



# MD6-ES24VK



## READ AND SAVE THESE INSTRUCTIONS

The purpose of this manual is to aid in the proper installation and operation of fans manufactured by S&P. These instructions are intended to supplement good general practices and are not intended to cover detailed instruction procedures, because of the wide variety and types of fans manufactured by S&P.



# Installation Instructions

## MD6-ES24VK

### 1. WARNINGS

READ AND SAVE THESE INSTRUCTIONS. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE!



#### CAUTION:

- (1) For General Ventilating Use Only. Do Not Use To Exhaust Hazardous Or Explosive Materials And Vapors.
- (2) The MD6-ES24VK is suitable for operation within indoor environments only.

**WARNING:** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR INJURY, OBSERVE THE FOLLOWING:

1. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
2. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
3. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
4. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent back drafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
5. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
6. Ducted fans must always be vented to the outdoors.

### 2. PRE-INSTALLATION INSPECTION

The MD6-ES24VK has been manufactured in accordance with rigorous standards of production. All the components have been checked and tested at the end of the manufacturing process. We recommend that you check the following after receiving this product:

1. The correct size has been received.
2. The correct model has been received.
3. The details on the rating label correspond to the electrical supply: voltage, frequency etc.

Remove the unit from packaging and inspect for shipping damage within 15 days of receipt. If the product is found to be damaged, immediately contact your local authorized supplier. **DO NOT OPERATE THE UNIT IF DAMAGED.** These instructions should be considered as a supplement to EPA standard practices, as well as all state and local building code regulations.

Before installing the product check the following points:

1. The damper blade opens and closes freely.
2. There are no obstructions to the airflow.

### 3. ENVIRONMENT

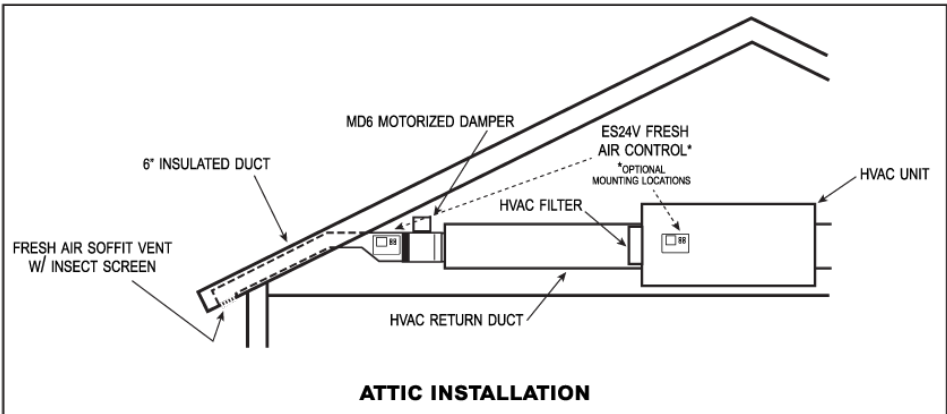
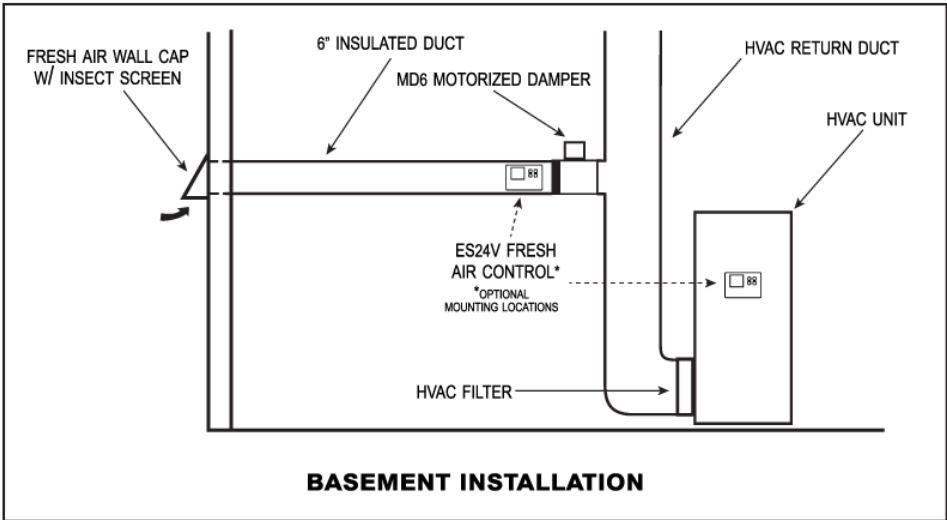
The MD6-ES24VK IS suitable for operation within indoor environments only. The MD6-ES24VK is suitable for the supply of both conditioned and un-conditioned airstreams within the temperature ranges (inclusive of duct airstream's temperature) of -40°C up to +60°C.

