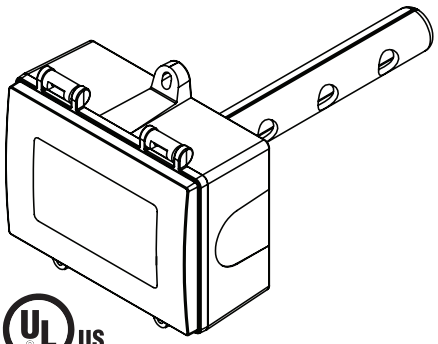
# DUCT VOC TRANSMITTER

VOCDT Series - Analog Installation Instructions



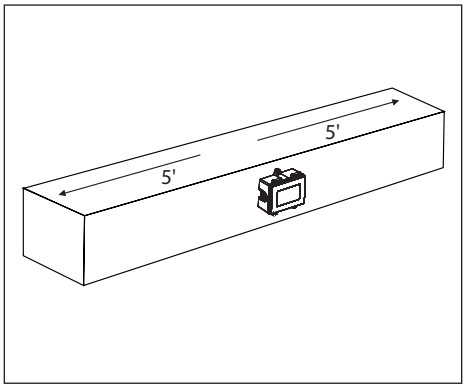
## INTRODUCTION

The Duct VOC Transmitter uses an advanced MOx (metal oxide semicondutor) sensor to detect poor air quality. The sensor reacts quickly to detect a broad range of VOCs such as smoke, cooking odors, bioeffluence, outdoor pollutants and from human activities. Dual linear analog output signals of 4-20mA, 0-5/0-10 Vdc signals provide indication of the TVOC level or quality levels against a VOC index and temperature levels. An optional output of humidity is also available. Additional add-on features of feed through temperature sensor, and adjustable relay output are available.

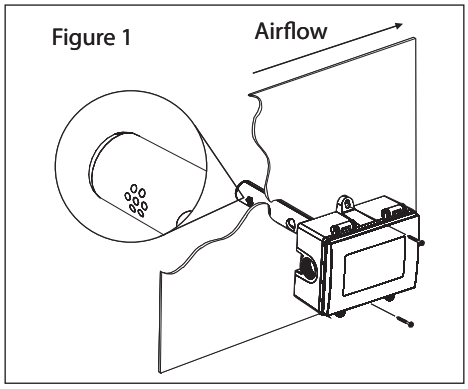
## ⚠ WARNING

Read these installation instructions carefully before commissioning the VOC. Failure to follow these instructions may result in product damage. Do not use in an explosive or hazardous environment, with combustible or flammable gases, as safety or emergency stop devices or in any other application where failure of the product could result in personal injury. Use electrostatic discharge precautions during installation and do not exceed the device ratings.

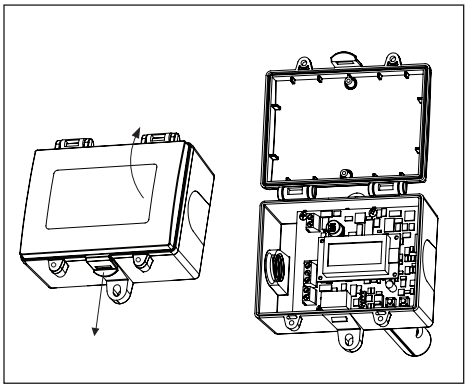
## MOUNTING



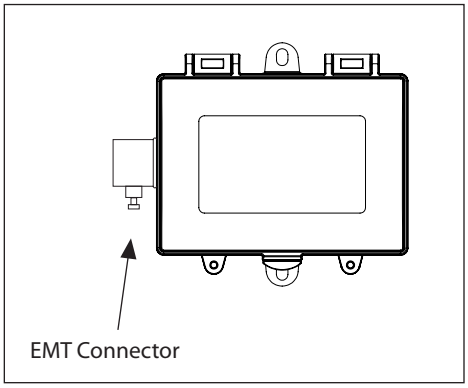

1 Mount the sensor in an easily accessible location in a straight section of duct at least five feet from corners or other items that may cause disturbances in the air flow. Avoid areas where the detector is exposed to vibrations or rapid temperature changes.



