Life Is On | Schneider Electric

Sensors, Relays & Power Supplies Catalog

NAM
Digital Buildings Division | 2024

www.schneider-electric.com

About Schneider Electric

Schneider Electric is leading the digital transformation of energy management and automation in homes, buildings, data centers, infrastructure and industries. With a global presence in over 100 countries, Schneider is the undisputable leader in power management – medium voltage, low voltage and secure power, and in automation systems. We provide integrated efficiency solutions, combining energy, automation and software.

In our global ecosystem, we collaborate with the largest partner, integrator and developer community on our open platform to deliver real-time control and operational efficiency.

We believe that great people and partners make Schneider a great company and that our commitment to innovation, diversity and sustainability ensures that Life Is On everywhere, for everyone and at every moment.

Life Is On | Schneider Electric

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High accuracy sensor provides an ideal operating environment for critical applications. A modern aesthetic and touchscreen display allow for optimal humidity control at zone level.

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Complete leak detection systems protect expensive electronics from costly water damage. Monitor a single location or large area with reliable sensing devices and controller systems.

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Precisely measure differential air pressure or velocity with the flip of a switch using Bluetooth® technology.

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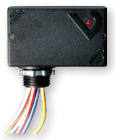

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HVAC & Physical Plant

Increase efficiency,
extend safety

Liquid & Chemical Leak Detection

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Complete leak detection systems protect expensive electronics from costly water damage. Monitor a single location or large area with reliable sensing devices and controller systems.

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Temperature Sensors

SLA, TW2, ETD SERIES

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Monitor temperature at a zone level with high accuracy to provide an ideal environment.

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Precisely measure differential air pressure or velocity with the flip of a switch using Bluetooth® technology.

Relays

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Energize lighting contactors with a pilot-duty relay in an easy-to-use nipple mount enclosure.

Energy & Power Usage Monitoring

Monitor and meter power usage and heated or chilled liquids

Flow Monitoring

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HVAC & Physical Plant

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Liquid & Chemical Leak Detection

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Complete leak detection systems protect expensive electronics from costly water damage. Monitor a single location or large area with reliable sensing devices and controller systems.

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The PWR Series remote wet media pressure transducers allow remote pressure sensing capability using existing plumbing runs. With no need to run plumbing lines all the way to the transducer, the installation time and cost is greatly reduced.

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Provide ideal environmental conditions, while optimizing efficiency

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Monitor temperature at a zone level with high accuracy to provide an ideal environment.

Building Safety & Efficiency

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SLA, CW2 SERIES

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Calling for fresh air only when CO_2 levels are high saves energy. Make the SLA or CW2 Series part of your demand controlled ventilation strategy.

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Accurately monitor and invoice energy consumption

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H308

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Reliably detect belt loss, coupling shear, and mechanical failures.

HVAC & Physical Plant

Detect leaks in sprinkler systems, measure chiller/boiler line pressure, and enable rooftop unit control via sensors

Motor Control Relays

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The Victory 100 Series 10A relays are pilot-duty relays in an easy-to-use nipple mount enclosure. Great for building control applications.

Flow Monitoring

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Metering of heated or chilled liquid, with a turbine flow meter and BTU transducer in one compact package.

Residential Multi-Tenant

Living & Shared Spaces

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Occupancy Sensors

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CO_2 Sensors

SLA, CW2 SERIES

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Calling for fresh air only when CO_2 levels are high saves energy. Make the SLA or CW2 Series part of your demand controlled ventilation strategy.

Building Infrastructure

Monitor sprinkler systems for leaks and efficiently maintain ideal air quality

Liquid & Chemical Leak Detection

LD, SC SERIES

Pages 139, 141, 143, 147

Complete leak detection systems protect expensive electronics from costly water damage. Monitor a single location or large area with reliable sensing devices and controller systems.

Gas Detection

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Easy parking garage monitoring with the GWN and GWNP modular platforms. Monitor CO and NO_2 separately or together.

BTU Monitoring

380 SERIES

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Metering of heated or chilled liquid, with a turbine flow meter and BTU transducer in one compact package.

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Temperature Sensors

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Pages 53, 55, 183

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Building Safety & Efficiency

Monitor parking structures, maintain wood shop/metal shop pressure control, manage demand controlled ventilation

Gas Detection

CO, NO_2 SENSORS

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Easy parking garage monitoring with the GWN and GWNP modular platforms. Monitor CO and NO_2 separately or combined.

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HVAC & Physical Plant

Empower motor control, detect mechanical failure, meter heated or chilled liquids

Adjustable Current Switches

H308

Page 207

Reliably detect belt loss, coupling shear, and mechanical failures.

Flow Monitoring

380 SERIES

Page 91

Metering of heated or chilled liquid, with a turbine flow meter and BTU transducer in one compact package.

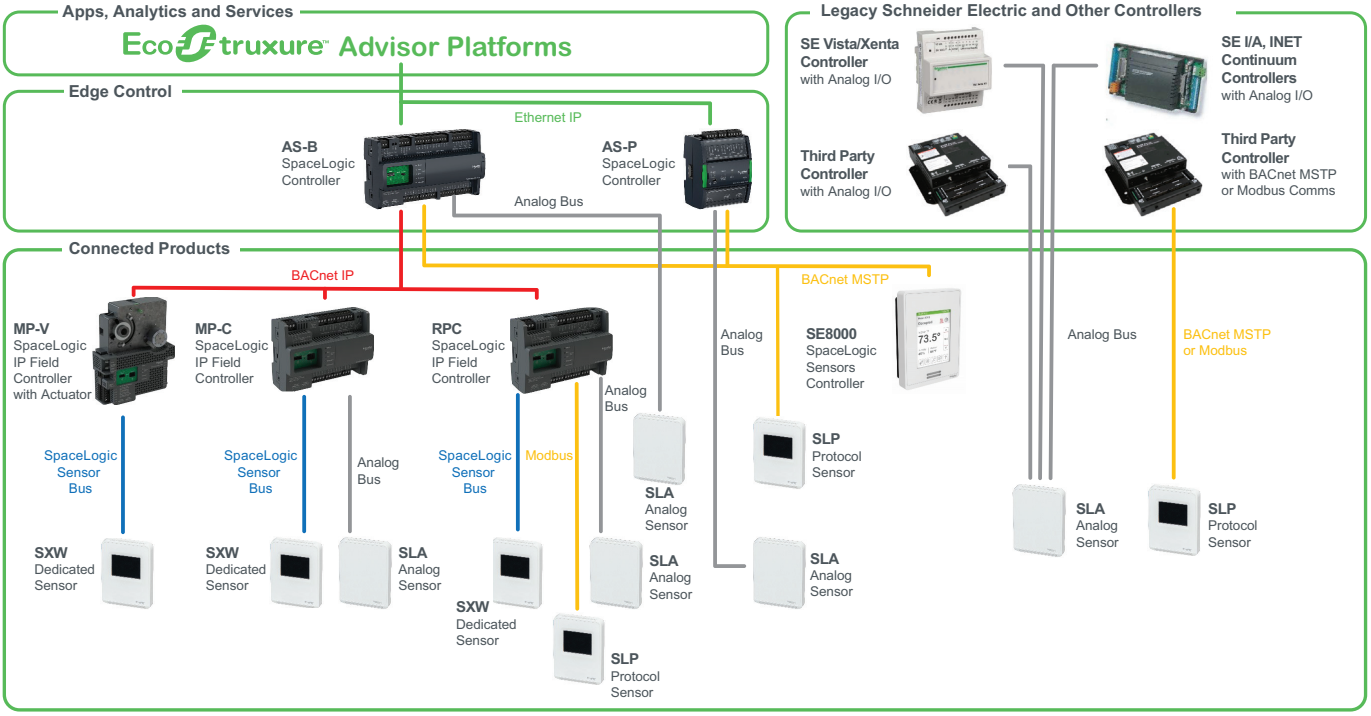
Living Space Sensors

Living Space Sensors and Controller Compatibility Matrix

Sensor	MP-x	RP-x	AS-B	AS-P	Continuum	TAC I/A	TAC Vista	Third Party	Page
SXWS – CO_2	X	X							17
SXWS – CO_2 / CO_2 & VOC	X	X							17
SXWS – Temp.	X	X							17
SLA	X	X	X	X	2	2	2	2	25
SLA – Humidity	1	1	X	X	2	2	2	2	43
SLA – Temp.	X	X	X	X	2	2	2	2	53
SLP		X	3	X				2	21
SLP – Humidity		X	3	X				X	31
SLP – Temp.		X	3	X				X	49
CW2 – CO_2 / CO_2 & VOC	1	1	X	X	X	X	X	X	27
CW2 Protocol									23
CWE2 & CWV2									29
HW2 – Humidity	1	1	X	X	X	X	X	X	45
HW2 Protocol									41
HEW	1	1	X	X				X	47
TW2 – Temp.	X	X	X	X	X	X	X	X	55
TW2 Protocol									51
TE & TP	X	X	X	X	X	X	X	X	59
TTS					X				61
MN-S						X			63

1. While this will work with the I/O on MP controllers, SXWS CO2 and RH models using the Sensor Bus are generally a better choice as they do not use multiple points of I/O.
2. SLA sensors have selectable 0-5V, 0-10V and 4-20mA temperature outputs. If a specific thermistor is required, use CW2, HW2 or TW2..
3. AS-B controllers with 'L' in the product name do not support Modbus or BACnet MS/TP and the RS-485 port is not used. SLA models should be used on AS-B controllers with 'L'.

Architecture Diagram



Note: SXWS, SLA and SLP sensors used for reference.

Living Space Sensors Overview

Schneider Electric offers a comprehensive SpaceLogic Sensors platform for use with current and legacy Schneider Electric controllers as well as third-party controllers. This flexible approach allows the modern aesthetic and feature set of the SpaceLogic Sensors platform to be used in new construction, expansions and retrofit applications. With the complexity of modern control systems, there are many different ways to configure sensors hardware in a system. This guide is intended to provide general guidance to create cost-effective configurations for commonly used Schneider Electric and third-party controller applications.

The latest Schneider Electric SpaceLogic Sensors are a multi-sensor platform supporting CO_2, RH and Temperature with Touchscreen, LCD, 3-Button and Blank user interfaces. PIR Occupancy and VOC sensors and Light and Blind control are available on specific models. Communicating, Analog and BACnet/Modbus outputs are available to maximize applications. All SXWS, SLA and SLP Series sensors are available in “Medium” matte white, “Optimum” white glass panel and “Optimum” black glass panel finishes.

SpaceLogic SXWS Series Sensors

SXWS Series sensors communicate with MP and RP Series controllers via RJ-45 connectors. They are modular and are ordered in two parts: the sensor base and the cover. Four SXWS Series communicating sensor base models are available that can be paired with any SXWS cover model. CO_2, Relative Humidity, and Temperature sensor bases are available. Covers are available with PIR Occupancy sensors.

SpaceLogic SLA Series Sensors

SLA Series sensors have selectable 4-20mA, 0-5V or 0-10V analog outputs with screw terminals. All SLA Series include the cover and base and are available with CO_2/VOC, CO_2, Relative Humidity, and Temperature sensors.

SpaceLogic SLP Series Sensors

SLP Series sensors have selectable BACnet MSTP/Modbus RTU RS-485 outputs with screw terminals. All SLP Series include the cover and base and are available with CO_2/VOC, CO_2, Relative Humidity, and Temperature sensors.

SXWS, SLA, SLP Sensors

Optimum White | Optimum Black | Medium White

CW2, HW2 and TW2 Series, Veris No-Logo

CW2, HW2 and TW2 Series sensors are created with third-party controllers and legacy applications in mind. Sensors from Veris are very similar to the SLA/SLP Series and use screw terminals for wiring. Analog versions have 4-20mA, 0-5V or 0-10V analog outputs and several popular thermistor/RTD options to provide resistive temperature outputs. Protocol models have selectable BACnet MSTP/Modbus RTU RS-485 outputs. Veris sensors are available only in “Medium” matte white and have no branding on the sensor and may be used in place of SLA/SLP Sensors when no branding is a requirement.

HEW Series

HEW Economy Series wall mount humidity transmitters offer high performance in an easy-to-install housing at an affordable price.

TE & TP Series

TE Series wall mounted temperature sensors feature a discreet appearance combined with high accuracy and reliability. TP Series flush mounted stainless steel sensors are designed to monitor the temperature of the air in areas where sensor durability and security are needed. They are ideal for spaces where moisture and water vapor are concerns.

CW2, HW2, TW2 Sensors | HEW Sensors | TE Sensors

No Logo | No Logo | No Logo

Legacy Sensors

Two legacy sensor offers within the Schneider Electric Living Space Sensor Offer are also supported.

MN-S Series Sensors

MN-S Series Sensors are available with RH and temperature sensors and communicate to TAC I/A controllers via S-Link communication. Sensors are available in six- and four-button LCD display models and one-button with setpoint and status LED models.

TTS Series Sensors

TTS Series Temperature Sensors communicate to Continuum controllers via Infinet communication. Sensors are available in seven-, six- and three-button LCD, one-button status LED and blank cover variants.

Legacy Sensors

MN-S | TTS

SpaceLogic Sensors SXWS Series

For MP and RP IP Controllers

Note: A subset of models shown with covers installed.

SXWS sensors are a family of living space sensors for use with MP and RP IP controllers that use the EcoStruxure Building Operation user interface. These sensors use an RJ-45 sensor bus that provides communication and power from the IP controller. For quick installation, up to four SXWS sensors may be connected to each IP controller through the RJ-45 sensor bus using Cat 5/6 cable (22 to 26 AWG). A Bluetooth® adapter is available for commissioning and service. It is temporarily connected to installed communicating sensors and allows for quick setup and configuration. The Bluetooth adapter communicates to upload devices (smart phone, laptop, table, etc.) with the Living Space Sensor EcoStruxure Building Operation app installed via USB or Bluetooth communications.

SXWS living space sensors are modular and are ordered in two parts: the sensor base and the cover. Four SXWS communicating sensor base models are available that can be paired with any SXWS cover model. CO_2, Relative Humidity, and Temperature sensor base options provide an efficient, cost effective solution for living space air quality and comfort needs. Covers are available with a 61 mm (2.4”) backlit color touchscreen and a three button non-display version for override and setpoint. Blank covers with no user interface are also available. All modular cover variants are available with and without passive infrared occupancy sensors.

Two complete sensor/cover combination model types are available:

- Temperature-only with LCD display. Communicating with three button cover. This is a low cost temperature sensor with a basic display.
- A two-wire, resistive-only, non-communicating temperature sensor is offered for a low cost conformance part. This uses an I/O port on the controller.

Combination models come with a sensor base and cover and are available in medium matte white, optimum glass white and optimum glass black. Combination units have the same form factor as the modular sensor bases and covers of the same housing type. Combination units will not work with other covers.

SXWS living space sensors measure the levels of CO_2 (if equipped), RH (if equipped), and temperature of air in a living space application. The CO_2 sensor operates within accuracy specifications for an interval of two years and can be field calibrated.

Specifications

CO_2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000 ppm
Accuracy	±30 ppm ±2% of measured value
Repeatability	±20 ppm ±1% of measured value
Response time	<60 seconds for 90% step change
RH Sensor	
HS Sensor	Solid state capacitive
Accuracy*	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis	1.5% typical
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor (Non-communicating Models)	
Sensor Type	10K Type 3 thermistor
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.2 °F)
Output Range	0 to 50 °C (32 to 122 °F)
Temperature Sensor (Communicating Models)	
Accuracy	±0.2 °C (±0.4 °F) typical
Occupancy Sensor	
Sensor type	Passive infrared (PIR)
Light and Blind Control	
Number of Light Control Zones	1 manually controlled 4 configurable in scenes
Number of Blind Control Zones	1 manually controlled 4 configurable in scenes
User Interface	Any SXWS cover with touchscreen
Communication	Sensor Bus on RP-x models with light/blind modules
Preconfigured Scenes	Configurable via EcoStruxure Building Operation software
Light Control	On/off/dimming
Blind Control	Blind open /close/adjust Louver open/close/adjust
Operating Environment	
Operating Temp.	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH, non-condensing
Housing Material	High impact ABS plastic Flammability rating UL 94 V-0
Input Power	2 or 3 watts (depending on controller model), 24 Vdc over sensor bus
Wiring Terminals	
Non-communicating Models	Screw, 2-wire, 18-24 AWG
Communicating Models	RJ-45 female sensor bus

Specifications (cont.)

Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN61000-6-3 EN61000 Series - industrial immunity standard FCC Part 15 Class B, REACH, RoHS, Green Premium, RCM (Australia), ICES-003 (Canada), EAC (Russia)

*Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability.

Software Specifications

Using the SpaceLogic Bluetooth Adapter to Configure

- Custom field-configurable sensor displays
- Auto-ranging of displayed values
- Occupant command capabilities
- Adjustable minimum/maximum limit setpoint values
- Controller driven, automatically configured, customized display/command values

Communications

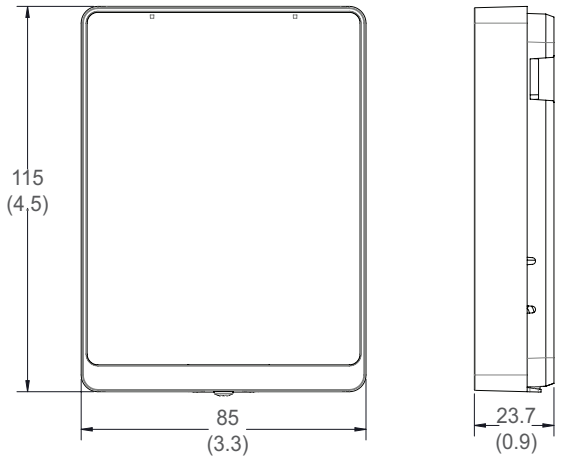
IP Controller Sensor Bus

IP controller sensor bus communications wiring provides power and communication interface to the MP Series controllers. The IP controller sensor bus connects up to four sensor devices per controller using unshielded RJ-45 connectors and Cat 5/6 cable (22 to 26 AWG)*. The maximum total length of the IP controller sensor bus is 61 m (200 ft.).

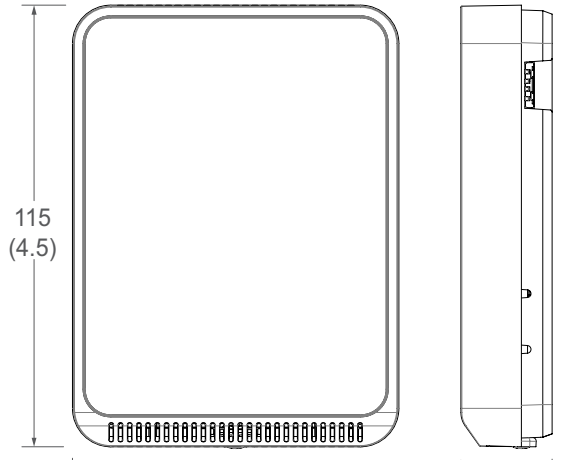
*Due to power constraints, limitations exist for the number of sensors the Sensor Bus can support. For specific sensor combinations supported, see the Sensor Bus Configuration Calculator on the last page of this document.

Dimensional Drawings – mm (in.)

SXWS Sensor Base with Cover Installed, Optimum Housing



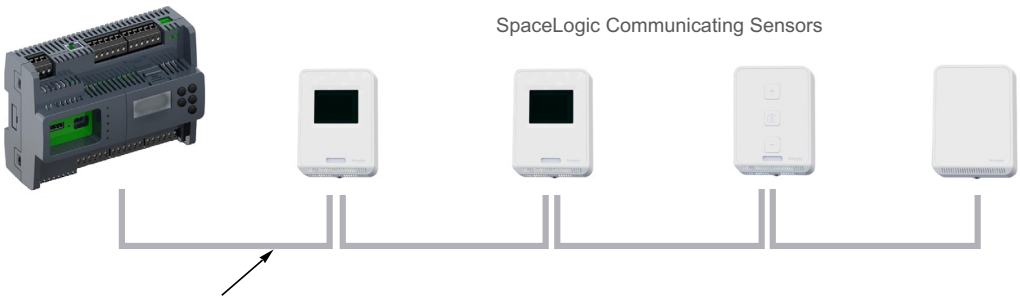
SXWS Sensor Base with Cover Installed, Medium Housing



MP-x/RP-x Controller and Sensor Bus with Communicating Sensors

MP-x/RP-x Controller

SpaceLogic Communicating Sensors



Cat 5/6 cable (22 to 26 AWG) terminated via unshielded RJ-45 connector.
61 m (200 ft.) total maximum length.
Up to four communicating sensors on sensor bus. For specific combinations of sensors supported by the Sensor Bus, see the Sensor Bus Configuration Calculator section later in this document.

Ordering Information: 2-Piece Sensors

Step 1: Select sensor base

Model	Temp.	RH	CO_2	Cover	SpaceLogic Sensor Bus	Base Color
SXWSBTXXXSXX	X			Not included	X	Clear/transparent
SXWSBTHXXSXX	X	X		Not included	X	Clear/transparent
SXWSBTXCXSXX	X		X	Not included	X	Clear/transparent
SXWSBTHCXSXX	X	X	X	Not included	X	Clear/transparent

Step 2: Select cover (see cover option photo examples below)

		Model	61mm (2.4") Color Touchscreen	Override	Setpoint	Occupancy Sensor (PIR)	Housing Finish
Touchscreen		SXWSCDXSELXX	X	X	X		Medium, White
		SXWSCDPSELXX	X	X	X	X	Medium, White
		SXWSCDXSELXW	X	X	X		Optimum, White
		SXWSCDPSELXW	X	X	X	X	Optimum, White
		SXWSCDXSELXB	X	X	X		Optimum, Black
		SXWSCDPSELXB	X	X	X	X	Optimum, Black
3-Button		SXWSC3XSELXX		X	X		Medium, White
		SXWSC3PSELXX		X	X	X	Medium, White
		SXWSC3XSELXW		X	X		Optimum, White
		SXWSC3PSELXW		X	X	X	Optimum, White
		SXWSC3XSELXB		X	X		Optimum, Black
		SXWSC3PSELXB		X	X	X	Optimum, Black
Blank		SXWSCBXSELXX					Medium, White
		SXWSCBPSELXX				X	Medium, White
		SXWSCBXSELXW					Optimum, White
		SXWSCBPSELXW				X	Optimum, White
		SXWSCBXSELXB					Optimum, Black
		SXWSCBPSELXB				X	Optimum, Black

Optimum Covers

Standard-Medium Covers

Ordering Information: 1-Piece Sensors

Model	LCD	Temp.	Override	Set-point	SpaceLogic System Bus	Housing Finish
SXWSATXXXSLX	X	X	X	X	X	Medium, White
SXWSATXXXSLW	X	X	X	X	X	Optimum, White
SXWSATXXXSLB	X	X	X	X	X	Optimum, Black

LCD Cover Options

SpaceLogic Sensors

SLP Series Air Quality Sensors – BACnet & Modbus

Individual or 4-in-1 CO_2, VOC, RH & Temperature

SLPSTCxx

SLPSLCxx

SLPSXCxx

The SpaceLogi SLP Protocol Series of air quality sensors for living space is a flexible multi-sensor platform for use with BAS controllers designed to accept BACnet or Modbus outputs. SLP Protocol Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank. CO2 and temperature sensors are included with all SLP Protocol Series air quality sensors. Models with VOC sensors and relative humidity sensors are also available.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Protocol Output	BACnet or Modbus via RS-485, selectable
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Ma-terial	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
CO_2 Transmitter	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 10,000 ppm
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
VOC Transmitter Option	
Sensor Type	Solid state
Output Range	0 to 100% AQI for VOC
Accuracy	±15% of measured value
Output Scale	0 to 1,000 ppb of total VOC (TVOC)

	Level	Ventilation Recommendation	TVOC (ppb)
AQI Table*	>61%	Greatly increased	>610
	20 to 61%	Significantly increased	200 to 610
	10 to 20%	Slightly increased	100 to 200
	5 to 10%	Average	50 to 100
	0 to 5%	Target value	0 to 50

Communicating

Embedded BACnet and Modbus communication protocols…easy systems integration

Configurable baud rates

Configurable to multiple baud rates…transfer data at the right speed for the system

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 indication

Stoplight feature for visual indication at user-configurable CO_2 threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

RH Transmitter Option	
HS Sensor	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)**	±3.5% RH from 10 to 80% RH @ 25°C (77 °F) ±5% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Transmitter	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
Setpoints	
Temperature Setpoint	Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	Scale: 0 to 100% RH
Fan Speed Setpoint	Off, Low, Medium, High, Auto

Specifications (cont.)

Override	
Override Button	Display models feature momentary override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).
**Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.

Housing Finishes


Optimum White


Optimum Black


Medium White

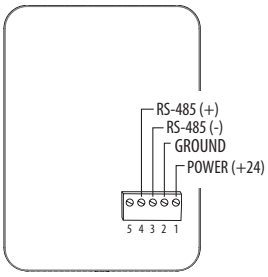
User Interface Types


Touchscreen

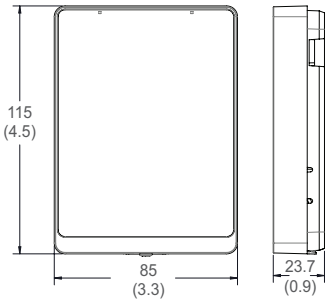

LCD with Buttons


Blank

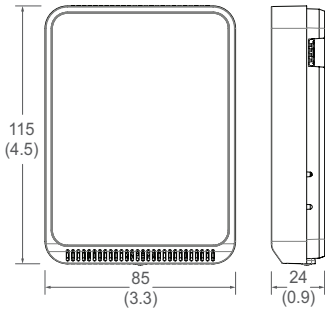
Wiring Diagram



Dimensional Drawings – mm (in.)



Optimum Housing



Medium Housing

Ordering Information

SLP [Housing Finish] [User Interface] [VOC Sensor] [RH Accuracy*]

Housing Finish
B = Optimum housing, black
W = Optimum housing, white
S = Medium housing, white

User Interface
TC = Color touchscreen
LC = 3-button LCD display
XC = None

VOC Sensor
V = NDIR CO2 /
Blank = VOCNone

RH Accuracy*
2 = 2% RH Sensor
X = None***

Example: SLP B L C V 2

* Replaceable 1% with NIST certificate, 2% with NIST certificate and 2% elements available.

Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration


Replaceable RH Element

CW2 Protocol Series

Individual or 4-in-1 CO_2, VOC, RH & Temperature from Veris

CW2Txxxx CW2Lxxxx CW2Xxxxx

The Veris CW2 Protocol Series of air quality sensors for living space is a flexible multi-sensor platform for use with BAS controllers designed to accept BACnet or Modbus outputs. CW2 Protocol Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank. CO_2 and temperature sensors are included with all CW2 Protocol Series air quality sensors. Models with VOC sensors and relative humidity sensors are also available.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Protocol Output	BACnet or Modbus via RS-485, selectable
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
CO_2 Transmitter	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 10,000 ppm
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
VOC Transmitter Option	
Sensor Type	Solid state
Output Range	0 to 100% AQI for VOC
Accuracy	±15% of measured value
Output Scale	0 to 1,000 ppb of total VOC (TVOC)

Communicating

Embedded BACnet and Modbus communication protocols…easy systems integration

Configurable baud rates

Configurable to multiple baud rates…transfer data at the right speed for the system

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 indication

Stoplight feature for visual indication at user-configurable CO_2 threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

	Level	Ventilation Recommendation	TVOC (ppb)
AQI Table*	>61%	Greatly increased	>610
	20 to 61%	Significantly increased	200 to 610
	10 to 20%	Slightly increased	100 to 200
	5 to 10%	Average	50 to 100
	0 to 5%	Target value	0 to 50

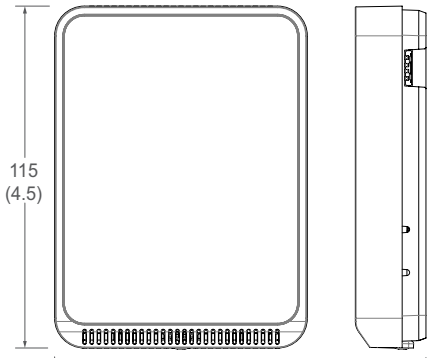
RH Transmitter Option	
HS Sensor	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)**	±3.5% RH from 10 to 80% RH @ 25°C (77 °F) ±5% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Transmitter	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout

Specifications (cont.)

LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
Setpoints	
Temperature Setpoint	Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	Scale: 0 to 100% RH
Fan Speed Setpoint	Off, Low, Medium, High, Auto
Override	
Override Button	Display models feature momentary override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).
**Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.

Dimensional Drawing – mm (in.)



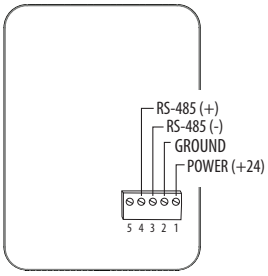
User Interface Types


Touchscreen


LCD with Buttons


Blank

Wiring Diagram



Ordering Information

CW2	User Interface	Output	RH Accuracy*		VOC Sensor
	T = Color touchscreen L = 3-button LCD X = display None***	P = BACnet/Modbus	2 = 2% X = None	A	V = NDIR CO2 / VOC = None

Example: CW2 T P 2 A V

* Replaceable 1% with NIST certificate, 2% with NIST certificate and 2% elements available.

Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration


Replaceable RH Element

SpaceLogic Sensors

SLA Series Air Quality Sensors – Analog

Individual or 4-in-1 CO_2, VOC, RH & Temperature

SLASTCxx

SLASLCxx

SLASXCxx

The SpaceLogic SLA Series of air quality sensors for living space is a flexible multi-sensor platform for use with BAS controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs. SLA Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank. CO_2 and temperature sensors are included with all SLA Series air quality sensors. Models with VOC sensors and relative humidity sensors are also available.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
CO_2 Transmitter	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000/5000 ppm (selectable)
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
VOC Transmitter Option	
Sensor Type	Solid state
Output Range	0 to 100% AQI for VOC
Accuracy	±15% of measured value
Output Scale	0 to 1,000 ppb of total VOC (TVOC)

	Level	Ventilation Recommendation	TVOC (ppb)
AQI Table*	>61%	Greatly increased	>610
	20 to 61%	Significantly increased	200 to 610
	10 to 20%	Slightly increased	100 to 200
	5 to 10%	Average	50 to 100
	0 to 5%	Target value	0 to 50

Microprocessor based

Microprocessor controlled for excellent stability

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 indication

Stoplight feature for visual indication at user-configurable CO_2 threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

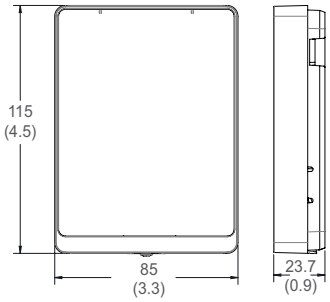
RH Transmitter Option	
HS Sensor	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)**	±3.5% RH from 10 to 80% RH @ 25°C (77 °F) ±5% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Transmitter Option	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout*** Lockout override: Touchscreen/button lockout***
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout*** Lockout override: Touchscreen/button lockout***
Setpoints****	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	0 to 10V output Scale: 0 to 100% RH

Specifications (cont.)

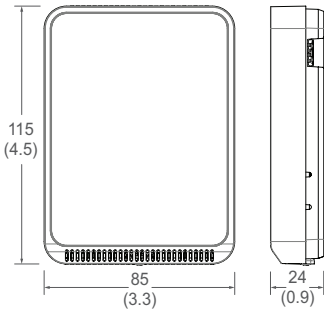
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V
Override	
Override Button	Display models feature momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).
**Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
***DIP switch selectable.
****One setpoint type is selectable via DIP switch on display models only.

Dimensional Drawings – mm (in.)



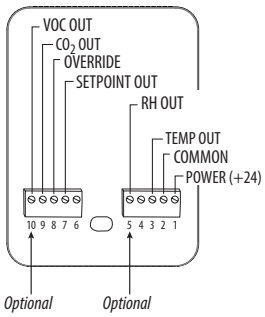
Optimum Housing



Medium Housing

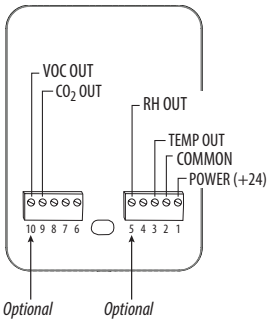
SLABTCxx/SLABxxx Display Models with Temp. Transmitter

Wiring Diagram



SLABXCxx with Temp. Transmitter

Wiring Diagram



Housing Finishes


Optimum White


Optimum Black


Medium White

User Interface Types


Touchscreen


LCD with Buttons


Blank

Ordering Information

SLA [ ] [ ] [ ] [ ]

Housing Finish:
B = Optimum housing, black
W = Optimum housing, white
S = Medium housing, white

User Interface:
TC = Color touchscreen
LC = 3-button LCD display
XC = None***

VOC Sensor:
V = NDIR CO2 / VOC**
Blank = None

RH Accuracy*:
2 = 2% RH Sensor
X = None***

Example: SLA B L C V 2

* Replaceable 1% with NIST certificate, 2% with NIST certificate and 2% elements available.
** VOC only availble with temperature transmitter option
*** For analog non-display, non-RH, models with RTD/thermistor order from CWE2 line.

Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration


Replaceable RH Element

CW2 Analog Series

Individual or 4-in-1 CO2, VOC, RH and Temperature from Veris

No Logo

CW2Txxxx

CW2Lxxxx

CW2Xxxxx

The Veris CW2 Series of air quality sensors for living space is a flexible multi-sensor platform for use with BAS controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs. CW2 Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank. CO2 and temperature sensors are included with all CW2 Series air quality sensors. Models with VOC sensors and relative humidity sensors are also available.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes

CO_2 Transmitter	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000/5000 ppm (selectable)
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change

VOC Transmitter Option			
Sensor Type	Solid state		
Output Range	0 to 100% AQI for VOC		
Accuracy	±15% of measured value		
Output Scale	0 to 1,000 ppb of total VOC (TVOC)		
	Level	**Ventilation Recommendation**	**TVOC (ppb)**
AQI Table*	>61%	Greatly increased	>610
	20 to 61%	Significantly increased	200 to 610
	10 to 20%	Slightly increased	100 to 200
	5 to 10%	Average	50 to 100
	0 to 5%	Target value	0 to 50

Microprocessor based

Microprocessor controlled for excellent stability

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 indication

Stoplight feature for visual indication at user-configurable CO_2 threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

RH Transmitter Option	
HS Sensor	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)**	±3.5% RH from 10 to 80% RH @ 25°C (77 °F) ±5% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical

Temperature Transmitter Option	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)

Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout*** Lockout override: Touchscreen/button lockout***
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout*** Lockout override: Touchscreen/button lockout***

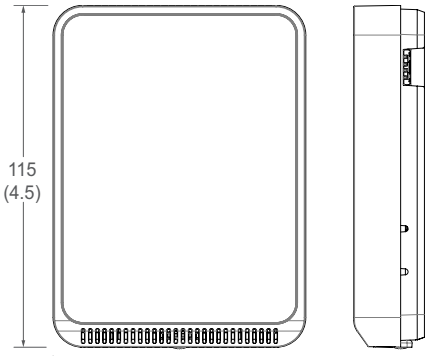
Setpoints****	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	0 to 10V output Scale: 0 to 100% RH
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V

Specifications (cont.)

Override	
Override Button	Display models feature momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).
**Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
***DIP switch selectable.
****One setpoint type is selectable via DIP switch on display models only.

Dimensional Drawing – mm (in.)



User Interface Types

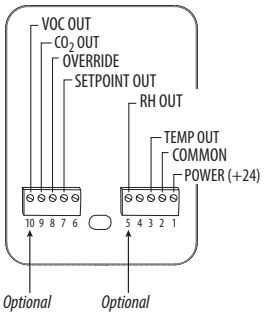

Touchscreen


LCD with Buttons


Blank

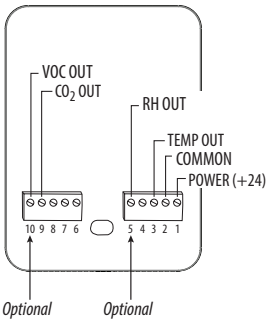
CW2L/CW2T Display Models with Temp Transmitter

Wiring Diagram



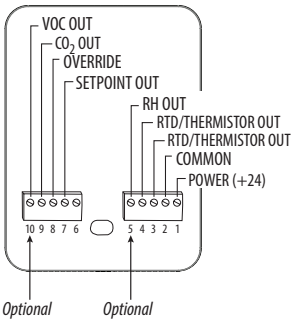
CW2x with Temp Transmitter

Wiring Diagram



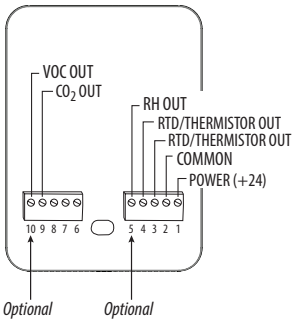
CW2L/CW2T Display Models with RTD/Thermistor

Wiring Diagram



CW2x with RTD/Thermistor

Wiring Diagram



Ordering Information

CW2 [ ] [ ] [ ] [ ] [ ]

User Interface
T = Color touchscreen
L = 3-button LCD display
X = None[2]

Output
A = Analog output

RH Accuracy[1]
2 = 2%
X = None[2]

Temperature
A = Transmitter
C = 1000 PT RTD
D = 10K T2 thermistor
G = 10K CPC thermistor[3]
H = 10K T3 thermistor
K = 10K curve G/11K shunt
M = 20K NTC thermistor
N = 1.8K TAC thermistor

VOC Sensor
V = NDIR CO2 / VOC[4]
= None

Example: CW2 T A 2 A V

1. Replaceable RH module available to be ordered separately per table below.
2. For analog non-display, non-RH models with RTD/thermistor, order from the CWE2 line.
3. Available in CW2LAXG only.
4. VOC only available with temperature transmitter option.

Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration


Replaceable RH Element

CWE2 & CWV2 Analog Series

Economy and Value Wall Mount CO_2 Sensors from Veris

The Veris CWE2 and CWV2 Series of air quality sensors for living space are for use with BAS controllers designed to accept 4 to 20mA, 0 to 5 Vdc or 0 to 10 Vdc outputs. These sensors measure CO2 levels using a dual-beam, non-dispersive infrared (NDIR) technology.

The CWE2 Series Economy sensor has an accuracy of ±30 ppm ±3% of measured value, features 2-wire 4 to 20mA and 3-wire voltage outputs, and is available with optional temperature output.

The CWV2 Value sensor with an accuracy of ±40 ppm ±5.5% of measured value, is ideal for bid-spec applications.

Flexible

3+ wires, 4 to 20 mA or 0-5/0-10 Vdc versions…flexible systems compatibity…save time in the field, stock fewer devices

Economy Sensor

Competitively-priced sensors ideal for bid-spec

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Applications

- Controlling ventilation in response to occupancy
- Office buildings, conference rooms, schools, retail stores, etc.
- Facilitating compliance with ASHRAE 62.1 standard for air quality

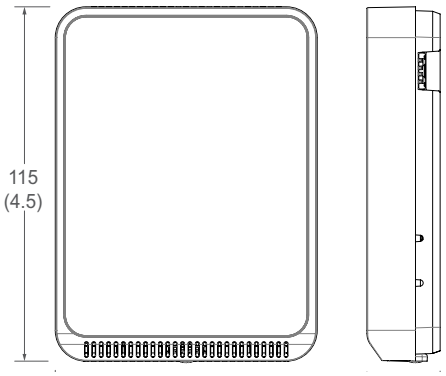
Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Max. Current	CWE2: 20 mA CWV2: 45 mA
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
CO_2 Transmitter	
Sensor Type	Dual-beam, non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000 ppm
Accuracy	CWE2: ±30 ppm ±3% of measured value CWV2: ±40 ppm ±3.5% of measured value
Repeatability	CWE2: ±20 ppm ±1% of measured value CWV2: ±30 ppm ±2.5% of measured value
Response Time	≤75 seconds for 90 degree step change
Startup Time	CWE2: ≤20 seconds
Max. Load Resistance*	CWE2: 100 Ω at 20 Vdc 250 Ω at 24 Vdc 500 Ω at 30 Vdc

Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	CWE2: 3 years CWV2: 1 year
Compliance Information	
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

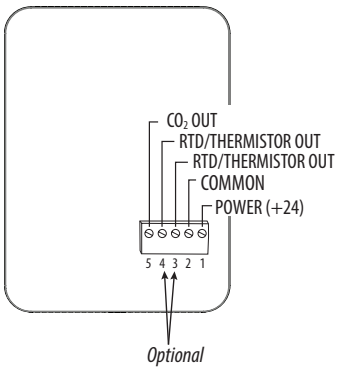
*Applicable for CWE2 4-20 mA current mode only. If load parameters are not met, product will reset.

Dimensional Drawing – mm (in.)



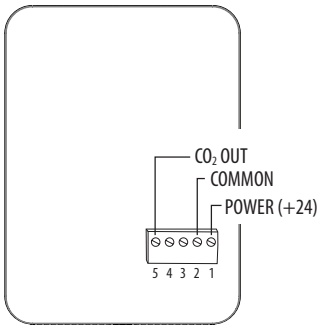
CWE2 Voltage Output

Wiring Diagram



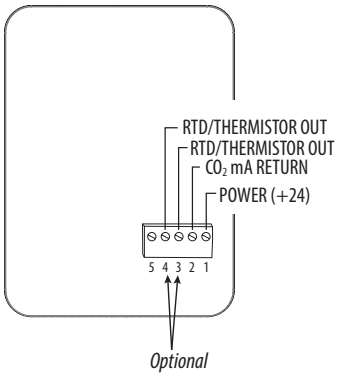
CWV2

Wiring Diagram



CWE2 Current Output

Wiring Diagram



Ordering Information

Temperature Option

CWE2 ☐

Blank = None
C = 1000 PT RTD
D = 10K T2 thermistor
H = 10K T3 thermistor
K = 10K curve G/11K shunt
M = 20K NTC thermistor
N = 1.8K TAC thermistor

Example:
CWE2 C

CWV2 (No Options)

SpaceLogic Sensors

SLP Series PM Sensors – BACnet & Modbus

All-in-one Temperature, RH, CO2, VOC, PM1, PM2.5, PM4 and PM10

SLPSXCVP2

SLPWTCVP2

The SpaceLogic SLP PM (Particulate Matter) Series of air quality sensors for living space is a flexible multisensor platform for use with BAS controllers designed to accept BACnet or Modbus outputs. Housings are available in Medium matte white and Optimum faces available in black and white. All housing types are available with touchscreen and blank user interface options. The SLP PM Series offers an all-in-one sensor with temp, RH, CO2, VOC, PM1, PM2.5, PM4 and PM10.

Communicating

Embedded BACnet and Modbus communication protocols…easy systems integration

Configurable baud rates

Configurable to multiple baud rates…transfer data at the right speed for the system

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 & PM indication

Stoplight feature for visual indication at user-configurable CO_2 and PM threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Protocol Output	BACnet or Modbus via RS-485, selectable
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
PM Sensor	
Range	0 to 1,000 µg/m³
Accuracy	PM 1 and PM 2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM 4 and PM 10[1]: 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)
CO_2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 10,000 ppm
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
VOC Sensor	
Sensor Type	Solid state
Output Range	0 to 100% AQI for VOC
Accuracy	±15% of measured value
Output Scale	0 to 1,000 ppb of total VOC (TVOC)

	Level	Ventilation Recommendation	TVOC (ppb)
AQI Table[2]	>61%	Greatly increased	>610
	20 to 61%	Significantly increased	200 to 610
	10 to 20%	Slightly increased	100 to 200
	5 to 10%	Average	50 to 100
	0 to 5%	Target value	0 to 50

RH Sensor	
Sensor Type	Solid state capacitive
Accuracy (Includes Hysteresis)[3]	±3.8% RH from 10 to 60% RH @ 25°C (77 °F) ±4.8% RH from 60 to 80% RH @ 25°C (77 °F) ±5.8% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical

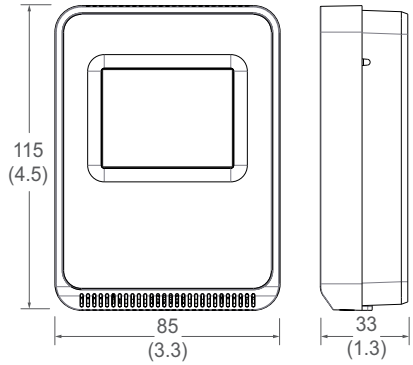
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
Setpoints[4]	
Temperature Setpoint	Scale: 0 to 50 °C (32 to 122 °F) max., adjustable span
Humidity Setpoint	Scale: 0 to 100% RH
Fan Speed Setpoint	Off, Low, Medium, High, Auto
Override	
Override Button	Display models feature momentary override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
EBO integration[5]	Download Modbus Device Type template for Modbus models from the Building Application tool.
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, ICES-003 (Canada), UKCA (UK)

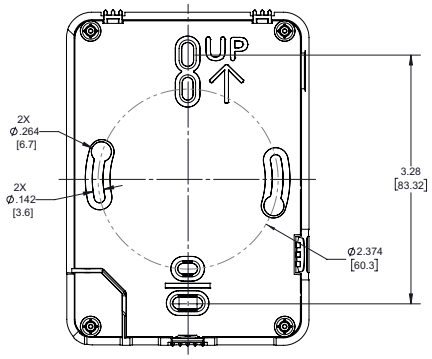
1. PM4 and PM10 output values are calculated based on distribution profile of all measured particles.
2. Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).
3. Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
4. On display models only.
5. See http://bms-applications.schneider-electric.com/type/MB/download/419 for device import file and instructions.

Ordering Information

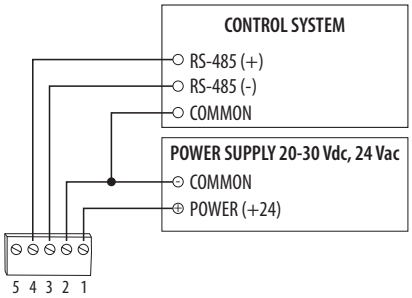
Part Number	Description
SLPSTCVP2	PM, CO_2, VOC, RH, Temp, Touch, BAC/MB, Medium White
SLPBTCVP2	PM, CO_2, VOC, RH, Temp, Touch, BAC/MB, Optimum Black
SLPWTCVP2	PM, CO_2, VOC, RH, Temp, Touch, BAC/MB, Optimum White
SLPSXCVP2	PM, CO_2, VOC, RH, Temp, BAC/MB, Medium White
SLPBXCVP2	PM, CO_2,VOC, RH, Temp, BAC/MB, Optimum Black
SLPWXCVP2	PM, CO_2, VOC, RH, Temp, BAC/MB, Optimum White

Dimensional Drawing





Wiring Diagram



Power Table

Part Number	Description	Max. VA
SLPxTCPV2	Touch CO_2/Temperature/Humidity/PM	2.520
SLPxxCPV2	Blank CO2/VOC/Temperature/Humidity/PM	2.016

Note: Model numbers based on supported product matrix.

Replaceable PM Module

Model	Description
SLXPMS	PM, Replacement Module

Replaceable PM Module

PMW Protocol Series

All-in-one Temperature, RH, CO2, VOC, PM1, PM2.5, PM4 and PM10 from Veris

PMWTPC2AV

PMWXPC2AV

The Veris PMW Protocol Series of air quality sensors for living space is a flexible all-in-one platform for use with BAS controllers designed to accept BACnet or Modbus outputs. PMW Protocol Series sensors are available with two user interface options: touch-screen and blank. Both user interfaces come with temperature, RH, CO2, VOC, PM1, PM2.5, PM4 and PM10 all in the same device.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Protocol Output	BACnet or Modbus via RS-485, selectable
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
PM Sensor	
Range	0 to 1,000 µg/m³
Accuracy	PM 1 and PM 2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM 4 and PM 10*: 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)
CO_2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 10,000 ppm
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
VOC Sensor	
Sensor Type	Solid state
Output Range	0 to 100% AQI for VOC
Accuracy	±15% of measured value

Communicating

Embedded BACnet and Modbus communication protocols…easy systems integration

Configurable baud rates

Configurable to multiple baud rates…transfer data at the right speed for the system

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 & PM indication

Stoplight feature for visual indication at user-configurable CO_2 and PM threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

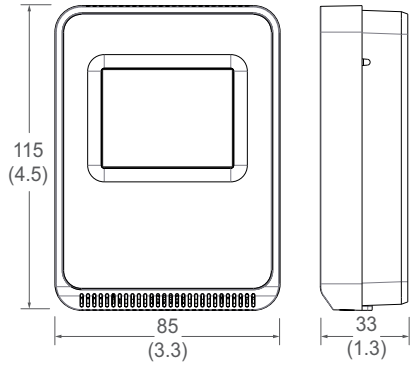
Output Scale	0 to 1,000 ppb of total VOC (TVOC)		
	Level	**Ventilation Recommendation**	**TVOC (ppb)**
AQI Table**	>61%	Greatly increased	>610
	20 to 61%	Significantly increased	200 to 610
	10 to 20%	Slightly increased	100 to 200
	5 to 10%	Average	50 to 100
	0 to 5%	Target value	0 to 50

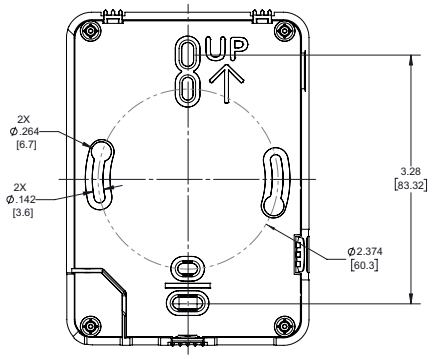
RH Sensor	
Sensor Type	Solid state capacitive
Accuracy (Includes Hysteresis)***	±3.8% RH from 10 to 60% RH @ 25°C (77 °F) ±4.8% RH from 60 to 80% RH @ 25°C (77 °F) ±5.8% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout

Setpoints**	
Temperature Setpoint	Scale: 0 to 50 °C (32 to 122 °F) max., adjustable span
Humidity Setpoint	Scale: 0 to 100% RH
Fan Speed Setpoint	Off, Low, Medium, High, Auto
Override	
Override Button	Display models feature momentary override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, ICES-003 (Canada), UKCA (UK)

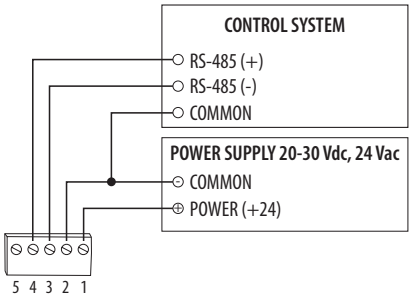
*PM4 and PM10 output values are calculated based on distribution profile of all measured particles.
**Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).
***Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
**** On display models only.

Dimensional Drawing





Wiring Diagram



Power Table

Part Number	Description	Max. VA
PMWTPC2AV	Touch CO_2/Temperature/Humidity/PM	2.520
PMWXPC2AV	Blank PM	2.016

Note: Model numbers based on supported product matrix.

Ordering Information

Part Number	Description
PMWTPC2AV	PM, Wall, Touch, CO2, RH 2%, Temp, Xmtr, VOC, Prot
PMWXPC2AV	PM, Wall, Blank, CO2, RH 2%, Temp, Xmtr, VOC, Prot

Replaceable PM Module

Model	Description
PMSX	PM, Replacement Module

Replaceable PM Module

SpaceLogic Sensors
SLA Series PM Sensors – Analog

All-in-one Temperature, RH, CO2, VOC, PM1, PM2.5, PM4 and PM10

SLASXXPX

SLAWTCP2

The SpaceLogic SLA PM (Particulate Matter) Series of air quality sensors for living space is a flexible multisensor platform for use with BAS controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs. Housings are available in Medium matte white and Optimum faces available in black and white. All housing types are available with touchscreen and blank user interface options. Touchscreen models offer an all-in-one sensor with temp, RH, CO2 and PM; while the blank model offers only PM to best suit retrofit environments.

Microprocessor based

Microprocessor controlled for excellent stability

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 & PM indication

Stoplight feature for visual indication at user-configurable CO_2 and PM threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
PM Sensor	
Range	0 to 1,000 µg/m³
Accuracy	PM 1 and PM 2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM 4 and PM 10*: 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)
CO2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000/5000 ppm (selectable)
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change

RH Sensor	
Sensor Type	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)**	±3.8% RH from 10 to 60% RH @ 25°C (77 °F) ±4.8% RH from 60 to 80% RH @ 25°C (77 °F) ±5.8% RH from 80 to 100% RH @ 25°C (77 °F)
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
Setpoints**	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	0 to 10V output Scale: 0 to 100% RH
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V

Specifications, cont.

Override	
Override Button	Display models feature momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - industrial immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, ICES-003 (Canada), UKCA (UK)

*PM4 and PM10 output values are calculated based on distribution profile of all measured particles.
**Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
***DIP switch selectable.

Power Table

Part Number	Description	Max. VA
SLAxTCP2	Touch CO2/Temperature/Humidity/PM	4.152
SLAxxxPx	Blank PM	3.288

Note: Model numbers based on supported product matrix.

Ordering Information

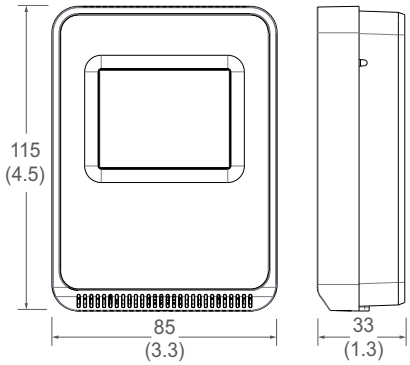
Model	Description
SLASTCP2	Sensor, PM2.5, CO_2, RH, Touch, Analog, Med. White
SLABTCP2	Sensor, PM2.5, CO_2, RH, Touch, Analog, Optimum Black
SLAWTCP2	Sensor, PM2.5, CO_2, RH, Touch, Analog, Optimum White
SLASXXPX	Sensor, PM1, PM2.5, PM4, PM10, Analog, Med. White
SLABXXPX	Sensor, PM1, PM2.5, PM4, PM10, Analog, Optimum Black
SLAWXXPX	Sensor, PM1, PM2.5, PM4, PM10, Analog, Optimum White

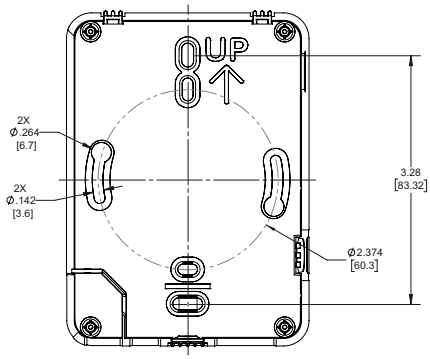
Replaceable PM Module

Model	Description
SLXPMS	PM, Replacement Module

Replaceable PM Module

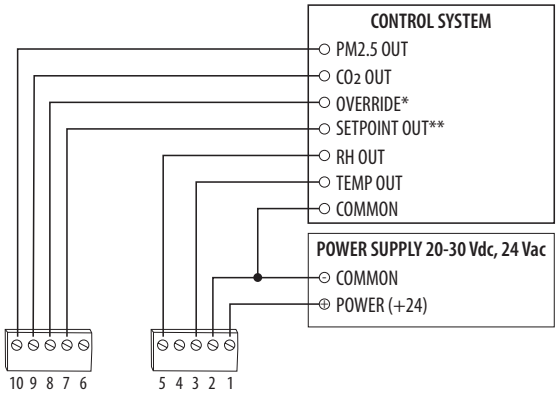
Dimensional Drawing





Touchscreen Model

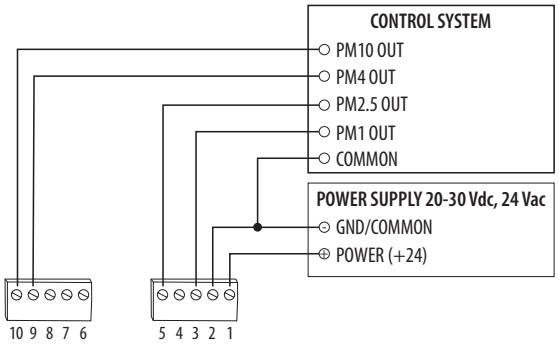
Wiring Diagram



* Momentary to ground.
** 0-10V DIP switch selectable for temperature, RH (if equipped) or fan speed (off, 0V, Auto 1.5V, Low 3.3V, Medium 6.7V or high 10V).

Blank Model

Wiring Diagram



PMW Analog Series

PM Only or Multi-Sensor with Temperature, RH, CO2 and PM2.5 from Veris

PMWTAC2A

PMWXAXXX

The PMW Series of air quality sensors for living space is a flexible multi-sensor platform for use with BAS controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs. PMW Series sensors are available with two user interface options: touchscreen and blank. The touchscreen version offers multi-sensor with temperature, RH, CO2, and PM2.5, while the blank version offers PM1, PM2.5, PM4 and PM10, all in the same device.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
PM Sensor	
Range	0 to 1,000 µg/m³
Accuracy	PM 1 and PM 2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM 4 and PM 10*: 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)
CO2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000/5000 ppm (selectable)
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
RH Sensor	
Sensor Type	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)**	±3.8% RH from 10 to 60% RH @ 25°C (77 °F) ±4.8% RH from 60 to 80% RH @ 25°C (77 °F) ±5.8% RH from 80 to 100% RH @ 25°C (77 °F)
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
Setpoints**	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	0 to 10V output Scale: 0 to 100% RH
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V

Microprocessor based

Microprocessor controlled for excellent stability

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Visual CO2 & PM indication

Stoplight feature for visual indication at user-configurable CO_2 and PM threshold levels (touchscreen models only)

Applications

- Controlling ventilation in response to accuracy
- ASHRAE 62.1 compliant
- Office buildings, conference rooms, schools, retail stores, etc.

Specifications, cont.

Override	
Override Button	Display models feature momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - industrial immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, ICES-003 (Canada), UKCA (UK)

*PM4 and PM10 output values are calculated based on distribution profile of all measured particles.
**Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
***DIP switch selectable.

Power Table

Part Number	Description	Max. VA
PMWTAC2A	Touch CO2/Temperature/Humidity/PM	4.152
PMWXAXXX	Blank PM	3.288

Note: Model numbers based on supported product matrix.

Ordering Information

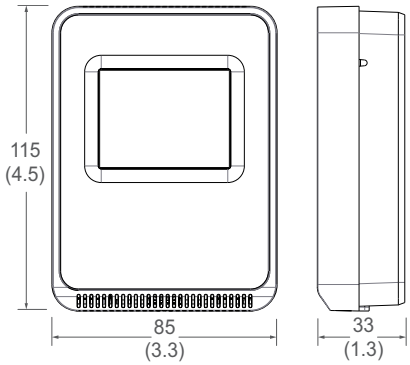
Model	Description
PMWTAC2A	PM, Wall, Touch, PM2.5, CO2, RH 2%, Temp, Xmtr
PMWXAXXX	PM, Wall, Blank, PM1, PM2.5, PM4, PM10

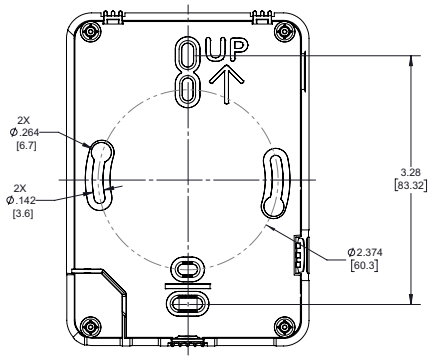
Replaceable PM Module

Model	Description
PMSX	PM, Replacement Module

Replaceable PM Module

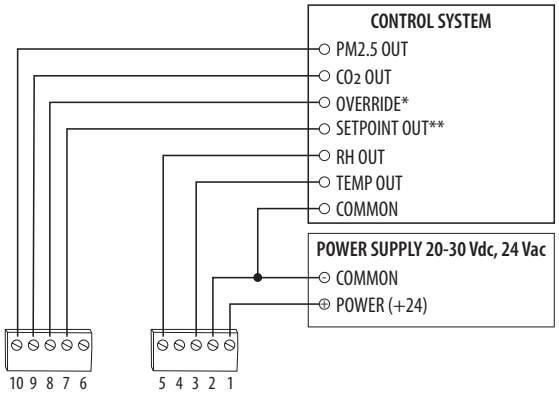
Dimensional Drawing





PMWTAC2A Touchscreen Model

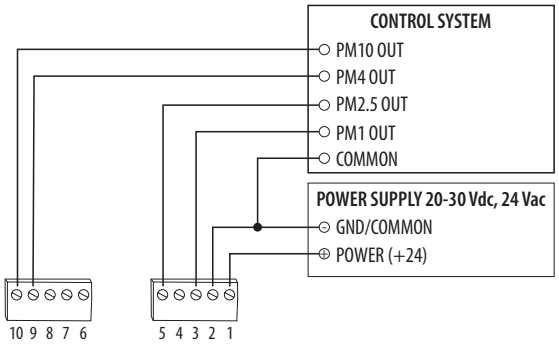
Wiring Diagram



* Momentary to ground.
** 0-10V DIP switch selectable for temperature, RH (if equipped) or fan speed (off, 0V, Auto 1.5V, Low 3.3V, Medium 6.7V or high 10V).

PMWXAXXX Blank Model

Wiring Diagram



SpaceLogic Sensors
SLXPMS

Replacement PM Module for SLA & SLP Series PM Sensors

SLXPMS

The SLXPMS replacement PM (Particulate Matter) module is designed to provide a smooth field replacement experience by the technician or the end-user, whenever it is needed. The module is compatible with all Scheider Electric SLA and SLP PM sensors, making replacement quick and easy. No need to install a new PM sensing device, just insert a new module into the existing unit and resume operation.

The replacement module is based on the laser-scatter measurement principle. This technology, together with high-quality and long-lasting components, enables precise measurement by the module from its first operation throughout the lifetime of the device.

The module provides highly precise measurement for different particulate sizes such as PM1, PM2.5, PM4 and PM10.

At 41 x 41 x 12 mm³, the small size of this module also contributes to an easy replacement experience in the field.

Specifications

Range	0 to 1,000 µg/m³
Accuracy	PM 1 and PM 2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM 4 and PM 10*: 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)

*PM4 and PM10 output values are calculated based on distribution profile of all measured particles.

Ordering Information

Model	Description
SLXPMS	PM, Replacement Module

PMSX

Replacement PM Module for Veris PMW Series

PMSX

The PMSX replacement PM (Particulate Matter) module is designed to provide a smooth field replacement experience by the technician or the end-user, whenever it is needed. The module is compatible with all Veris PMX Series PM sensors, making replacement quick and easy. No need to install a new PM sensing device, just insert a new module into the existing unit and resume operation.

The replacement module is based on the laser-scatter measurement principle. This technology, together with high-quality and long-lasting components, enables precise measurement by the module from its first operation throughout the lifetime of the device.

The module provides highly precise measurement for different particulate sizes such as PM1, PM2.5, PM4 and PM10.

At 41 x 41 x 12 mm³, the small size of this module also contributes to an easy replacement experience in the field.

Specifications

Range	0 to 1,000 µg/m³
Accuracy	PM 1 and PM 2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM 4 and PM 10*: 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)

*PM4 and PM10 output values are calculated based on distribution profile of all measured particles.

Ordering Information

Part Number	Description
PMSX	PM, Replacement Module

HW2 Protocol Series

Wall Mount Humidity Sensors from Veris

HW2Txxxx HW2Lxxxx HW2Xxxxx

The Veris HW2 Protocol Series of humidity sensors for living space is a flexible multisensor platform for use with BAS controllers designed to accept BACnet and Modbus outputs. HW2 Protocol Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank. Humidity and temperature sensors are included with all HW2 Protocol Series sensors.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Protocol Output	BACnet or Modbus via RS-485, selectable
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
RH Transmitter	
HS Sensor	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)*	±3.5% RH from 10 to 80% RH @ 25°C (77 °F) ±5% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Transmitter	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)

No Logo

BACnet & Modbus

Embedded BACnet and Modbus communication protocols…easy systems integration

Field replaceable

Replace element in the field…maintain accuracy and minimize downtime

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Interchangable element

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Calibration free

Calibration-free interchangeable NIST traceable HS element

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: Temperature, humidity or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
Setpoints	
Temperature Setpoint	Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	Scale: 0 to 100% RH
Fan Speed Setpoint	Off, Low, Medium, High, Auto
Override	
Override Button	Display models feature momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years

Specifications, cont.

Compliance Information

Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.

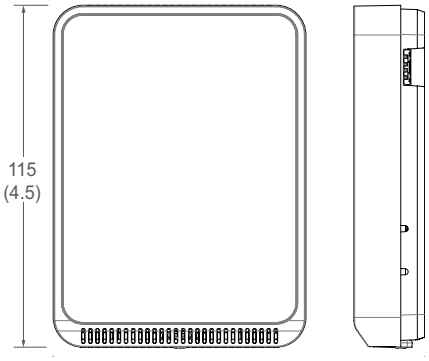
User Interface Types

Touchscreen

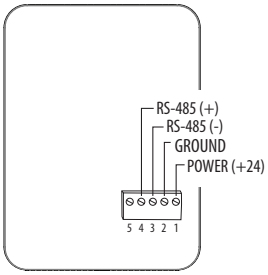
LCD with Buttons


Blank

Dimensional Drawing – mm (in.)



Wiring Diagram



Ordering Information

Model	User Interface	RH*	Temp	Setpoint	Override
HW2TP2A	Touchscreen	X	X	X	X
HW2LP2A	LCD / 3 Buttons	X	X	X	X
HW2XP2A	Blank	X	X		

* Replaceable 1% with NIST certificate, 2% with NIST certificate and 2% elements available.

Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration


Replaceable RH Element

SpaceLogic Sensors
SLA Series Humidity Sensors – Analog
Wall Mount Humidity Sensors

SLAWTX2 SLALX2 SLASXX2

The SpaceLogic SLA Series of humidity sensors for living space is a flexible multisensor platform for use with BAS controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs. Housings are available in Medium matte white and Optimum faces available in black and white. All housing types are available with three user interface options: touchscreen, LCD with three buttons and blank. Humidity and temperature sensors are included with all SLA Series air quality sensors.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
RH Transmitter	
HS Sensor	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)*	±3.5% RH from 10 to 80% RH @ 25°C (77 °F) ±5% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Transmitter Option	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Field replaceable

Replace element in the field…maintain accuracy and minimize downtime

Interchangable element

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Flexible

Polarity insensitive, two-wire resistive thermistor, 3+ wires 4 to 20 mA or 0-5/0-10 Vdc versions…flexible systems compatibity…save time in the field, stock fewer devices

Calibration free

Calibration-free interchangeable NIST traceable HS element

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

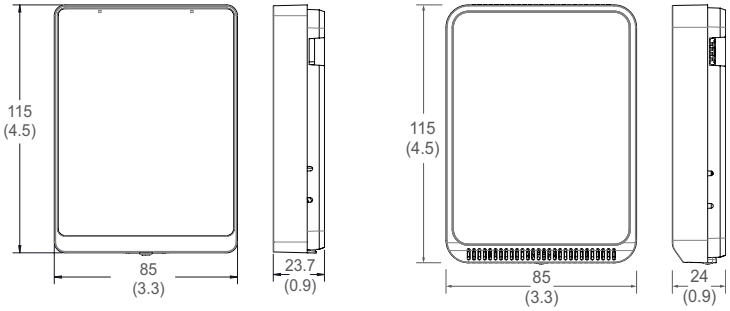
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10 Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout** Lockout override: Touchscreen/button lockout**
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout** Lockout override: Touchscreen/button lockout**
Setpoints* **	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	0 to 10V output Scale: 0 to 100% RH
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V
Override	
Override Button	Display models feature momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.

Specifications, cont.

Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
**DIP switch selectable.
***One setpoint type is selectable via DIP switch on display models only.

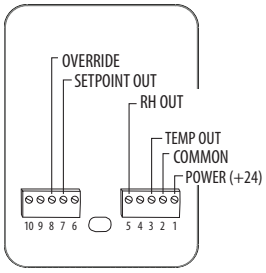
Dimensional Drawings – mm (in.)



Optimum Housing | Medium Housing

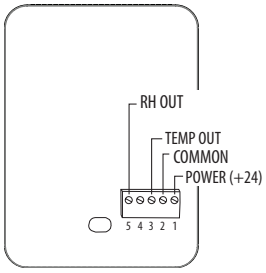
SLAxxx2 Display Models with Temp Transmitter

Wiring Diagram



SLAxxx2 with Temp Transmitter

Wiring Diagram



Housing Finishes

Optimum White | Optimum Black | Medium White

User Interface Types

Touchscreen | LCD with Buttons | Blank

Ordering Information

Housing		User Interface			RH Sensor*
SLA	☐	☐		X	2

S = Medium white matte housing
W = Optimum white housing
B = Optimum black housing

T = Color touchscreen
L = 3-button LCD display
X = None

2 = 2% RH** and temp.

Example: SLA S T X 2

*Replaceable RH module available to be ordered separately per table below.

Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration

Replaceable RH Element

HW2 Analog Series

Wall Mount Humidity Sensors from Veris

HW2Txxxx HW2Lxxxx HW2Xxxxx

The Veris HW2 Series of humidity sensors for living space is a flexible multisensor platform for use with BAS controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs. HW2 Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank. Humidity and temperature sensors are included with all HW2 Series sensors.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
RH Transmitter	
HS Sensor	Solid state capacitive, replaceable
Accuracy (Includes Hysteresis)*	±3.5% RH from 10 to 80% RH @ 25°C (77 °F) ±5% RH from 80 to 100% RH @ 25°C (77 °F)
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Transmitter Option	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10 Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout** Lockout override: Touchscreen/button lockout**
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout** Lockout override: Touchscreen/button lockout**
Setpoints* **	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Humidity Setpoint	0 to 10V output Scale: 0 to 100% RH
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V
Override	
Override Button	Display models feature momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Field replaceable

Replace element in the field…maintain accuracy and minimize downtime

Interchangable element

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Flexible

3+ wires, 4 to 20 mA or 0-5/0-10 Vdc versions…flexible systems compatibity…save time in the field, stock fewer devices

Calibration free

Calibration-free interchangeable NIST traceable HS element

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

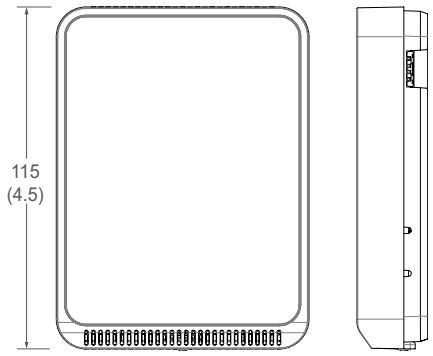
Specifications, cont.

Compliance Information

Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Humidity sensor overall accuracy should include: accuracy, temperature coefficient and stability. Humidity accuracy is shown as an absolute value, so if testing accuracy with a hand-held device, you must check for deviation in its readings instead of calculating the percentual deviation. Additionally, you must consider the overall accuracy of the hand-held device in the comparison.
***One setpoint type is selectable via DIP switch on display models only.

Dimensional Drawing – mm (in.)



User Interface Types


Touchscreen


LCD with Buttons


Blank

Ordering Information

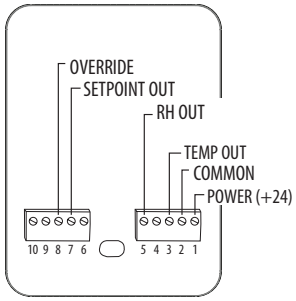
User Interface	Output	RH Accuracy*	Temperature
HW2 ☐	☐	☐	☐
T = Color touchscreen L = 3-button LCD display X = None	A = Analog output	2 = 2%	A = Transmitter only C = 1000 PT RTD D = 10K T2 thermistor G = 10K CPC thermistor** H = 10K T3 thermistor K = 10K curve G/11K shunt M = 20K NTC thermistor N = 1.8K TAC thermistor R = 10K curve G***

Example: HW2 T A 2 A

* Replaceable 1% with NIST certificate, 2% with NIST certificate and 2% elements available.
** Available in HW2XA2G only.
*** Available in HW2XA2R only.

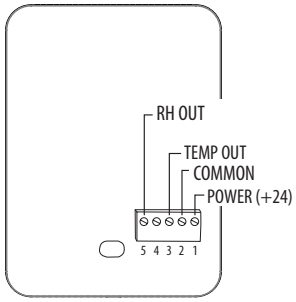
HW2L/HW2T Display Models with Temp Transmitter

Wiring Diagram



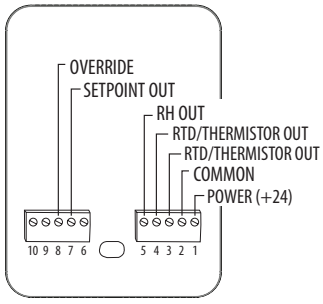
HW2x with Temp Transmitter

Wiring Diagram



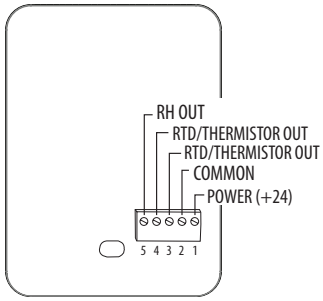
HW2L/HW2T Display Models with RTD/Thermistor

Wiring Diagram



HW2x with RTD/Thermistor

Wiring Diagram



Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration


Replaceable RH Element

HEW Series

2%, 3%, and 5% Accuracies from Veris

HEW

The Veris HEW Economy Series wall mount humidity transmitters offer high performance in an easy to install housing at an affordable price. The thin-film capacitive sensor element provides high accuracy and performance, great long-term stability, and full recovery from saturation. Temperature sensing options are also available.

The wall housing was created using sophisticated thermal analysis techniques for optimum airflow. It is ideal for schools and other applications requiring exceptional durability and a discrete appearance. All Economy models come with a standard one-year warranty.

RH & temperature

Monitor humidity and temperature with a single device…reduces installation costs

Low profile

Housing is low-profile…perfect for schools and museums

Sensor options

Semiconductor temperature transmitter, or popular thermistor/RTD sensors available

Applications

- HVAC economizer control
- Managing energy systems
- Facilitating ASHRAE standards for environmental control

Specifications

Input Power	
Voltage Model	Class 2; 12 to 24 Vdc or 24 Vac
mA Model	Class 2; 12 to 24 Vdc
AC Voltage Tolerance	±10%
AC Frequency	50/60 Hz
Max. Inrush Current after 1 msec (mA version)	25 mA
Output	
mA Output	4 to 20mA, 2-wire, not polarity sensitive
mA Max. Loop Resistance	500 Ω at 24 Vdc input voltage; 250 Ω at 12 Vdc input voltage
Voltage Output	0 to 5 V or 0 to 10 V (jumper selectable)
Voltage Min. Load Resistance	5 kΩ
Voltage Min. Sinking Current	0.2 mA
Humidity	
RH Element	Digitally profiled thin-film capacitive, non-removable
Accuracy*	±2%, 3%, or 5% (10 to 90% RH, 20 to 30 °C)
Temperature Effect (Outside 20° to 30°C)	≤0.1% RH per °C
Response Time (to 90% change at 20°C)	110 sec
Annual Drift	≤1%
Output Scaling	0 to 100% RH
Temperature Option	
Active Output Accuracy	±0.5 °C (±.9 °F)
Active Output Temp Scaling	10 to 35 °C (50 to 95 °F)
Self-Heating Error (Resistive temperature only)	≤±0.5 °C at 20 to 30 °C (68 to 86 °F); ≤±0.75 °C outside of 20 to 30 °C (68 to 86 °F)
Operating Environment	
Operating Temperature	0 to 50 °C (32 to 122 °F)
Operating Humidity	0 to 100% RH non-condensing (Unit will recover from saturation)
Housing	
Material	ABS plastic with UL V-0 5VB Flame Class
Mounting Holes	US and European junction box
Warranty	
Limited Warranty	1 year

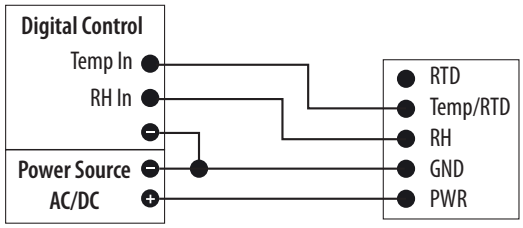
Agency Approvals

CE

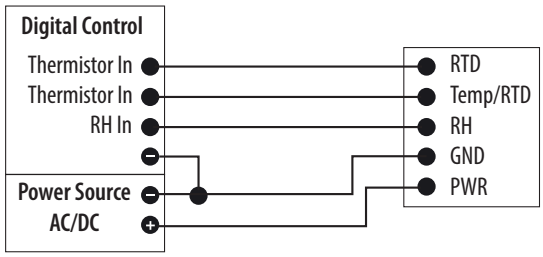
EMC Conformance: Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.

*Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability.

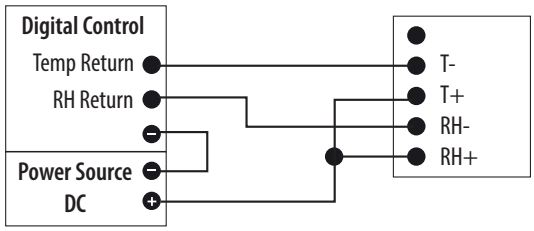
0-5V/0-10V Models, Temperature Transmitter
Wiring Diagram



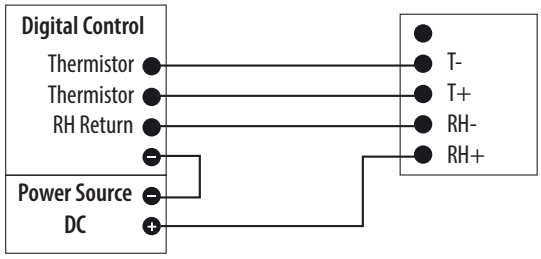
0-5V/0-10V Models, Temperature Transmitter
Wiring Diagram



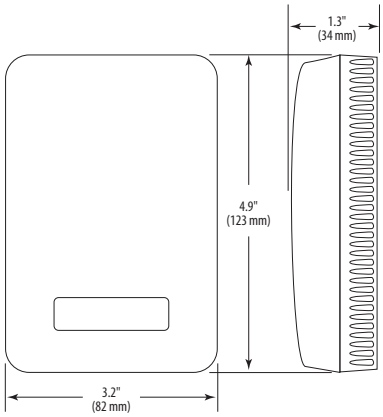
4-20 mA Models, Temperature Transmitter
Wiring Diagram



4-20 mA Models, Thermistor
Wiring Diagram



Dimensional Drawing – in. (mm)



Ordering Information

Accuracy	Output	US or EU	Temp.	Sensor Type	Temp Cert
HEW [ ]	[ ]	[S]	[ ]	[ ]	[ ]
2 = 2% 3 = 3% 5 = 5%	M = 4-20mA V = 0-5 Vdc/0-10 Vdc	S = Standard	T = Temp X = No Temp (Stop here)	A = Temp. Transmitter B = 100R Platinum, RTD C = 1k Platinum, RTD D = 10k T2, Thermistor E = 2.2k, Thermistor F = 3k, Thermistor G = 10k CPC Thermistor H = 10k T3, Thermistor J = 10k Dale, Thermistor K = 10k with 11k shunt, Thermistor M = 20k NTC, Thermistor N = 1800 ohm TAC, Thermistor R = 10k US, Thermistor S = 10k 3A 221 Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor	Blank = None 2 = 2 pt cal*

Examples:

With Temp:

HEW [3] [M] [S] [T] [C]

Without Temp:

HEW [3] [V] [S] [X] Stop Here

*Not available with W and Y high-accuracy thermistors.

SpaceLogic Sensors

SLP Series Temperature Sensors – BACnet and Modbus

Wall Mount Temperature Sensors

SLPxTXX SLPxLXX SLPxXXX

The SpaceLogic SLP Series of temperature sensors for living space is for use with BAS controllers which use BACnet MSTP or Modbus outputs. Housings are available in Medium matte white and Optimum faces in black and white. All housing types are available with three user interface options: touchscreen, LCD with three buttons and blank.

BACnet & Modbus

Embedded BACnet and Modbus communication protocols…easy systems integration

Multiple baud rates

Configurable baud rates… ensures network compatibility

Network configuration

Eliminates the cost of home run wiring and analog inputs required by traditional sensors

Displays have setpoint

Selectable temperature or fan speed setpoint…easy to use

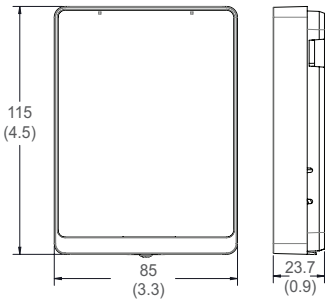
Applications

- Controlling HVAC systems for improved comfort & energy savings
- Museums, schools, printing shops, hospitals, data centers, & other locations that require temperature control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

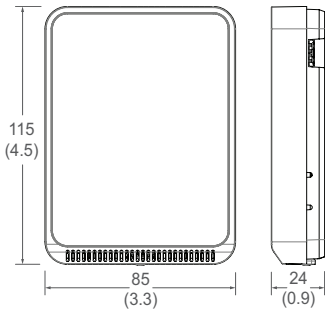
Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Protocol Output	BACnet or Modbus via RS-485, selectable
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
Temperature Transmitter	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: Temperature or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: Temperature or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
Setpoints	
Temperature Setpoint	Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Fan Speed Setpoint	Off, Low, Medium, High, Auto
Override	
Override Button	Display models feature a momentary override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

Dimensional Drawing – mm (in.)



Optimum Housing



Medium Housing

Housing Finishes

Optimum White

Optimum Black

Medium White

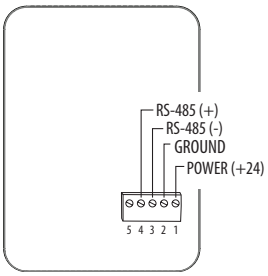
User Interface Types

Touchscreen

LCD with Buttons

Blank

Wiring Diagram



Ordering Information

Model	Housing	User Interface	Temperature Sensor
SLPWTXX	Optimum White	Touchscreen	Temperature Transmitter
SLPWLXX	Optimum White	LCD / 3 Buttons	Temperature Transmitter
SLPWXXX	Optimum White	Blank	Temperature Transmitter
SLPBTXX	Optimum Black	Touchscreen	Temperature Transmitter
SLPBLXX	Optimum Black	LCD / 3 Buttons	Temperature Transmitter
SLPBXXX	Optimum Black	Blank	Temperature Transmitter
SLPSTXX	Medium White	Touchscreen	Temperature Transmitter
SLPSLXX	Medium White	LCD / 3 Buttons	Temperature Transmitter
SLPSXXX	Medium White	Blank	Temperature Transmitter

TW2 Protocol Series

Wall Mount Temperature Sensors from Veris


TW2TPXx


TW2LPXx


TW2XPXx

The Veris TW2 Protocol Series of temperature sensors for living space is a versatile sensor platform for use with BAS controllers designed to accept BACnet or Modbus outputs. TW2 Protocol Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank.

BACnet & Modbus

Embedded BACnet and Modbus communication protocols…easy systems integration

Multiple baud rates

Configurable baud rates… ensures network compatibility

Network configuration

Eliminates the cost of home run wiring and analog inputs required by traditional sensors

Displays have setpoint

Selectable temperature or fan speed setpoint…easy to use

Applications

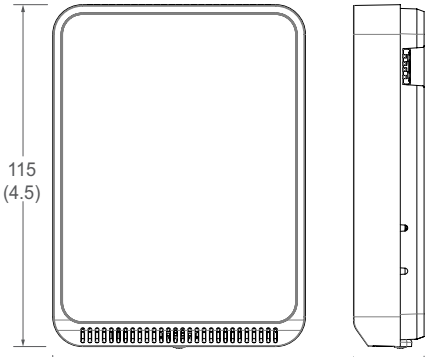
- Controlling HVAC systems for improved comfort & energy savings
- Museums, schools, printing shops, hospitals, data centers, & other locations that require temperature control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Protocol Output	BACnet or Modbus via RS-485, selectable
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
Temperature Transmitter	
Sensor Type	Solid state, integrated circuit
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: Temperature or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: Temperature or fan speed selectable Timeout override: Display timeout Lockout override: Touchscreen/button lockout

Setpoints	
Temperature Setpoint	Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Fan Speed Setpoint	Off, Low, Medium, High, Auto
Override	
Override Button	Display models feature a momentary override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

Dimensional Drawing – mm (in.)



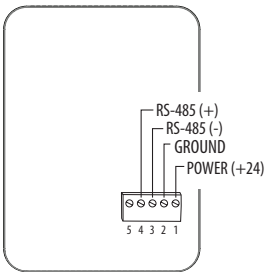
User Interface Types

Touchscreen

LCD with Buttons

Blank

Wiring Diagram



Ordering Information

Model	User Interface	Setpoint	Override	Temperature Sensor
TW2TPXA	Touchscreen	X	X	Temperature Transmitter
TW2LPXA	LCD / 3 Buttons	X	X	Temperature Transmitter
TW2XPXA	Blank			Temperature Transmitter

SpaceLogic Sensors

SLA Series Temperature Sensors – Analog

Wall Mount Temperature Sensors

SLAxTXX

SLAxLXX

SLAxXXX

The SpaceLogic SLA Series of temperature sensors for living space is for use with BAS controllers which use 4 to 20mA, 0 to 5Vdc, 0 to 10Vdc or 10K Type 3 thermistors. Housings are available in Medium matte white and Optimum faces in black and white. All housing types are available with three user interface options: touchscreen, LCD with three buttons and blank. Touchscreen and LCD models provide 4 to 20mA, 0 to 5Vdc and 0 to 10Vdc outputs. Blank models provide a low-cost resistive output with a 10K Type 3 thermistor.

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
Temperature Transmitter Option	
Sensor Type	Solid state, integrated circuit or other thermistors
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout* Lockout override: Touchscreen/button lockout*
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout* Lockout override: Touchscreen/button lockout*
Setpoints**	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V
Override	
Override Button	Display models feature a momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

c UL us LISTED

*DIP switch selectable.
**One setpoint type is selectable via DIP switch on display models only.

Flexible

Polarity insensitive, two-wire 4 to 20 mA or 3-wire 0-5/0-10 Vdc versions…flexible systems compatibity…save time in the field, stock fewer devices

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Calibration-free

No calibration required

Applications

- Controlling HVAC systems for improved comfort & energy savings
- Museums, schools, printing shops, hospitals, data centers, & other locations that require temperature control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

Housing Finishes

Optimum White

Optimum Black

Medium White

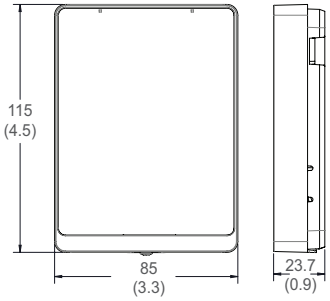
User Interface Types

Touchscreen

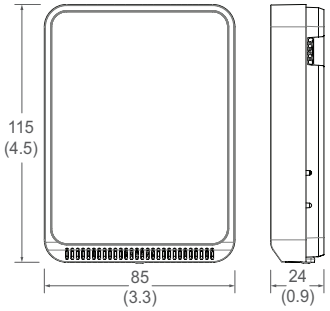
LCD with Buttons

Blank

Dimensional Drawings – mm (in.)



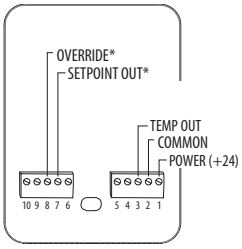
Optimum Housing



Medium Housing

SLAxxXX Display Models with Temp Transmitter

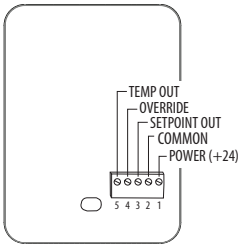
Wiring Diagram



*Touchscreen models only.

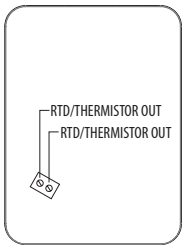
SLAxxXX with Temp Transmitter

Wiring Diagram



SLAxXXXwith RTD/Thermistor

Wiring Diagram



Ordering Information

Model	Housing	User Interface	Temperature Sensor
SLAWTXX	Optimum White	Touchscreen	Temperature Transmitter
SLAWLXX	Optimum White	LCD / 3 Buttons	Temperature Transmitter
SLAWXXX	Optimum White	Blank	10K Type 3 Thermistor
SLABTXX	Optimum Black	Touchscreen	Temperature Transmitter
SLABLXX	Optimum Black	LCD / 3 Buttons	Temperature Transmitter
SLABXXX	Optimum Black	Blank	10K Type 3 Thermistor
SLASTXX	Medium White	Touchscreen	Temperature Transmitter
SLASLXX	Medium White	LCD / 3 Buttons	Temperature Transmitter
SLASXXX	Medium White	Blank	10K Type 3 Thermistor

TW2 Analog Series

No Logo

Wall Mount Temperature Sensors from Veris


TW2TAXx


TW2LAXx


TW2XAXx

The Veris TW2 Series of temperature sensors for living space is a versatile sensor platform for use with BAS controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs. TW2 Series sensors are available with three user interface options: touchscreen, LCD with three buttons and blank.

Flexible

Polarity insensitive, two-wire resistive thermistor, 3+ wires 4 to 20 mA or 0-5/0-10 Vdc versions…flexible systems compatibity…save time in the field, stock fewer devices

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Calibration-free

No calibration required

Applications

- Controlling HVAC systems for improved comfort & energy savings
- Museums, schools, printing shops, hospitals, data centers, & other locations that require temperature control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
Temperature Transmitter Option	
Sensor Type	Solid state, integrated circuit or other thermistors
Accuracy	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 122 °F)
Display Models	
Touchscreen	61 mm (2.4 in), color, backlit, capacitive, 240x300 px Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout* Lockout override: Touchscreen/button lockout*
LCD	52mm (2.05 in), segmented with 3 buttons Setpoint: 0-10Vdc. Temperature, humidity or fan speed selectable Timeout override: Display timeout* Lockout override: Touchscreen/button lockout*

Setpoints**	
Temperature Setpoint	0 to 10V output Scale: 10 to 35 °C (50 to 95 °F) / 0 to 50 °C (32 to 122 °F)
Fan Speed Setpoint	0 to 10V output Off 0V, Auto 1.5V, Low 3.3V, Med. 6.7V, High 10.0V
Override	
Override Button	Display models feature a momentary-to-ground override button
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada), UKCA (UK)

c UL us LISTED

*DIP switch selectable.
**One setpoint type is selectable via DIP switch on display models only.

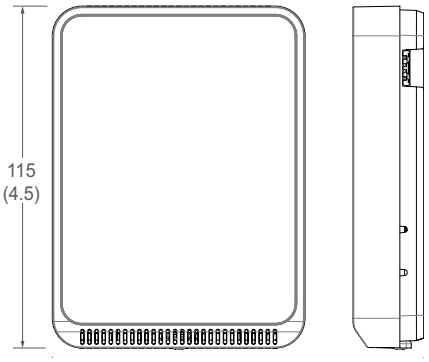
User Interface Types

Touchscreen

LCD with Buttons

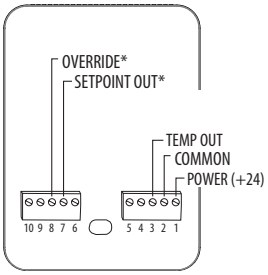

Blank

Dimensional Drawing – mm (in.)



TW2X/TW2T Display Models with Temp Transmitter

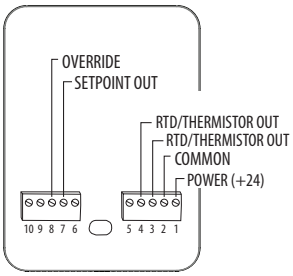
Wiring Diagram



*TW2T models only.

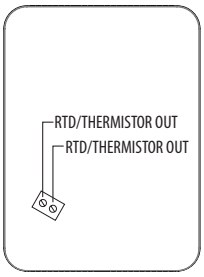
TW2L/TW2T Display Models with RTD/Thermistor

Wiring Diagram



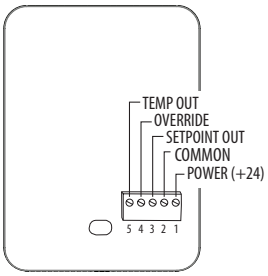
TW2x with RTD/Thermistor

Wiring Diagram



TW2L with Temp Transmitter

Wiring Diagram



Ordering Information

User Interface	Output		Temperature
TW2 ☐	☐	X	☐
T = Color touchscreen L = 3-button LCD display X = None	A = Analog output		A = Transmitter only C = 1000 PT RTD D = 10K T2 thermistor H = 10K T3 thermistor K = 10K curve G/11K shunt M = 20K NTC thermistor N = 1.8K TAC thermistor

Example: TW2 [T] [A] X [A]

Table of Standard RTD and Thermistor Values

Class	Pt RTD	THERMISTOR		
Type	**1000 Ohm**	**10k Type 2**	**10k Type 3**	**20k**
Accuracy	±0.3°C	±1.0°C	±0.2°C	Consult
	0.00385 curve	-50/150°C	0/70°C	Factory
Temp. Response*	PTC	NTC	NTC	NTC

*PTC: Positive Temperature Coefficient *NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	1000 Ohm	10k Type 2	10k Type 3	20k NTC
-50	-58	803.06	692,700	454,910	1,267,600
-40	-40	842.71	344,700	245,089	643,800
-30	-22	882.22	180,100	137,307	342,000
-20	-4	921.60	98,320	79,729	189,080
-10	14	960.86	55,790	47,843	108,380
0	32	1,000.00	32,770	29,588	64,160
10	50	1,039.03	19,930	18,813	39,440
20	68	1,077.94	12,500	12,272	24,920
25	77	1,097.35	10,000	10,000	20,000
30	86	1,116.73	8,055	8,195	16,144
40	104	1,155.41	5,323	5,593	10,696
50	122	1,193.97	3,599	3,894	7,234
60	140	1,232.42	2,486	2,763	4,992
70	158	1,270.75	1,753	1,994	3,512
80	176	1,308.97	1,258	1,462	2,516
90	194	1,347.07	919	1,088	1,833
100	212	1,385.06	682	821	1,356
110	230	1,422.93	513	628	1,016
120	248	1,460.68	392	486	770
130	266	1,498.32	303	380	591
Sensor Codes		**C**	**D**	**H**	**M**

SpaceLogic Sensors
SLA Series 1.8 kΩ Temperature Sensors – Analog
Wall Mount Temperature Sensors

SLASTCX-100 SLASLXX-100 SLASXxx-100

The SpaceLogic SLA Series 1.8 kΩ temperature sensors for living space is a flexible multisensor platform for use with Schneider Electric controllers designed to accept 4 to 20mA, 0 to 5Vdc or 0 to 10Vdc outputs.

Flexible

Polarity insensitive, 2-wire resistive thermistor, 3+ wires 4 to 20 mA or 0-5/0-10 Vdc versions…flexible systems compatibity…save time in the field, stock fewer devices

Easy to install

Large wiring terminals on baseplate and snap-on covers with security screw simplify installation and service

Applications

- Controlling HVAC systems for improved comfort & energy savings
- Museums, schools, printing shops, hospitals, data centers, & other locations that require temperature control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

Specifications

Operating Environment	
Input Power	Class 2; 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Analog Output, CO_2 & Humidity	Selectable 4 to 20 mA, 0 to 5 V, 0 to 10 V
Operating Temperature Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High-impact ABS plastic
IP Rating	IP 30
Mounting Location	For indoor use only. Not suitable for wet locations.
Surface Mount	The device can be surface mounted on Single Gang J-Box, British Standard and CE60 wall boxes
CO_2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000/5000 ppm (selectable)
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
RH Sensor	
Sensor Type	Solid state capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis*	1.5% typical
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Thermistor, see table next page
Wiring Terminals	
Terminal Blocks	Screw terminals, 18-24 AWG
Screw Terminal Torque	0.2 N-m (2.0 in-lbF) max.
Compliance Information	
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 60730-2-9, EN 60730-2-13, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, Green Premium, ICES-003 (Canada), UKCA (UK)

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*Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability.

User Interface Types

Touchscreen

LCD with Buttons

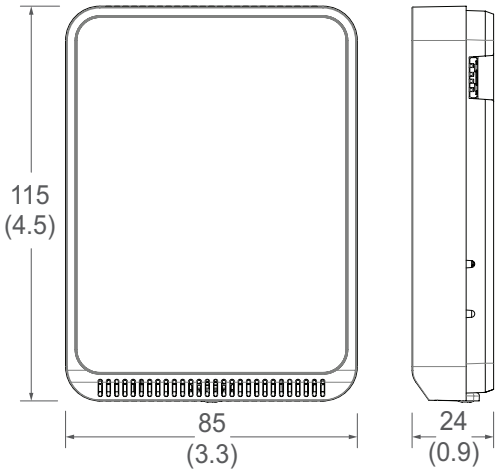

Blank

Ordering Information

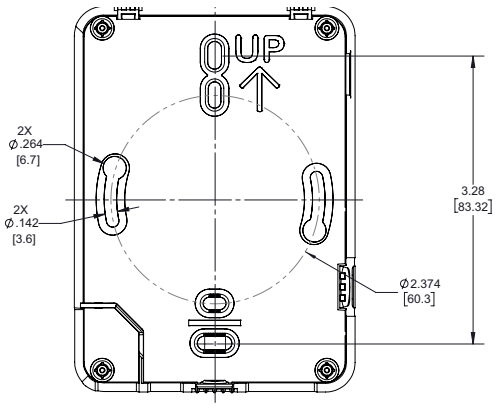
Model	Description	Housing Type	Housing Color
SLASXXX-100	Sensor, Temp, 1.8k, Analog	Blank	Med. white matte
SLASLXX-100	Sensor, Temp, 1.8k, Analog, LCD	LCD	Med. white matte
SLASXX2-100*	Sensor, Temp, 1.8k, RH, Analog	Blank	Med. white matte
SLASXC2-100*	Sensor, Temp, 1.8k, RH,CO_2, Analog	Blank	Med. white matte
SLASTCX-100	Sensor, Temp, 1.8k, CO_2, Analog, Touch	Touch-screen	Med. white matte

*Replaceable RH module available to be ordered separately per table below.

Dimensional Drawing – mm (in.)



Dimensional Drawing – Base Hole Measurement



Replaceable RH Elements

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration


Replaceable RH Module

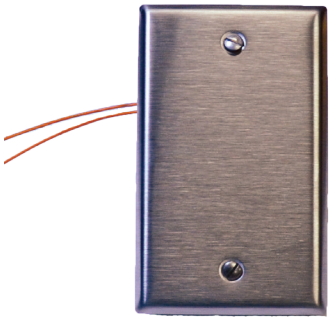
Table of Standard RTD and Thermistor Values

°C	°F	TAC Vista 1.8K
0	32	5,096
5	41	4,077
10	50	3,287
15	59	2,671
20	68	2,185
25	77	1,800
30	86	1,492
35	95	1,245
40	104	1,044
45	113	881
50	122	747

TE & TP Series

Durable Devices for Temperature Monitoring from Veris

TE



TP

Veris TE Series wall mounted temperature sensors feature a discreet appearance combined with high accuracy and reliability. These devices are aesthetically pleasing in any interior environment. Flexible mounting options include flush and single-gang for ease of installation.

TP Series flush mounted temperature sensors are designed to monitor the temperature of the air in areas where sensor durability and security are needed. They are ideal for spaces where moisture and water vapor are concerns. The back of the TP is insulated to reduce interior wall temperature influence. The TP is for indoor use only, and it is warranted for a period of five years.

Specifications
TP Series

Wiring	22 AWG; 2-wire: RTD/Thermistor
Housing	Brushed 430 stainless steel
Mounting Location	Not suitable for wet locations. For indoor use only.
Operating Temperature	-25 to 105 °C (-13 to 221 °F)*
WARRANTY	
Limited Warranty	5 years
Agency Approvals	

CE

*Room temperature offset documented on each unit.

Moisture resistant

Potted sensor element (TP Series)

Durable

Stainless steel construction (TP Series)

Flexibile

Available with RTD and thermistors. TE Series also available with transmitter and linitemp outputs.

Simple maintenance

Easy to clean

Easy installation

Mounts to standard duplex wall mount box

Specifications
TE Series

Wiring	22 AWG; 2-wire: RTD Thermistor, 4 to 20 mA; 3-wire: voltage output models
Housing	Black or white ABS plastic
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Linitemp Option	
Input Power	Class 2; 5 to 30 Vdc
Output	10 mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Calibration Offset	1.5 °C (2.7 °F) typ.; 2.5 °C (4.5 °F) max. at 25 °C (77 °F)*
Offset over Temp	1.8 °C (3.24 °F) typical; 3.0°C (5.4 °F) max. over 0 to 70 °C (32 to 158 °F) range; 2.0 °C (3.6 °F) typical, 3.5 °C (6.3 °F) max. over -25 to 105 °C (-13 to 221 °F) range
Warranty	
Limited Warranty	5 years

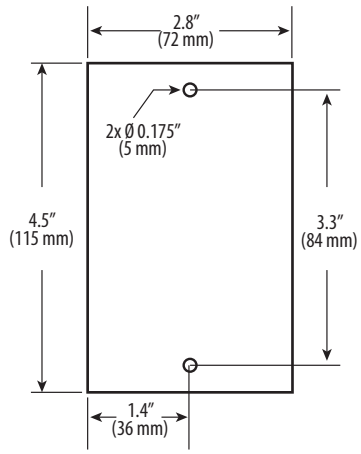
Specifications
TEA Series

Input Power	4 to 20 mA mode; loop powered Class 2; 24 Vdc only; 0-10 V, 3-wire, observe polarity; 12-30 Vdc; 0-5 V, 3-wire, observe polarity; 24 Vac, 50/60 Hz, 12-30 Vdc
Ranges	
TEA Model	10 to 35 °C (50 to 95 °F)
Analog Output TEA 4 to 20 mA model	2-wire, not polarity sensitive (clipped & capped)
Transmitter Type	Solid-state, integrated circuit
Transmitter Accuracy	±0.5 °C (±.9 °F) typical
Warranty	
Limited Warranty	5 years
Agency Approvals	

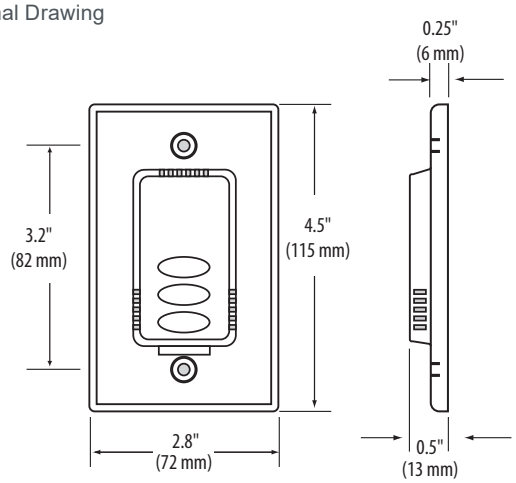
CE

*Room temperature offset documented on each unit.
Note: RTD/Thermistors in wall packages are not compensated for internal heating of product.

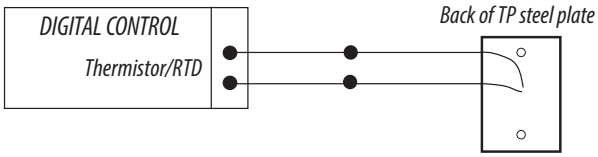
TP
Dimensional Drawing



TE/TEA
Dimensional Drawing



TP
Wiring Diagram



Ordering Information

Sensor Type

TP [ ]

B = 100R Platinum, RTD
C = 1k Platinum, RTD
D = 10k T2, Thermistor
E = 2.2k, Thermistor
F = 3k, Thermistor
H = 10k T3, Thermistor
I = 1k Balco (Nickel-iron) RTD
J = 10k Dale, Thermistor
K = 10k w/11k shunt,Thermistor
M = 20k NTC, Thermistor
N = 1800 ohm, Thermistor
W = 10k T2 high accuracy, Thermistor
Y = 10k T3 high accuracy, Thermistor

[ ]

0 = None
2 = 3-point NIST calibration

Example:
TP [W] [2]

Output / US or EU / Housing Color

TEA [ ] [S] [ ]

M= 4 to 20 mA
V = 0-10 Vdc
J = 0-5 Vdc

S = Standard

None = Cloud White
B = Black

Example:
TEA [J] [S]

Sensor Type / Setpoint/ Override / Cal Certificate / Housing Color

TE [ ] [ ] [ ] [ ]

B= 100R platinum, RTD
C= 1k platinum, RTD
D= 10k T2, Thermistor
E= 2.2k, Thermistor
F= 3k, Thermistor
G= 10k CPC, Thermistor
H= 10k T3, Thermistor
I= 1k Balco (Nickel-iron) RTD
J= 10k Dale, Thermistor
K= 10k w/11k shunt, Thermistor
M= 20k NTC, Thermistor
N= 1800 ohm, Thermistor
P= 10mV/°C, Linitemp
R= 10k US, Thermistor
S= 10k 3A221, Thermistor
T= 100k, Thermistor
U= 20k "D", Thermistor
W= 10k T2 high accuracy, Thermistor
Y= 10k T3 high accuracy, Thermistor

0 = None
1 = Override*
2 = 1k Setpoint
3 = 10k Setpoint
4 = 1k Setpoint with override*
5 = 10k Setpoint with override*

0 = None
1 = 1-point cal validation**
2 = 2-point cal validation**

None = Cloud white
B = Black

Example:
TE [D] [5] [2]

*Pushbutton override short circuits RTD/thermistor output
** Not available with W and Y high-accuracy thermistors.

TTS Series

Temperature Monitoring for Continuum Controllers

TTS-SE-1

TTS-SD-LCD-1

The Smart Sensor Series combines an attractive display with a room temperature sensor to provide users with a cost effective way to view or modify VAV box operation. It is designed for use with the i2 and b3 field controllers and can also accomplish many local control and monitoring tasks.

The standard Smart Sensor provides an LCD display and a 6 button programmable keypad that enables operators and occupants to change setpoints, monitor occupancy status and turn equipment on and off. An alternative version of the Smart Sensor is also available with a 4-button keypad.

The function keys can be custom programmed to perform a wide variety of functions, including switching a specific zone to occupied mode, signaling an alarm condition, adjusting the amount of override time, arming or disarming a security system, and enforcing password security. Programming the display and function keys is done with Plain English® programming language.

The Smart Sensor comes in a well-ventilated plastic enclosure. The active sensing element is a highly stable, precision thermistor, accurate to within ± 0.36 °F (± 0.2 °C). The sensor has an operating range of 32 to 105 °F (0 to 40 °C). Both versions of the Smart Sensor provide a connection for the RoamIO-2 Lap-Top Service Tool.

Features

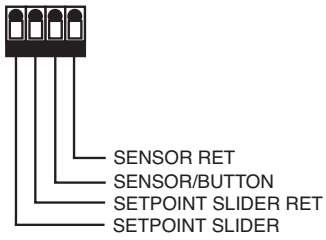
- Accurate, Reliable 10K Type III Thermistor
- LCD Display
- Programmable Keypad
- Built-in Service Port to be Used with the RoamIO-2 Service Tool
- Powered Directly from an i2 or b3 Field Controller

Specifications

Sensing Element	10K Type III Thermistor, 10,000 ohms at 77 °F (25 °C)
Range	32 to 105 °F (0 to 40 °C)
Accuracy	Thermistor ± 0.36 °F (± 0.2 °C)
Stability	Thermistor will not deviate from accuracy specification for minimum of 5 years.
Wire Specifications	18 (0.823 mm^2) to 24 gauge (0.205 mm^2), 3 conductor, unshielded wire. An additional single pair twisted shielded is required for Lap-Top Service Tool connection.
Maximum Distance to Sensor	18 gauge (0.823 mm^2) wire: 1,200 ft. (366 m) with less than 0.18 °F (-17.67 °C) error 20 gauge (0.518 mm^2) wire: 790 ft. (241 m) with less than 0.18 °F (-17.67 °C) error 22 gauge (0.326 mm^2) wire: 500 ft. (152 m) with less than 0.18 °F (-17.67 °C) error 24 gauge (0.205 mm^2) wire: 300 ft. (91 m) with less than 0.18 °F (-17.67 °C) error
Dimensions	4.50” H x 3.50” W x 0.813” D (11.5 cm H x 8.9 cm W x 2.0 cm D)
Color	Off-white
Power	One Smart Sensor is powered directly from an i2 or b3 field controller.

TTS

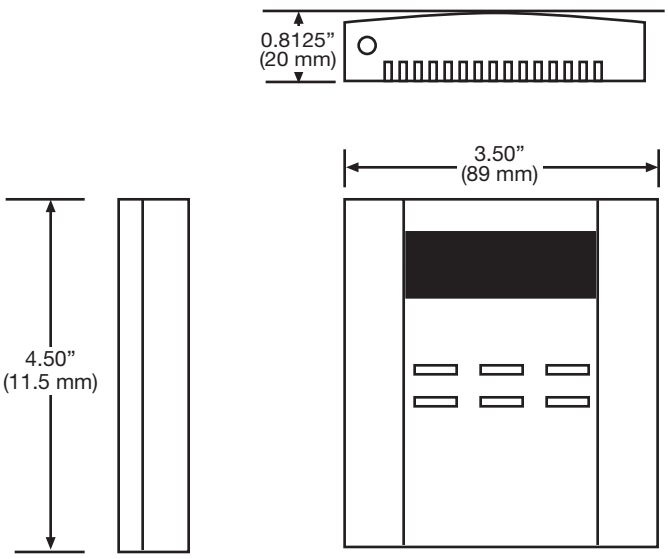
Wiring Diagram



TTS-SD-LCD

Wiring Diagram

Dimensional Drawing



Ordering Information

Model	Display	Override	Setpoint	Cover	Temp.	Housing Finish	Faceplate Logo
TTS-SE-1	LED Indicator	X	X		10K T3	Matte White	Schneider Electric
TTS-SD-LCD-4-2	LCD		X	4 Button	10K T3	Matte White	Schneider Electric
TTS-SD-LCD-4-2-A*	LCD		X	4 Button	10K T3	Matte White	Schneider Electric
TTS-SD-LCD-1	LCD	X	X	6 Button	10K T3	Matte White	Schneider Electric
TTS-SD-LCD-1-A*	LCD	X	X	6 Button	10K T3	Matte White	Schneider Electric

*Made in USA version.

MN-S Series

Temperature and Humidity Monitoring for MN Controllers

MN-S

The I/A Series MicroNet™ Sensors (MN-Sxxx series) are a family of digital wall temperature and humidity sensors for use with I/A Series MicroNet controllers. These sensors feature a Sensor Link (S-Link) communication protocol which provides a simple two-wire interface for power and exchange of sensor and subbase information. Subbase information includes selecting occupancy override, fan speed, operating mode, or emergency heat.

Available in 12 models, MN-Sxxx series sensors provide an integral analog-to-digital conversion for elimination of sensor-to-controller noise effects and wire resistance offset.

Using the digital wall sensor, the operator can monitor performance and edit operational settings. MN-Sxxx series sensors are suitable for direct-wall, 2 x 4 electrical box, 1/4 DIN electrical box, or surface box mounting.

The MN-Sxxx series sensor measures room conditions and transmits the information to the controller via the S-Link. A single sensor is connected directly to an application specific I/A Series MicroNet controller via low-cost, unshielded, twisted pair cable. The connection between the sensor and controller is not polarity-sensitive.

A convenient connection to either a MicroNet LonWorks® or MicroNet BACnet network is provided as an option with each sensor in the series. If the LonWorks network wiring is connected to the sensor, a PC running WorkPlace Tech Tool or a third party Network Management Tool can be connected to the network at the sensor. This feature allows convenient access to the MicroNet LonWorks network.

Specifications

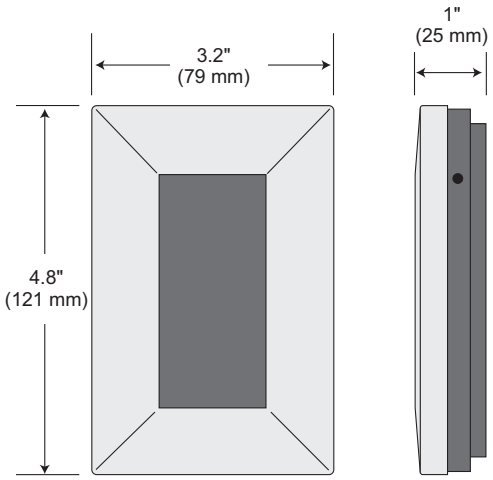
Temperature Sensor	
Type	Precision thermistor
Range	32 to 122 °F (0 to 50 °C)
Humidity Sensor	
Element	Type: Thermoset polymer capacitive sensor Accuracy: ±2% RH at 77 °F (25 °C)
Range	5 to 95%, non-condensing
Hysteresis	±1.2% RH maximum
Immersion	Extended exposure to equal to or greater than 90% RH causes a reversible 3% shift. Sensor will recover from short term exposure to liquid water or condensation. Repeated exposure will degrade the performance of the sensor.