#### 4. MOUNTING

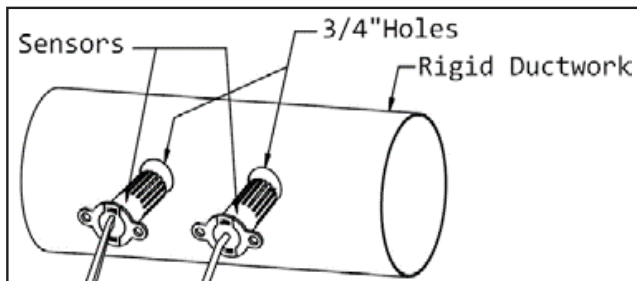
Choose a mounting location which allows convenient wiring and maintenance accessibility. The MD6-ES24VK can be mounted in any orientation, horizontal or vertical, and is suitable for supply/fresh air applications. The 6" MD6 motorized damper will be installed between the fresh air wall cap/roof cap/soffit vent (with insect screen) and the HVAC unit return duct. The ES24V fresh air control can be mounted:



- On the 6" insulated ductwork between the wall cap and the MD6 motorized damper, or (Note, the 24V power wires (R & C) will need to be extended from the HVAC unit power supply or a separate 120V-24V transformer)
- On the HVAC unit (Note, the temperature (26AWG cable) and humidity (6P6C phone cable) sensor wires will need to be extended.)



Make sure the temperature and humidity sensors are installed into the 6" insulated fresh air duct between the wall cap and MD6 motorized damper if necessary.



## 5. DUCTING

All ducting and fresh air intake construction/location must comply with local and national building codes. Do not locate fresh air intakes near contaminant sources (ex: dryer exhaust vent, garbage, etc). Connect the ductwork to the wall cap and HVAC return duct with screws, cable ties, worm clamps, and rated tape as necessary. Ensure that the ductwork is properly connected to a properly sized, low restriction fresh air intake with weather hood and insect screen.

S&P recommends round 6" insulated rigid ductwork for best air and sound performance. Round 6" flexible ductwork is acceptable, but ensure that it is pulled tight to reduce losses. Keep the length of duct and number of elbows to a minimum for best air and sound performance. Insulated ductwork will minimize building heat loss/gain and reduce the potential for condensation.

The ducting from the HVAC unit fan to the outside of the building has a strong effect on the air flow, noise and energy use of the fan. Use the shortest, straightest duct routing possible for best performance, and avoid installing smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth.

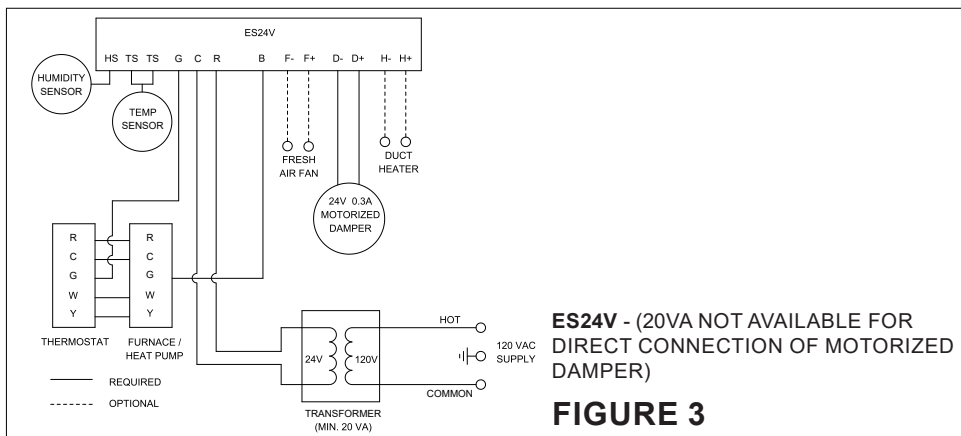
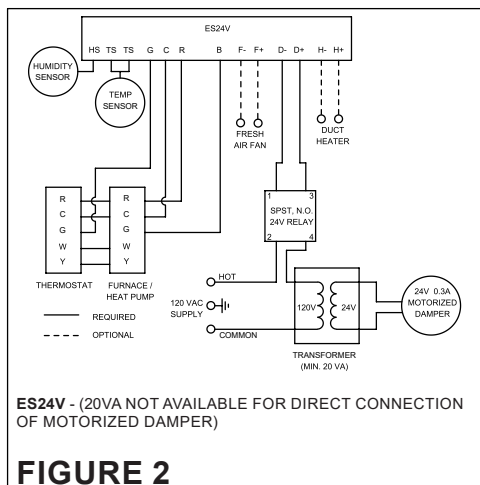
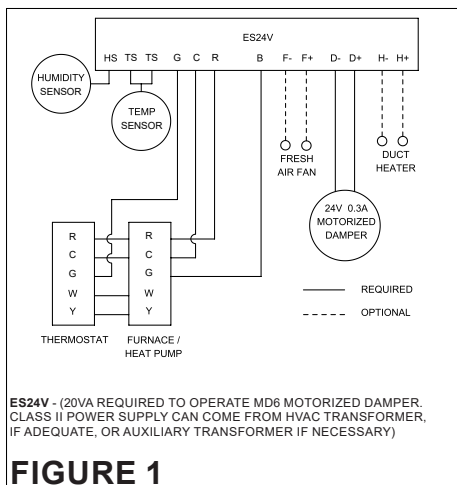
Ductwork connections and penetrations should be sealed with duct tape, duct fast-clamps, or caulk (available through your local distributor) to create an air-tight path from the building exterior to the ventilated space.

