AUTOMATIC VENTILATION COOLING SYSTEM

Model: ventCool™

The Field Controls Healthy Home System™ ventCool™ is designed to be installed as part of the central HVAC forced-air duct system of a home or other suitable building, in areas where outdoor conditions may exist to cool the building with outdoor air, such as California climate zones 8 through 14.

California Energy Code (CEC) Title 24 provides large building energy reduction credits for Central Fan Integrated Ventilation Cooling Systems (see Title 24 Residential Compliance Manual section regarding HVAC Requirements, Alternate Systems). Similar in cost and function to a Whole House Fan, the Healthy Home System™ Automated Ventilation Cooling System monitors indoor and outdoor conditions day and night, and automatically provides 100% outdoor air ventilation for cooling whenever outdoor conditions allow.

ITEMS INCLUDED IN KIT:
- 3- ventCool™ Ventilation Cooling System Dampers of either 14", 16", 18", or 20" diameter
- 1- Integrated Ventilation Relay Control (IVRC) Damper Control Module
- 3- 15 foot long Damper Cables with modular connectors
- 1- TrioMAC8-2025 ™ Media Air Cleaner
- 1- Venstar® T7850 Programmable Smart Thermostat with WiFi, touchscreen, and ventilation cooling function
- 1- Venstar® ACC-TSEN Outdoor Temperature Sensor
- 1- 50 VA, 24 Volt Transformer, junction box mounted

OPTIONAL COMPONENTS:
Healthy Home System™ Components for optional Fresh Air Mechanical Ventilation:
- HHSC+ Ventilation Control
- FAD Fresh Air Damper
- Relief Duct Termination/screened cap

T Sensor temperature-sensing damper controller

COMPONENTS NOT INCLUDED:
- Outdoor Air Intake Ventilation Cooling Termination(s)
- Ductwork, fittings, 24V wiring & associated hardware
- Inlet termination for optional Fresh Air Mechanical Ventilation
- Air Handler and other HVAC system components

READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY BEFORE PROCEEDING WITH THE INSTALLATION.

Please retain these instructions after installation.

Installed By: ___________________ Phone: ___________________ Installation Date: ________________

www.fieldcontrols.com
The system consists of an outdoor air intake duct with Ventilation Cooling Damper (outdoor air intake not included), a Return Air Damper, a Relief/Exhaust Damper (screened termination cap not included), a damper control module (IVRC), and smart thermostat with outdoor air temperature sensing and free cooling mode capabilities. All outdoor air coming into the building must be filtered by a media air cleaner such as the Field Controls Trio™, which when installed as shown serves as the HVAC system filter for extended dust and particulate removal.

The system dampers are automatically controlled by the IVRC Damper Control Module, which is in turn controlled by the smart thermostat. The smart thermostat determines when the Automatic Ventilation Cooling mode should occur, based on indoor and outdoor temperature conditions.

Optional items not included are components for year-round fresh air mechanical ventilation, which may be directly integrated into the ventCool™ system for the purpose of meeting mechanical ventilation code requirements of ASHRAE 62.2: FAD Fresh Air Damper, HHSC+ Ventilation Control, and optional T-Sensor Damper Control.

**NOTE:** When the HVAC system is in “Free Cooling Mode”, the HVAC fan is enabled and the heating and mechanical cooling functions of HVAC system is disabled.

**DESCRIPTION OF OPERATION:**

When the smart thermostat senses a need for indoor cooling, and outdoor conditions are suitable (refer to System Setup section), the ventCool™ Ventilation Cooling Mode will be activated. At all other times, the smart thermostat will command normal operation of the mechanical HVAC system, for both heating and mechanical cooling, and the ventCool™ system will be de-activated.
When Ventilation Cooling Mode is activated, the following actions occur:

1. Thermostat displays “Free Cooling” on the Home Screen, and sends a 24 volt signal to the IVRC damper control module to activate ventilation cooling.
2. The IVRC commands the Ventilation Cooling Damper to open, the Relief Damper to open, and the Return Damper to close.
3. When the dampers respond with appropriate signals, the IVRC will then allow the HVAC system fan to run, bringing outdoor air into the building, and allowing return indoor air to exhaust into the attic area and exit the building via attic ventilation openings. The Relief Damper serves to increase the outdoor air exchange rate and cool the attic area.
4. The IVRC display will appear as shown in FIG 2.