Features

- Contemporary, low-profile packaging.
- Digital zone temperature indication (selectable for 0.1 or 1 degree display resolution of °F or °C).
- Self-compensating temperature conversions remove the need to calibrate over time.
- Digital zone humidity indication (selectable for 0.1 or 1% RH display resolution).
- Long-life humidity sensing element with excellent resistance to contamination and condensation.
- Pushbutton override capabilities allow occupants to switch to timed occupied mode for after hours operation.
- Displays selected system values such as setpoints, outdoor air temperature, and operating mode.
- Provides the ability to change operating modes.
- Directly connects to selected I/A Series MicroNet controllers via low-cost, unshielded, twisted-pair cable, which provides both power and communication.
- Separate wiring subbase and electronics.
- LonWorks network jack for convenient network access.
- S-Link jack for Pocket I/A access to the connected controller.

Dimensions	4-21/32 H x 3 W x 1 D in (118.5 x 76.2 x 24 mm)
Enclosure	Conforms to NEMA-1 requirements
Ambient Limits	
Operating Temperature	32 to 122 °F (0 to 50 °C)
Shipping and Storage Temperature	-40 to 160 °F (-40 to 71 °C)
Humidity	5 to 95% RH, non-condensing
Hardware	
Wiring Terminals	Four (4) screw terminals. AWG #18 to #24 (0.823 mm^2 maximum) wire.
Display	Setpoints, input spans, and units vary with the controller application
Range	-99 to 999 or -9.9 to 99.9
Units	°F, °C, or %. Command Options (S4xx and S5xx models) Varies with the controller application
System	Heat/Cool/Off/Auto (except MN-S4xx-FCS)
Fan Mode	Off/On/Speed (Low, Medium, High)/Auto
Override	Occupied/Unoccupied (except MN-S4xx-FCS)
Emergency Heat	Enable/Disable (MN-S5xx models only).
Compliance Information	
Agency Approvals	FCC Class B, UL Listed: UL-916 (File # E71385 Category PAZX). UL Listed to Canadian Safety Standards (CAN/CSA C22.2). European Community – EMC Directive 89/336/EEC. Emissions and Immunity EN61326

Dimensional Drawing



Ordering Information

Model	Display	Override	Setpoint	Keypad	Controller Mode	RH	Temp	Cover
MN-S1-500	None						X	*
MN-S1HT-500	None					X	X	*
MN-S2-500	Status LED	X		1 Button			X	*
MN-S2HT-500	Status LED	X		1 Button		X	X	*
MN-S3-500	LCD and LED Override Status	X	X	3 Button			X	*
MN-S3HT-500	LCD and LED Override Status	X	X	3 Button		X	X	*
MN-S4-500	LCD and LED Override Status	X	X	6 Button	X		X	*
MN-S4HT-500	LCD and LED Override Status	X	X	6 Button	X	X	X	*
MN-S4-FCS-500	LCD and LED Fan Status	X	X	6 Button	X		X	*
MN-S4HT-FCS-500	LCD and LED Fan Status	X	X	6 Button	X	X	X	*
MN-S5-500	LCD and LED Override Status with Emergency Heat	X	X	7 Button	X		X	*
MN-S5HT-500	LCD and LED Override Status with Emergency Heat	X	X	7 Button	X	X	X	*

* DCQC-150-SE cover is sold separately.

Plant Room Sensors: Air Quality/Gas Detection

Schneider Electric offers an extensive line of CO, CO_2, VOC, Particulate Matter (PM) and NO_2 sensors. Whether your application requires ventilation of a parking garage or an indoor venue, we have the perfect product for your needs. Comply with OSHA and ASHRAE 62.1 standards for air quality while saving energy by limiting runtime of exhaust fans and HVAC equipment. Ideal for Demand Control Ventilation (DCV) applications.

Model	Description	Page
SCD2	Analog & Protocol Air Quality Sensors	67
CD2	Analog & Protocol Air Quality Sensors	69
CD2E	Analog Air Quality Sensors, Economy	71
SPMDP & SPMOP	Laser-Scatter Type Duct or Outdoor Mount PM Sensors	73
PMDP & PMOP	Laser-Scatter Type Duct or Outdoor Mount PM Sensors	75
GWN	Platform, CO/NO_2 Gas Sensors	77
GWNP	Platform, CO/NO_2 Gas Sensors, Protocol Communication	79
UG-7-A6O Uniguard	Duct Mount Smoke Detector	81

Plant Room Air Quality Selection Guide

CO_2 Sensors

Feature/Option	Duct Mount
Protocol Output (BACnet and Modbus)	SCD2, CD2 pages 67, 69
Field-Selectable Analog Output	SCD2, CD2, CD2E pages 67, 69, 71

Particulate Matter (PM) Sensors

Feature/Option	Duct Mount	Outdoor Mount
Field-Selectable Analog Output	SPMDP, PMDP pages 73, 75	SPMOP, PMOP pages 73, 75

Gas Platforms

Feature/Option	CO Sensors	NO_2 Sensors	CO/NO_2 Sensors	Refrigerant Sensors
Selectable Output 4 to 20 mA/0-5 or 0-10 Vdc	GWN page 77	GWN page 77		GWN page 77
Protocol Output (BACnet and Modbus)	GWNP page 79	GWNP page 79	GWNP page 79	GWNP page 79

Duct Smoke Sensors

Feature/Option	Duct Mount
Relay Output	UG-7-A6O page 81

SpaceLogic Sensors SCD2 Series

Individual or 3-in-1 CO_2, RH and Temperature

SCD2

SpaceLogic SCD2 Series Air Quality Sensors are duct mount all-in-one sensors for monitoring air quality. The device combines CO_2, temperature, humidity, VOC and particulate matter (PM) sensing into a single unit to ensure a building's optimum air quality and energy efficiency.

Each device is an active sensor that converts a measurement into one of the following output options:

- Analog output: 4-20 mA, 0 to 5 Vdc or 0 to 10 Vdc
- Protocol output: BACnet MS/TP, Modbus RTU

As an integral part of Schneider Electric EcoStruxture™ Building Operation (EBO) software, the SCD2 protocol models' Ready-Connect feature enables a plug & play experience for easy integration and configuration.

Different models are available based on application requirements for lower-cost installations.

SCD2 is available with an LCD display option on select models (see Ordering Information, page 2).

Specifications

Operating & Storage Environment	
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH (non-condensing)
Storage Temp. Range	-25 to 70 °C (-13 to 158 °F)
Storage Humidity Range	0 to 95% RH (non-condensing)
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	Analog: selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc Protocol: BACnet MS/TP, Modbus RTU
Power Consumption	See Max. Power Consumption table, next page
Tube Length	200 mm
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP 65
Protection Class	Class III
CO_2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling

BACnet & Modbus

Embedded BACnet and Modbus communication protocols for easy systems integration

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Field replaceable

Replace RH element and temp transmitter in the field… maintain accuracy and minimize downtime and cost

Applications

- HVAC systems
- Indoor air quality monitoring
- Life sciences applications
- Key component for the LEED green building program and WELL Building Standard*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

Output Range	Analog models: 0 to 2000/5000 ppm (selectable) Protocol models: 0 to 10,000 ppm	
Accuracy	±30 ppm ±3% of measured value	
Repeatability	±20 ppm ±1% of measured value	
Response Time	<60 seconds for 90% step change	
Calibration	Field calibration support	
VOC Sensor Option		
Sensor Type	Solid state	
Output Range	0 to 100% AQI for VOC	
Accuracy	±15% sensor-to-sensor variation	
	Level	**Ventilation Recommendation**
AQI Table	>61%	Greatly increased
	20 to 61%	Significantly increased
	10 to 20%	Slightly increased
	5 to 10%	Average
	0 to 5%	Target value
RH Sensor Option		
Sensor Type	Solid state capacitive, replaceable	
Accuracy[1]	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% replaceable models	
Hysteresis	1.5% typical	
Linearity	Included in accuracy specification	
Stability	±1% @ 20°C (68 °F) annually for 2 years	
Output Range	0 to 100% RH	
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical	
Temperature Sensor Option		
Sensor Type	Solid state, integrated circuit	

Specifications (cont.)

Temp. Sensing Element[2]	See Ordering Information for available temp. sensing elements
Time Constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy[3]	±0.2 °C (±0.4 °F) typical at 25 °C
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 131 °F)
PM Sensor Option	
Sensor Type	Laser-scatter
Particulate Size	PM1.0, PM2.5, PM4.0, PM10
Resolution	±1 µg/m³
Mass Concentration Range	±1 µg/m³
Accuracy	PM1 and PM2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM4 and PM10[4]: 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)
Display Models	
LCD Type	Positive display with backlight
Measurement Values Displayed	CO_2: ppm, Temp: °C or °F, Humidity: % RH, VOC: % AQI, PM: µg/m³
Display Resolution	CO_2: 1 ppm, Temp: 0.1 °C or °F, Humidity: 0.1% RH VOC: 1% AQI, PM: 1 µg/m³
Wiring	
Wiring	Screwless terminal block with spring actuator, 16-24 AWG
EBO Integration[5]	Download Modbus Device Type template for Modbus models from the Building Application tool.
Warranty	
Limited Warranty	2 years
Compliance information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class A, Green Premium (REACH, RoHS),RoHS 2 (China), RCM (Australia), ICES-003 (Canada), UKCA (UK), EAC (Russia)

c UL us LISTED

1. Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability.
2. Analog models only. See installation guide for accuracy.
3. ±0.5 °C over full operating range.
4. Sensor-to-sensor variation.
5. See http://bms-applications.schneider-electric.com/type/MB/download/263 for device import file and instructions.

Max. Power Consumption

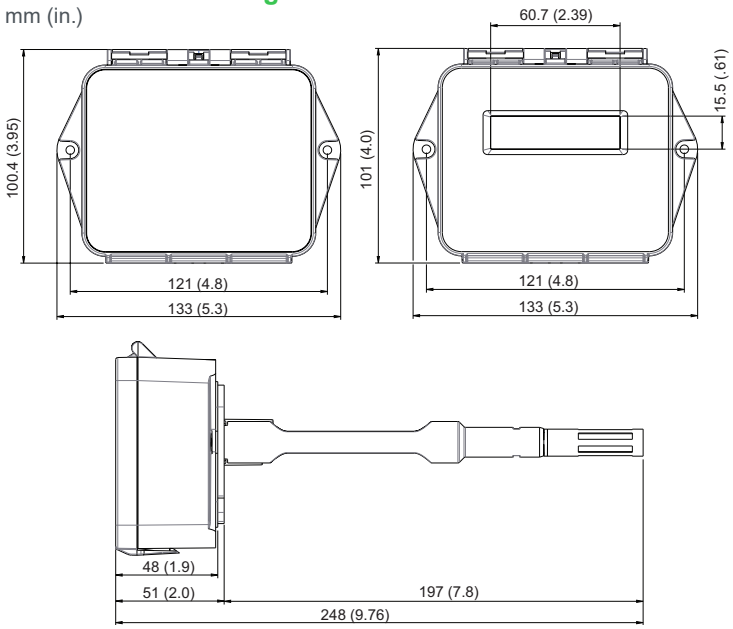
Series	LCD	CO2/VOC	PM	Temp/RH	Max. Power
SCD2 Analog	Yes	Yes	Yes	Yes	9VA @ 24VAC
	Yes	Yes	No	Yes	8VA @ 24VAC
	Yes	No	Yes	Yes	7VA @ 24VAC
	No	Yes	No	Yes	6VA @ 24VAC
	No	Yes	No	No	4VA @ 24VAC
SCD2 Protocol	Yes	Yes	Yes	Yes	4VA @ 24VAC
	Yes	Yes	No	Yes	3VA @ 24VAC
	No	Yes	Yes	Yes	2VA @ 24VAC
	Yes	Yes	No	Yes	1.5VA @ 24VAC

Wiring Diagram

See installation guide for wiring information.

Dimensional Drawing

mm (in.)



Ordering Information

Model	LCD	2% RH Sensor	Temp. XMTR	1000 PT RTD	10K T3	NDIR CO2	VOC	PM
Analog Models								
SCD2XA2ACX						X		
SCD2XA2CCX		X	X			X		
SCD2XA2HCX		X		X		X		
SCD2XAXACX		X			X	X		
SCD2XAXCCX			X			X		
SCD2XAXHCX				X		X		
SCD2XAXXVX					X	X	X	
Protocol Models								
SCD2LP2AVP	X	X	X			X	X	X
SCD2LP2AVX	X	X	X			X	X	
SCD2LPXAVP	X		X			X	X	X
SCD2LPXAVX	X		X			X	X	
SCD2LPXXVX	X					X	X	
SCD2XP2AVP		X	X			X	X	X
SCD2XP2AVX		X	X			X	X	
SCD2XPXAVP			X			X	X	X
SCD2XPXAVX			X			X	X	

Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
SLXXT2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
SLXRHT2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with SHO2 Series outdoor humidity sensors.
**For use on temperature transmitter models only.

CD2 Series

Duct Mount All-in-One CO2, RH, Temp, VOC and PM Sensing from Veris

CD2

Veris CD2 Series Air Quality Sensors are duct mount all-in-one sensors for monitoring air quality. The device combines CO2, temperature, humidity, VOC and particulate matter (PM) sensing into a single unit to ensure a building's optimum air quality and energy efficiency.

Each device is an active sensor that converts a measurement into one of the following output options:

Analog output: 4-20 mA, 0 to 5 Vdc or 0 to 10 Vdc

Protocol output: BACnet MS/TP, Modbus RTU

Different models are available based on application requirements for lower-cost installations.

CD2 is available with an LCD display option on selected models. See Ordering Information for details.

Specifications

Operating & Storage Environment	
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH (non-condensing)
Storage Temp. Range	-25 to 70 °C (-13 to 158 °F)
Storage Humidity Range	0 to 95% RH (non-condensing)
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	Analog: selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc Protocol: BACnet, Modbus
Power Consumption	See Maximum Power Consumption table, next page
Tube Length	200 mm
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP 65
Protection Class	Class III
CO_2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	Analog models: 0 to 2000/5000 ppm (selectable) Protocol models: 0 to 10,000 ppm
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
Calibration	Field calibration support

BACnet & Modbus

Embedded BACnet and Modbus communication protocols for easy systems integration

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Field replaceable

Replace RH element and temp transmitter in the field… maintain accuracy and minimize downtime and cost

Applications

- HVAC systems
- Indoor air quality monitoring
- Life sciences applications
- Key component for the LEED green building program and WELL Building Standard*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

VOC Sensor Option		
Sensor Type	Solid state	
Output Range	0 to 100% AQI for VOC	
Accuracy	±15% sensor-to-sensor variation	
	LEVEL	**VENTILATION RECOMMENDATION**
AQI Table	>61%	Greatly increased
	20 to 61%	Significantly increased
	10 to 20%	Slightly increased
	5 to 10%	Average
	0 to 5%	Target value

RH Sensor Option	
Sensor Type	Solid state capacitive, replaceable
Accuracy*	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% replaceable models
Hysteresis	1.5% typical
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical

Temperature Sensor Option	
Sensor Type	Solid state, integrated circuit
Temp. Sensing Element**	See Ordering Information on page 2 for available temp. sensing elements
Time Constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy***	±0.2 °C (±0.4 °F) typical at 25 °C
Resolution	0.1 °C (0.1 °F)
Range	0 to 50 °C (32 to 131 °F)

Specifications (cont.)

PM Sensor Option	
Sensor Type	Laser-scatter
Particulate Size	PM1.0, PM2.5, PM4.0, PM10
Resolution	±1 µg/m³
Mass Concentration Range	±1 µg/m³
Accuracy	PM1 and PM2.5: 0 to 100 µg/m³ +/-[5µg/m³+5% m.v.], 100 to 1000 ug/m³ +/-[10% m.v.] PM4 and PM10:**** 0 to 100 µg/m³ +/-[25µg/m³], 100 to 1,000 µg/m³ +/-[25% m.v.] (sensor-to-sensor deviation)
Display Models	
LCD Type	Positive display with backlight
Measurement Values Displayed	CO_2: ppm, Temp: °C or °F, Humidity: % RH, VOC: % AQI, PM: µg/m³
Display Resolution	CO_2: 1 ppm, Temp: 0.1 °C or °F, Humidity: 0.1% RH VOC: 1% AQI, PM: 1 µg/m³
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class A, REACH, RoHS, RoHS 2 (China), RCM (Australia), ICES-003 (Canada), UKCA (UK)

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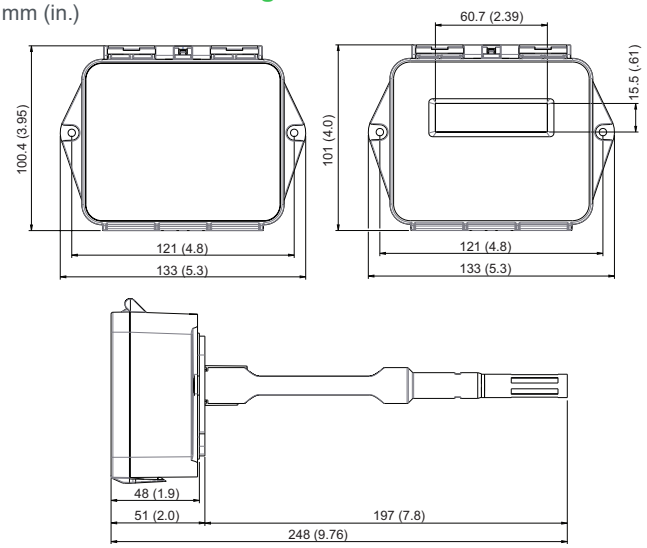
* Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability.
**See thermistor table Z202030 for accuracy.
***±0.5 °C over full operating range.
****PM4 and PM10 output values are calculated based on the distribution profile of all measured particles.

Dimensional Drawing

mm (in.)



Wiring Diagram

See installation guide for wiring information.

Maximum Power Consumption

Series	LCD	CO2/VOC	PM	Temp/RH	Max. Power
CD2 Analog	Yes	Yes	Yes	Yes	9VA @ 24VAC
	Yes	Yes	No	Yes	8VA @ 24VAC
	Yes	No	Yes	Yes	7VA @ 24VAC
	No	Yes	No	Yes	6VA @ 24VAC
	No	Yes	No	No	4VA @ 24VAC
CD2 Protocol	Yes	Yes	Yes	Yes	4VA @ 24VAC
	Yes	Yes	No	Yes	3VA @ 24VAC
	No	Yes	Yes	Yes	2VA @ 24VAC
	Yes	Yes	No	Yes	1.5VA @ 24VAC

Ordering Information

Model	LCD	2% RH Sensor	Temp.	NDIR CO2	VOC	PM
Analog Models						
CD2LAXAVP	X		Temp Transmitter	X	X	X
CD2LAXAVX	X		Temp Transmitter	X	X	
CD2LAXAXP	X		Temp Transmitter			X
CD2XA2AVX		X	Temp Transmitter	X	X	
CD2XA2BCX		X	100 PT RTD	X		
CD2XA2CCX		X	1000 PT RTD	X		
CD2XA2DCX		X	10K T2	X		
CD2XA2HCX		X	10K T3	X		
CD2XA2KCX		X	10K Curve G/11K	X		
CD2XA2MCX		X	20K NTC	X		
CD2XA2NCX		X	1.8K	X		
CD2XAXAVX			Temp Transmitter	X	X	
CD2XAXBCX			100 PT RTD	X		
CD2XAXCCX			1000 PT RTD	X		
CD2XAXDCX			10K T2	X		
CD2XAXHCX			10K T3	X		
CD2XAXKCX			10K Curve G/11K	X		
CD2XAXMCX			20K NTC	X		
CD2XAXNCX			1.8K	X		
Protocol Models						
CD2LP2AVP	X	X	Temp Transmitter	X	X	X
CD2LP2AVX	X	X	Temp Transmitter	X	X	
CD2LPXAVP	X		Temp Transmitter	X	X	X
CD2LPXAVX	X		Temp Transmitter	X	X	
CD2XP2AVP		X	Temp Transmitter	X	X	X
CD2XP2AVX		X	Temp Transmitter	X	X	
CD2XPXAVP			Temp Transmitter	X	X	X
CD2XPXAVX			Temp Transmitter	X	X	

Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH Sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
TS2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
THS2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with HO2 Series outdoor humidity sensors.
**For use on temperature transmitter models only.

CD2E

Economy Duct Mount CO_2 Sensor from Veris

CD2E

Veris CD2E is an Economy Duct Mount CO2 Sensor for monitoring air quality.

This device is an active sensor that converts a measurement into 4-20 mA, 0 to 5 Vdc or 0 to 10 Vdc output.

Economy Sensor

Competitively priced sensors, ideal for bid-spec

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Self-calibrating

Innovative self-calibration algorithm…easy to maintain

Field selectable

Field-selectable outputs for operation flexibility

Dual-beam NDIR CO2 sensor

Dual-beam, non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value…high accuracy measurement

Specifications

Operating & Storage Environment	
Operating Temp. Range	0 to 50 °C (32 to 122 °F)
Operating Humidity Range	0 to 95% RH (non-condensing)
Storage Temp. Range	-25 to 70 °C (-13 to 158 °F)
Storage Humidity Range	0 to 95% RH (non-condensing)
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	4 VA at 24 Vac
Tube Length	200 mm
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP 65
Protection Class	Class III
CO_2 Sensor	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000/5000 ppm (selectable)
Accuracy	±30 ppm ±3% of measured value
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change
Calibration	Field calibration support
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG
Warranty	
Limited Warranty	5 years

Applications

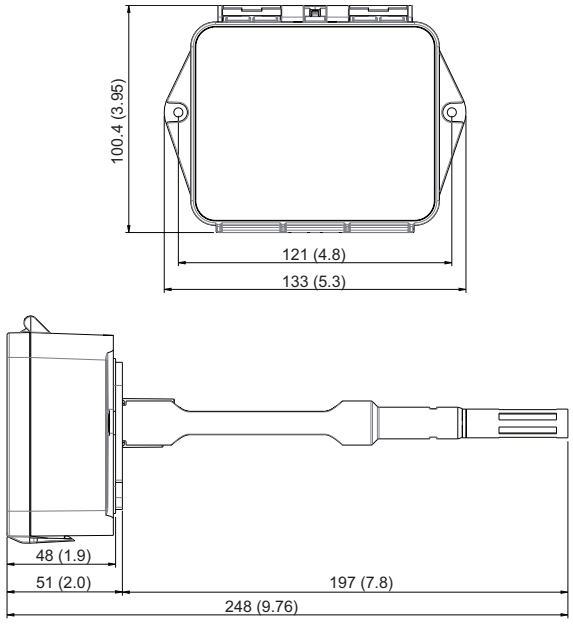
- HVAC systems
- Indoor air quality monitoring
- Life sciences applications
- Key component for the LEED green building program and WELL Building Standard*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

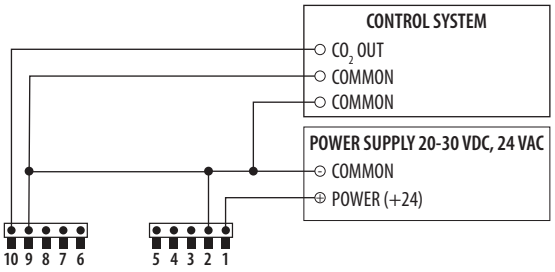
Compliance Information	
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class A REACH, RoHS, RoHS 2 (China), RCM (Australia), ICES-003 (Canada), UKCA (UK)

Dimensional Drawing

mm (in.)



Wiring Diagram

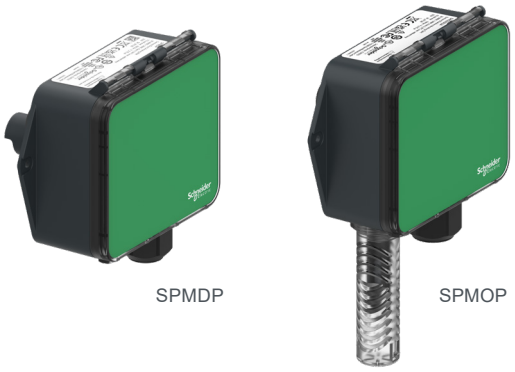


Ordering Information

Part Number	Description
CD2E	CO_2 transmitter, analog

SpaceLogic Sensors
SPMDP & SPMOP

Duct or Outdoor Mount PM Sensors



SPMDP SPMOP

The SpaceLogic SPMDP and SPMOP Particulate Matter (PM) Sensors represent a technological breakthrough in optical PM sensors. This laser-scatter type sensor detects and counts particles using light scattering principles and features innovative contamination resistance technology to perform highly accurate and reliable PM measurements. These sensors are designed for use in duct mount (SPMDP) or outdoor (SPMDO)applications.

Over a ten-year lifetime, these sensors provide superior precision measurement of numerous PM types and higher-resolution particle size binning, allowing for the detection of many types of environmental dust and other particles.

The detection concentration range is 0 to 1,000 µg/m³

These versatile sensors offer selectable PM measurement options of PM1.0, PM2.5, PM4.0 and PM10.

Highly accurate

Innovative contamination resistance technology for highly accurate measurement of particulate matter

Reliable

Laser-based, light scattering particle sensing with 10-year expected lifetime

Versatile

Selectable PM measurement options of PM1.0/2.5/4.0/10

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Selectable output

Analog DIP switch selectable output: 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc

LEED & WELL

Assists with LEED and WELL certification*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

Applications

- Air quality monitoring
- HVAC

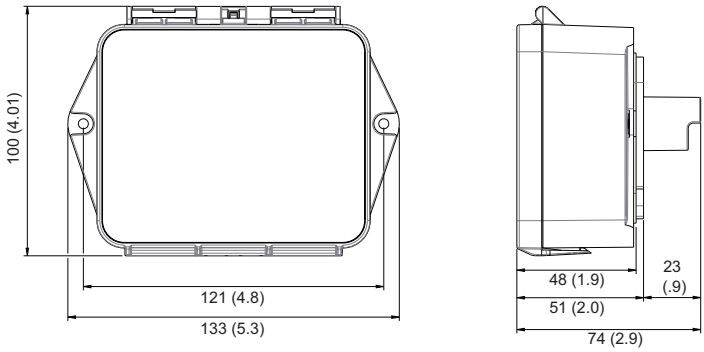
Specifications

Operating & Storage Environment	
Operating Temp. Range	-10 to 60 °C (14 to 140 °F)
Operating Humidity Range	0 to 95% RH (non-condensing)
Storage Temp. Range	-40 to 60 °C (-40 to 140 °F)
Storage Humidity Range	0 to 95% RH (non-condensing)
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	3.7 VA
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	PMDP: For indoor use only. Not suitable for wet locations. PMOP: For outdoor use.
IP Rating	IP65
Protection Class	Class III
PM Sensor	
Sensor Type	Laser-scatter
Particulate Size	PM1.0, PM2.5, PM4.0, PM10
Resolution	± 1 µg/m³
Mass Concentration Output Range	0 to 1000 µg/m³
Accuracy*	PM 1.0 and PM 2.5: ±5 ug/m³ (+5% measured value), ±10% (100 to 1000 µg/m³) PM 4.0 and PM 10**: ±25 µg/m³ (0 to 100 µg/m³), ±25% (100 to 1000 µg/m³)
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16- 24 AWG
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1 EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class A REACH, RoHS, RoHS 2 (China), RCM (Australia), ICES-001 (Canada), UKCA (UK)

*Sensor-to-sensor variation.
**PM4.0 and PM10 output values are calculated based on the distribution profile of all measured particles.

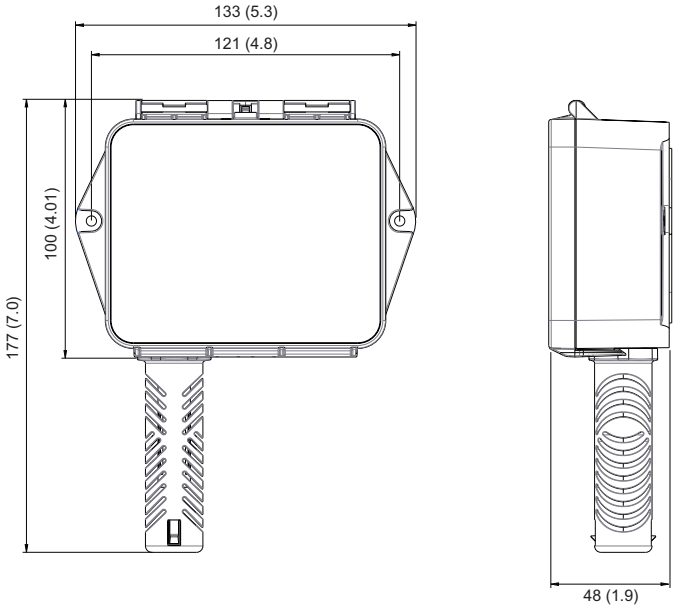
SPMDP

Dimensional Drawing - mm (in.)



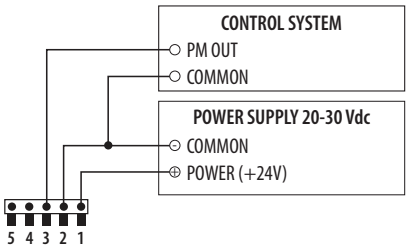
SPMOP

Dimensional Drawing - mm (in.)



Wiring Diagram

Voltage and Current Modes



Ordering Information

Installation		Output
SPM	☐	P
O = Outdoor Wall Mount D = Duct Mount		P = PM1.0/2.5/4.0/10 selectable

Example: SPM O P

PMDP & PMOP

Duct or Outdoor Mount PM Sensors from Veris

PMOP

PMDP

Veris PMDP and PMOP Particulate Matter (PM) Sensors represent a technological breakthrough in optical PM sensors. This laser-scatter type sensor detects and counts particles using light scattering principles and features innovative contamination resistance technology to perform highly accurate and reliable PM measurements. These sensors are designed for duct mount (PMDP) or outdoor (PMOP) applications.

Over a ten-year lifetime, these sensors provide superior precision measurement of numerous PM types and higher-resolution particle size binning, allowing for the detection of many types of environmental dust and other particles.

The PMDP and PMOP detection concentration range is 0 to 1,000 µg/m³ and is intended for duct or outdoor mounting.

This versatile sensor offers selectable PM measurement options of PM1.0, PM2.5, PM4.0 and PM10.

Highly accurate

Innovative contamination resistance technology for highly accurate measurement of particulate matter

Reliable

Laser-based, light scattering particle sensing with 10-year expected lifetime

Versatile

Selectable PM measurement options of PM1.0/2.5/4.0/10

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Selectable output

Analog DIP switch selectable output: 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc

LEED & WELL

Assists with LEED and WELL certification*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

Applications

- Air quality monitoring
- HVAC

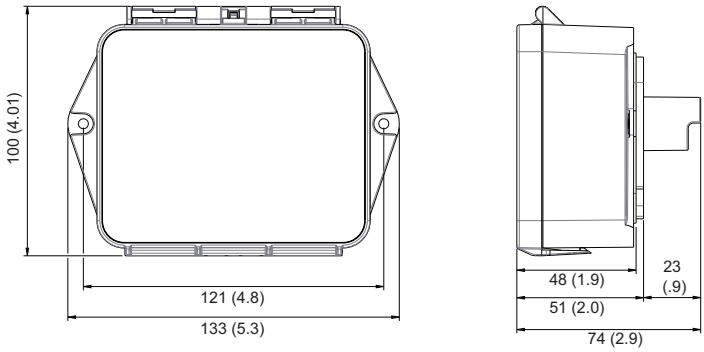
Specifications

Operating & Storage Environment	
Operating Temp. Range	-10 to 60 °C (14 to 140 °F)
Operating Humidity Range	0 to 95% RH (non-condensing)
Storage Temp. Range	-40 to 60 °C (-40 to 140 °F)
Storage Humidity Range	0 to 95% RH (non-condensing)
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	3.7 VA
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	PMDP: For indoor use only. Not suitable for wet locations. PMOP: For outdoor use.
IP Rating	IP65
Protection Class	Class III
PM Sensor	
Sensor Type	Laser-scatter
Particulate Size	PM1.0, PM2.5, PM4.0, PM10
Resolution	± 1 µg/m³
Mass Concentration Output Range	0 to 1000 µg/m³
Accuracy*	PM 1.0 and PM 2.5: ±5 ug/m³ (+5% measured value), ±10% (100 to 1000 µg/m³) PM 4.0 and PM 10**: ±25 µg/m³ (0 to 100 µg/m³), ±25% (100 to 1000 µg/m³)
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16- 24 AWG
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1 EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class A REACH, RoHS, RoHS 2 (China), RCM (Australia), ICES-001 (Canada), UKCA (UK)

*Sensor-to-sensor variation.
**PM4.0 and PM10 output values are calculated based on the distribution profile of all measured particles.

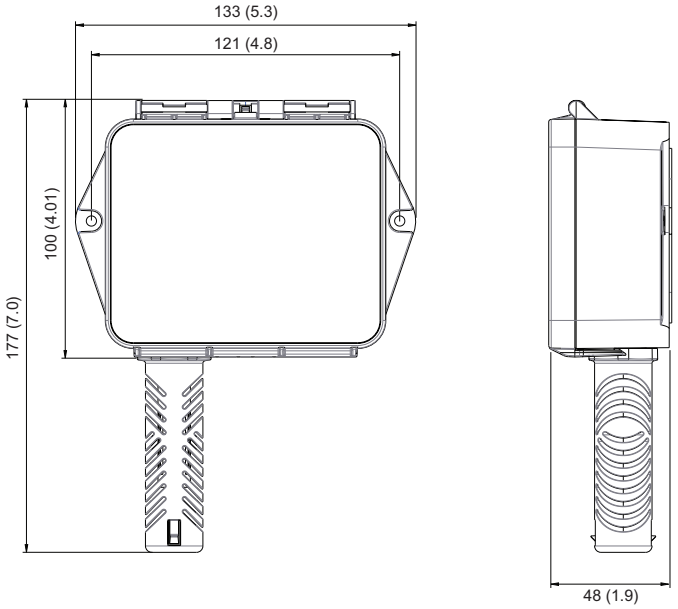
PMDP

Dimensional Drawing - mm (in.)



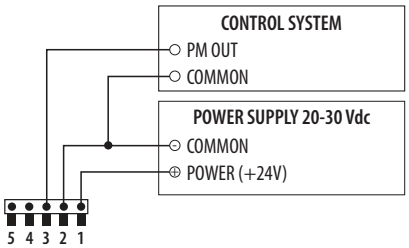
PMOP

Dimensional Drawing - mm (in.)



Wiring Diagram

Voltage and Current Modes



Ordering Information

	Installation	Output
PM	☐	P
	O = Outdoor Wall Mount D = Duct Mount	P = PM1.0/2.5/4.0/10 selectable

Example: PM O P

GWN

Modular Gas Sensor Platform Accepts AG Series Gas Sensors from Veris

GWN

AGAE Enclosure
(sold separately)

The Veris GWN Series platform offers a convenient means for sensing gases in the environment. The GWN is mounted to any single-gang electrical box and wired to the building controller. Then, a single AGxx gas sensor (sold separately) is installed in the GWN. With this design, there is no need for a costly new installation when a sensor reaches the end of its life. The GWN platform remains installed, and the installer simply opens the GWN housing to replace the modular sensor inside, reducing labor costs and downtime.

AG Series sensors can be swapped in the GWN platform at any time with minimal effort. The GWN platform converts the signal from the AG sensor into an analog or relay signal compatible with building control systems.

The available AGAE metal enclosure (sold separately) provides a modular solution for applications that require a rugged enclosure along with an integral audible horn and 10 A relay for direct fan control.

Modular design

Modular platform accepts Veris AG Series sensors (sold separately)…no need to install a new GWNP when the sensor life wears out

Wide options

Interface to control system via 4 to 20 mA with relay, 0 to 5 / 0 to 10 Vdc with relay, or relay only options…application flexibility

LEDs

Three colored LEDs - red, yellow and green - for easy status viewing

No calibration

No calibration required...easy maintenance and worry-free

Microprocessor based

Microprocessor controlled… excellent stability operation

Versatile interface

Interface to DDC systems or direct fan control

Applications

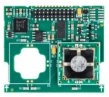
- Parking garage ventilation
- Air quality compliance
- Vehicle bays (ambulance/fire/taxi)
- Mechanical rooms
- Sally ports

Specifications

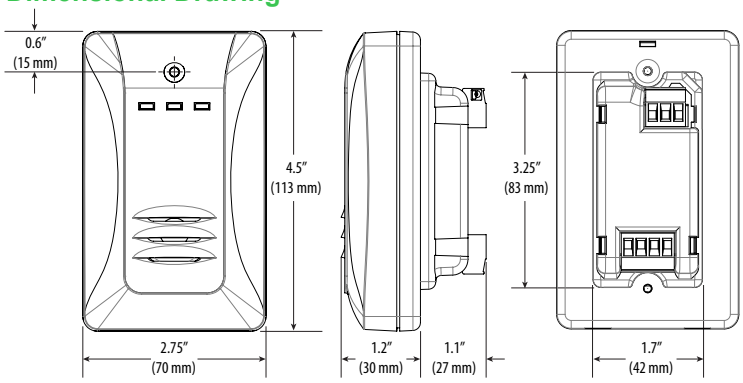
Input Power	15 to 30 Vdc/24 Vac ±20%, Class 2, 50/60Hz, max. 60 mA
Relay Ratings	1A/30 Vac/dc, normally open
Operating Temperature Range	-20 to 50 °C (-4 to 122 °F)
Operating Humidity Range	0 to 90% RH non-condensing
Terminal Block Wire Size	30 to 12 AWG
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
Protection Class (self-evaluated)	IP20
Warranty	
Limited Warranty	5 years*
Compliance information	
Agency Approvals	Intertek ETL Listed to UL 61010-1

The GWN operates only when an AG Series gas sensor is installed (sold separately). Accuracy, sensitivity, setpoints, and measurement range are dependant on the AG Series sensor connected to the GWN platform. See the AG Series sensor installation guide for details.

