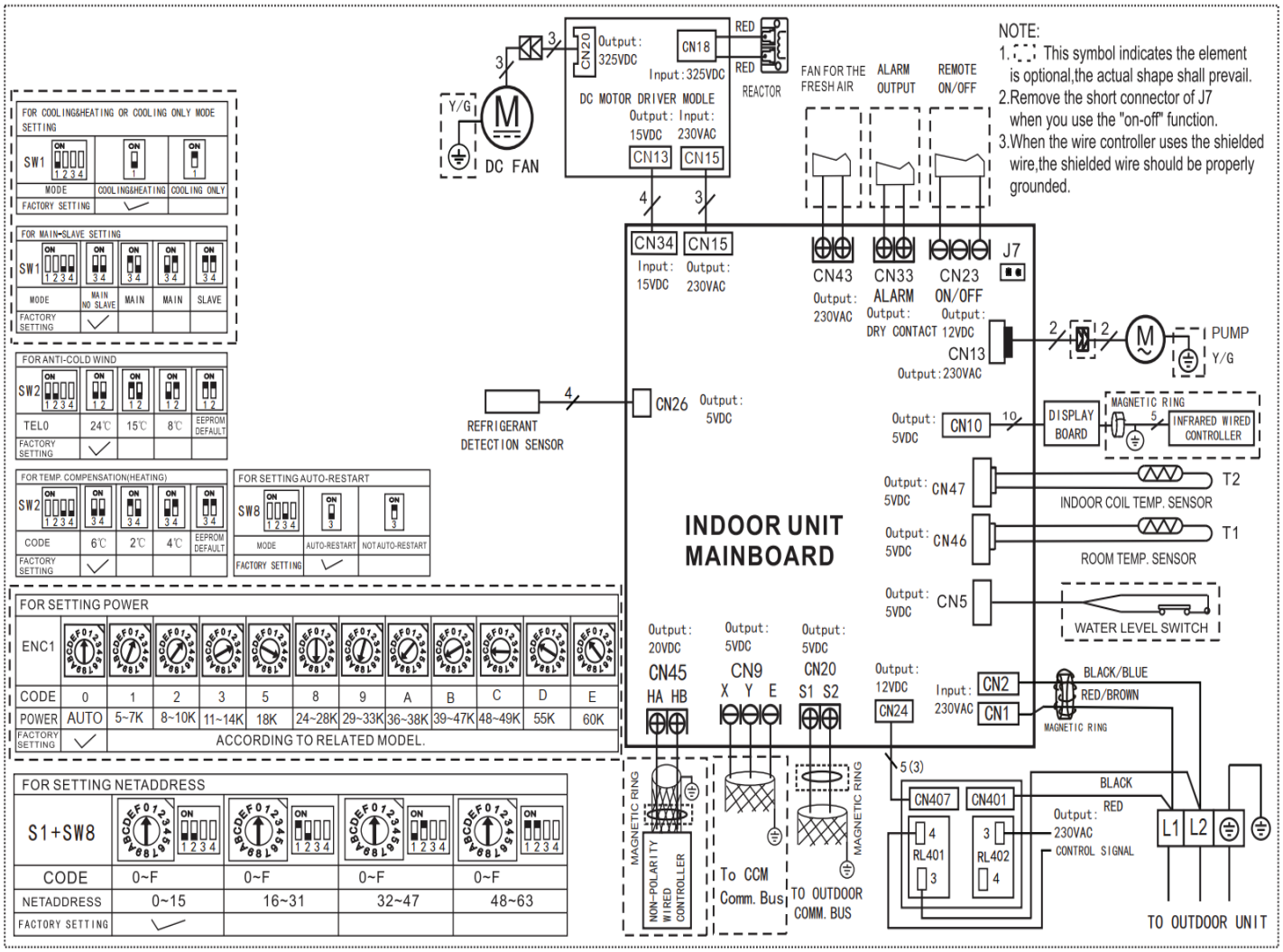



**Fig. 41 – Sizes 36/48/58K**

# GUIDE SPECIFICATIONS

## SLIM DUCTLESS SYSTEM

Size Range: 1/2 to 5 Ton Nominal Cooling and Heating Capacity
Model Number: **45MBDA**

## Part 1 - GENERAL

### 1.01 System Description

Indoor, in-ceiling cassette, direct-expansion fan coils are matched with a heat pump outdoor unit.

### 1.02 Agency Listings

Unit are 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 manufacturer's recommendations.

### 1.04 Warranty (For Inclusion By Specifying Engineer)

## Part 2 - PRODUCTS

### 2.01 Equipment

**A. General:**

Indoor, direct-expansion fan coil. Unit is complete with a cooling/heating coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, and an 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. 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 lift pump and a drain connection for a hose attachment to remove condensate.

**E. Motors:**

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

**F. Controls:**

Controls consist of a microprocessor-based control system which controls the space temperature, determines the 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, has the ability to act 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 at the same operating conditions as at failure.
2. A timer function to provide a minimum 24-hour timer cycle for the system's Auto Start/Stop.
3. Temperature-sensing controls sense the return air temperature.
4. Indoor coil freeze protection.
5. Wireless infrared remote control to enter set points and operating conditions.
6. Dehumidification mode which provides increased latent removal capability by modulating system operation and set point temperature.
7. A fan-only operation to provide room air circulation when no cooling is required.
8. Diagnostics to provide continuous checks of the unit operation and warn of possible malfunctions. Any error messages are displayed at 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. Control includes deadband to prevent rapid mode cycling between heating and cooling.
11. Indoor coil high temperature protection is provided to detect excessive indoor discharge temperature when unit is in the heat pump mode.

**G. Filters:**

The unit has a filter track with factory-supplied cleanable filters.

**H. Electrical Requirements:**

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

**I. Operating Characteristics:**

The **45MBDA** system has a minimum SEER2 (Seasonal Energy Efficiency Ratio) and HSPF at AHRI conditions, as listed on the specifications table.

**J. Refrigerant Lines:**

All units should have refrigerant lines that can be oriented to connect from the left, right or back of unit. Both refrigerant lines must be insulated.

**K. Refrigerant Leak Detection and Mitigation**

System comes with a refrigerant leak sensor and mitigation system.

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

**NOTES:**

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