When Ventilation Cooling Mode is de-activated, the following actions occur:

1. Thermostat cuts off the 24 volt Ventilation Cooling signal to the IVRC damper control module. Thermostat will display either “System Idle” or “Cooling”, depending on current conditions.
2. The IVRC commands the Ventilation Cooling Damper to close, the Relief Damper to close, and the Return Damper to open.
3. When the dampers respond with appropriate signals to the IVRC, normal operation of the HVAC heating and mechanical cooling will be allowed.
4. The IVRC display will appear as shown in FIG 3.

With optional Year-Round Fresh Air Mechanical Ventilation:

Mechanical fresh air ventilation may be required by code, for the purpose of providing adequate fresh air ventilation throughout the year. The Field Controls ventCool™ is designed to be fully compatible with the Field Controls Healthy Home System™ HHSC+ ventilation controller when installed as directed with a dedicated FAD fresh air damper. **NOTE:** It is not recommended to use the Ventilation Cooling damper for the purpose of routine fresh air mechanical ventilation, due to the large volume of outdoor air that may potentially be brought in during periods of adverse weather conditions.

Normal, independent operation of the HHSC+ and dedicated damper is allowed when the ventCool™ ventilation cooling mode is de-activated; see the HHSC+ instructions for operation details. When the ventCool™ ventilation cooling mode is activated, it will continue to allow the HHSC+ to control the dedicated damper according to HHSC+ programming; cycling of the dedicated damper may occur but will have no significant impact on ventilation cooling.

If a mechanical ventilation system by another manufacturer is intended to be installed as part of the HVAC system, refer to the manufacturers’ instructions to ensure proper operation of the overall system. Field Controls cannot guarantee proper operation if another manufacturer’s ventilation system is installed.
SIZING, SEALING, AND INSULATION OF COMPONENTS AND DUCTWORK:

Sizing of Dampers and Ducts: All three ventCool™ dampers and associated fittings and ductwork should be sized as large or larger than trunk return duct sizes as required by applicable local HVAC code, ACCA Manual D as applicable, or the authority having jurisdiction, as required for return plenum sizing. The Ventilation Cooling outdoor air intake portion of the ventCool™ system essentially becomes a substitute for the return trunk duct or plenum when it is activated. **The recommended design velocity in such ductwork is 600 feet/minute or less.** Separate mechanical ventilation systems and associated ductwork installed for the sole purpose of meeting ventilation codes and standards (such as ASHRAE 62.2) should be sized, sealed and insulated according to the manufacturer’s installation instructions.

Insulation and Sealing of Dampers and Ductwork: The Ventilation Cooling Damper, outdoor air intake ductwork, and return plenum/trunk ductwork downstream of the outdoor air intake duct junction should be sealed and insulated as required by applicable local HVAC code for fresh air inlet ducts for the space in which they are located, or as otherwise required by applicable local code. The Relief Damper and relief ductwork should be **sealed** and **insulated** as required by applicable local code for return trunk ductwork for the space in which they are installed, or as otherwise required by local code or authority having jurisdiction.

**IMPORTANT:** Ensure that insulation, draw ties, tape etc. do not interfere with motion of the damper shafts.

Ventilation Cooling Outdoor Air Intake Sizing: refer to California Energy Code (CEC) Title 24 Residential Compliance Manual for guidelines for installation and sizing. The total open area of the outdoor air intake(s) must be of sufficient size for their type and design; air inlet openings are often the greatest factor affecting pressure loss and flow rate in air ducts, and their characteristics must be taken into account in duct flow calculations.

INSTALLATION:

Outdoor Air Inlet Termination(s): Outdoor air intakes should be regarded and considered as forced air inlets as described in National Fuel Gas Code ANSI Z223.1, NFPA 54, NFPA 31, ASHRAE 62.2 appendices, and all applicable local codes. Intake termination shall be located away from possible sources of fumes and contamination, such as appliance exhaust vents, gas meters, oil or gas storage tanks, garbage containers etc. Outdoor air intakes should be located upwind of the attic vents or dedicated Relief Outlet Termination as much as possible, to minimize cross-contamination of the intake with the relief air being exhausted from the building.

Outdoor air intakes may be of the following types, with the given considerations:

- **Through the roof/false chimney:** roofing systems may retain significant heat and may elevate the intake air temperature above that of other types, especially if not sufficiently elevated above the roofline. Typically the least affected by wind loading although high winds may create a significant pressure loss depending on design.
- **Gable end:** wind loading may significantly affect air flow rates, depending on wind direction while the system is active.
- **Hip extension/dormer:** wind loading and roof heat may be factors, especially with a hip extension.
- **Roof Eyebrow:** wind loading and roof heat may be significant factors.
- **Soffit vents:** roof heat may be a factor if located on a downwind side of the building; also wind loading may be a factor.