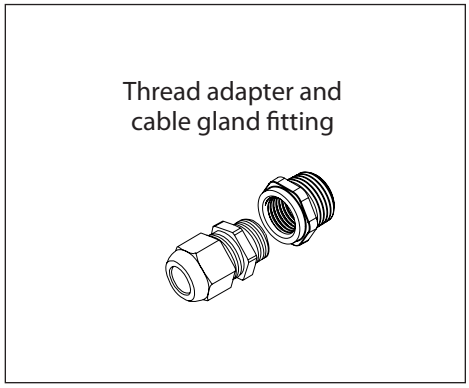

2 Clean all drilled holes of debris before mounting the device. Mount the enclosure to the duct with two sheet metal screws such that the duct air flow is parallel with the vent holes in the probe To prevent air leaks, ensure the gasket is compressed around the probe between the device enclosure and the air duct.



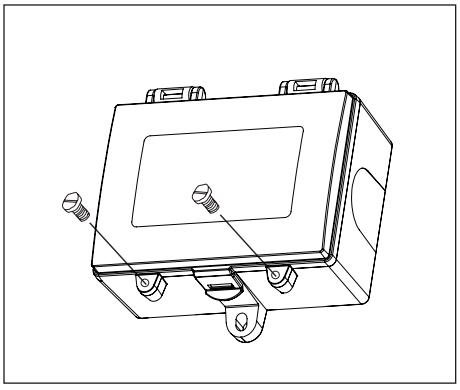
3 The enclosure has a hinged cover with a latch. Open the cover by pulling slightly on the latch on the bottom of the enclosure, at the same time pulling on the cover.




4 A 1/2" NPT threaded connection hole is provided in the side of the enclosure. Screw an EMT connector or cable gland connector in until tight. A weatherproof conduit or cable gland fitting is recommended.




5 An optional 1/2" NPT to M16 thread adapter and cable gland fitting are available.



6 Two security screws are provided which can be installed to help secure the cover once settings and wiring connections are complete.

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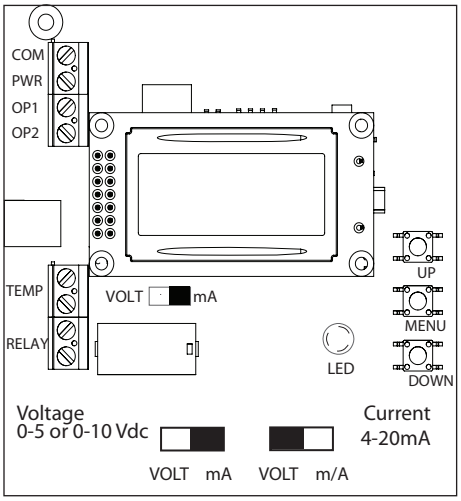
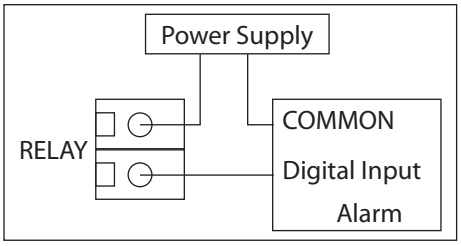
## WIRING

**⚠ WARNING**

Deactivate the power supply until all connections are made to the device to prevent electrical shock or equipment damage. Use 16-22 AWG shielded wire for all connections (only ground the shield at the controller end) and do not locate the device wires in the same conduit with wiring used to supply inductive loads such as motors. Pull at least six inches of wire into the enclosure and complete the wiring connection according to the wiring diagram. The device is reverse voltage protected and will not operate if connected backwards. It has a half-wave power supply so the supply common is the same as the signal common. Several devices may be connected to one power supply and the output signals all share the same common. Use caution when grounding the secondary of a transformer or when wiring multiple devices to ensure the ground point is the same on all devices and the controller.

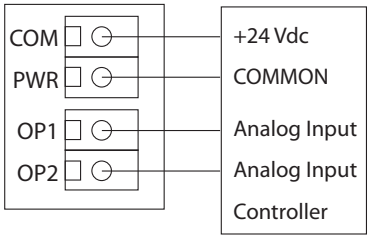



7 Select output type by sliding switch.

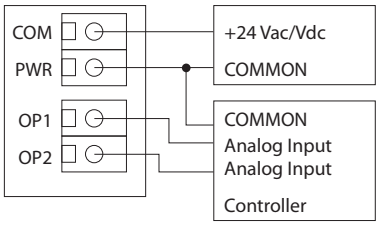



9 The optional relay output connects to the RELAY terminals. The relay output is completely isolated and has a Normally Open (NO) signal. This signal can be used to directly control an alarm or ventilation fan. See specifications for contact ratings.