* The AG Series gas sensors are warranted for two years from the date of manufacture. The AG Series sensors are not included in the five-year GWN warranty.

	 AG01 CO Sensor	 AG01E CO Sensor	 AG02 NO_2 Sensor	 AG05 R134a Refrigerant Sensor	 AG06 R410a Refrigerant Sensor
Sensor Type	Electrochemical	Electrochemical	Electrochemical	Non-dispersive infrared	Non-dispersive infrared
Measurement Range	0 to 300 ppm	0 to 500 ppm	0 to 15 ppm	0 to 2000 ppm	0 to 2000 ppm
Accuracy	±3% of range	±5% of range	±5% of range at 25 °C	±2% of range (60 to 2000 ppm)	±2% of range (60 to 2000 ppm)
Analog Output Scaling	0 to 200 ppm	0 to 500 ppm	0 to 15 ppm	0 to 2000 ppm	0 to 2000 ppm
Resolution	1 ppm	1 ppm	0.1 ppm	1 ppm	1 ppm
Sensor Warranty	2 years from manufacture date	2 years from manufacture date	2 years from manufacture date	2 years from manufacture date	2 years from manufacture date
Low Setpoint Value	25 or 35 ppm (switch selectable)	25 or 35 ppm (switch selectable)	1 ppm (fixed)	100 ppm (fixed)	100 ppm (fixed)
High Setpoint Value	180 ppm (fixed)	180 ppm (fixed)	3 ppm (fixed)	500 ppm (fixed)	500 ppm (fixed)
Operating Temperature Range	-20 to 50 °C (-4 to 122 °F)	-20 to 40 °C (-4 to 104 °F)	-20 to 50 °C (-4 to 122 °F)	-20 to 50 °C (-4 to 122 °F)	-20 to 50 °C (-4 to 122 °F)
Operating Humidity Range	0 to 90% RH non-condensing	0 to 90% RH non-condensing	0 to 90% RH non-condensing	0 to 90% RH non-condensing	0 to 90% RH non-condensing

Dimensional Drawing



Ordering Information – Platform

GWN* [ ] X X [ ]

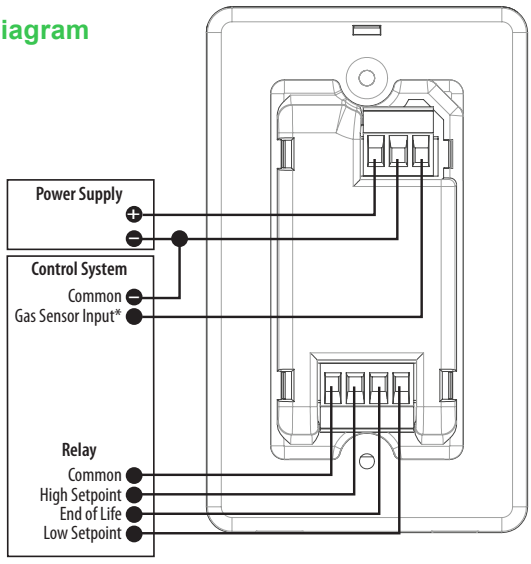
Output:
- V = Field-selectable, 0-5/0-10 Vdc with relay
- M = 4 to 20 mA with relay
- 1 = Relay only

Housing Color:
- Blank = Black
- W = White

Example: GWN M X X W

*The GWN will not operate without an AG Series sensor installed. Sensors are sold separately.

Wiring Diagram



** Not available on relay only models.*

Ordering Information – Required Sensors

Model	Description
AG01	CO sensor, 3% accuracy. CO sources include exhaust from gasoline powered engines, furnaces, water heaters and generators.
AG01E	CO sensor, 5% accuracy. CO sources include exhaust from gasoline engines, furnaces, water heaters and generators
AG02	NO_2 sensor. NO_2 sources include exhaust from diesel powered engines and generators.
AG05	R134a sensor. R134a is a refrigerant used in HVAC applications.
AG06	R410a sensor. R410a is a refrigerant used in HVAC applications.

Note: See Specifications section for AG sensor warranty details.

Ordering Information – Accessory Enclosure

Model	Description
AGAE	Metal wall mount enclosure for the GWN gas platform with audible horn and 10 A relay

GWNP

Modular Gas Sensor Platform Accepts AG Series Gas Sensors from Veris

GWNP

AGPE Enclosure (sold separately)

The Veris GWNP Series protocol communications platform offers a convenient means for sensing gases in the environment. The GWNP is mounted to any single-gang electrical box and wired to the building controller. Then, a single AGxx gas sensor (sold separately) is installed in the GWNP. With this design, there is no need for a costly new installation when a sensor reaches the end of its life. The GWNP platform remains installed, and the installer simply opens the GWNP housing to replace the modular sensor inside, reducing labor costs and downtime.

AG Series sensors can be swapped in the GWNP platform at any time with minimal effort. The GWNP platform converts the signal from the AG sensor into protocol communications compatible with building control systems.

The available AGPE metal enclosure (sold separately) provides a modular solution for applications that require a rugged enclosure along with an integral audible horn and 10 A relay for direct fan control.

Specifications

Input Power	15 to 30 Vdc/24 Vac ±20%, Class 2, 50/60Hz, max. 60 mA
Relay Ratings	1A/30 Vac/dc, normally open
Operating Temperature Range	-20 to 50 °C (-4 to 122 °F)
Operating Humidity Range	0 to 90% RH non-condensing
Terminal Block Wire Size	30 to 12 AWG
Protocol	BACnet and Modbus (selectable)
Terminal Block Torque	0.5 to 0.6 N-m (0.37 to 0.44 in-lbf)
Protection Class (self-evaluated)	IP20
Warranty	
Limited Warranty	5 years*
Compliance Information	
Agency Approvals	Intertek ETL Listed to UL 61010-1

Intertek

The GWNP operates only when an AG Series gas sensor is installed (sold separately). Accuracy, sensitivity, setpoints, and measurement range are dependant on the AG Series sensor connected to the GWNP platform. See the AG Series sensor installation guide for details.

* The AG Series gas sensors are warranted for two years from the date of manufacture. The AG Series sensors are not included in the five-year GWNP warranty.

Communication

Interface to control system via BACnet and Modbus protocols. BTL certified.

Microprocessor based

Microprocessor controlled for excellent stability

Modular platform

Modular platform accepts Veris AG Series sensors (sold separately)…no need to install a new GWNP when the sensor life wears out

No calibration

No calibration required…easy maintenance and worry-free operation

LEDs

Three colored LEDs - red, yellow and green - for easy status viewing

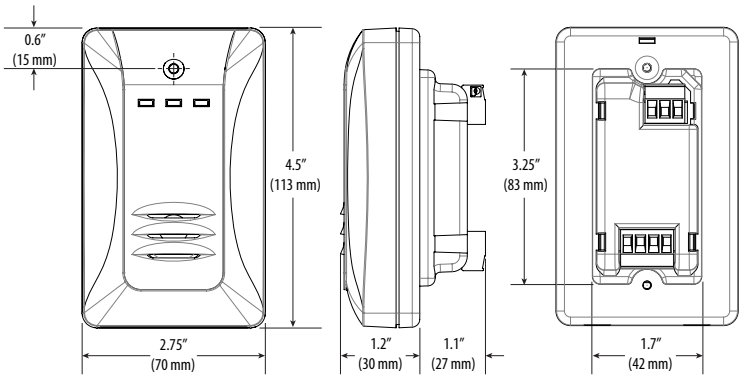
Versatile interface

Interface to DDC systems or direct fan control

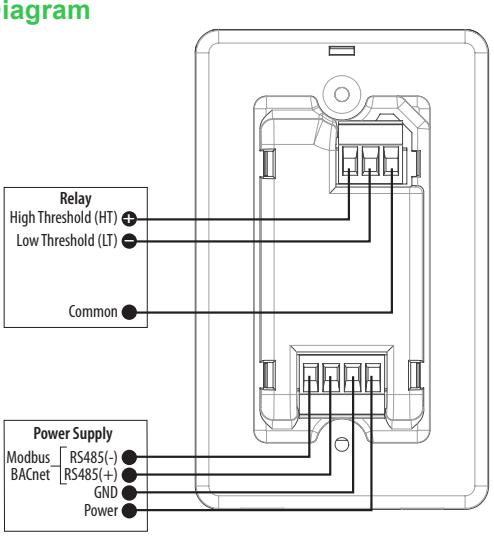
Applications

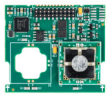
- Parking garage ventilation
- Air quality compliance
- Vehicle bays (ambulance/fire/taxi)
- Mechanical rooms
- Sally ports

Dimensional Drawing



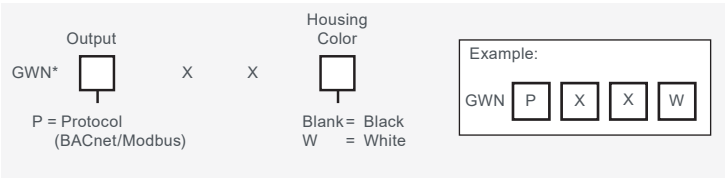
Wiring Diagram



	 AG01 CO Sensor	 AG01E CO Sensor	 AG02 NO_2 Sensor	 AG04* CO & NO_2 Sensor	 AG05 R134a Refrig. Sensor	 AG06 R410a Refrig. Sensor
Sensor Type	Electrochemical	Electrochemical	Electrochemical	CO: Electrochemical NO_2: Electrochemical	Non-dispersive infrared	Non-dispersive infrared
Measurement Range	0 to 300 ppm	0 to 500 ppm	0 to 15 ppm	CO: 0 to 500 ppm NO_2: 0 to 20 ppm	0 to 2000 ppm	0 to 2000 ppm
Accuracy	±3% of range	±5% of range	±5% of range at 25 °C	CO: ±5% of range NO_2: ±5% of range	±2% of range (60 to 2000 ppm)	±2% of range (60 to 2000 ppm)
Analog Output Scaling	0 to 200 ppm	0 to 500 ppm	0 to 15 ppm	N/A	0 to 2000 ppm	0 to 2000 ppm
Resolution	1 ppm	1 ppm	0.1 ppm	CO: 1 ppm NO_2: 0.1 ppm	1 ppm	1 ppm
Sensor Warranty	2 years from manufacture date	2 years from manufacture date	2 years from manufacture date	2 years from manufacture date	2 years from manufacture date	2 years from manufacture date
Low Setpoint Value	25 or 35 ppm (switch selectable)	25 or 35 ppm (switch selectable)	1 ppm (fixed)	CO: 25 ppm (default)** NO_2: 1 ppm (default)**	100 ppm (fixed)**	100 ppm (fixed)**
High Setpoint Value	180 ppm (fixed)	180 ppm (fixed)	3 ppm (fixed)	CO: 180 ppm (default)** NO_2: 3 ppm (default)**	500 ppm (fixed)**	500 ppm (fixed)**
Operating Temp. Range	-20 to 50 °C (-4 to 122 °F)	-20 to 40 °C (-4 to 104 °F)	-20 to 50 °C (-4 to 122 °F)	-20 to 40 °C (-4 to 104 °F)	-20 to 50 °C (-4 to 122 °F)	-20 to 50 °C (-4 to 122 °F)
Operating Humidity Range	0 to 90% RH non-condensing	0 to 90% RH non-condensing	0 to 90% RH non-condensing	0 to 90% RH non-condensing	0 to 90% RH non-condensing	0 to 90% RH non-condensing

*The AG04 sensor works only with GWNP (protocol output) Series gas platform devices. The AG04 will not work with GWNM, GWNV or GWN1 versions of the GWN Series.
**Low and high level setpoint can be adjusted between 0 and top of range if used with a GWNP (protocol) gas platform.

Ordering Information – Platform



*The GWNP will not operate without an AG Series sensor installed.
Sensors are sold separately.

Ordering Information – Required Sensors

Model	Description
AG01	CO sensor, 3% accuracy. CO sources include exhaust from gasoline powered engines, furnaces, water heaters and generators.
AG01E	CO sensor, 5% accuracy. CO sources include exhaust from gasoline engines, furnaces, water heaters and generators
AG02	NO_2 sensor. NO_2 sources include exhaust from diesel powered engines and generators.
AG04	CO & NO_2 combination sensor. CO sources include exhaust from gasoline powered engines, furnaces, water heaters and generators. NO_2 sources include exhaust from diesel engines and generators
AG05	R134a sensor. R134a is a refrigerant used in HVAC applications.
AG06	R410a sensor. R410a is a refrigerant used in HVAC applications.

Note: See Specifications section for AG sensor warranty details.

Ordering Information – Accessory Enclosure

Model	Description
AGPE	Metal wall mount enclosure for the GWNP gas platform with audible horn and 10 A relay

UG-7-A6O Uniguard®

Optical Smoke Detector with Single High-Efficiency Sampling Tube

UG-7-A6O Series
with pickup tube installed

Smoke entering a duct system will be dispersed throughout the entire building. Uniguard duct detectors utilize the photoelectric sensing method and are designed to sense the existence of smoke in the duct. This housing design, along with the detector technology, is capable of detecting unsafe conditions by sampling the air in the duct. When smoke is detected, the Uniguard's relays provide a signal which may be used to turn off circulating fans, blowers and any other auxiliary devices that are connected to the system. This enables the management of hazardous smoke through the space being monitored by the duct detection arrangement.

This Uniguard comes in two models: UG-7-A6O-24V operates with 24 Vdc/ac and UG-7-A6O-120V with 120 Vac. Alarm and supervisory relay contacts are accessible to interface with a control panel, HVAC control, and multiple auxiliary functions including turning off the fan.

The Uniguard can be installed on any side of the duct.

The UG-7-A6O detector contains an intelligent controlling circuit. This circuit is adjusting the sensitivity to give an optimal function during the entire lifetime of the detector. When the controlling circuit can no longer compensate for contamination, a service alarm is indicated.

UG-7-A6O has a linking function that allows interconnection between a maximum of 100 units. The linking function can close dampers or stop fans further away in the ventilation system, before the smoke has reached the places were the linked detectors are installed. When one of the linked UG-7-A6O goes into smoke alarm, all other detectors' AUX relays are activated.

Specifications

Power Supply Voltage	UG-7-A6O-24V: 24 Vdc (-5/+20%) 24 Vac (±10%), 50-60 Hz UG-7-A6O-120V: 110-120 Vac, 50-60 Hz
Reset Time (by power down)	1 sec. max.
Power Up Time	1 min.
Sensitivity Test	Nominal sensitivity 0.96 to 1.20%/ft.

Efficient Sampling

Highly efficient single sampling tube

Adjustable

Automatic sensitivity adjustment. Multiple pickup tube lengths available.

Easy to Install

Single sampling tube allows quick installation. Device can be installed on any side of the duct.

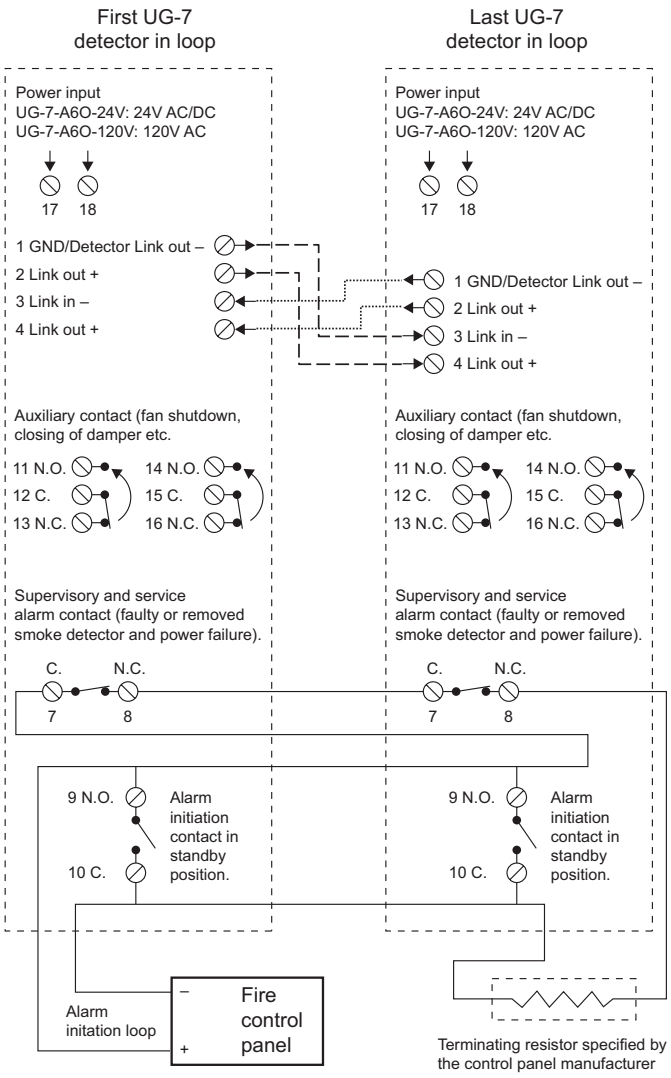
Applications

- Duct smoke detection in HVAC systems

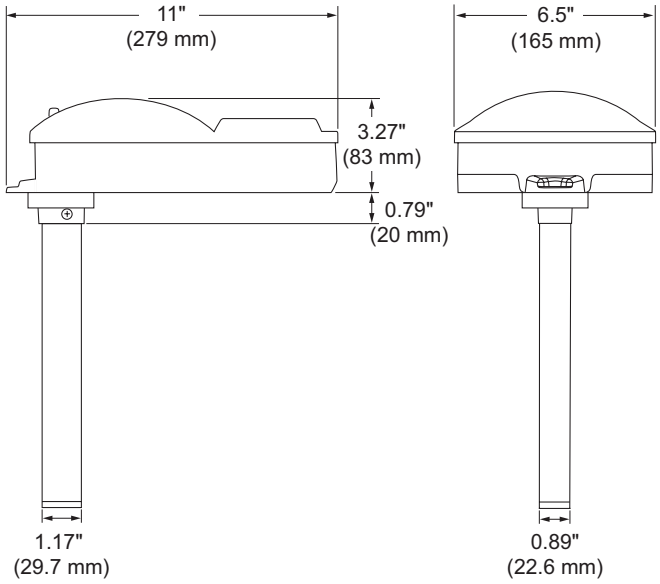
Max. Standby Current	UG-7-A6O-24V: 42 mA (DC mode), 82 mA (AC mode) UG-7-A6O-120V: 31 mA at 120 Vac
Max. Alarm Current	UG-7-A6O-24V: 83 mA (DC mode), 145 mA (AC mode) UG-7-A6O-120V: 42 mA at 120 Vac
Link Current	5 mA
Total Max. Auxiliary Current Output, Terminals 2 & 5	Without linked detectors: 30 mA With linked detectors: 25 mA
Operating Temperature	32 to 100 °F (0 to 38 °C)
Storage Temperature	-22 to 158 °F (-30 to 70 °C)
Humidity	0 to 95% RH
Duct Air Velocity Range	100 to 4000 ft/min (0.5 to 20.32 m/s)
Dimensions (L x W x D)	11 x 6.5 x 3.27" (279 x 165 x 83 mm)
Weight	1.04 kg
Air Sampling Tube	Aluminium, hole diameter 1.5" (38 mm)
Relay Contact Ratings	
Alarm Initiation Contacts (SPST)	1.0 A @ 24 Vdc (resistive) 1.0 A @ 120 Vac (resistive)
Supervisory Contacts (SPST)	1.0 A @ 24 Vdc (resistive) 1.0 A @ 120 Vac (resistive)
Alarm Auxiliary Contacts (DPDT)	10 A @ 30 Vdc (resistive) 10 A @ 250 Vac (resistive) ½ HP @ 240 Vac ¼ HP @ 120 Vac
Warranty	
Limited Warranty	2 years
Agency Approvals	
Agency Approvals	UL Signaling Listed: S24724 Fire Alarm Equipment Listed: California State Fire Marshall

SIGNALING UL LISTED

Wiring Diagram



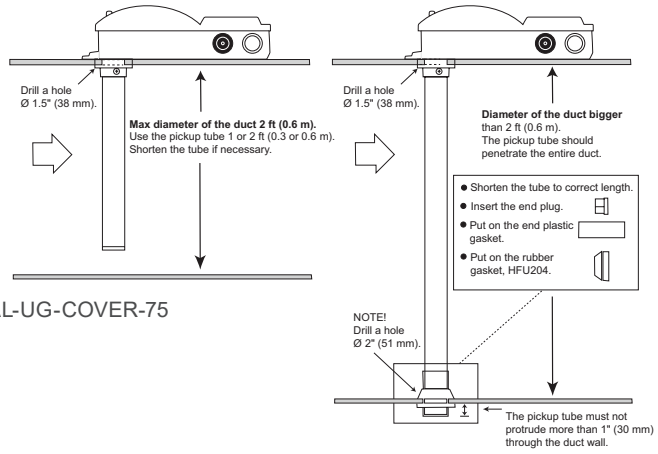
Dimensional Drawing



Air Pickup Tube

The air pickup tube has a continuous pickup along its entire length. The length of the pickup tube is chosen based on the width of the ventilation duct. Pickup tubes are available in four lengths: 1, 2, 5 and 9 ft (0.3, 0.6, 1.5 and 2.8 m). When the ventilation duct is wider than Ø 2 ft (0.6 m), the pickup tube should penetrate the whole duct. See diagram below.

Hole diameter 1.5” (38 mm).



CAL-UG-COVER-75

Ordering Information

Model	Description
CAL-UG-7-A6O-24V*	SMOKE,DUCT,24V,UL
CAL-UG-7-A6O-120V*	SMOKE,DUCT,120V,UL
CAL-ST1	SMOKE,ACCY,PICKUP TUBE,1FT
CAL-ST2	SMOKE,ACCY,PICKUP TUBE,2FT
CAL-ST5	SMOKE,ACCY,PICKUP TUBE,5FT
CAL-ST9	SMOKE,ACCY,PICKUP TUBE,9FT
CAL-UG-MB-75	SMOKE,ACCY,MOUNTING BRACKET
CAL-UG-COVER-75	SMOKE,ACCY,CONDENSATION COVER

*Pickup tube not included. Pickup tube ordered separately.

CAL-UG-MB-75
Mounting Bracket

CAL-STx
Pickup Tube

CAL-UG-COVER-75
Condensation Cover

Accessories Selection Guide: Air Quality/Gas Detection

Product	Description	CD	CDE	GWN	GWNP
CO_2 Monitoring					
AA01*	CO_2 Calibration Kit, Includes 16-Liter "Zero" Gas, Regulator Valve, Carrying Case & Tubing Kit	•	•		
AA26*	17-Liter CO_2 Span Calibration Gas (2000 ppm) — Replacement Disposable Bottles	•	•		
AA27*	103-Liter CO_2 Span Calibration Gas (2000 ppm) — Replacement Disposable Bottles	•	•		
AA28*	17 liter CO_2 Zero Calibration Gas — Disposable Replacement Bottles	•	•		
AA29*	103 liter CO_2 Zero Calibration Gas — Disposable Replacement Bottles	•	•		
CO Monitoring					
AA32	CO Test Verification Kit, 17 Liter			•	•
AA37	CO Gas 100 PPM 17-Liter Disposable Replacement Gas (Requires Regulator Valve AA40)			•	•
AA38	CO Gas 100 PPM 103-Liter Disposable Replacement Gas (Requires Regulator Valve AA41)			•	•
AA39	CO Test Verification Kit, 103 Liter			•	•

*SCD2, CD2 and CD2E do not use gas for field calibration.

AA01
CO2 Calibration Kit, Includes 16-Liter “Zero” Gas, Regulator Valve, Carrying Case & Tubing Kit

AA26
17-Liter CO_2 Span Calibration Gas (2000 ppm) - Disposable Replacement Bottles

AA27
103-Liter CO_2 Span Calibration Gas (2000 ppm) - Disposable Replacement Bottles

AA38
CO Gas 100 PPM 103 Liter Replacement Disposable Gas (Requires Regulator Valve AA41)

AA39
Carbon Monoxide Test Verification Kit 103 Liter

AA40
Regulator Valve for 17-Liter Bottle

AA41
Regulator Valve for 103-Liter Bottle

Flow Monitoring

Schneider Electric offers an extensive range of Badger Meter devices for monitoring flow and the transfer of thermal energy in liquids. Our impeller models are available in insertion and tee styles for installation flexibility, including hot tap models for your convenience. Several non-impeller designs are also available, including an ultrasonic meter for sensing without cutting into a pipe, an electromagnetic meter for slurries, a nutating disc meter for industrial applications, and a turbine meter for long term service. We also carry a selection of transmitters and monitors, making us a “one-stop shop” for all your flow monitoring needs.

Flow Sensor Selection Guide

Flow Sensors

	Insert	Metal Tee
Basic Model	220x, 228x page 89	228x, 250x pages 89, 90
Hot Tap Capability	SDI page 87	
BTU Measurement		380 page 91
Small Diameter Impeller	SDI page 87	
Built-in Transmitter	SDI page 87	

Transmitters and Monitors

	Analog Output	Scaled Pulse Output	Protocol Output
Transmitter	310 page 93	320 page 93	
Transmitter with BTU Calculation	340 page 93		340 page 93
Flow Monitor with LCD Display	3000 page 107	3000 page 107	3000 page 107
Ultrasonic Flow Monitor with LCD Display and BTU Calculation	3050 page 107	3050 page 107	3050 page 107

Speciality Meters

Non-Impeller Styles	Electromagnetic page 95	Nutating Disc page 99	Turbine page 101	Ultrasonic page 97	Vortex Shedding page 105

SDI Series

For Pipe Sizes 1-½” to Over 36”

Direct Insert Version
(shown in special order brass)

Hot Tap Version

NEMA 4 housing

Rugged and weather-proof

Highly durable

Stainless steel impeller, tungsten carbide shaft and Torion® bearing

Multiple outputs

Scaled pulse and 4 to 20 mA output available

Material options

Other materials available. See chart, next page.

Fewer leaks

Viton® O-ring seal standard

The direct insert style liquid flow sensor with stainless steel/PPS plastic or PEEK plastic tip combines flow sensing with a built-in transmitter for an all-in-one flow measuring system. This device fits all 1-1/2” to over 36” (38 to 915 mm) pipes, and it is intended for direct installation into the pipe through a 1” NPT hole.

This sensor is available with or without hot tap capability. In the hot tap installation, the sensor is mounted in the pipe under pressure by attaching a service saddle or weld-on fitting to the pipe. Then the sensor assembly is attached to an isolation valve and extended into the pipeline to measure flow. Hot tap installations are often required in retrofit projects, but even in new construction, a hot tap sensor can be desirable for service considerations.

Software and programming cable are required to operate these meters. If the meter will be used for hot tap installation, the BGR-8A1027 tool is also needed (see Ordering Information).

Applications

- Flow measuring projects
- True hot tap installations
- BTU applications (requires temperature sensors and transmitter/monitor)

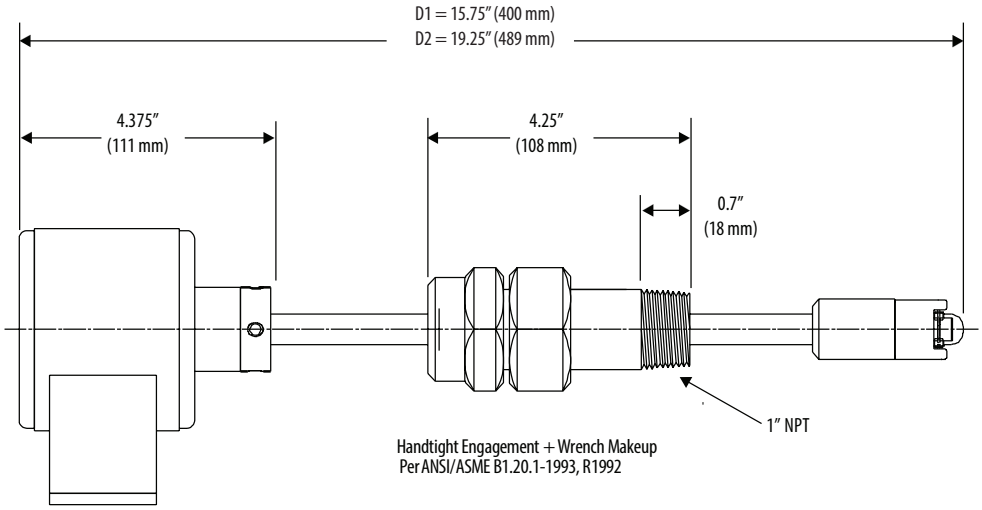
Specifications

Recommended Design Flow Range	0.3 to 20 ft./sec
Pressure Rating	1000 psi @ 21 °C (70 °F)
Maximum Temp Rating	135 °C (300 °F)
Operating Temperature	Electronics: 20 to 65 °C (14 to 150 °F)
Pressure Drop	0.5 psi or less @ 10 ft/sec for all pipe sizes 1.5” diameter and up
Accuracy	±1% of rate over optimum flow range*
Repeatability	±0.5%
Warranty	
Limited Warranty	1 year

* ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.

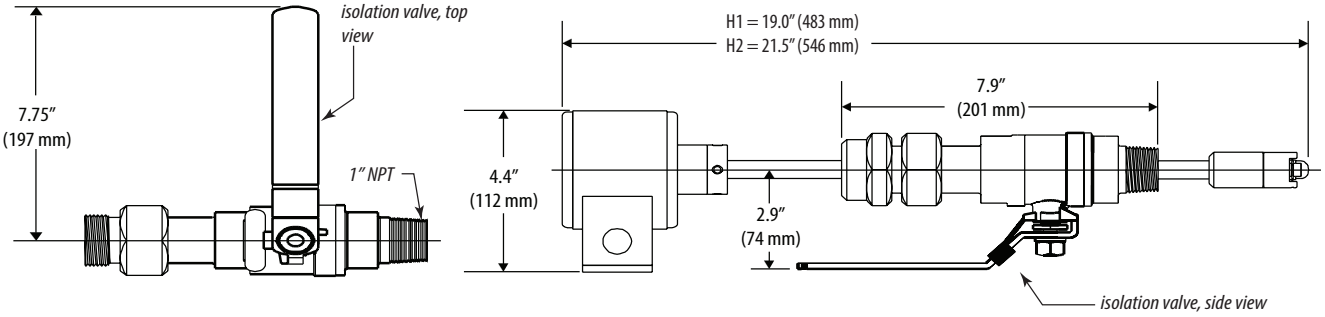
Direct Insert

Dimensional Drawing



Hot Tap

Dimensional Drawing



Ordering Information

	Material*	Type	Electronic Housing	Output*	Display		O-Ring*	Shaft	Impeller	Bearing
BGR-8SDI	0		N			-	0	2	0	0
	0 = Stainless steel/ PPS plastic tip	D1 = Direct insert for pipe 1.5 to 10" D2 = Direct insert for pipe 12 to 36" H1 = Hot tap for pipe 1.5 to 10" H2 = Hot tap for pipe 12 to 36"	N = NEMA 4x	0 = Frequency (standard) 1 = Analog 4 to 20 mA 2 = Scaled pulse	0 = No display 1 = LCD option (requires output option 1 or 2)		0 = Viton®	2 = Tungsten carbide	0 = Stainless steel	0 = Torlon®

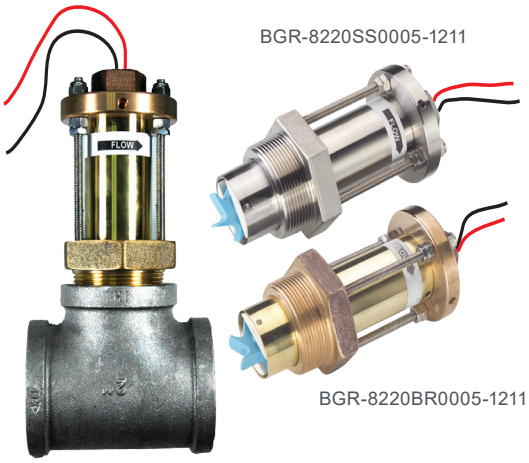
Example:

BGR-8SDI	0	D1	N	2	0	-	0	2	0	0

*Alternate materials such as brass, bi-directional output, alternate O-rings and alternate shaft materials are available as a special order. Consult sales team for specific options available.

220x & 228x Series

For Pipe Sizes 3” to Over 40”



Insert-style liquid flow sensors with brass or stainless steel sleeves fit pipe sizes from 3” to 40” (77 to 1016 mm). These sensors can be purchased with a bronze or iron tee. Sensor output is a frequency that indicates flow rate. Used in conjunction with a compatible flow monitor or transmitter, these non-magnetic flow sensors provide an accurate reading of the rate of liquid flow, as well as total accumulated flow.

Specifications

Temperature Rating	105 °C (221 °F) continuous
Pressure Rating	At 38 °C (100 °F) Insert: 400 psi; brass tee: 200 psi; iron tee: 175 psi
Recommended Design Flow Range	0.5 to 30 ft/sec (0.15 to 9 m/sec); initial detection below 0.3 ft/sec
Wetted Materials	UHMW-PE bearing, polyamide impeller, tungsten carbide shaft, EPDM O-rings
Accuracy	1% F.S. over recommended design flow range; ±4% of reading within calibration range*
Repeatability	±0.3% of full scale over recommended design flow range*
Linearity	±0.2% of full scale over recommended design flow range*
Output Frequency	3.2 Hz to 200 Hz
Output Pulse Width	5 ms ±25%
Warranty	
Limited Warranty	1 year

* ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.

2000 ft signal travel

Signal can travel up to 2000 ft (609 m) between the sensor and the display unit without the need for amplification

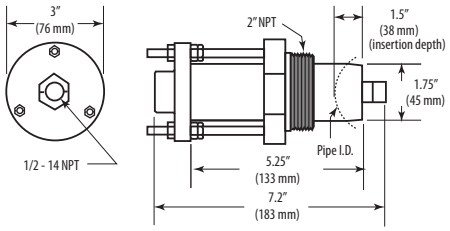
Non-magnetic sensing

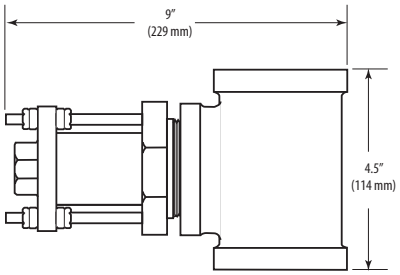
Six-bladed impeller design with a proprietary, non-magnetic sensing mechanism for high accuracy and repeatability. Forward-swept impeller is less prone to fouling by water-borne debris…reliable performance with minimal downtime.

Cable options

Supplied with 20 ft (6 m) of 2-conductor AWG 20 UL type PTLC cable (105 °C rated)

Dimensional Drawings





Ordering Information

Model #	Manuf. Part #	Description
BGR-8220BR0005-1211	8220BR0005-1211	Flow, Sensor, Insert, Brass Sleeve, 3” to 40” (77 to 1016 mm) pipe
BGR-8220SS0005-1211	8220SS0005-1211	Flow, Sensor, Insert, SS Sleeve, 3” to 40” (77 to 1016 mm) pipe
BGR-8228BR2005-1211	8228BR2005-1211	Flow, Sensor, Insert, Brass, 2” Brass Tee
BGR-8228CB2005-1211	8228CB2005-1211	Flow, Sensor, Insert, Brass, 2” Iron Tee
BGR-8228BR2505-1211	8228BR2505-1211	Flow, Sensor, Insert, Brass, 2.5” Brass Tee

250x Series

For Pipe Sizes ½” to 1½” NPT

BGR-8250BR0505-1211

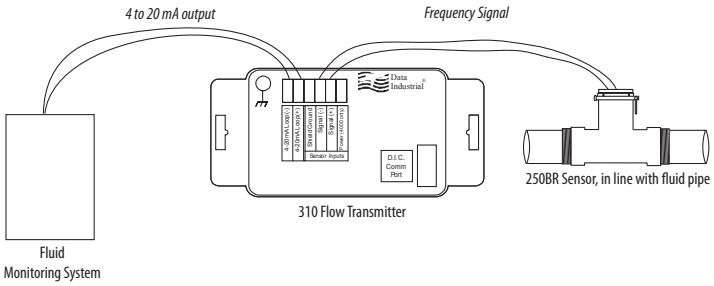
Metal tee-style liquid flow sensor with cast brass housing fits ½” to 1½” NPT. These sensors are accurate, even at low flow rates. Use in conjunction with a flow monitor or transmitter for a complete flow monitoring system.

Specifications

Maximum Pressure	At 38 °C (100 °F) 400 psi; at 105 °C (221 °F) 325 psi
Wetted Materials	UHMW-PE bearing, polyamide impeller, tungstencarbide shaft, EPDM O-rings
Recommended Flow	0.3 to 15 ft/sec (0.09 to 4.5 m/sec)
Accuracy	±1.0% of rate
Repeatability	±0.7% over recommended design flow range*
Linearity	±0.7% over recommended design flow range*
Rangeability	60:1
Output Frequency	0.8 to 80 Hz
Warranty	
Limited Warranty	1 year

* ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.

Application Example



2000 ft signal travel

Signal can travel up to 2000 ft (609 m) between the sensor and the display unit without the need for amplification

No amplification

Signal can travel up to 2000 ft (609 m) between the sensor and the display unit without the need for amplification

Ideal for low flow rates

Operation and repeatability even at low flow rates

Cable options

Supplied with 20 ft (6 m) of 2-conductor AWG 20 UL type PTLC cable (105 °C rated)

Non-magnetic sensing

Six-bladed impeller design with a proprietary, non-magnetic sensing mechanism for high accuracy and repeatability. Forward-swept impeller is less prone to fouling by water-borne debris…reliable performance with minimal downtime.