Multiple outdoor air intakes may be combined to provide adequate open area for air flow while reducing the size of the intakes.

**Relief Outlet Termination:** Maximum ¼” screen or mesh size is recommended for protection from animal/debris intrusion. An attic location is highly recommended for cooling of the attic space and roof structure. Refer to CEC Title 24 Residential Compliance Manual, Tables 4-20 and 4-21 for guidelines on ventilation of the attic to outdoors. If an attic location is not feasible, termination locations as given for the outdoor air intake may be preferred; if so, wind loading will tend to be an even more significant factor while roof heat is of lesser concern.
ventCool™ Ventilation Cooling, Return, and Relief Dampers: All three dampers are identical in size and each may be used interchangeably as shown on the system diagram. The dampers may be installed vertically, horizontally, or at an angle. Install with the damper shaft as close as possible to a horizontal (level) position as shown in FIG 4:

IVRC Damper Control Module: The IVRC may be installed in an attic or mechanical room area, away from heat sources such as vent connectors, chimneys and heating appliances (see Specifications for max service temperature), and in a dry and protected indoor location. Install the IVRC such that the relay status indicator lamps are visible, and all wiring connections are accessible. Ensure that the wiring connections to the Smart Thermostat and HVAC system do not exceed maximum wiring lengths and gauge limitations as given in their respective installation instructions.

Smart Thermostat Ventstar T 7850: Install the thermostat in the living space, in a location as recommended in the thermostat installation instructions included with the thermostat. Refer to those installation instructions for maximum wiring lengths and gauge limitations. The complete installation manual is available online for free download at www.Venstar.com.

Outdoor Temperature Sensor Venstar ACC-TSEN: Install the outdoor temp sensor according to the instructions included with the sensor. Ensure that the sensor is not subjected to direct sunlight or other heat sources such as appliance and dryer vents, etc.

HHSC+ Fresh Air Ventilation Control (optional): Refer to the installation instructions included with the HHSC+. Attic installation in hot climates is not recommended; see the Specifications section in the HHSC+ installation instructions for maximum service temperature and other limitations.

T-Sensor Damper Control (optional): Refer to the installation instructions included with the T-Sensor. Install the T-Sensor on the dedicated fresh air duct upstream of the FAD damper.

ELECTRICAL CONNECTIONS:
(Please refer to the appropriate wiring diagrams as shown below)

⚠️ CAUTION: All connections to the ventCool™ system and its components (except 120V/24V system transformer) are to be nominal 24VAC. Ensure all wiring is properly supported and installed; use strain reliefs where present and required by code.

⚠️ WARNING: All wiring is to be installed and inspected in compliance with all local code requirements of the jurisdiction having authority.

⚠️ WARNING: Ensure that all wiring connections to the ventCool™ System do not exceed nominal 24VAC. Connection to the ventCool™ system with different line voltages (power) will cause severe component damage, electrical shock hazards, and potential fire hazard!

⚠️ WARNING: Disconnect branch circuit for 24VAC transformer and all power sources to the HVAC system before beginning installation!
Install 50VA 24VAC System Transformer: Following the instructions included with the transformer, install the transformer near the IVRC damper control module. Ensure the power is disconnected to the line voltage circuit that will power the transformer, and connect the 120V side of the transformer to the line voltage. Connect the 24VAC side of the transformer to the IVRC damper control module terminals CX and RX (IVRC terminals 1 & 2). **NOTE:** 120V power must be maintained to the transformer at all times for proper operation of the ventCool™ system.

**IMPORTANT:** The IVRC terminals CX and RX terminals (1 & 2) must ONLY be connected to the ventCool™ system 24VAC transformer! ventCool™ power must be separate and independent from the HVAC 24V control power. The HVAC system, thermostat, and ventCool™ system must be installed as shown in this manual or equipment damage may occur! Connect ventCool™ System Dampers to the IVRC Damper Control Module.

Use the included modular damper cables to connect dampers to the IVRC (see figures below). The Dampers and IVRC have modular connectors to prevent miswiring and for ease of installation. The cables have different connectors on either end, that mate to corresponding connectors on the IVRC and on the damper motors. The damper cables are not specific to any of the dampers and may be freely interchanged. (HINT: Mark connector housing of each damper harness for identification purposes, when installation is complete.)