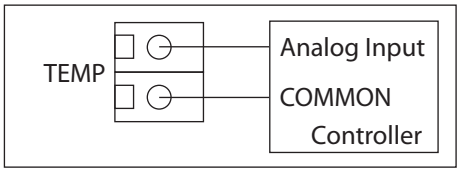
Wiring for alloutput signal and 24 Vdc power from controller




Wiring for all output and external 24 Vac power transformer or external 24 Vac power supply




8 This is a 3-wire sourcing device. Connect the plus DC or the AC voltage hot side to the PWR terminal and the common is connected to the COM terminal. The analog outputs are available on the OP1 & OP2 terminals.




10 The optional two-wire temperature sensor output is available with various RTDs and thermistors to suit all control applications and is available on the TEMP terminals.

## OPERATIONS

**⚠ WARNING**

The VOC Sensor requires a continuous burn-time of at least 3 weeks before the sensor algorithms provide accurate measurements. During this period the product-to-product readings may show variations. The sensor will calibrate itself over this time to the environment it is installed in.

The VOC Sensor is meant to provide an accurate measurement of INDOOR air quality. Diesel exhaust is not a component of indoor air quality, and the sensor should not be used in such an application.

In normal operation, the VOC Sensor will detect a broad range of reducing gases such as CO and VOCs and translate the measurement into a VOCI (VOC Index) value representing the average TVOC reading.

This value is displayed on the LCD in either VOCI, ug/mg$^3$, or ppb as set in the menu.

The **GOOD**, **FAIR** and **POOR** air quality levels will also be displayed on the tri-color front panel LED. The LED colors are displayed as **GOOD=green**, **FAIR = yellow** and **POOR=red**.
If required, the LED operation can be disabled via the menu.

## CONFIGURATION

The device has several parameters that can be configured locally via the Setup menu using the keypad and LCD. Any changes made are saved in non-volatile memory and are restored in case of a power loss. The menu can be accessed at any time after the start-up mode and if there is 5 minutes of inactivity the menu will close and normal operation will continue.

To enter the menu, press and release the <MENU> key. This will enter the Setup Menu step 1, pressing the <MENU> key a second time saves the setting and advances to step 2. Each press of the <MENU> key saves the current setting and advances the menu item.

The <UP> and <DOWN> keys are used to make changes to program variables by scrolling through the available options. The first column below shows what will be displayed on the LCD, including the default value.