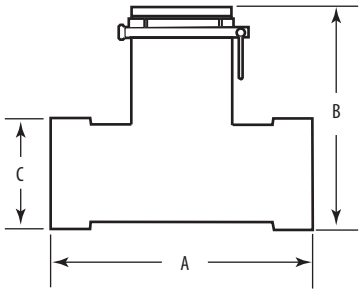
Highly durable

PPS electronics housing

Applications

- Measuring liquid flow rates

Dimensional Drawing



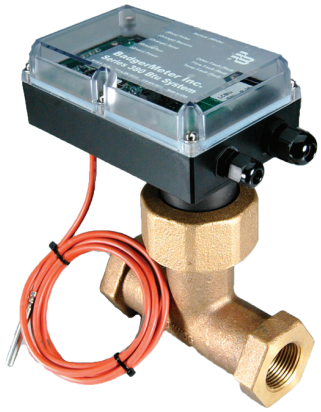
Model	A	B	C
BGR-8250BR0505-1211	4.0″ (102 mm)	4.7″ (120 mm)	1.7″ (44 mm)
BGR-8250BR0705-1211	4.0″ (102 mm)	4.7″ (120 mm)	1.7″ (44 mm)
BGR-8250BR1005-1211	5.5″ (140 mm)	4.8″ (121 mm)	2.2″ (56 mm)
BGR-8250BR1205-1211	6.1″ (155 mm)	5.0″ (127 mm)	2.4″ (61 mm)
BGR-8250BR1505-1211	6.5″ (165 mm)	5.2″ (132 mm)	2.7″ (69 mm)

Ordering Information

Model #	Manuf. Part #	Description
BGR-8250BR0505-1211	8250BR0505-1211	Flow, Sensor, 1/2” Cast Brass Tee
BGR-8250BR0705-1211	8250BR0705-1211	Flow, Sensor, 3/4” Cast Brass Tee
BGR-8250BR1005-1211	8250BR1005-1211	Flow, Sensor, 1” Cast Brass Tee
BGR-8250BR1205-1211	8250BR1205-1211	Flow, Sensor, 1-1/4” Cast Brass Tee
BGR-8250BR1505-1211	250BR1505-1211	Flow, Sensor, 1-1/2” Cast Brass Tee

380 Series

Measures Temperature and Flow Rate and Calculates Energy



Series 380 BTU system provides a low-cost system for metering hot and cold systems. The 380 measures flow and temperature differential to accurately calculate energy. With BACnet, Modbus RS-485, or scaled pulse output, it can interface with many existing control systems.

The rugged design incorporates an impeller flow sensor and two temperature probes, one mounted in the flow sensor tee and the other on either the supply or return line, depending on the application.

Commissioning can be done in the field via a computer connection or set up at the factory. Setup includes energy measurement units, measurement method, communication protocol, pulse output control, fluid density, and specific heat parameters (requires re-usable programming cable and software, see Ordering Information).

Specifications

Input Power	12 to 35 Vdc/12 to 28 Vac, 200 mA
Communication	Modbus RTU, BACnet MSTP
Output	Scaled pulse, open drain
Flow Calculation Accuracy	±2% of flow rate within range; 0.5% repeatability
Temperature Sensors	Meets IEC751 Class B
Flow Range	1 to 15 FPS
Pressure	Up to 400 psi
Materials	
Housing	Polycarbonate
Flow Sensor	PEEK
Potting Material	Polyurethane
Tee Material	Bronze
Environmental	
Fluid Temperature	-20 to 126 °C (-4 to 260 °F)
Ambient Temperature	-20 to 65 °C (-4 to 149 °F)
Warranty	
Limited Warranty	1 year

BACnet & Modbus

BACnet and Modbus protocols are standard features…easy integration with existing control systems

Easy installation

Minimal connections…simplify installation, saving time and cost

Stainless steel impeller

316 stainless steel impeller with tungsten carbide shaft

Integrated flow & temperature

Integration of flow and temperature sensors with metering components...single solution for BTU metering

Two temperature probes

Rugged, compact design with two temperature probes

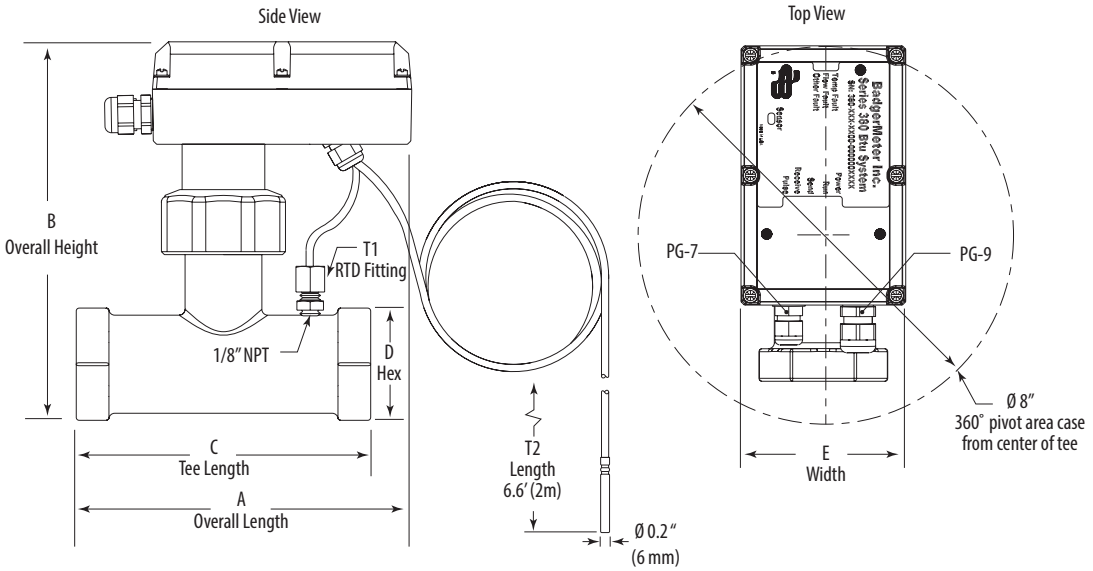
Sensor

PEEK sensor tip

Applications

- Energy management
- Data systems

Dimensional Drawing



Tee/NPT Size	A	B	C	D	E
2" (51 mm)	7.9" (201 mm)	8.5" (216 mm)	7.8" (197 mm)	3.3" (84 mm)	3.5" (89 mm)
1.5" (38 mm)	7.3" (185 mm)	8.3" (209 mm)	6.7" (170 mm)	2.75" (70 mm)	3.5" (89 mm)
1.25" (32 mm)	7.1" (180 mm)	8.1" (204 mm)	6.2" (158 mm)	2.4" (60 mm)	3.5" (89 mm)
1" (25.4 mm)	6.7" (170 mm)	7.9" (201 mm)	5.4" (137 mm)	2" (51 mm)	3.5" (89 mm)
0.75" (19 mm)	6.7" (170 mm)	7.9" (201 mm)	5.4" (137 mm)	2" (51 mm)	3.5" (89 mm)

Ordering Information

Model #	Manuf. Part #	Description	Max. Gal/Min (GPM)
BGR-8380207000-1202*	8380207000-1202	BTU system, hot and cold service, ¾" tee NPT, with pulse, Modbus and BACNet outputs	25
BGR-8380210000-1202*	8380210000-1202	BTU system, hot and cold service, 1" tee NPT, with pulse, Modbus and BACNet outputs	40
BGR-8380212000-1202*	8380212000-1202	BTU system, hot and cold service, 1-¼" tee NPT, with pulse, Modbus and BACNet outputs	70
BGR-8380215000-1202*	8380215000-1202	BTU system, hot and cold service, 1-½" tee NPT, with pulse, Modbus and BACNet outputs	95
BGR-8380220000-1202*	8380220000-1202	BTU system, hot and cold service, 2" tee NPT, with pulse, Modbus and BACNet outputs	150
BGR-8A304-1M **	8A304-1M	Programming Cable with CD for 380 Series	n/a

* Requires programming accessory.
** Required to program 380 Series BTU meters (reusable). Standard USB type A to mini-B cable included. Software available from manufacturer's website, www.badgermeter.com

3x0 Series

Converts Flow Signal to a Linear 4 to 20 mA Analog or a Protocol Signal

BGR-8340-00

BGR-8310-00

BGR-8320-00

Compact

Saves space in crowded enclosures

Communicating

Communication protocols available on the 340 models

Programmable

Programmable (units of measure, calibration, etc.) using computer with Windows®-based operating system...save installation time in the field by pre-programming the device

Input options

Accepts sine wave input from a variety of other sources for application flexibility

Applications

- Converting sine/square wave signals to 4 to 20 mA or protocol
- Increasing wire run length limit for flow sensors
- Connecting flow sensors to BAS panels

3x0 programmable transmitters are capable of converting the frequency signal from any compatible flow sensors to a preferred output type (analog, scaled pulse, protocol). In addition to standard square wave signals, it can also accept a sine wave, making it a versatile transmitter for numerous applications. The 310 and 320 offer analog and scaled pulse output, respectively, while the 340 models offer communication protocols (N2, BACnet/Modbus, or LonWorks), with energy (BTU) measurement (appropriate software and programming cables are required for installation; see Ordering Information).

Specifications

310-00

Power Requirements	Loop input voltage 9 to 35 Vdc
Input Frequency	0.4 Hz to 10 kHz
Load Resistance	Max 750 Ω @ 24 Vdc
Operating Temp Range	-29 to 70 °C (-20 to 158 °F)
Storage Temp Range	-40 to 85 °C (-40 to 185 °F)
Accuracy	±0.04% of reading over entire span
Linearity	0.1% of full scale
Warranty	
Limited Warranty	1 year

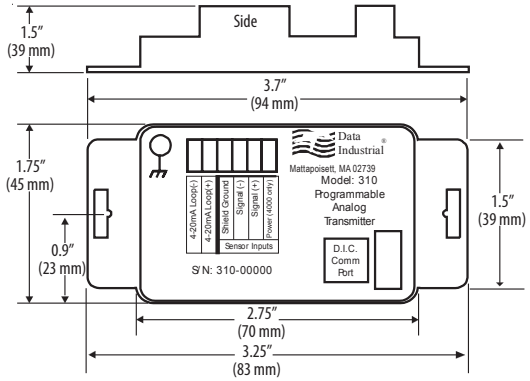
320-00

Power Requirements	12 to 24 Vac 85 mA max.; 12 to 35Vdc, 30 mA max.; reverse and over voltage protected to 40 Vdc
Input Frequency	0.4 to 10 kHz
Transient Suppression	Complies with IEC-801-4 electrical burst, fast transient specification
Pulse Output	Isolated solid state switch in any standard or custom flow total units; adjustable 50 ms to 1.0 sec pulse output width in 50 ms increments
Maximum Sinking Current	100 mA @ 35 Vdc
Operating Temp Range	-29 to 70 °C (-20 to 158 °F)
Storage Temperature Range	-40 to 85 °C (-40 to 185 °F)
Warranty	
Limited Warranty	1 year

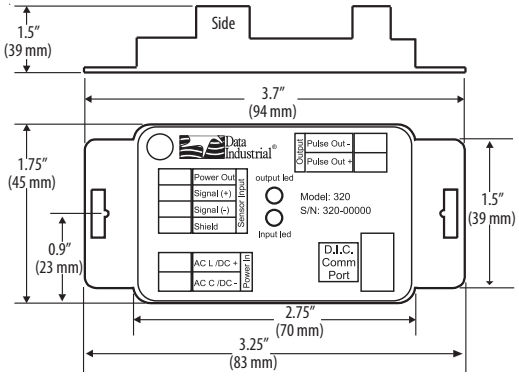
340-00

Power Requirements	12 to 24 Vdc or 12 to 24 Vac, 70 mA max.
Flow Sensor Input	Excitation voltage 3-wire sensors: 9.1 Vdc 500Ω source impedance
Frequency	4 to 10000 Hz
Temp Sensor Input	10k Dale Thermistor (requires two, sold separately)
Operating Temp Range	-29 to 70 °C (-20 to 158 °F)
Storage Temp Range	-40 to 85 °C (-40 to 185 °F)
Units of Measure	
Flow Rate	gpm, gph, l/sec, l/min, l/hr, ft^3/sec, ft^3/min, ft^3/hr, m^3/sec, m^3/min, m^3/hr
Total Flow	gallons, liters, cubic feet, cubic meters
Energy Rate	kBTU/min, kBTU/hr, kW, MW, hp, tons
Total Energy	BTU, kBTU, MBTU, kWh, MWh, kJ, MJ
Warranty	
Limited Warranty	1 year

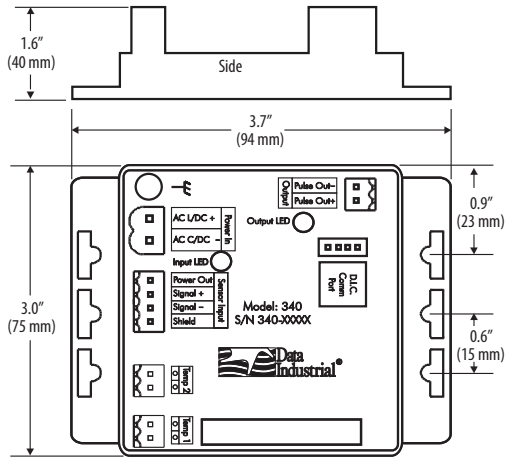
BGR-8310-00
Dimensional Drawing



BGR-8320-00
Dimensional Drawing



BGR-8340-00
Dimensional Drawing



Ordering Information

Model #	Manuf. Part #	Description
BGR-8310-00	8310-00[1, 2]	Flow Transmitter, Analog, Programmable, 4 to 20 mA Output
BGR-8340BN/MB-00	8340BN/MB-00[1, 2]	Flow Transmitter, BTU, BN-MB, No Enclosure
BGR-8340BN/MB-03	8340BN/MB-03[1, 2]	Flow Transmitter, BTU, BN-MB, Plastic Enclosure
BGR-8320-00	8320-00[1]	Flow Transmitter, Programmable, Scaled Pulse Output
BGR-8340-00	8340-00[1, 2]	Flow Transmitter, Programmable, Frequency Output
BGR-8A301-20	8A301-20	Programming Cable with CD for Analog/Modbus/BACnet/LonWorks Outputs, Serial PC Connector
BGR-40134-0002	840134-0002	Programming Cable with CD for Analog/Modbus/BACnet/LonWorks Outputs, USB PC Connector

1. Software and programming cable are required for analog, Modbus, BACnet transmitter and meter products.
2. 340 Series also requires two 10k T2 thermistors for energy (BTU) measurement.

Accessories

ETI Series immersion temperature sensors with 10K Type 2 thermistor work with the 340 Series transmitters with BTU.

ETI

Electromagnetic Series

Measure Fluid Flow in Wastewater and Slurries

Electromagnetic Series

Electromagnetic (mag) flow meters are capable of measuring flow in almost any liquid, slurry, or paste with a minimum of electrical conductivity using Faraday's law of induction. These meters are highly accurate, at 0.2% or better, exceeding AWWA accuracy standards for mechanical meters. The smart, micro-processor based electronics are simple to operate, with AMR and SCADA ready standard outputs. The NEMA 4X enclosure provides durability.

Reliable, durable design

Open flow tube design…no head loss, no moving parts to fail

Password security

Protect against unwanted program changes

0.2% accuracy

0.2% accuracy independent of fluid viscosity, density, and temperature

Wide flow range

Exceeds operating characteristics of turbine and propeller meters

Bi-directional

Bi-directional flow measurement capability…suitable for inter-city billing

Well & reclaimed water

Works with most solids common in liquid systems… great for well water and reclaimed water systems… not fouled by sand, gravel, or debris

Applications

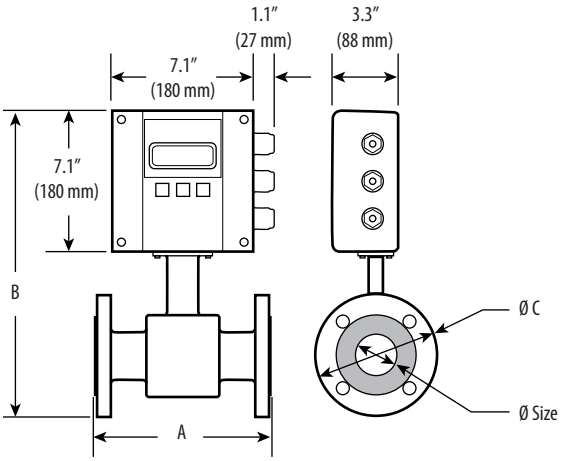
- Monitoring flow in systems likely to contain solids

Specifications

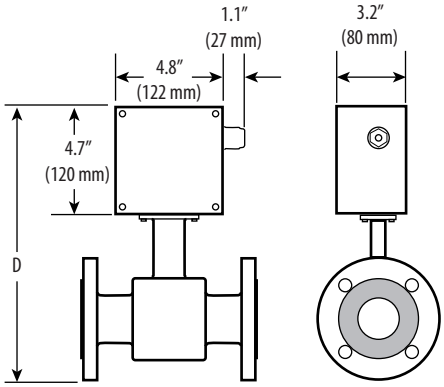
Flow Range	0.1 to 39.4 fps (0.03 to 12 m/s)
Max. Operating Pressure	150 psi
Accuracy	±0.2% of rate for velocities greater than 1.64 fps (0.50 m/s); ±0.004 fps (±0.001 m/s) for velocities less than 1.64 fps (0.50 m/s)
Repeatability	±0.1%
Analog Outputs	4 to 20 mA, 0 to 20 mA, 0 to 10 mA, 2 to 10 mA (programmable and scalable) Voltage sourced 24 Vdc (isolated); max. loop resistance < 800 Ω
Digital Outputs	Four total, configurable 24 Vdc sourcing active output (up to two), 100 mA total, 50 mA each; sinking open collector output (up to four), 30 Vdc max., 100 mA each; AC solid-state relay (up to two), 48 Vac, 500 mA max.
Pulse Outputs	Scalable up to 10 kHz, passive open collector up to 10 kHz, active switched 24 Vdc. Up to two outputs (forward and reverse) Pulse width programmable from 1 to 1100 ms or 50% duty cycle
Flow Direction	Unidirectional or bidirectional, two separate totalizers (programmable)
Coil Power	Pulsed DC
Minimum Conductivity	5.0 micromhos/cm
Electrode Materials	Standard: alloy C; Optional: 316 stainless steel, gold/platinum plated, tantalum, platinum/rhodium
Liner Material	PFA up to 3/8", PTFE 1/2" thru 24", soft or hard rubber from 1" thru 54"
NSF Listed	Models with hard rubber liner 4" size and up; Models with PTFE liner all sizes
Fluid Temperature	With remote amplifier: PFA, PTFE, 155 °C (311 °F) With Meter Mounted Amplifier: Rubber 80 °C (178 °F); PFA, PTFE 100 °C (212 °F)
Pipe Spool Material	316 stainless steel
Meter Housing Material	Carbon steel welded
Flanges	Standard (ANSI B16.5 Class 150 RF): carbon steel; Optional: 316 stainless steel
Meter Enclosure Classification	NEMA 4X (IP66); Optional: Submersible NEMA 6P (remote amplifier required)
Junction Box Enclosure Protection	For remote amplifier option: powder coated die-cast aluminum, NEMA 4 (IP65)
Cable Entries	½" NPT cord grip
Optional Stainless Steel Grounding Ring Thickness	For meter sizes up to 10": 0.135" thickness per ring; For meter sizes above 10": 0.187" thickness per ring
Power Supply	
AC	85 to 265 Vac; typical power: 20 VA or 15 W; max. power: 26 VA or 20 W
DC (special order)	10 to 36 Vdc; Typical power: 10 W; max. power: 14 W
Warranty	
Limited Warranty	2 years

Electromagnetic Series

Dimensional Drawings



Meter with M2000 amplifier



Meter with junction box for remote M2000 amplifier

Size		A		B		C		D		Est. Weight with M-2000		Flow Range			
												LPM		GPM	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lb	kg	min	max	min	max
2	50	8.9	225	15.9	403	6.0	152	13.2	335	26	11.5	4.70	1400	1	373
3	80	11.0	280	17.3	440	7.5	191	14.7	372	54	24.5	12	3600	3	956
4	100	11.0	280	18.4	466	9.0	229	15.7	398	56	25.5	19	5600	5	1493
6	150	15.8	400	20.6	524	11.0	279	17.9	456	60	27.0	40	12700	11	3361
8	200	15.8	400	22.5	572	13.5	343	20.4	518	86	39.0	75	22600	20	5975
10	250	19.7	500	26.8	681	16.0	406	24.1	613	178	81.0	120	35300	30	9336

Note: Other meter sizes and configurations are available.

Ordering Information

BGR-M2-[Meter Size*]-R1-A-[Amplifier]-[Output*]-XX-[Units]F

Meter Size*
- 010 = 1” pipe
- 020 = 2” pipe
- 025 = 2.5”pipe
- 030 = 3” pipe
- 040 = 4” pipe
- 060 = 6” pipe
- 080 = 8” pipe
- 100 = 10” pipe

Amplifier
- M-WW = Meter mounted
- R-AF = Remote mounted with 30’ cable

Output*
- S = Standard output (4-20mA/frequency)
- M = Standard output plus Modbus 485 RTU

Units
- G = Gallons

Example: BGR-M2-[010]-R1-A-[R-AF]-[S]-XX[G]F

*Additional pipe sizes, liner material, remote cable length and unit of measure outputs are available as special orders. Consult sales team for details.

TFX5000 Series

Accurate Readings from Outside the Pipe

2"+ Transducersr

BGR-TFX5000 Meter

3/4" & 1" Transducers

Temperature Sensors for BTU Models

Transit time flow meters measure the time difference between the travel time of an ultrasound wave going with the fluid flow and against the fluid flow. The time difference is used to calculate the velocity of the fluid traveling in a closed-pipe system. The transducers used in transit time measurements operate alternately as transmitters and receivers. Transit time measurements are bi-directional and are most effective for fluids that have low concentrations of suspended solids and are sonically conductive.

An ultrasonic meter equipped with heat flow capabilities measures the rate and quantity of heat delivered or removed from devices such as heat exchangers. By measuring the volumetric flow rate of the heat exchanger liquid, the temperature at the inlet pipe and the temperature at the outlet pipe, the energy usage can be calculated.

Specifications

System	
Flow Accuracy	3/4 in. (20 mm) ±1% of full scale 1 in. (25 mm) ±1% ± 0.03 ft/s (0.009 m/s) of reading 2+ in. (50mm+) ± 0.5% ± 0.025 ft/s (0.008 m/s) of reading
Velocity	3/4 and 1 in. up to 20 ft/s, depending on pipe and fluid 2+ in. (50mm+) up to 40 ft/s, depending on pipe and fluid
Repeatability	0.2% above 1.5 ft/s
Straight Run Requirements	10 diameters upstream, 5 diameters downstream from single elbow
Monitor	
Power	85 to 264V AC 47 to 63 Hz @ 24VA max. 1 Amp slow-blow fuse, manually field replaceable. Over-Voltage Rating Category II (CAT II)
Display	128 × 64 pixel LED backlit graphical display; adjustable brightness and timeout; polycarbonate window Flow rate/total: 8-digit
Keypad	4-button navigation, keypad with tactile feedback; polyester film
Housing	Aluminum construction, EPDM Gasket, NEMA Type 4X, IP67

Wide range of measurable fluids

Water, brine, sewage, ethylene glycol, glycerin, and more… flexibility in commercial and industrial applications

Communicating

Modbus RTU or BACnet MS/TP over EIA-485 and Modbus TCP/IP

Bi-directional

Measure forward flow, reverse flow, and net total

Rugged housing

Compact, rugged aluminum housing…long service in harsh environments

No fluid contact

Safe from fouling and damage from system pressure

LCD display

Easy to read

Applications

- Liquid flow meter for water delivery, sewage, cooling water, glycol, alcohol and chemicals
- Heating/cooling energy flow meter ideal for hydronic process and HVAC

Ambient Temperature Range	-4 to 140 ° F (-20 to 60 °C)
Humidity	0 to 85%, non-condensing
Velocity	feet/second, meters/second
Engineering Units (User Configured)	Gal, liters, million gal, ft3, m3, acre-ft, oil barrels (42 gal); liquor barrels (31.5 gal), ft, m, lb, kg*
Energy Version	BTU, MBTU, MMBTU, Ton, Kwh, Kcal*
Outputs	4 to 20mA: 1 for Flow Model, 2 for Energy Model; Frequency Output, Pulse (totalizer, programmable)
Communication Protocols	EIA-485: Modbus RTU or BACnet MS/TP Ethernet: 10/100 Base T RJ45, communication via Modbus TCP/IP
Transducers	
Construction	3/4 in. (20 mm) and 1 in. (25 mm): CPVC, Ultem®, Nylon cord grip, PVC cable jacket; –40 to 194° F (-40 to 90°C) 2+ in. (50mm+): PBT glass filled, Ultem®, Nylon cord grip; PVC cable jacket; –40 to 250° F (–40 to 121° C)
Warranty	
Limited Warranty	1 year

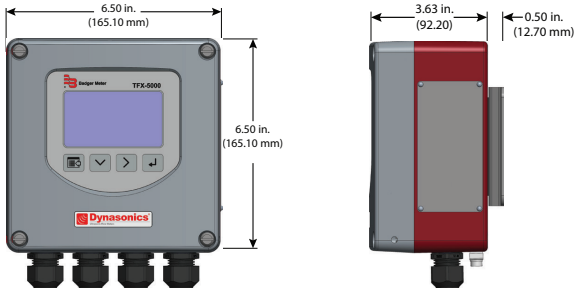
Agency Approvals

NRTL/C

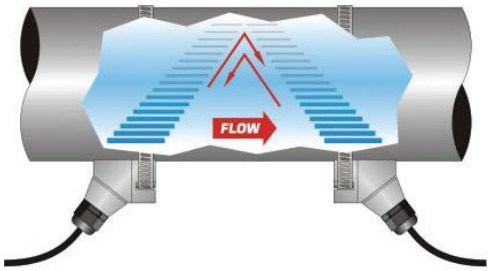
Electrical and Hazardous Location Safety E112904 (FSR Only)

* Additional non-HVAC units available in display menu.

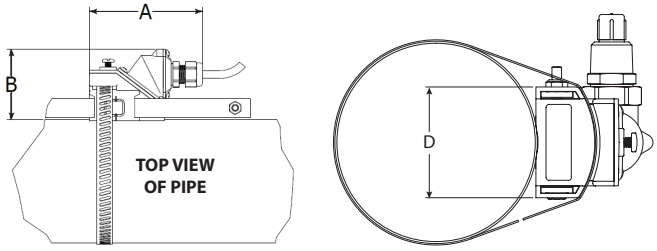
BGR-TXF5000 Meter
Dimensional Drawing



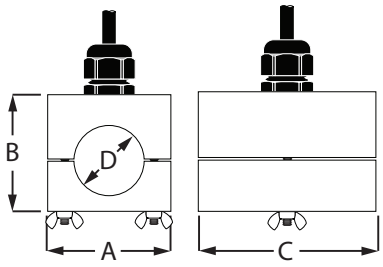
Operating Example



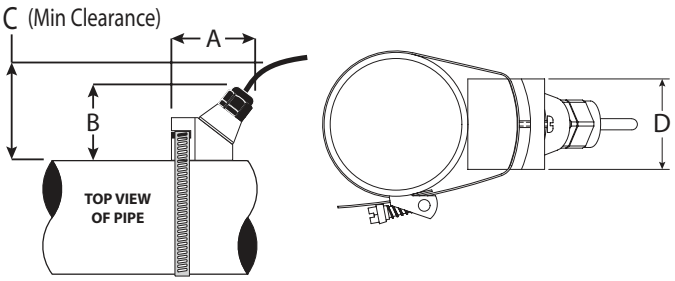
Transducers for Pipes 2-8” (RZ)
Dimensional Drawing



Transducers for Pipes and Tubing, 3/4” and 1”
Dimensional Drawing



Transducers for Pipes Larger than 8” (LZ)
Dimensional Drawing



Pipe Size	Pipe Material	A	B	C	D
3/4”	ANSI	2.46” (63 mm)	2.57” (66 mm)	2.66” (68 mm)	1.050” (27 mm)
	Copper	2.46” (63 mm)	2.50” (64 mm)	3.56” (91 mm)	0.875” (23 mm)
1”	ANSI	2.46” (63 mm)	2.92” (75 mm)	2.86” (73 mm)	1.315” (34 mm)
	Copper	2.46” (63 mm)	2.87” (73 mm)	3.80” (97 mm)	1.125” (29 mm)
2-8”	Multi	3.75” (95 mm)	3.35” (90 mm)		2.19” (56 mm)
8”+	Multi	3.40” (86.4 mm)	2.94” (75 mm)	3.20” (81.3 mm)	2.50” (64 mm)

Note: Other transducer sizes available.

Ordering Information - Liquid Flow Meters

BGR-DQ-G- [Pipe Type*] - [Power] -S-AK-WW-N-XX- [Output] GF

RZ = Medium pipe (2.5 to 8”)
LZ = Large pipe (8” or larger)

B = 24V AC/DC
R = 110/220V AC

S = Standard output (Modbus RTU or BACnet MS/TP, field selectable)
T = Standard output plus Modbus TCP Ethernet
V = Standard output plus BACnet IP Ethernet

Example: BGR-DQ-G- [LZ] - [B] -S-AK-WW-N-XX- [S] GF

*For pipe size 0.5 to 2 in. for ANSI, copper and stainless steel tube, exact sized transducers are required. Consult sales team for details.

Ordering Information - Energy/BTU Meters

BGR-DR-G- [Pipe Type*] - [Power] -S-AKWWCAKNXX [Output] GRF

RZ = Medium pipe (2.5 to 8”)
LZ = Large pipe (8” or larger)

B = 24V AC/DC
R = 110/220V AC

S = Standard output (Modbus RTU or BACnet MS/TP, field selectable)
T = Standard output plus Modbus TCP Ethernet
V = Standard output plus BACnet IP Ethernet

Example: BGR-DR-G- [LZ] - [B] -S-AKWWCAKNXX [S] GRF

*For pipe size 0.5 to 2 in. for ANSI, copper and stainless steel tube, exact sized transducers are required. Consult sales team for details.

Nutating Disc Series

Cost-effective Metering for Industrial Applications

Nutating Disc positive displacement meters are a cost-effective solution for industrial flow monitoring. These devices are available in sizes from 1/2” to 2” and are capable of handling flows up to 170 gallons per minute. Maintenance is fast, easy, and rarely required. The meter houses a measurement chamber that contains a disc. Liquid flowing through the chamber causes this disc to nutate, or wobble. This motion is sensed by a magnet, which transmits flow data.

Specifications

Max. Flow Rate	M25: 1/2”, 25 GPM M35: 3/4”, 35 GPM M25: 1”, 70 GPM M25: 1-1/2”, 120 GPM M25: 2”, 170 GPM
Max. Operating Pressure	150 psi
Max. Operating Temp.	49 °C (120 °F)
Operating Temp. Range	0 to 49 °C (32 to 120 °F), optional to 121 °C (250 °F)
Accuracy	±1.5% of full scale
Repeatability	±0.5%
Wetted Materials	Brass, SAN, Noryl, Nylon, Polyethylene, Polypropylene
Warranty	
Limited Warranty	1 year

Wide flow range

Increased accuracy at high and low
flow rates

Rugged construction

Rugged bronze or plastic construction

Easy maintenance

No need to remove from the line…reduce costly downtime

Durable components

Minimal maintenance required

Increased versatility

Optional pulse output transmitter

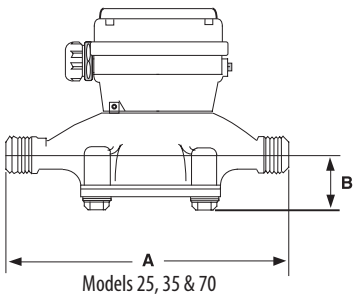
Simple operation

Easy-to-read LCD display

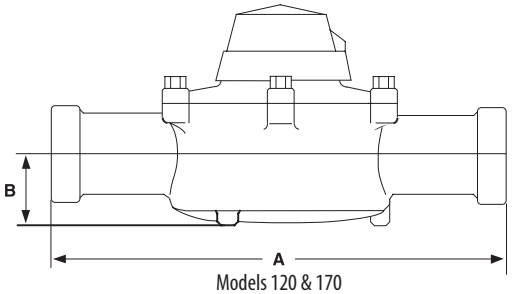
Applications

- Industrial flow systems
- Inventory and process control of cold and hot systems
- Fuel consumption

Dimensional Drawings



Models 25, 35 & 70



Models 120 & 170

Dimensions in Inches without Register					Flow Rate in Gallons	
Meter Model	Meter Size	Housing Material	A: Meter Length	B: Center to Baseline	Cold Liquids: 32 to 120°F	Approx. Weight
BGR-M25	5/8"	Bronze	7-1/2"	1-3/8"	1/2 to 25 gpm	5 lbs.
BGR-M35	3/4"	Bronze	9"	1-3/4"	3/4 to 35 gpm	6 lbs.
BGR-M70	1"	Bronze	10-3/4"	2-1/4"	1 to 70 gpm	12 lbs.
BGR-M120	1-1/2"	Bronze	12-5/8"	2-5/8"	2 to 120 gpm	20 lbs.
BGR-M170	2"	Bronze	15-1/4"	3-3/8"	2 to 170 gpm	30 lbs.

Note: Other meter sizes and configurations are available.

Ordering Information

Model #	Manuf. Part #	Description
BGR-M25-625LNSA-HP-GAXX	M25-625LNSA-HP-GAXX	Flow, Disc, 1/2"Line, Connections, Pulse Output with LCD
BGR-M35-750LNSB-HP-GAXX	M35-750LNSB-HP-GAXX	Flow, Disc, 3/4"Line, Connections, Pulse Output with LCD
BGR-M70-100LNSC-HP-GAXX	M70-100LNSC-HP-GAXX	Flow, Disc, 1"Line, Connections, Pulse Output with LCD
BGR-M120-150LNSF-HP-GAXX	M120-150LNSF-HP-GAXX	Flow, Disc, 1-1/2"Line, Connections, Pulse Output with LCD
BGR-M170-200LNSG-HP-GAXX	M170-200LNSG-HP-GAXX	Flow, Disc, 2"Line, Connections, Pulse Output with LCD

Note: Other meter sizes and configurations are available.

Turbo Series

For Pipe Sizes 2”, 3”, 4”, 6”, 8”, 10”, 12”, 16” & 20”

Turbo Series meters are built for long term service with minimal maintenance. The meter is designed to reduce wear by reducing the friction between the moving parts of the rotor and bearing system, resulting in a longer product life.

Water flows into the meter’s measuring element, contacting the multi-vaned rotor. The resulting rotor revolutions give flow readings, which are transmitted by magnetic drive couplings.

Specifications

Flow Range	3”: 2.5 to 160 GPM (continuous) 4”: 2.5 to 200 GPM (continuous) 6”: 4 to 450 GPM (continuous) 8”: 6 to 1000 GPM (continuous)
Max. Operating Pressure	150 psi
Max. Operating Temp	49 °C (120 °F)
Accuracy	±1.5% of full scale
Repeatability	±0.5%
Warranty	
Limited Warranty	1 year

Increased versatility

Optional pulse output transmitter

Low flow sensitivity

Direct drive mechanism… highest low flow sensitivity

Service in-line

Easy to service in-line… minimize downtime

Easy operation

Mechanical dial display

Wide flow range

Suitable for a wide flow range… application flexibility

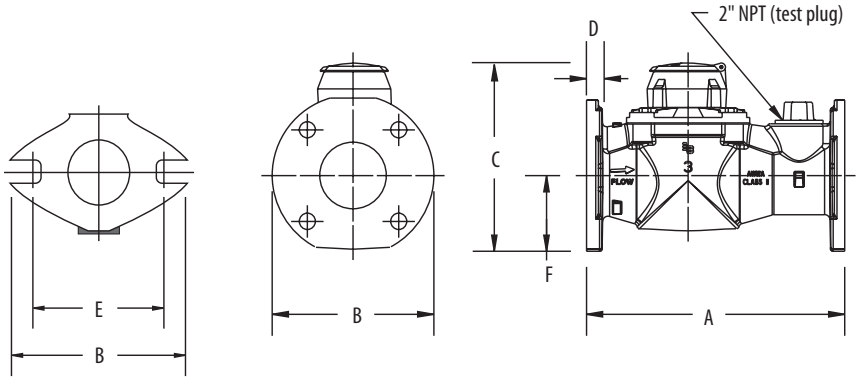
Reliable bearings

Long lasting ceramic bearings

Applications

- Chemical or industrial fluid monitoring
- Potable cold water with flow in one direction only

Dimensional Drawing



	2”	4”	6”	8”
Meter Flanges	2” Elliptical	4” Round	6” Round	8” Round
Qty. of Bolts	2	8	8	8
Length (A)	10” (254 mm)	14” (356 mm)	18” (457 mm)	20” (508 mm)
Width (B)	5-27/32” (148 mm)	9” (229 mm)	11” (280 mm)	13-1/2” (343 mm)
Height (C)	6-1/2” (165 mm)	9-21/32” (245 mm)	13-5/16” (338 mm)	15-3/16” (385 mm)
Flange (D)	25/32” (20 mm)	13/16” (21 mm)	7/8” (22 mm)	1” (25 mm)
Bolt Circle (E)	4-1/2” (114 mm)	7-1/2” (191 mm)	9-1/2” (241 mm)	11-3/4” (298 mm)
Centerline (F)	2-1/16” (52 mm)	4-5/16” (109 mm)	5-1/4” (133 mm)	6-3/8” (162 mm)

Note: Other meter sizes and configurations are available.