Ensure that the system dampers are connected to the correct connectors on the IVRC, depending on their function. Refer to the system diagram and connector identification on the IVRC. Incorrect connections will not damage the IVRC or dampers, but will cause incorrect operation of the ventCool™ system. Damper cables may be extended up to 50 feet with 18 gauge wire. Make sure proper connections are made; incorrect connections may damage the IVRC, 24V transformer, and/or system dampers.

**Connect IVRC Damper Control Module, Outdoor Temperature Sensor, and Smart Thermostat to HVAC System:**
Select the appropriate wiring diagram for the HVAC system type from the wiring diagrams (A through D), and wire the IVRC, Outdoor Temperature Sensor, and Smart Thermostat into the HVAC system as shown.

**NOTE:** The IVRC is connected to the thermostat in place of the “Free Cooling Damper” as shown in the Venstar® thermostat installation instructions diagram.

**IMPORTANT:** The thermostat terminal Y2 is the sole mechanical cooling output from the thermostat when configured for free cooling, as Y1 is used exclusively to control Automatic Ventilation Cooling. If the HVAC system has multi-stage mechanical cooling, to utilize full capacity of the mechanical cooling system, configure the HVAC mechanical cooling system to operate with a single-stage input, refer to the HVAC equipment manufacturer’s instructions regarding control by a single-stage thermostat. In some cases, this may require the use of an installer-supplied delay-on-make timer to activate 2nd stage cooling.
System Setup Procedure:

1. Remove the Venstar thermostat from its base, and make sure the outdoor temperature sensor is properly connected to the thermostat. An electrical short in the sensor wiring or connections may cause failure of the HVAC system control fuse or damage the system transformer.

2. Make sure the thermostat dip switches on the circuit board are set to the correct settings for the HVAC system type. Refer to Venstar operations manual found at www.venstar.com

3. Carefully install the thermostat onto its base. Press firmly around all outside edges.

4. Turn on power to the HVAC system, to power the thermostat and HVAC controls. Verify that the thermostat powers up properly according to instructions.

5. At the Venstar thermostat, select “Free Cooling” from the “Installation Settings” menu, and configure the thermostat to enable “Free Cooling”; see “Free Cooling” section of thermostat instructions. **Note:** If the thermostat dip switches are configured for a Heat Pump: the number of compressor stages must be set to 1 in the “Heat & Cool Stages” menu, regardless of the number of cooling stages (see note in the Electrical Connections of this manual). “Free Cooling” cannot be enabled if Compressor Stages is set to 2.

6. Set “Free Cooling” parameters on thermostat according to preference; see thermostat instructions section regarding “Free Cooling”.

7. Exit the “Free Cooling” menu, and select “Sensor Settings” from the “Installation Settings” menu.

8. Select “Wired Sensor Use”, and select the “Outdoor Sensor” setting.

9. Set remaining thermostat program and system parameters according to preference and HVAC system type.

10. Turn on power to the ventCool™ system 24V transformer. Depending on existing damper positions, some dampers may open or close.

WARNING: Before restoring power to the HVAC and ventCool™ systems, check all wiring for proper connections and voltages. All circuits must have appropriate circuit protection.

System Checkout Procedure:

**Verify Ventilation Cooling De-Activated Mode Operation:**

1. At the Venstar thermostat Home Screen, press the “Mode” button and select “Off”, to put the HVAC system on standby.

2. Verify that the Return Damper reaches an open position within approximately 15 seconds, as shown in FIG 7 below:

![FIG 7](image)
3. Verify that both the Ventilation Cooling Damper and Relief Damper reach closed positions within approximately 15 seconds, as shown below:

![FIG 8](image)

4. Verify that the IVRC damper control module indicator lamps are as shown in Figure 3.
5. At the Venstar thermostat Home Screen, press the Fan icon and select “On” to turn the HVAC system fan on. Verify that the system fan operates properly.
6. At the Venstar thermostat, press the Fan icon and select “Auto”. The fan should stop operating.