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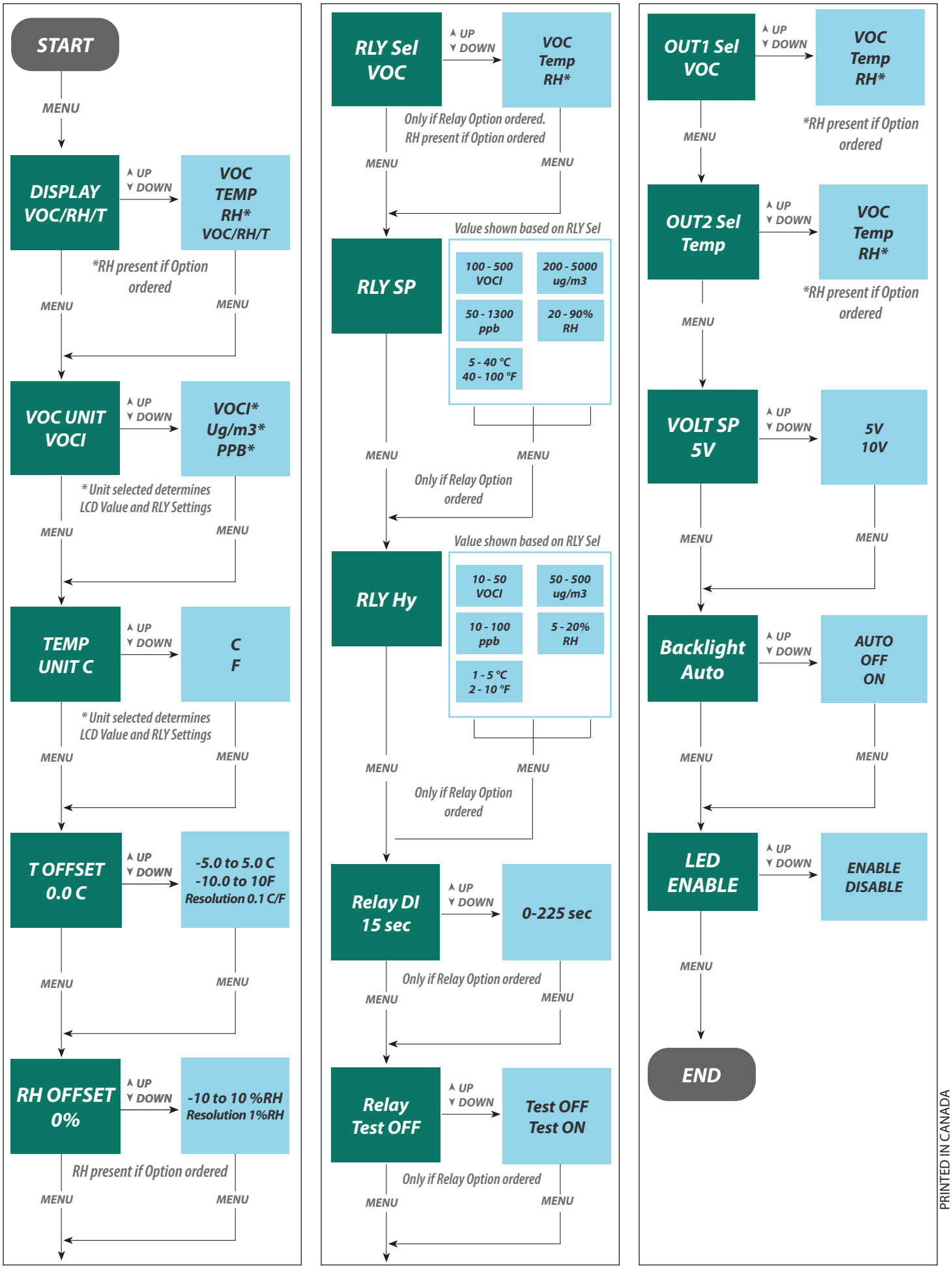


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# SPECIFICATIONS

## VOLATILE ORGANIC COMPOUNDS

**Sensor Type:**
MOX metal oxide semiconductor
**Range:**
VOC Index: 0 to 500 VOCI
TVOC: 0 to 2000 ug/m3 or 0 to 1000 PPB
**Device Variation:**
±15 VOC Index points, or ±15% VOC Index value (the larger value)
**Repeatability:**
±5 VOC Index points, or ±5% VOC Index value (the larger value)
**Drift Compensation:** Automatic baseline correction

## TEMPERATURE

**Sensor Type:** Bipolar transistor sensor chip
**Range:** 0 to 50°C, 32 to 122°F
**Accuracy:** ± 0.2°C, ± 0.4°F (Typical)
**Resolution:** 0.1°C/°F
**Calibration:**
-5 to 5°C Offset, Resolution = 0.1°C ;
-10 to 10°F Offset, Resolution = 0.1°F

## OPTIONAL HUMIDITY

**Type:** Thermoset polymer-based capacitance sensor chip
**Range:** 0-100% RH
**Accuracy:** ±2% RH
**Resolution:** 0.1% RH
**Calibration:**
-10 to 10%RH Offset, Resolution = 1% RH

## GENERAL

**Wiring:** Screw terminal block (14 to 22 AWG)
**Operating Conditions:**
0 to 50°C (32 to 122°F), 0 to 90 %RH non-condensing
**Storage Conditions:**
-20 to 60°C (-4 to 140°F), 0 to 80 %RH non-condensing
**Response Time:** <10 seconds
**Warm-up Time:** 1 minute for detecting VOC events, 1 hour to meet specifications
**Sensor Coverage:** 100 m2 (1000 ft2) typical
**Protection Class:** III
**Power Source UL:** 24Vac/dc SELV (Class 2) supply
**Outputs:** Limited Energy, < 15W
**Consumption:** 150 mA max
**EU Conformity:** CE
**UL Model:** MIAQDTXPV & MIAQDTNPV
**Certification:** UL 60730 & CSA E60730, (UL E539555 file#)
**UL 2043 / CSA/ULC S142 Compliant:** Suitable for Use In Air Handling Spaces in Accordance with Section 300.22, (C) of the National Electrical Code
**Purpose of Control:** Operating Control
**Type of Action:** Type 1
**Impulse Voltage:** 330V
**Pollution Degree:** 2
**Country of Origin:** Canada