## 6. WIRING

**CAUTION:** Ensure that power is turned off and locked out before making any wiring connections.

The MD6-ES24VK operates from a standard 24V 60Hz AC electrical supply. There are multiple wiring scenarios available depending on the installer preferences. The diagrams below show 3 common scenarios where the ES24V is connected either directly to the HVAC unit transformer or an auxiliary transformer and the MD6 is connected either directly to the ES24V damper terminals or to the ES24V damper terminals through a SPST, N.O. 24V relay and transformer. This will depend on the VA available from the HVAC unit transformer. S&P recommends 20VA be available to operate the MD6 motorized damper. If 20VA is not available from the HVAC unit transformer, then an auxiliary transformer to power the ES24V and MD6 is recommended (transformers and relays provided by others).

All wiring must be carried out by a qualified electrician in accordance with National Electrical Code and all applicable state and local buildings codes. Electrical connections should be made in accordance with the following **Figures: 1-3**



Refer to the ES24V – Envirosense Ventilation Control IOM on pages 8-9 for ES24V wiring connections and operation.

## 7. AIRFLOW SETTING

**CAUTION:** Refer to local and national Ventilation and Indoor Air Quality standards to ensure the proper airflow rate.



Ensure the HVAC unit air filter is clean and installed. Turn the ES24V to the "ON" position and wait approximately 10 seconds for the HVAC unit fan to turn on and the MD6 motorized damper to open. (Note, ensure that the Motorized Damper is enabled on the ES24V, refer to ES24V IOM on page 8-9). Using a manometer, measure and record the airflow through the fresh air duct (refer to the manometer instructions). Once complete, turn the ES24V to the "OFF" position and calculate the required continuous CFM based on the ventilation code.

ASHRAE 62.2-2010

Required Continuous CFM =  $((0.01 * \text{Floor Area in ft}^2) + 7.5(\# \text{ of bedrooms} + 1))$

Example:

2,000 square foot dwelling

3 bedrooms

**= 50 CFM continuous**

ASHRAE 62.2-2013 & 2016

Required Continuous CFM =  $((0.03 * \text{Floor Area in ft}^2) + 7.5(\# \text{ of bedrooms} + 1))$

Example:

2,000 square foot dwelling

3 bedrooms

**= 90 CFM continuous**

Now that the required continuous CFM is known, calculate the required run time / hour.

Run Time / Hour =  $60 * (\text{Required Continuous CFM} / \text{Actual Measured CFM})$

Example (based on ASHRAE 62.2-2010 example above):

50 Required Continuous CFM

150 Actual Measured CFM

**= 20 minutes / hour**

Set the ES24V to the correct Run Time / Hour and High / Low Temperature & Humidity limits per the ES24V IOM on pages 8-9.



| Airflow / Air Velocity Reference Table |                    |     |     |
|----------------------------------------|--------------------|-----|-----|
| Airflow<br>(CFM)                       | Duct Size (in)     |     |     |
|                                        | 6                  | 7   | 8   |
|                                        | Air Velocity (FPM) |     |     |
| 30                                     | 153                | 112 | 86  |
| 40                                     | 204                | 150 | 115 |
| 50                                     | 255                | 187 | 143 |
| 60                                     | 306                | 225 | 172 |
| 70                                     | 357                | 262 | 201 |
| 80                                     | 407                | 299 | 229 |
| 90                                     | 458                | 337 | 258 |
| 100                                    | 509                | 374 | 286 |
| 110                                    | 560                | 412 | 315 |
| 120                                    | 611                | 449 | 344 |
| 130                                    | 662                | 486 | 372 |
| 140                                    | 713                | 524 | 401 |
| 150                                    | 764                | 561 | 430 |
| 160                                    | 815                | 599 | 458 |
| 170                                    | 866                | 636 | 487 |
| 180                                    | 917                | 674 | 516 |
| 190                                    | 968                | 711 | 544 |
| 200                                    | 1019               | 748 | 573 |

Note, if the Actual Measured CFM is not enough, the installer may need to increase the duct size or add a booster fan if necessary. Ensure there is no blockage in the ductwork first.

## 9. MAINTENANCE

**CAUTION: BEFORE CARRYING OUT ANY MAINTENANCE OR SERVICING, ENSURE THE UNIT IS DISCONNECTED FROM THE MAIN ELECTRICAL SUPPLY.**

S&P recommends inspection of the MD6 and ES24V at least once every twelve (12) months. To inspect the unit disconnect from electrical supply. Remove the MD6 motorized damper from the fresh air ductwork and inspect the damper blade for damage and proper function. If any debris is evident on the damper blade clean with a damp (not wet) cloth. **DO NOT USE** any detergents or abrasive materials for cleaning. Reinstall MD6 motorized damper to the fresh air ductwork and reseal joints.