**Verify Ventilation Cooling Activated Mode Operation:**

1. At the thermostat Home Screen, press the “Mode” button and select “Off”, to put the HVAC system on standby.
2. Enter the “Installation Settings” menu, select “Free Cooling” menu, and temporarily disable “Free Cooling”.
3. From the “Installation Settings” menu, select “Test Outputs”, and press the Cooling 1st Stage button.
4. Within a few seconds, the Y1 and G output indicators should illuminate, and the Y1 and G terminals should be energized with nominal 24VAC. This should activate the ventCool™ active mode. Note: if “Free Cooling” has not been disabled, the Y1 indicator will not illuminate and Y1 terminal will not be energized.
5. Verify that the Return Damper reaches a closed position within approximately 15 seconds, as shown in Figure 8.
6. Verify that both the Ventilation Cooling Damper and Relief Damper reach open positions within approximately 15 seconds, as shown in Figure 7.
7. Verify that the IVRC damper control module output indicator lamps are illuminated as shown in Figure 2.
8. Verify that the HVAC system fan begins operating at the speed configured for a fan call with Y1 (high speed is recommended). Outdoor air should now begin being drawn into the house, and indoor air should be exiting the Relief Damper duct termination cap, assuming all house doors and windows are shut.
9. Exit the Venstar thermostat “Test Outputs” menu, select “Free Cooling”, and enable Free Cooling Mode. The ventCool™ system should become de-activated when exiting the “Test Outputs” menu.

⚠️ **IMPORTANT:** Make sure to re-enable “Free Cooling”!
Verify Mechanical Cooling and Heating Operation (if installed):

1. At the Venstar thermostat, in the **Installation Settings** menu, select “Free Cooling” and ensure that Free Cooling is enabled. Exit to the “Installation Settings” menu.

2. Select the “Test Outputs” menu, and press the Cooling 2nd Stage button. The Y2 and G indicators should illuminate, and Y2 and G terminals should be energized.

3. Verify that the ventCool™ system becomes or remains de-activated, as described in this manual’s **System Setup** section.

4. Verify that the HVAC mechanical air conditioning system operates properly. Keep in mind that when “Free Cooling” is enabled, the thermostat will only call for mechanical cooling with Y2 and G, and Y1 will not be energized.

5. If gas, electric, or heat pump heating is installed, return the thermostat to the Home Screen, set the system mode to Heating, and set the thermostat to a setting that would create a heating call. Verify proper operation of the heating system.

**Testing of the ventCool™ system is now complete!**

⚠️ **IMPORTANT:** The HVAC system may now be placed into the desired mode of operation!

Maintenance, Inspection and Cleaning

At the beginning of every heating or cooling season:

- Inspect the dampers for proper operation as directed in the System Checkout section of this manual. Make sure the dampers are able to rotate freely without interference. Damper bearings and motor are maintenance-free; no lubrication is required.
- Inspect all cables and wiring for possible damage by animals or human activity.
- Inspect the Outdoor Air intake and Relief Duct Termination Cap and clean if necessary. Remove any debris or other items that may have accumulated. Remind all occupants to keep objects and contaminant sources away from the intake and relief terminations.
- Inspect the Outdoor Air Temp Sensor and clean if necessary. Make sure it remains in a shaded area away from any heat sources.

Troubleshooting

Damper Operation: For diagnostic purposes, temporarily turn the HVAC system to **Off** from the Home Screen at the Venstar thermostat. This should leave the ventCool™ system powered and in the de-activated state. With the HVAC system off, damper cable connections may safely be swapped to those sockets that are ON or OFF (as indicated by the IVRC control module indicator lamps), to easily check damper functions. Make sure to return cable connections to their proper positions and turn the HVAC system back on when finished.

- Inspect damper for mechanical binding or interference.

- **Intermittent operation:** Wiggle the cable connector at the damper and the IVRC damper control module while the system is calling for the damper to operate. If a bad connection is present, inspect and repair or replace the damper cable, or damper motor assembly as required.

- **Damper fails to open:** Remove the cap from the damper motor. While the IVRC indicator lamp for the specific damper is illuminated, check for voltage from blue cable wire (orange circuit board wire) to white cable wire (black circuit board wire). If nominal 24V is present and the damper will not open, replace the damper motor assembly. If not, check cable connections as above.
• **Damper fails to close**: Remove the cap from the damper motor and make sure the small slide switch on the circuit board is switched **away from the round base** (see FIG 9 below). Next, while the IVRC indicator lamp for the specific damper is **NOT** illuminated, check for voltage from red cable wire (brown circuit board wire) to white cable wire (black circuit board wire). If nominal 24V is present and the damper will not close, check for voltage from blue cable wire (orange circuit board wire) to white cable wire (black circuit board wire). If nominal 24V is NOT present on orange and black wires, replace the damper motor assembly. If the orange and black wires have voltage and the corresponding IVRC indicator is not illuminated, check the IVRC for correct operation.