Ordering Information

Model #	Manuf. Part #	Description
BGR-RT-0300BRWPNSC-HP-GA-XXXX	RT-0300BRWPNSC-HP-GA-XXXX	Flow, Turbine, 3", w Conn, RTR Pulser, Gal, Pulse Output with LCD
BGR-RT-0400BRWPNSC-HP-GA-XXXX	RT-0400BRWPNSC-HP-GA-XXXX	Flow, Turbine, 4", w Conn, RTR Pulser, Gal, Pulse Output with LCD
BGR-RT-0600BRWPNSC-HP-GA-XXXX	RT-0600BRWPNSC-HP-GA-XXXX	Flow, Turbine, 6", w Conn, RTR Pulser, Gal, Pulse Output with LCD
BGR-RT-0800BRWPNSC-HP-GA-XXXX	RT-0800BRWPNSC-HP-GA-XXXX	Flow, Turbine, 8", w Conn, RTR Pulser, Gal, Pulse Output with LCD

Note: Other meter sizes and configurations are available.

B142 Series/B3000 Monitor

Accurately Measures Gas Flow

B142

B3000

B142 Series gas turbine flow meter offers reliable measurement of natural gas flow rates in boiler systems. The stainless steel housing and tungsten carbide shaft and bearings are durable in any compatible environment. The unique wafer style design is fast and easy to install between two 2" ANSI flanges, reducing costly downtime. The B142 meter is compatible with the B3000 flow monitor for a complete flow monitoring system. The B142 is also compatible with most standard computers, simplifying configuration within existing systems.

Consistent

Consistent, reliable gas flow measurement

Wafer mount

Better fit in limited spaces

Quick response

Lightweight balanced rotor… quick response to changes in flow rate

No mating flange design

Allows quick and easy installation

Durable

Reliable performance in harsh environmental conditions

Applications

- Monitor natural gas flow in boilers and other industrial systems

B142 Meter Specifications

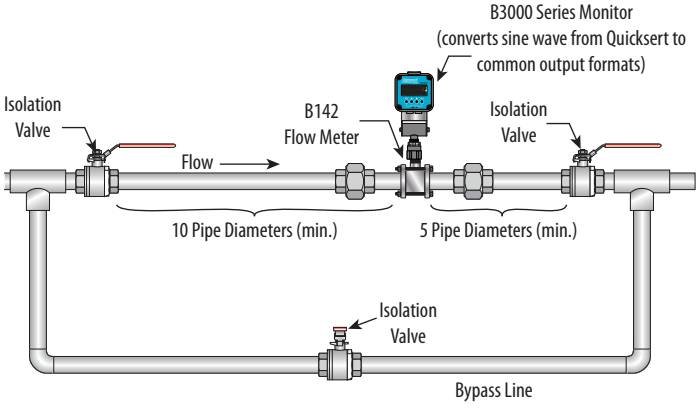
FLow Measurement Range	
B142-20L	7 to 70 ACFM*; 10 to 100 MCFD**; 423 to 4230 MBH† 365 pulses per ACF (12900 pulses per m^3)
B142-20M	14 to 210 ACFM*; 20 to 300 MCFD**; 846 to 12690 MBH† 190 pulses per ACF (6710 pulses per m^3)
B142-20H	35 to 350 ACFM*; 50 to 500 MCFD**; 2115 to 21150 MBH† 85 pulses per ACF (3000 pulses per m^3)
System	
Working Pressure	Vacuum to 2220 psig (15.3 MPa)
Pressure Drop	3" of water column (7.5 mbar) at maximum rated flow rate (dry air)
Pressure Port	1/8" NPTF (plugged)
Operating Temperature Range	-40 to +165 °C (-40 to +330 °F)
Output Voltage	100 mVP-P minimum when used with B111113 magnetic pickup
Accuracy	
Linearity	±2% of reading over the specified measurement range
Uncertainty	±1% of reading when calibration data is entered into an intelligent monitor/transmitter
Repeatability	±0.5%
Construction	
Body and Cartridge	316/316L stainless steel
Bearing Mounts	304 stainless steel
Set Screws and Pressure Port Plug	316 stainless steel
Bearings and Rotor Shaft	Tungsten carbide
Rotor	410 stainless steel
Connections	
Pickup	Mates with AN3106A-10SL connector
Conduit	1" NPT (25 mm)
Warranty	
Limited Warranty	1 year
Compliance Information	
Agency Approvals	UL913; CSA 22.2 No. 157-92; Class 1 Division 1 Groups C, D
Explosion Proof	UL1203; CSA 22.2 No. 30-M1986; Class 1 Division 1 Groups C, D
Seal	ANSI/ISA 12.27.01-2003

Agency Approvals

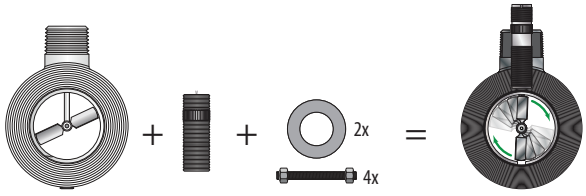
B3000 Monitor Specifications

Input Power	Auto switching between internal battery and external loop power; Advanced output models include isolation between loop power and other I/O Battery: 3.6VDC lithium "D Cell" gives up to 6 years of service life Loop: 4 to 20 mA, two-wire, 25 mA limit, non-polarity sensitive, 7 Vdc loop loss
Outputs	
Analog 4 to 20mA	4 to 20 mA, two-wire current loop; 25 mA current limit
Totalizing Pulse	Pulse Type: (selected by circuit board jumper) Opto-isolated (Iso) open collector transistor, Non-isolated open drain FET Maximum Voltage: 28 Vdc Maximum Current Capacity: 100 mA Maximum Output Frequency: 16 Hz Pulse Width: 30 msec fixed
Modbus (Advanced Output Models Only)	Modbus RTU over RS-485, 127 addressable units/2-wire network, 9600 baud, long integer and single precision IEEE754 formats; retrieve: flow rate, job totalizer, grand totalizer, alarm status and battery level; write: reset job totalizer, reset grand totalizer
Engineering Units	
Gas	Cubic Feet, Thousand Cubic Feet, Million Cubic Feet, Standard Cubic Feet, Actual Cubic Feet, Normal Cubic Meters, Actual Cubic Meters, Liters
Rate Time	Seconds, minutes, hours, days
Totalizer Exponents	0.00, 0.0, X1, x10, x100, x1000
K Factor Units	Pulses/Gallon, Pulse/cubic meter, pulses/liter, pulses/cubic foot

Application Example



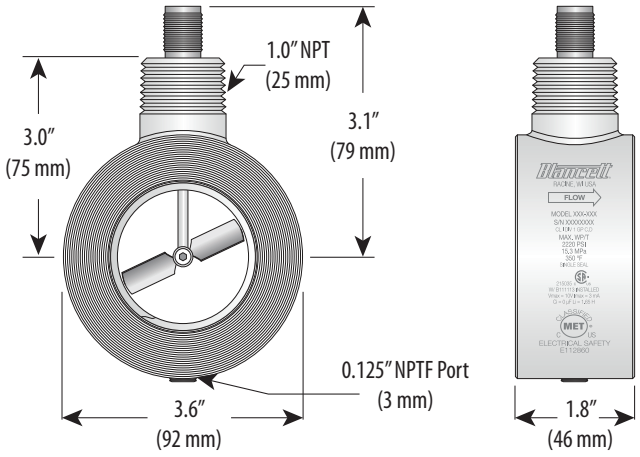
B142 Meter Required Parts



B142 meter | B111113 magnetic pickup | B142-20-150KIT hardware kit | Gas Quicksert Assembly (not including the two 2″ ANSI flanges)

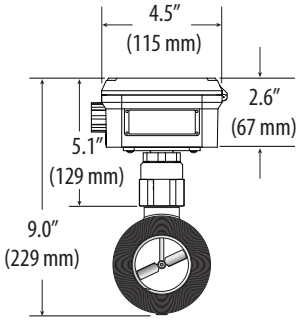
B142 Meter with B111113 Magnetic Pickup Installed

Dimensional Drawing



B142 Meter with B3000 Display Installed

Dimensional Drawing



Ordering Information

Model #	Manuf. Part #	Description
BGR-B142-20L	B142-20L	Flow, Gas, Quicksert, 2", SS, Low Rate, Pulse
BGR-B142-20M	B142-20M	Flow, Gas, Quicksert, 2", SS, Med Rate, Pulse
BGR-B142-20H	B142-20H	Flow, Gas, Quicksert, 2", SS, High Rate, Pulse
BGR-B111113	B111113	Flow, Gas, Quicksert, Magnetic Pickup, SS
BGR-B142-20-150KIT	B142-20-150KIT	Flow, Gas, Quicksert, Bolt and Gasket Kit
BGR-B30AM-CS	B30AM-CS	Flow Monitor, B3000, Advanced Output
BGR-B30BM-CS	B30BM-CS	Flow Monitor, B3000, Standard Output

VN2000 Series

Accurately Measure Steam

VN2000

The VN2000 Compact Insertion Vortex Flow Meter measures the flow of steam over a large flow range. The meter includes a mounting assembly alignment pin to simplify the installation. The meter is designed for specific pipe sizes and includes parts for installation. The vortex sensing element is CNC machined out of one piece of solid stainless steel and engineered to stand up to abusive environments inside and outside the pipe. The dual ceramic piezoelectric sensors are bonded inside the vortex element, which is press-fit to the stainless steel insertion bar and completely welded together. There are no internal o-rings or seals of any kind and absolutely no leak paths into the sensors or electronics. These sensors do not touch the process fluid, which gives them an almost unlimited life span.

Onboard display

Provides several units of measure

Multiple outputs

4-20mA and pulse outputs standard with optional BACnet and Modbus

Easy installation

Insertion meter and pipe mounting assembly designed for specific pipe sizes

No moving parts or o-rings

No parts to service means long product life

Stainless steel consruction

Vortex assembly is machined from a single piece and stands up to the abusive environment inside the pipe

High temperature

Standard model handles process temperatures up to 400° F
(204° C)

Applications

- Steam flow rate or volumetric measurement

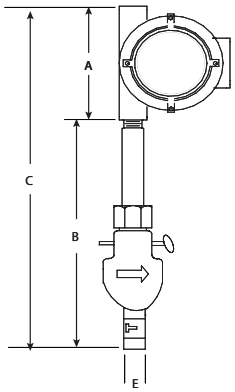
Specifications

Flow Accuracy	±1% of reading
Repeatability	±0.25% of reading
Straight Run Requirements	Upstream 10 diameters; downstream 5 diameters with one 90° elbow before the meter
Media Temperature	-250 to 400 °F (-120 to 204 °C)
Maximum Pressure	1000 psi (68.9 bar)
Wetted Materials	Stainless steel 304L
Connections	"1-1/2 in. carbon steel mounting assembly Sealing assembly: Two ethylene propylene O-rings"
Sensors	Dual piezo vortex sensors
Units of Measure	Pounds, kilograms, tons, metric tons, cubic feet, cubic meters, gallons, liters
Measurement interval	Second, minute, hour, day
Transmitter	
Display	2×16 characters reflective display, Rotatable display
	Flow rate: 6 digits with decimal; Totalizer
Keypad	4 membrane buttons
Power	14 to 36 V DC; loop powered with 4 to 20 mA option, 28V DC max
Operating Temperature	32 to 140° F (0 to 60° C)
Operating Humidity	5 to 95% relative humidity non-condensing
Analog Output	One 4 to 20 mA, 10 to 36V max load, 24-bit resolution
Digital Output	One min. input resistance 1000 Ohm; Max output frequency = 12.5 Hz; Opto isolator 5 to 24 Vdc
Communications	Optional via special order: EIA-485 with Modbus RTU or BACnet MS/TP*
Enclosure	General Purpose
Mounting	Intergral meter mount; remote mount available via special order*
Warranty	
Limited warranty	1 year

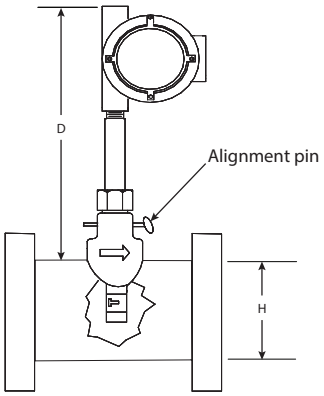
*Other meter sizes and configurations are available.

VN2000 Meter with 1-1/2” NPT Connection

Dimensional Drawing



Meter



Meter inserted into pipe

H	A	B	C	D	e
2” (51 mm)	5” (127 mm)	11” (279 mm)	16” (406 mm)	15” (381 mm)	1.25” (32 mm)
3” (76 mm)	5” (127 mm)	11” (279 mm)	16” (406 mm)	14.5” (368 mm)	1.25” (32 mm)
4” (102 mm)	5” (127 mm)	12” (305 mm)	17” (432 mm)	15” (381 mm)	1.25” (32 mm)
6” (152 mm)	5” (127 mm)	13” (330 mm)	18” (457 mm)	15” (381 mm)	1.25” (32 mm)
8” (203 mm)	5” (127 mm)	14” (356 mm)	19” (483 mm)	15” (381 mm)	1.25” (32 mm)

Saturated Steam Flow Rates (lbs/hr)

Pipe Line Size	5 psig 0.0486 lb/ft3	50 psig 0.1503 lb/ft3	100 psig 0.2577 lb/ft3	150 psig 0.3614 lb/ft3	200 psig 0.4688 lb/ft3	300 psig 0.6481 lb/ft3	400 psig 0.8613 lb/ft3
2”	58.38 (min.) 1019 (max.)	124.0 (min.) 3152 (max.)	177.7 (min.) 5404 (max.)	222.7 (min.) 7580 (max.)	264.9 (min.) 9832 (max.)	328.7 (min.) 13592 (max.)	397.4 (min.) 18064 (max.)
3”	128.6 (min.) 2244 (max.)	273.2 (min.) 6945 (max.)	391.4 (min.) 11905 (max.)	490.5 (min.) 16698 (max.)	583.5 (min.) 21662 (max.)	724.2 (min.) 29944 (max.)	875.5 (min.) 39797 (max.)
4”	221.5 (min.) 3865 (max.)	470.5 (min.) 11959 (max.)	674.0 (min.) 20501 (max.)	844.7 (min.) 28755 (max.)	1005 (min.) 37302 (max.)	1247 (min.) 51565 (max.)	1508 (min.) 68531 (max.)
6”	502.6 (min.) 8771 (max.)	1068 (min.) 27140 (max.)	1530 (min.) 46525 (max.)	1917 (min.) 65256 (max.)	2280 (min.) 74653 (max.)	2830 (min.) 117021 (max.)	3421 (min.) 155525 (max.)
8”	870.4 (min.) 15188 (max.)	1849 (min.) 46997 (max.)	2649 (min.) 80564 (max.)	3319 (min.) 112999 (max.)	3949 (min.) 146586 (max.)	4900 (min.) 202637 (max.)	5924 (min.) 269310 (max.)

Note: Other meter sizes and configurations are available.

Ordering Information

Model #	Manuf. Part #	Description
BGR-VCA020-C-S-S-W-V-E-WW-SSSG	VCA020-C-S-S-W-V-E-WW-S-S-S-G	Flow,Vortex,2",Steam,Insertion,4-20mA/Pulse
BGR-VCA030-C-S-S-W-V-E-WW-SSSG	VCA030-C-S-S-W-V-E-WW-S-S-S-G	Flow,Vortex,3",Steam,Insertion,4-20mA/Pulse
BGR-VCA040-C-S-S-W-V-E-WW-SSSG	VCA040-C-S-S-W-V-E-WW-S-S-S-G	Flow,Vortex,4",Steam,Insertion,4-20mA/Pulse
BGR-VCA060-C-S-S-W-V-E-WW-SSSG	VCA060-C-S-S-W-V-E-WW-S-S-S-G	Flow,Vortex,6",Steam,Insertion,4-20mA/Pulse
BGR-VCA080-C-S-S-W-V-E-WW-SSSG	VCA080-C-S-S-W-V-E-WW-S-S-S-G	Flow,Vortex,8",Steam,Insertion,4-20mA/Pulse

Note: Other meter sizes and configurations are available. .

FC-5000 Series

Displays Flow Rate, Flow Total and Energy

FC-5000

The Badger Meter® FC-5000 is a microprocessor-driven device designed for energy/BTU and flow monitoring. The FC-5000 BTU Monitor is compatible with the complete line of Badger Meter industrial flow meters and temperature sensors, creating a solution to monitor hydronic energy usage, flow rate and totals. Many years of experience in the industrial market has allowed Badger Meter to incorporate features indispensable in control operations

Enhanced viewing

Large, backlit graphical display

Intuitive navigation

Integrated softkeys and full numeric keypad

Programmable scaled outputs

Outputs transmit rate, total or temperature data via dedicated output channels

Programmable relays

Enables alarms or totalizing output capabilities for rates, totals and temperaturesr

Plug & play terminals

Easy, user-friendly installation

Rugged application

Robust enclosure, keypad and mechanical relays

Applications

- Interfacing and displaying sensor data
- Energy monitoring, communication, and management

Specifications

FC-5000 Series

Power Supply	
Input Range	10 to 40Vdc, 9 to 28Vac RMS (50 to 60 Hz)
Max. Power Consumption	8 W (power supply must provide 8 W min.)
Additional Parameters	Isolated from power ground Over-voltage, transient and reverse polarity protected
Flow Meter Inputs	
Independent Channels	1
Input Range	0.3 Hz to 10 kHz
Configuration Options	Square wave 0 to 30V pulse with 2.5V threshold, Sine wave, zero-centered with 45 mV threshold, Configurable debounce
Excitation Output	12 Vdc source
Voltage	Low: -0.3 to 1.85 Vdc High: 2.5 to 25 Vdc
Impedance	Pullup to 12 Vdc
Vdc Current	±50 mA, short circuit current
Response	100 µs/3.5 ms min pulse (high/low speed)
Temperature Inputs	
Independent Channels	2
RTD Specifications	50 µA/1000 µA excitation current source 2, 3 and 4-wire compatible (Platinum, 100 and 1000 Ω RTDs, optional two-point or customizable calibration configuration) Callendar-Van Dusen coefficients
Thermistor Specs	Type II thermistors or customizable calibration configuration, Steinhart-Hart coefficients

Scaled Outputs	
Independent Channels	2
Analog Output (Option A)	Configurable to 0 to 5V, 0 to 10V or 4 to 20 mA; Uncertainty: ±0.1% of reading; 16-bit resolution (0 to 10V and 4 to 20 mA), 15-bit resolution (0 to 5V); 200 ms, 90-10% step response; Sourcing analog output signal
Frequency Output (Option F)	TTL, 1 to 4000 Hz, square wave; Uncertainty: ±0.01% reading; Resolution: 0.01 Hz
Additional Parameters	Isolated from power ground Over-voltage, transient and reverse polarity protected Output is multiplexed on the process out pins
Digital I/O	
Independent Channels	6
Additional Parameters	Isolated from power ground Over-voltage, transient and reverse polarity protected 0 to 30V as input Debounce 0 to 5V, TTL, 200 ms 90-10% step response, driving < 0.1 uF
Calculations	
Flow Calculation	Uncertainty: ± 0.01% Adjustable FIR/IIR filtering
BTU Calculation	Meets EN 1434 requirements
Relay Outputs	
Configuration (Option C)	Two Form C mechanical relays

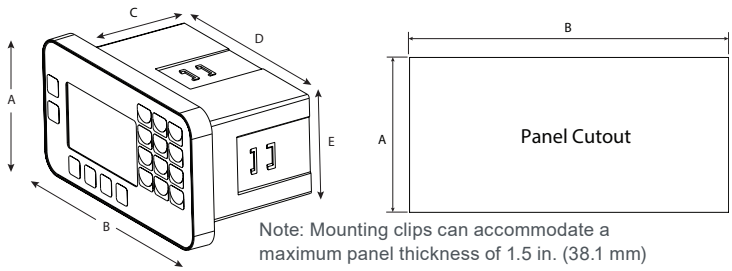
Specifications (cont.)

FC-5000 Series

Configuration (Option A)	One Form C mechanical relay One Form A solid state relay
Form C Relay	Load: Resistive Rated carry current: 5A (N.C. or N.O.) Max. switching voltage: 250 Vac, 30 Vdc Min. permissible load: 10 mA at 5 Vdc Coil rating: 5 to 24 Vdc Life expectancy: 5,000,000 operations
Form A Relay (N.O. SPST)	Switching speed: On (0.25 ms), Off (0.02 ms) Current rating (IO): 1A Max. output voltage (VO): 60V Output On-Resistance (R(ON)): 0.5 Ω @ IF = 5 mA, IO = 1 A Output Withstand Voltage (VO(OFF)): 60-65V @ VF = 0.8V, IO = 250 µA, TA = 77° F (25° C)
Additional Parameters	Isolated coil drivers Over-voltage, transient and reverse polarity protected
Network Communications	
Protocols	Modbus RTU, Modbus ASCII or BACnet
Physical Layer	EIA-485 (RS-485)
Baud Rates	1200 to 115.2K
Additional Parameters	Two-wire (half-duplex) Over-voltage/ESD Protection Isolated from power ground
USB Communications	
USB (Host)	Type A receptacle (currently not supported)
USB (Device)	Mini-B receptacle (used for field updates)
Additional Parameter	Over-voltage/ESD/transient protected
Display/User Interface	
Keypad	Membrane overlay, domed tactile response keys, keypad interface is protected from ESD
Display	128 × 64 pixel LCD graphical display, LED backlit
Additional Parameter	Protected from EMI/RFI
Environmental Ratings	
Pollution Degree	2
Altitude	Up to 2000 m (6561 ft)
Over-Voltage Rating	Category II
Ambient Temp.	32 to 130° F (0 to 55° C)
Storage Temp.	-40 to 160° F (-40 to 70° C)
Humidity	0 to 85%, non-condensing
Weights (Approx.)	
Panel Mount	1.25 lb (0.57 kg)
Wall Mount (Including Unit)	4.54 lb (2.06 kg)
Operator Functions	
Operator Functions	Unlatch relays, reset totalizers, unlatch relays and reset totalizers
Parameters	
Max. Displayed Digits	Rates: Max 8 (7 with decimal) Totals: Max 9 (8 with decimal)
Resolution/Display Precision	Configurable, 0 to 4
Volumetric Flow Rate Units Seconds (S), Minute (MIN), Hour (H), Day (D), Volumetric Flow Total Units	US Gallons (US GAL), Imperial Gallons (I GAL), Mega US Gallons (US MGAL), Mega Imperial Gallons (I MGAL), Liters (L), Mega Liters (ML), Cubic Meters (M3), Cubic Feet (FT3), Acre Feet (AC-FT), Oil Barrels (OBBL), Liquid Barrels (LBBL), US Ounces (US OZ), Imperial Ounces (I OZ), Custom (user-specified)
Energy Units	kBTU, BTU, KW, TONS (RT), Custom (user-defined)
Temperature Units	° F (Fahrenheit), ° C (Celsius), R (Rankine) or K (Kelvin)
Warranty	
Limited Warranty	1 year
Agency Approvals	
Aprovals	CE Marked for Low Voltage Directive and RoHS CSA Marked per Class C225286 and C225206, Process Control Equipment CSA C22.2 No. 61010-1-12, General requirements CAN/CSA-C22.2 No. 61010-1-12 Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1: General requirements — Tri-national standard with UL 61010-1 and ANSI/ISA-61010-1 (82.02.01)

Panel Mount

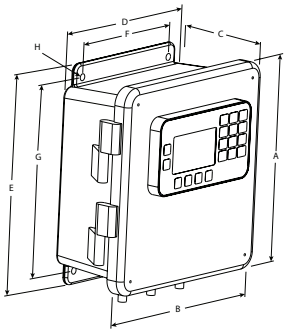
Dimensional Drawing



Note: Mounting clips can accommodate a maximum panel thickness of 1.5 in. (38.1 mm)

Wall Mount

Dimensional Drawing



	A	B	C	D	E	F	G	H
	Height	Width	Depth	Width	Height	Width	Height	Hole Dia.
Panel Cutout	2.65 (67.31)	5.40 (137.16)	–	–	–	–	–	–
FC-5000 Unit	3.50 (89.00)	6.22 (158.00)	3.07 (78.00)	5.38 (136.65)	2.54 (64.52)	–	–	–
Wall Mount Unit	9.38 (238.25)	9.38 (238.25)	4.88 (123.95)	8.00 (203.20)	9.56 (242.83)	6.00 (152.40)	8.75 (222.25)	0.31 (7.87)

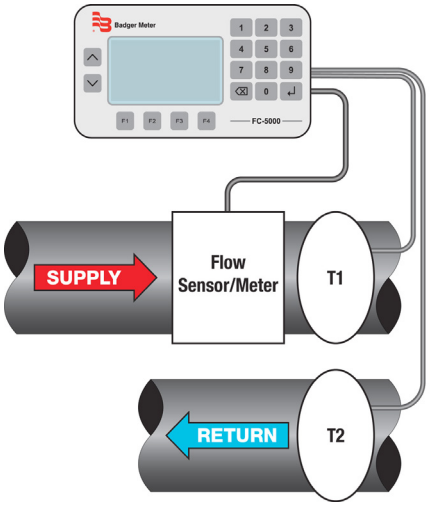
Note: All measurements: in. (mm)

Operation

Input signal—in the form of sine waves or pulses from open collector transistors or dry contact closures—can be scaled to any unit of measure for totalization and instantaneous rate-of-flow indication. Energy rate and flow totals are examples of parameters that can be viewed on the panel display or through communications protocols such as BACnet or Modbus.

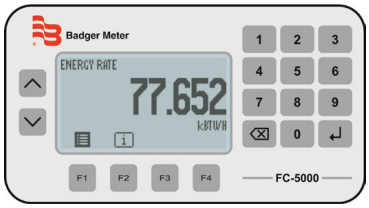
Two temperature sensor inputs can be configured to read RTDs or thermistors and are fully customizable to adapt to application needs. When used in conjunction with fluid flow, hydronic energy rates and total usage are achieved, while conforming to EN1434 standards.

Additionally, dedicated analog or frequency output channels provide scaled outputs that are assignable to parameters such as energy rate, total and temperature. A user defined damping function can be applied for improved stability of the flow readings.



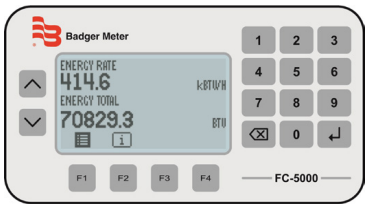
Viewing Capabilities

Single Display



- Flow Rate
- Flow Total
- Energy/BTU Rate
- Energy/BTU Total

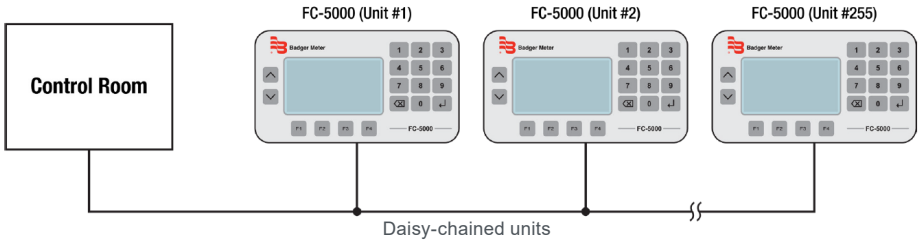
Dual Display



- Flow Rate and Flow Total
- Energy/BTU Rate and Energy/BTU total

EIA-485 (RS-485) Network

All FC-5000 BTU Monitors come equipped with an EIA-485 (RS-485) physical layer, and use BACnet or Modbus RTU protocols, selectable and programmed in the firmware. Up to 255 FC-5000 products can be run on a single daisy-chain network and be individually queried for flow/energy rate, positive flow/energy accumulator, supply temperature, return temperature and other information.



Ordering Information

FC-5000 Flow Display, Frequency Output

	Energy/BTU Option		Sensor Inputs		Scaled Outputs	Relay Outputs	Digital I/O	Comm.		Mount
BGR-FC5	–		–		–	F		6	A	–	

- Energy/BTU Option: BM = Energy/BTU Monitor; FD = Flow Display Only
- Sensor Inputs: P0 = 1 Pulse (Flow Display model); P1 = 1 Pulse (Energy/BTU model); P3 = 2 Pulse*
- Scaled Outputs: F = 2 Frequency Outputs
- Relay Outputs: A = 1 Form C Relay/ 1 Form A Relay**; C = 2 Form C Relays***
- Comm.: A = EIA-485 (RS-485), Modbus, BACnet, USB
- Mount: P = Panel Mount; W = Wall Mount (includes NEMA 4X IP67 rated enclosure)

Example: BGR - FC5 - FD - P3 - F A 6 A - P

*Special order. Not available on Energy/BTU models.
**Not available on Energy/BTU models.
***Special order on Flow Display Only models.

FC-5000 Flow Display, Analog Output

	Energy/BTU Option		Sensor Inputs		Scaled Outputs	Relay Outputs	Digital I/O	Comm.		Mount
BGR-FC5	–		–		–	A		6	A	–	

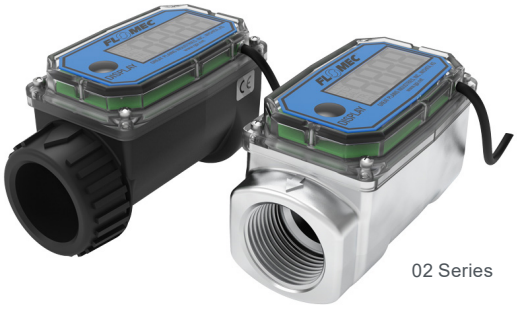
- Energy/BTU Option: BM = Energy/BTU Monitor; FD = Flow Display Only
- Sensor Inputs: P1 = 1 Pulse; P2 = 2 Pulse*
- Scaled Outputs: A = 2 Analog Outputs
- Relay Outputs: A = 1 Form C Relay/ 1 Form A Relay**; C = 2 Form C Relays***
- Comm.: A = EIA-485 (RS-485), Modbus, BACnet, USB
- Mount: P = Panel Mount; W = Wall Mount (includes NEMA 4X IP67 rated enclosure)

Example: BGR - FC5 - FD - P2 - A A 6 A - W

*Special order. Not available on Energy/BTU models.
**Not available on Energy/BTU models.
***Special order on Flow Display Only models.

02 Series

Displays Flow Rate, Flow Total and Energy



02 Series

The FLOMEC® 02 Series is a lightweight, accurate and reliable turbine meter. Choose the 02 Series for thin viscosity fluid applications (for installation on plastic pipes only).

- Aluminum or nylon housing
- Virtually maintenance free
- Display powered by two AAA batteries
- Offers one pulse per unit (gallons or liters)

Specifications

Fitting Size / Fitting Type	1 inch / BSPT (female) 1 inch / NPT (female)
Flow Rate	3 to 30 GPM 11 to 113 LPM
Accuracy (% of Reading)	± 5.0%
Pressure Rating	150 PSIG / 10.3 BAR
Operating Temperature Range	14 to 130 °F (-10 to 55 °C)
Pulse Out Description	Open Collector (also known as NPN or Current Sinking)
Pulse Duration	250 msec
Pulse Amplitude	5 to 30 Vdc
Scaling	One pulse per gallon or liter
Cable Length	5 ft. (1.5 m)
Wetted Materials (Aluminum)	Housing: Aluminum Bearings: Ceramic Shaft: Tungsten carbide Rotor: Nylon Rings: 316 stainless steel Signal generator: Ferrite
Wetted Materials (Nylon)	Housing: Nylon Bearings: Ceramic Shaft: Tungsten carbide Rotor: Nylon Rings: 316 stainless steel Signal generator: Ferrite
Limited Warranty	2 years
Approvals	CE

Note: FLOMEC is a registered trademark of Great Plains Industries, Inc., the manufacturer of the devices shown.

Complete meter

Includes turbine assemby, microprocessor and LCD readout

Easy installation

Lightweight, compact design

Remote monitor

Remote monitor option to connect to an external system (NPN Open Collector Pulse)

Battery powered

Display powered by two AAA alkaline batteries that are easy to replace, with the meter installed

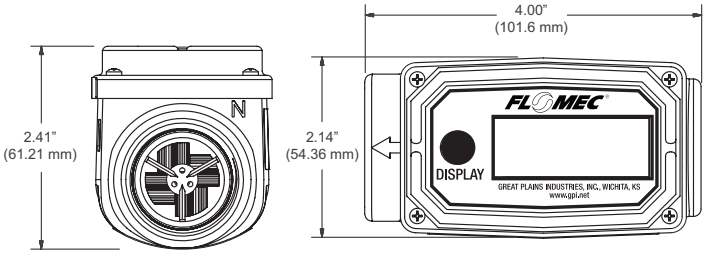
Totalization

Batch (resettable to measure flow during a single use) and Cumulative (non-resettable, to provide continuous measurement)

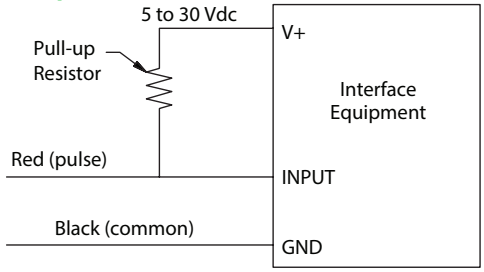
Applications

- Building automation (chillers)
- Consumption baselining

Dimensional Drawing



Internal Pull-up Resistor



Note: Some interface devices may not have an internal pull-up resistor. Use a minimum 820 Ω resistor, if necessary.

Ordering Information

Model #	Manuf. Part #	Description
FLO-02N31GM	02N31GM	Nylon flow meter, digital pulse, 1-inch NPT inner, gallons, display
FLO-02N12LM	02N12LM	Nylon flow meter,digital pulse, 1 inch BSPT inner, liters, display
FLO-02A31GM	02A31GM	Aluminum flow meter, digital pulse, 1-inch NPT inner, gallons, display
FLO-02A12LM	02A12LM	Aluminum flow meter, digital pulse, 1-inch BSPT inner, liters, display

QSE Series

Electromagnetic Flow Meter

QSE Series

Economical

Low investment and operating costs

Highly accurate

± 0.5% accuracy of reading (from 0.25 fps to 15 fps)

Modified bore

Slightly modified bore permits unobstructed flow, minimizes flow disturbances and straight pipe requirements

Durable

Non-intrusive, no moving parts to wear out, maintenance, repair costs low and tolerates high flows without damage

7 line sizes

½", ¾", 1", 1-½", 2", 3" and 4"

Wireless

Configure and monitor meters without display through Android app

The FLOMEC® QSE Mag Series is a dependable, highly accurate electromagnetic flow meter designed for flow and usage monitoring in commercial applications.

The Noryl® housing and flow tube offer a lightweight, easy-to-install mag meter that is resistant to heat (210 °F / 99 °C) and is compatible with many water-based liquid solutions (for installation on plastic pipes only).

The QSE Mag Meter monitors flow rate and total flow in a wide variety of applications including HVAC and water reclamation.

Meters without display are configured wirelessly using the FLOMEC app. The app is available through the Google Play™ store, for Android systems only.

Applications

- HVAC
- EMS (Energy Management Systems)
- BAS (Building Automation Systems)
- Chilled water
- Domestic water (hot and cold
- Energy sub-metering (BTU hot and cold)
- Process (blow down, make up, boiler feed, etc.)

Specifications

Fitting Size/Fitting Type	NPT, BSP 1/2" to 2" - NPT (male), BSP (male) (Rc thread) 3" and 4" 150# ANSI flanged, polymer
Recommeded Plastic Flange Bolt Torque	25 ft.-lbs. (33.89 N·m)
Pipe Sizes	½", ¾", 1", 1-½", 2", 3", 4"
Pressure Rating	150 PSI @ 73 °F (10 BAR @ 23 °C)
Accuracy	±0.5% of reading between 0.25 fps and 15 fps (reference owner's manual for complete accuracy specifications)
Operating Temperature Range	½" to 2": 32 to 210 °F (0 to 98 °C) 3" to 4": 32 to 180 °F (0 to 82 °C)
Ambient Temperature Range	0 to 140 °F (-18 to 60 °C)
Power Supply	Externally powered Voltage supply (min.): 12 Vdc or Vac Voltage supply (max.): 30 Vdc or Vac
Consumption	Max. current consumption: 150mA
Wetted Materials	Body: Noryl Electrodes: 316L SS Seals: NBR o-rings
Frequency Range (all sizes)	10 Hz min. 3,000 Hz max. (with blind pulse out)
Calibration Report	Standard NIST available
Limited Warranty	2 years
Approvals	NEMA 6P (pending), IP67, CE, NIST, NSF, Canadian Standards Association

Note: FLOMEC is a registered trademark of Great Plains Industries, Inc., the manufacturer of the devices shown.

Ordering Information

Model #	Manuf. Part #	Description
Flow with Display		
FLO-QSE05NPT42XXXA	QSE05NPT42XXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1/2inch,NPT_outer-thd
FLO-QSE05BSP42XXXA	QSE05BSP42XXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1/2inch,BSP_outer-thd
FLO-QSE07NPT42XXXA	QSE07NPT42XXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,3/4inch,NPT_outer-thd
FLO-QSE07BSP42XXXA	QSE07BSP42XXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,3/4inch,BSP_outer-thd
FLO-QSE10NPT42XXXA	QSE10NPT42XXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1inch, NPT_outer-thd
FLO-QSE10BSP42XXXA	QSE10BSP42XXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1inch, BSP_outer-thd
FLO-QSE15NPT42XXXD	QSE15NPT42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1-1/2inch,NPT_outer-thd
FLO-QSE15BSP42XXXD	QSE15BSP42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1-1/2inch,BSP_outer-thd
FLO-QSE20NPT42XXXD	QSE20NPT42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,2inch,NPT_outer-thd
FLO-QSE20BSP42XXXD	QSE20BSP42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,2inch,BSP_outer-thd
FLO-QSE30FAP42XXXB	QSE30FAP42XXXB	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,3inch,flange
FLO-QSE40FAP42XXXC	QSE40FAP42XXXC	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,4inch,flange
BTU without Display*		
FLO-QSE05NPTQBQ11A	QSE05NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1/2inch,NPT_outer-thd
FLO-QSE05BSPQBQ11A	QSE05BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1/2inch,BSP_outer-thd
FLO-QSE07NPTQBQ11A	QSE07NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,3/4inch,NPT_outer-thd
FLO-QSE07BSPQBQ11A	QSE07BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,3/4inch,BSP_outer-thd
FLO-QSE10NPTQBQ11A	QSE10NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1inch,NPT_outer-thd
FLO-QSE10BSPQBQ11A	QSE10BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1inch,BSP_outer-thd
FLO-QSE15NPTQBQ11A	QSE15NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1-1/2inch,NPT_outer-thd
FLO-QSE15BSPQBQ11A	QSE15BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1-1/2inch,BSP_outer-thd
FLO-QSE20NPTQBQ11A	QSE20NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,2inch,NPT_outer-thd
FLO-QSE20BSPQBQ11A	QSE20BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,2inch,BSP_outer-thd
FLO-QSE30FAPQBQ12B	QSE30FAPQBQ12B	Noryl,MagBTUFlowmeter,Modbus+pulse-out,3inch,Flange
FLO-QSE40FAPQBQ12C	QSE40FAPQBQ12C	Noryl,MagBTUFlowmeter,Modbus+pulse-out,4inch,Flange

*Products without display are configured wirelessly using the FLOMEC app.