## VISUAL INDICATION

**LCD Display:**
Alpha-numeric 2 line x 8 characters
**LCD Dimensions:**
35 x 15mm (1.4" x 0.6")
**LCD Backlight:**
Auto/Enable/Disable via Menu
**LCD Resolution:**
VOC Index value (0-500), resolution 1
TVOC value Analog 0 to 2000 ug/m3 or 0 to 1000 PPB, resolution 1
Temperature, 0-50°C (32 to 122°F), resolution 1°C (F)
Optional RH, 0-100%RH, resolution 1%RH
**LED Indicator:**
Tricolor (Green, Yellow, Red) see table, enable or disable via menu

## OUTPUT

**Outputs: (2x)**
4-20mA or 0-5 / 0-10 Vdc (selectable).
**Output Selection:**
TVOC
VOC Index
Relative Humidity (optional)
Temperature (optional)
User menu to select analog output configuration

## ENCLOSURE

**Enclosure:** Grey Polycarbonate, UL94-V0, IP65 (NEMA 4X)
**Dimensions:**
116.5mm W x 112.5mm H x 53.7mm D (4.58" x 4.43" x 2.11")
**Probe Dimensions:**
22.5mm D x 152mm L (0.88" x 6")

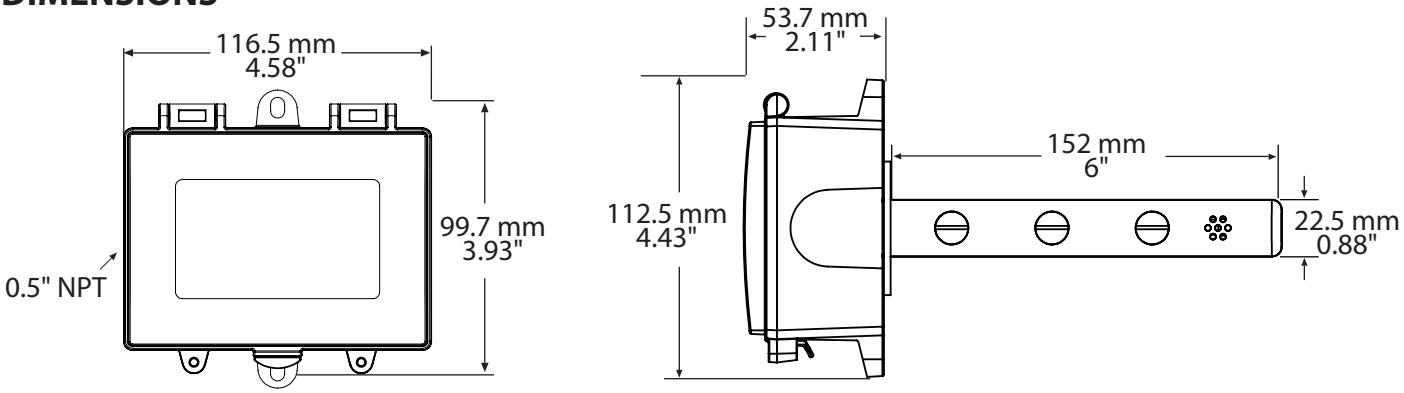
## OPTIONAL PASS-THRU TEMPERATURE SENSOR

**Type:** Thermistor and RTD
**Accuracy:**
Thermistors: ±0.2°C (±0.36°F) @ 25°C (77°F)
Platinum RTD's: ±0.3°C (±0.54°F) @ 0°C (32°F)
Nickel RTD's: ±0.4°C (±0.72°F) @ 0°C (32°F)
**Output:** 2-wire resistive

## OPTIONAL RELAY

**Contact Rating:** Form A 5Amp @ 30Vdc/ac, SELV (Class 2), non-inductive load
**Relay Setpoints (Selectable):**
VOC: 100 - 500 VOC Index;
TVOC: 200 - 5000 ug/ m3
50 - 1300 ppb;
Temperature: 5 - 40°C / 40 - 100°F
Optional Humidity: 20 - 90%;
**Setpoint/Hysterisis/Delay:**
Selectable based on selected assignment
**Relay Configuration:** Via Menu
**Switching Power:** 60W, 62.5VA

# DIMENSIONS

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