**IVRC Damper Controller Operation:**

The IVRC controls damper operation and permits a fan call on the G terminals to pass through, when the dampers are in their correct state and responding properly. Outputs to each damper to open are indicated with a glowing lamp corresponding to the damper cable socket for that damper. Each damper should be given 24VAC on the blue and white damper cable wires (orange and black damper motor circuit board wires) whenever there is a command output for the damper to open, and constant nominal 24VAC on the red and white damper cable wires (brown and black damper motor circuit board wires). The damper will not close if nominal 24VAC is not present on these wires.

**Note**: There are no user-serviceable parts inside the IVRC; modification or attempted field service will void the warranty.

• **No indicator lamps illuminated on IVRC**: Check for nominal 24VAC on the CX and RX terminals (1 & 2) on the IVRC. If there is voltage present and no damper output indicators are illuminated, the IVRC must be replaced. If there is no voltage on CX and RX, check the ventCool™ 24VAC transformer for input power. If the transformer has power, check for 24VAC output from the transformer.

• **No change in IVRC outputs and/or indicator illuminations when Ventilation Cooling should be activated by the thermostat**: check for nominal 24VAC from the thermostat from Y1 to C on the IVRC. If voltage is present but the system does not activate, the IVRC must be replaced. If no voltage is present, check the thermostat for voltage output on Y1.

**Venstar Thermostat and Outdoor Air Sensor:**

Please refer to thermostat and outdoor air sensor instructions for details on troubleshooting and operation. When properly configured, the thermostat should energize its Y1 & G terminals when free cooling conditions exist. The following conditions must be met for Ventilation (“Free”) Cooling to occur:

• Outdoor temperature sensor must be properly installed, thermostat must be configured for sensor to be for outdoor temp sensing

• Sensed outdoor temperature (as indicated on the thermostat) must be at or below the setting for “Useable Outdoor Temp”. The outdoor temp sensor may be calibrated as explained in the thermostat instructions, if desired.

• Sensed outdoor temperature (as indicated on the thermostat) must be **at least three or more degrees F below** the indoor temperature setpoint.

• Indoor sensed temperature must be **at least two degrees F above** the indoor temperature setpoint, depending on offset or deadband settings.
NOTE: The thermostat will not activate Automatic Ventilation Cooling when outdoor temperatures are above the “Useable Outdoor Temperature” setting. Also, if a cooling call was present while the outdoor temperature was above the “Useable Outdoor Temperature” setting, mechanical air conditioning will not transition into Ventilation (“Free”) Cooling until outdoor temperatures dropdown below the setpoint, until the indoor temperature setting is reached by means of mechanical cooling, and the thermostat is satisfied (mechanical cooling shuts off). Ventilation cooling will occur with the next cooling call if the outdoor temp remains below the “Useable Outdoor Temperature” setting.

**Specifications**

**IVRC Damper Control Module:**

- **Wiring Requirements:** 18 – 22 AWG, 24 VAC min.
- **Operating Voltage:** 18-32 VAC
- **Maximum Operating Power:** 40VA
- **Operating Ambient Temperature Range:** -40°F to 185°F (-40°C to 85°C)
- **Operating Humidity Range:** 5 to 90 % RH (non-condensing)
- **Shipping Temperature Range:** 14°F to 140°F (-10°C to 60°C)

**Ventilation Cooling Air Dampers:**

- **Minimum Wiring Requirements:** 24 VAC 22 AWG
- **Maximum Voltage:** 32 VAC
- **Motor Performance:** 2 RPM @ 60Hz, CW Rotation viewing shaft
- **Motor Rating:** Insulation Class A (105C) Permanent magnet synchronous, 4W Input power
- **Operating Ambient Temperature Range:** 32°F to 175°F (0°C to 80°C)
- **Operating Humidity Range:** 5 to 90 % RH (non-condensing)
- **Shipping Temperature Range:** -20 °F to 180°F (-29°C to 82°C)

**Venstar® T7850 Thermostat:**

Refer to manufacturer’s specification in installation manual. Installation manual can be downloaded at www.venstar.com

**Venstar® ACC-TSEN Outdoor Temperature Sensor:**

10K ohm at 77F/25C, negative Temperature Coefficient. Refer to manufacturers specifications for additional information.

**Trio™ Media Air Cleaner: TrioMAC8-2025 - Trio Mac 20x25 Merv 8**
## REPLACEMENT PARTS

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## WARRANTY

For warranty information about this or any Field Controls product, visit
www.fieldcontrols.com