Plant Room Sensors: Humidity Monitoring

Schneider Electric offers a complete line of sensors for commercial/industrial relative humidity monitoring applications. Our sensors include a factory-calibrated humidity sensing element, fully replaceable (on deluxe models) for long-term cost savings. All humidity sensors provide superior accuracy, excellent stability, and easy serviceability. Accuracy choices include 2%, 3%, and 5%, with 1% or 2% NIST traceability available on selected units. LCD displays are available on some models for easy viewing. Add temperature sensing for greater application flexibility.

Plant Room Humidity Sensor Selection Guide

Feature/Option	Duct Mount	Outdoor Mount	Probe
Protocol Output	SHD2 Protocol, HD2 Protocol pages 119, 121		
Analog Output	SHD2 Analog, HD2 Analog, HD, EHD, HED pages 115, 117, 127, 129, 131	SHO2, HO2, HO, EHO pages 123, 125, 127, 129	HN/HP page 133
NIST Traceable Accuracy Down to 1%	HD page 127	HO pagepage 127	HN/HP page 133
Resistive Temperature Sensing	HD, EHD pages 127, 129	HO, EHO pages 127, 129	HN/HP page 133

SpaceLogic Sensors
SHD2 Analog Series
Duct Mount Humidity Sensors

SHD2 Analog

SpaceLogic SHD2 Series Humidity Transmitters provide an ideal solution for measuring relative humidity in a wide range of conditions. All models are equipped with a solid state capacitive humidity sensor that is easy to replace in the field and a solid state temperature sensor for high accuracy measurements.

SHD2 is an all-in-one device combining humidity and temperature sensing. Intended for duct mount applications, the device ensures a building's optimum temperature and humidity levels, resulting in greater energy efficiency.

Each device is an active sensor that converts a humidity or temperature measurement into 4-20 mA, 0 to 5 Vdc or 0 to 10 Vdc analog output.

Different models are available based on application requirements for lower-cost installations.

Specifications

Operating & Storage Environment	
Operating Temp. Range	-35 to 60 °C (-31 to 140 °F)
Operating Humidity Range*	0 to 95% RH (non-condensing)
Storage Temperature	-35 to 70 °C (-31 to 158 °F)
Storage Humidity Range	0 to 95% RH non-condensing
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz; loop powered 20 to 30 Vdc
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	0.8VA @ 24VAC Voltage Mode 0.96W @ 24VDC Current Mode
Output Load	Voltage mode ≥ 5K Ohms Current mode ≤ 250 Ohms
Tube Length	200 mm
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP 65
Protection Class	Class III
Humidity Sensor	
Sensor type	Solid state capacitive, replaceable
Accuracy**	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% NIST and 2% replaceable option
Hysteresis	1.5% typical

Calibration free

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Field replaceable

Replace RH element and temp transmitter in the field… maintain accuracy and minimize downtime and cost

Sensor element

Solid state, capacitive sensor element recovers from 100% saturation

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Applications

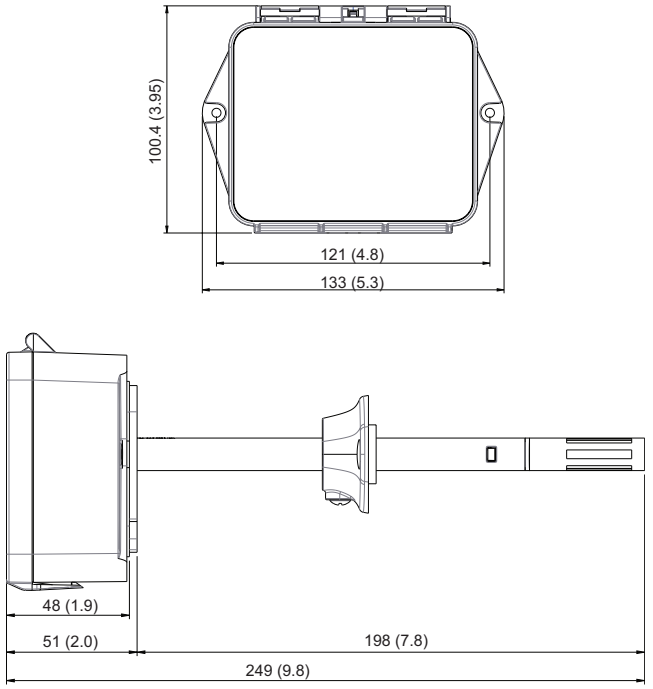
- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality
- Key component for the LEED green building program and WELL Building Standard*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

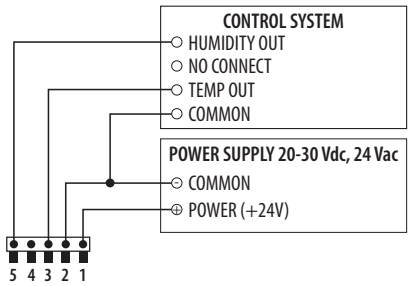
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Solid state, integrated circuit
Temp sensing element	10K T3 thermistor, 1000 PT RTD
Time constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy***	±0.2 °C (±0.4 °F) typical at 25 °C
Resolution	0.1 °C (0.1 °F)
Range	-35 to 60 °C (-31 to 140 °F)
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG
Warranty	
Limited Warranty	5 years
Regulatory Information	
Agency Approvals	UL 916 European conformance CE: EN 60730-1, EN 61000-6-2, EN 61000-6-3, EN 6100 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class A Green Premium (REACH, RoHS), RoHS 2 (China), RCM (Australia), ICES-001 (Canada), UKCA (UK)

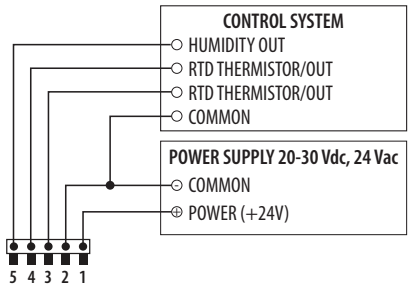
*Duct mount model with temperature and humidity only.
**Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability. Humidity sensor accuracy to -20°C.
***±0.5 °C accuracy from 0 to 60°C, ±1°C accuracy from -35 to 0°C.

Dimensional Drawing
mm (in.)

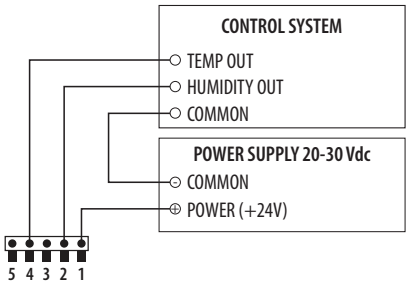


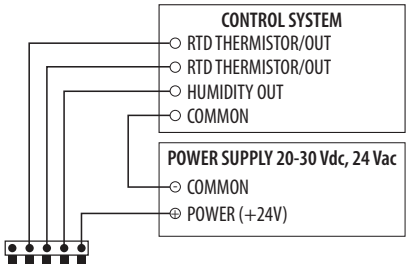
Wiring Diagram
Voltage Mode





Wiring Diagram
Current Mode





Ordering Information

	User Interface	Output	RH Sensor	Temp.
SHD2	X	A		
	X = None	A = Analog Output	2 = 2%	A = Transmitter only C = 1000 PT RTD H = 10K T3 Thermistor

Example: SHD2 X A 2 A

Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
SLXXT2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
SLXRHT2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with SHO2 Series outdoor humidity sensors.
**For use on temperature transmitter models only.

Replaceable RH and Temperature Module

HD2 Analog Series

Duct Mount Humidity Sensors from Veris

HD2 Analog

Veris HD2 Analog Series Humidity Transmitters provide an ideal solution for measuring relative humidity in a wide range of conditions. All models are equipped with a solid state capacitive humidity sensor that is easy to replace in the field and a solid state temperature sensor for high accuracy measurements.

HD2 is an all-in-one device combining humidity and temperature sensing. Intended for duct mount applications, the device ensures a building's optimum temperature and humidity levels, resulting in greater energy efficiency.

Each device is an active sensor that converts a humidity or temperature measurement into 4-20 mA, 0 to 5 Vdc or 0 to 10 Vdc analog output.

Different models are available based on application requirements for lower-cost installations.

Specifications

Operating & Storage Environment	
Operating Temp. Range	-35 to 60 °C (-31 to 140 °F)
Operating Humidity Range*	0 to 95% RH (non-condensing)
Storage Temperature	-35 to 70 °C (-31 to 158 °F)
Storage Humidity Range	0 to 95% RH non-condensing
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz; loop powered 20 to 30 Vdc
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	0.8VA @ 24VAC Voltage Mode 0.96W @ 24VDC Current Mode
Output Load	Voltage mode ≥ 5K Ohms Current mode ≤ 250 Ohms
Tube Length	200 mm
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP 65
Protection Class	Class III
Humidity Sensor	
Sensor type	Solid state capacitive, replaceable
Accuracy**	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% NIST and 2% replaceable option
Hysteresis	1.5% typical

Calibration free

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Field replaceable

Replace RH element and temp transmitter in the field… maintain accuracy and minimize downtime and cost

Sensor element

Solid state, capacitive sensor element recovers from 100% saturation

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Applications

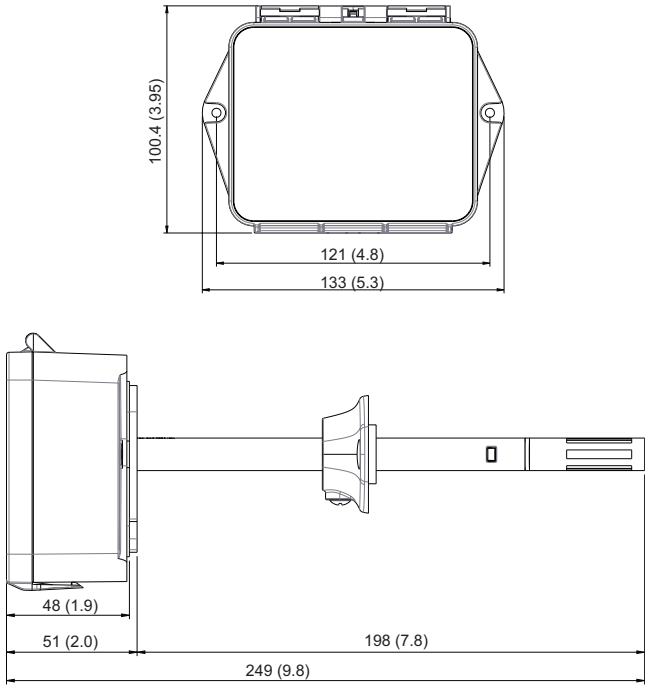
- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality
- Key component for the LEED green building program and WELL Building Standard*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

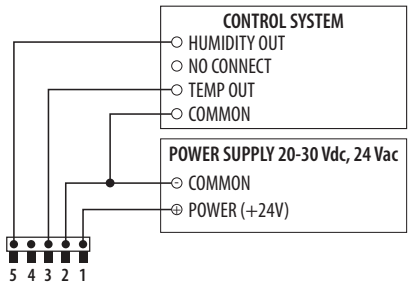
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Solid state, integrated circuit
Temp sensing element	See Ordering Information matrix for thermistor types
Time constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy***	±0.2 °C (±0.4 °F) typical at 25 °C
Resolution	0.1 °C (0.1 °F)
Range	-35 to 60 °C (-31 to 140 °F)
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG
Warranty	
Limited Warranty	5 years
Regulatory Information	
Agency Approvals	UL 916 European conformance CE: EN 60730-1, EN 61000-6-2, EN 61000-6-3, EN 6100 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class A Green Premium (REACH, RoHS), RoHS 2 (China), RCM (Australia), ICES-001 (Canada), UKCA (UK)

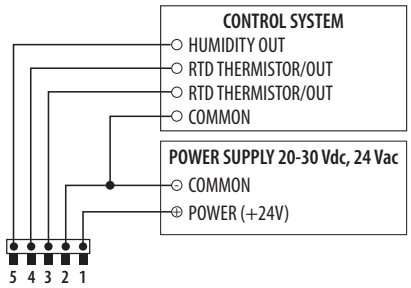
*Duct mount model with temperature and humidity only.
**Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability. Humidity sensor accuracy to -20°C.
***±0.5 °C accuracy from 0 to 60°C, ±1°C accuracy from -35 to 0°C.

Dimensional Drawing
mm (in.)

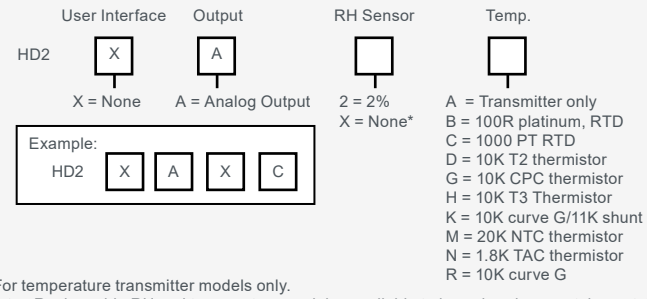


Wiring Diagram
Voltage Mode



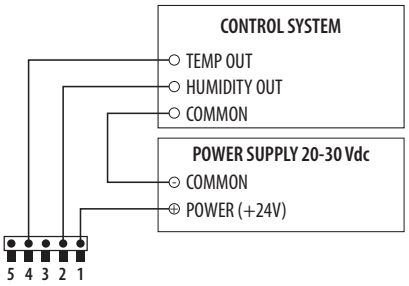


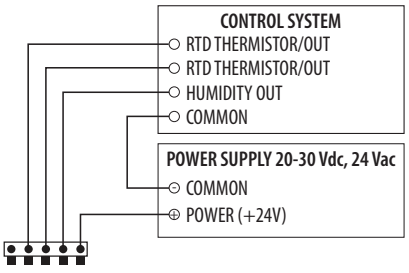
Ordering Information



*For temperature transmitter models only.
Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Wiring Diagram
Current Mode





Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
SLXXT2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
SLXRHT2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with SHO2 Series outdoor humidity sensors.
**For use on temperature transmitter models only.

Replaceable RH and Temperature Module

SpaceLogic Sensors
SHD2 Protocol Series

Duct Mount Humidity Sensors

SHD2

SpaceLogic SHD2 Series Humidity Transmitters provide an ideal solution for measuring relative humidity in a wide range of conditions. All models are equipped with a solid state capacitive humidity sensor that is easy to replace in the field and a solid state temperature sensor for high accuracy measurements.

SHD2 is an all-in-one device combining humidity and temperature sensing. Intended for duct mount applications, the device ensures a building's optimum temperature and humidity levels, resulting in greater energy efficiency.

Each device is an active sensor that converts a humidity or temperature measurement into BACnet MS/TP, Modbus RTU.

As an integral part of Schneider Electric EcoStruxture™ Building Operation (EBO) software, the SHD2 protocol models' Ready-Connect feature enables a plug & play experience for easy integration and configuration.

Different models are available based on application requirements for lower-cost installations.

SHD2 is available with an LCD display option on select models (see Ordering Information).

BACnet & Modbus

Embedded BACnet and Modbus communication protocols…easy systems integration

Field replaceable

Replace RH element and temp transmitter in the field… maintain accuracy and minimize downtime and cost

Sensor element

Solid state capacitive sensor element recovers from 100% saturation

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Calibration free

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality
- Key component for the LEED green building program and WELL Building Standard*

*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

Specifications

Operating & Storage Environment	
Operating Temp. Range	-35 to 60 °C (-31 to 140 °F)[1]
Operating Humidity Range	0 to 95% RH (non-condensing)[1]
Storage Temperature	-35 to 70 °C (-31 to 158 °F)[1]
Storage Humidity Range	0 to 95% RH (non-condensing)[1]
Power Supply	20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	BACnet MS/TP, Modbus RTU
Power Consumption	See Maximum Power Consumption table, next page
Tube Length	200 mm
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP 65
Protection Class	Class III
RH Sensor	
Sensor Type	Solid state capacitive, replaceable
Accuracy[2]	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% NIST and 2% replaceable option
Hysteresis	1.5% typical
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Transmitter Type	Solid state, integrated circuit
Temp. Sensing Element	10K T3 thermistor, 1000 PT RTD
Time Constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy[3]	±0.2 °C (±0.4 °F) typical @ 25 °C
Resolution	0.1 °C (0.1 °F)
Range	-35 to 60 °C (-31 to 140 °F)*
Display Models	
LCD Type	Positive display with backlight
Measurement Values Displayed	Temperature: °C or °F Humidity: % RH
Display Resolution	Temperature: 0.1 °C or °F Humidity: 0.1% RH

Specifications, Cont.

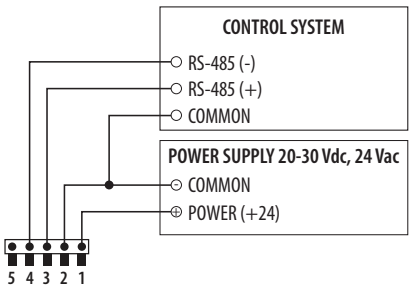
Wiring Terminals	
Wiring	Screwless terminal block with spring actuator, 16-24 AWG
EBO Integration[4]	Download Modbus Device Type template for Modbus models from the Building Application tool.
Warranty	
Limited Warranty	2 years
Compliance information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class A Green Premium (REACH, RoHS), RoHS 2 (China), RCM (Australia), ICES-003 (Canada), UKCA (UK), EAC (Russia)

1. Duct mount model with temperature and humidity only. LCD operation from -10 to 60 °C (14 to 140 °F).
2. Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability. Humidity accuracy up to -20°C.
3. ±0.5 °C accuracy from 0 to 60°C, ±1°C accuracy from -35 to 0°C over the full operating range.
4. See http://bms-applications.schneider-electric.com/type/MB/download/318 for device import file and instructions.

Maximum Power Consumption

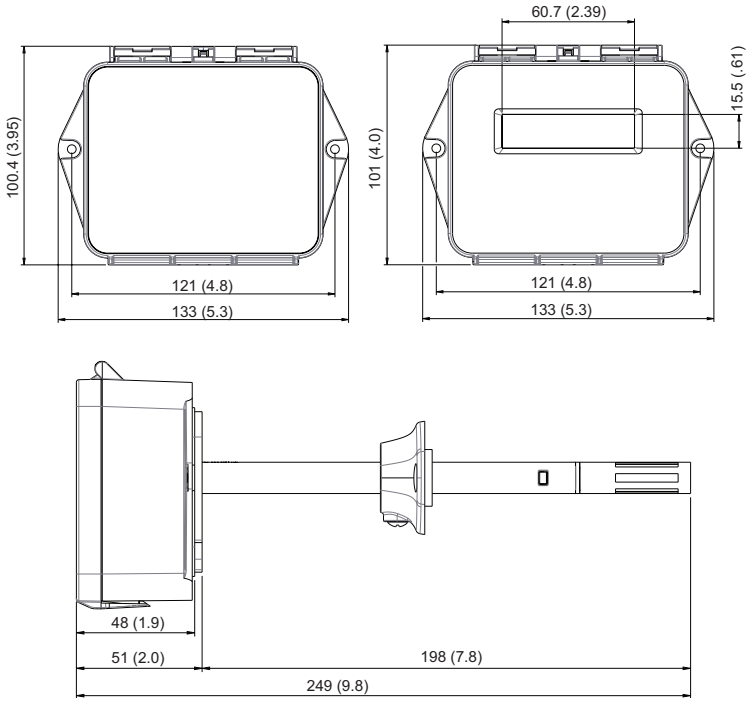
Series	LCD	Temp/RH	Max. Power
SHD2 Protocol	Yes	Yes	1.5VA @ 24VAC
	No	Yes	0.8VA @ 24VAC

Wiring Diagram



Dimensional Drawing

mm (in.)



Ordering Information

User Interface	Output	RH Accuracy	Temperature
SHD2 [ ]	[P]	[2]	[A]
L = LCD Display X = None	P = BACnet/Modbus	2 = 2%	A = Transmitter Only

Example: SHD2 [L] [P] [2] [A]

Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
SLXRHS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
SLXRHS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
SLXRHS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
SLXXT2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
SLXRHT2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with SHO2 Series outdoor humidity sensors.
**For use on temperature transmitter models only.

Replaceable RH and Temperature Module

HD2 Protocol Series

Duct Mount Humidity Sensors from Veris

HD2

Veris HD2 Series Protocol Humidity Sensors provide an ideal solution for measuring relative humidity in a wide range of conditions. All models are equipped with a solid state capacitive humidity sensor that is easy to replace in the field. A solid state temperature sensor provides high accuracy measurements.

HD2 is an all-in-one device combining humidity and temperature sensing. Intended for duct mount applications, the device ensures a building's optimum temperature and humidity levels, resulting in greater energy efficiency.

Each device is an active sensor that converts a humidity or temperature measurement into BACnet MS/TP or Modbus RTU.

Different models are available based on application requirements for lower-cost installations.

HD2 is available with an LCD display option on select models (see Ordering Information).

Specifications

Operating & Storage Environment	
Operating Temp. Range	-35 to 60 °C (-31 to 140 °F)*
Operating Humidity Range	0 to 95% RH (non-condensing)*
Storage Temperature	-35 to 70 °C (-31 to 158 °F)*
Storage Humidity Range	0 to 95% RH (non-condensing)*
Power Supply	20 to 30 Vdc, 24 Vac, 50 to 60 Hz
Output	BACnet MS/TP, Modbus RTU
Power Consumption	See Maximum Power Consumption table, next page
Tube Length	200 mm
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP 65
Protection Class	Class III
RH Sensor	
Sensor Type	Solid state capacitive, replaceable
Accuracy**	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% NIST and 2% replaceable option
Hysteresis	1.5% typical
Linearity	Included in accuracy specification

BACnet & Modbus

Embedded BACnet and Modbus communication protocols…easy systems integration

Field replaceable

Replace RH element and temp transmitter in the field… maintain accuracy and minimize downtime and cost

Sensor element

Solid state capacitive sensor element recovers from 100% saturation

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Calibration free

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality
- Key component for the LEED green building program and WELL Building Standard*

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Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Transmitter Type	Solid state, integrated circuit
Temp. Sensing Element***	See Ordering Information on page 2 for available temp. sensing elements
Time Constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy****	±0.2 °C (±0.4 °F) typical @ 25 °C
Resolution	0.1 °C (0.1 °F)
Range	-35 to 60 °C (-31 to 140 °F)*
Display Models	
LCD Type	Positive display with backlight
Measurement Values Displayed	Temperature: °C or °F Humidity: % RH
Display Resolution	Temperature: 0.1 °C or °F Humidity: 0.1% RH
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG

Specifications, Cont.

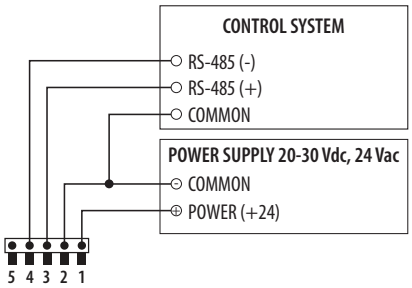
Warranty	
Limited Warranty	5 years
Compliance information	
Agency Approvals	UL 916, European Conformance CE: EN 60730-1 EN 61000-6-2 EN 61000-6-3 EN 61000 Series - Industrial Immunity EN 61326-1 FCC Part 15 Class A REACH, RoHS, RoHS 2 (China), RCM (Australia), ICES-003 (Canada), UKCA (UK)

*Duct mount model with temperature and humidity only. LCD operation from -10 to 60 °C (14 to 140 °F).
** Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability.
***See thermistor table Z202030 for accuracy.
****±0.5 °C over full operating range.

Maximum Power Consumption

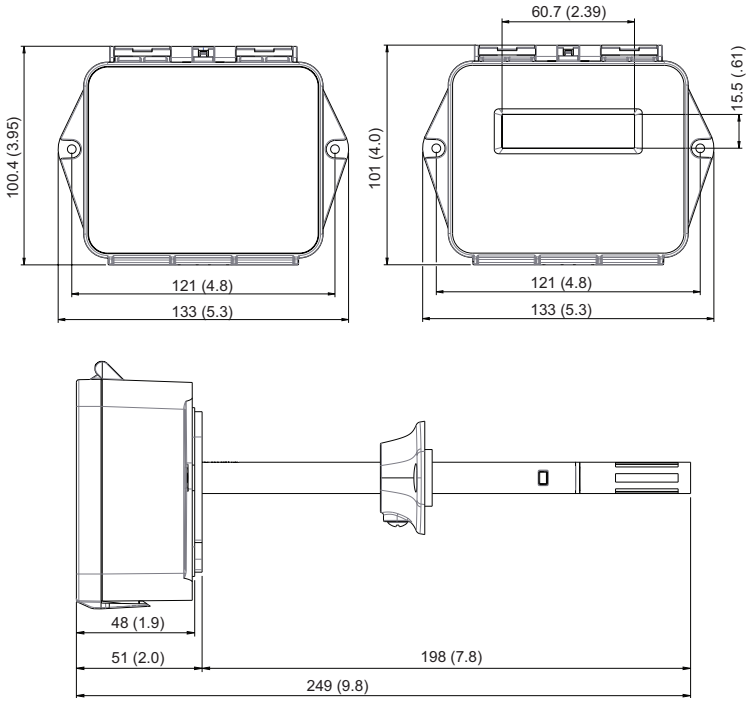
Series	LCD	Temp/RH	Max. Power
HD2 Protocol	Yes	Yes	1.5VA @ 24VAC
	No	Yes	0.8VA @ 24VAC

Wiring Diagram



Dimensional Drawing

mm (in.)



Ordering Information

	User Interface	Output	RH Accuracy	Temperature
HD2	[ ]	P	2	A
	L = LCD Display X = None	P = BACnet/Modbus	2 = 2%	A = Transmitter Only

Example: HD2 L P 2 A

Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH Sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
TS2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
THS2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with HO2 Series outdoor humidity sensors. **For use on temperature transmitter models only.

Replaceable RH and Temperature Module

SpaceLogic Sensors
SHO2 Series

Duct Mount Weatherproof Humidity Sensors

SHO2

SpaceLogic SHO2 Series Humidity Transmitters provide an ideal solution for measuring relative humidity in a wide range of humidity conditions. All models are equipped with a solid state capacitive humidity sensor that is easy to replace in the field. The housing is weatherproof and intended for outdoor mounting.

The SHO2 is an all-in-one device combining humidity and temperature sensing. The device ensures a building's optimum temperature and humidity levels, resulting in greater energy efficiency.

Each device is an active sensor that converts a humidity or temperature measurement into an analog output: current output (4-20 mA) or voltage output (0 to 5 Vdc or 0 to 10 Vdc).

Different models are available based on application requirements for lower-cost installations.

Specifications

Operating & Storage Environment	
Operating Temp. Range	-40 to 55 °C (-40 to 131 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Storage Temperature	-40 to 60 °C (-40 to 140 °F)
Storage Humidity Range	0 to 95% RH non-condensing
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz; loop powered 20 to 30 Vdc
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	0.8VA @ 24VAC Voltage Mode 0.96W @ 24V DC Current Mode
Output Load	Voltage mode ≥ 5K Ohms Current mode ≤ 250 Ohms
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For outdoor use
IP Rating	IP 65
Protection Class	Class III
RH Sensor	
Sensor Type	Solid state capacitive, replaceable
Accuracy*	±2% / ±3% from 10 to 80% RH @ 25 °C (77 °F) ±2% NIST and 2% replaceable option
Hysteresis	1.5% typical

Field replaceable

Replace RH element and temp. transmitter module in the field… maintain accuracy and minimize downtime and cost

Calibration free

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality
- Key component for the LEED green building program and WELL Building Standard*

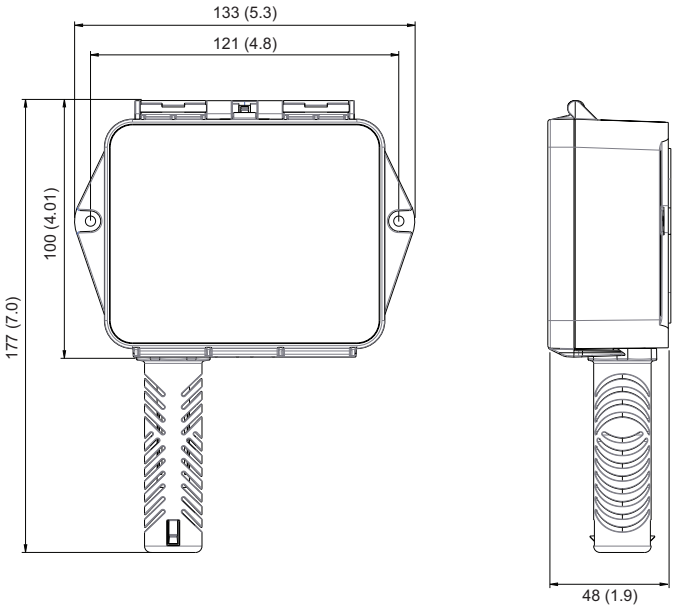
*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	Solid state, integrated circuit
Temp. Sensing Element**	10K T3 thermistor, 1000 PT RTD
Time Constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy***	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	-40 to 55 °C (-40 to 131 °F)
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1 EN 61000-6-2 EN 61000-6-3 EN 61000 Series - Industrial Immunity EN 61326-1 FCC Part 15 Class A REACH, RoHS, RoHS 2 (China), RCM (Australia), ICES-001 (Canada), UKCA (UK)

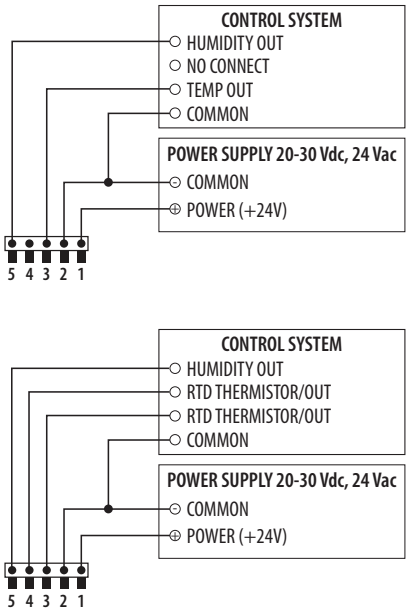
c UL us LISTED

* Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability. Humidity sensor accuracy to -20 °C.
**See thermistor table Z202030 for accuracy.
***±0.5 °C accuracy from 0 to 55°C, ±1 °C accuracy from -40 °C to 0 °C.

Dimensional Drawing
mm (in.)



Wiring Diagram
Voltage Mode



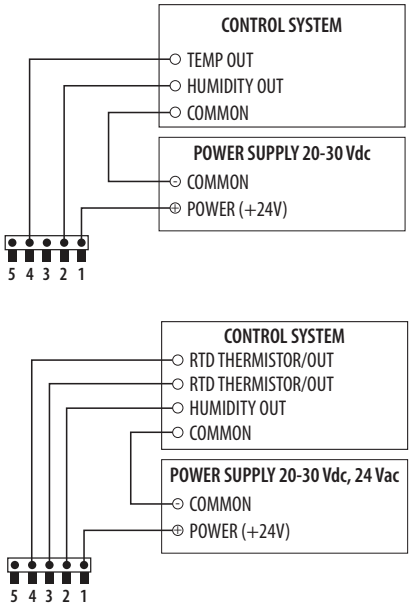
Ordering Information

	User Interface	Output	RH Sensor	Temp.
SHO2	X	A		
	X = None	A = Analog Output	2 = 2%	A = Transmitter only C = 1000 PT RTD H = 10K T3 Thermistor

Example: SHO2 X A 2 A

Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Wiring Diagram
Current Mode



Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH Sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
TS2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
THS2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with HO2 Series outdoor humidity sensors. **For use on temperature transmitter models only.

Replaceable RH and Temperature Module

HO2 Series

Duct Mount Weatherproof Humidity Sensors from Veris

HO2

Veris HO2 Series Humidity Sensors provide an ideal solution for measuring relative humidity in a wide range of conditions. All models are equipped with a solid state capacitive sensor that is easy to replace in the field. The housing is completely weatherproof and intended for outdoor mounting.

The HO2 is an all-in-one device combining humidity and temperature sensing. The device ensures a building's optimum temperature and humidity levels, resulting in greater energy efficiency.

Each device is an active sensor that converts a humidity or temperature measurement into an analog output (4-20 mA) or a voltage level (0 to 5 Vdc or 0 to 10 Vdc).

Different models are available based on application requirements for lower-cost installations.

Specifications

Operating & Storage Environment	
Operating Temp. Range	-40 to 55 °C (-40 to 131 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Storage Temperature	-40 to 60 °C (-40 to 140 °F)
Storage Humidity Range	0 to 95% RH non-condensing
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz; loop powered 20 to 30 Vdc
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	0.8VA @ 24VAC Voltage Mode 0.96W @ 24V DC Current Mode
Output Load	Voltage mode ≥ 5K Ohms Current mode ≤ 250 Ohms
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mounting Location	For outdoor use
IP Rating	IP 65
Protection Class	Class III
RH Sensor	
Sensor Type	Solid state capacitive, replaceable
Accuracy*	±2% / ±3% from 10 to 80% RH @ 25 °C (77 °F) ±2% NIST and 2% replaceable option
Hysteresis	1.5% typical
Linearity	Included in accuracy specification

Field replaceable

Replace RH element and temp. transmitter module in the field… maintain accuracy and minimize downtime and cost

Calibration free

Fully interchangeable element to 1% or 2% accuracy with NIST calibration certificate…no calibration

Easy to install

Latch-on sensor cover and screwless terminal block wiring with spring actuator

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality
- Key component for the LEED green building program and WELL Building Standard*

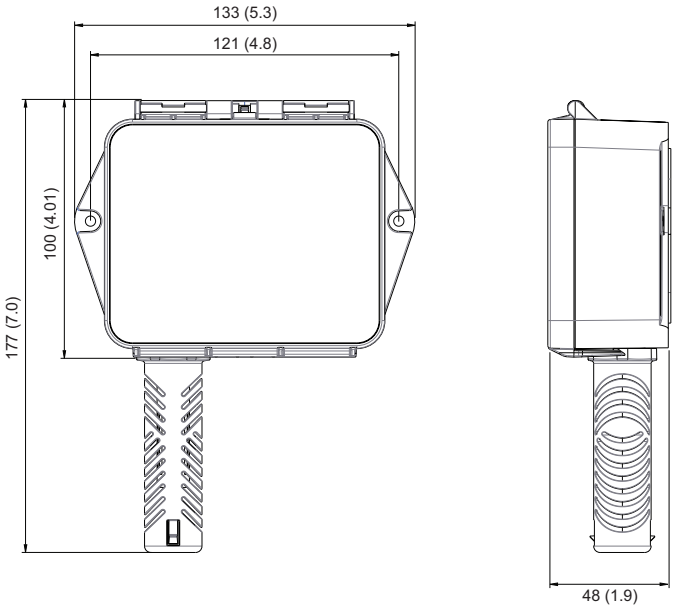
*Leadership in Energy and Environmental Design (LEED) is a registered trademark of the US Green Building Council. The WELL Building Standard is a trademark of the International WELL Building Institute in the United States and other countries..

Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
Temperature Sensor	
Sensor Type	See Ordering Information matrix for thermistor types
Temp. Sensing Element**	10K T3 thermistor, 1000 PT RTD
Time Constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy***	±0.2 °C (±0.4 °F) typical
Resolution	0.1 °C (0.1 °F)
Range	-40 to 55 °C (-40 to 131 °F)
Wiring Terminals	
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG
Warranty	
Limited Warranty	5 years
Compliance Information	
Agency Approvals	UL 916, European conformance CE: EN 60730-1 EN 61000-6-2 EN 61000-6-3 EN 61000 Series - Industrial Immunity EN 61326-1 FCC Part 15 Class A REACH, RoHS, RoHS 2 (China), RCM (Australia), ICES-001 (Canada), UKCA (UK)

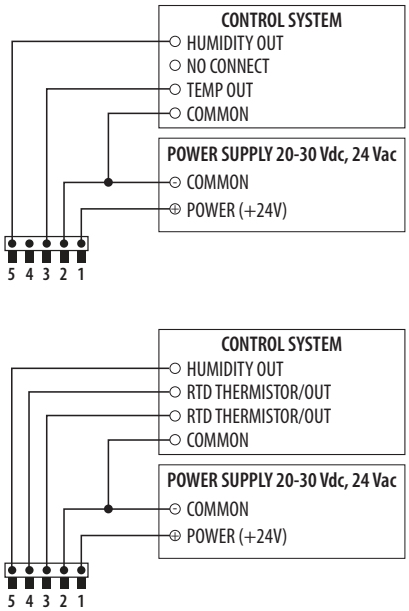
c UL us LISTED

* Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability. Humidity sensor accuracy to -20 °C.
**See thermistor table Z202030 for accuracy.
***±0.5 °C accuracy from 0 to 55°C, ±1 °C accuracy from -40 °C to 0 °C.

Dimensional Drawing
mm (in.)



Wiring Diagram
Voltage Mode



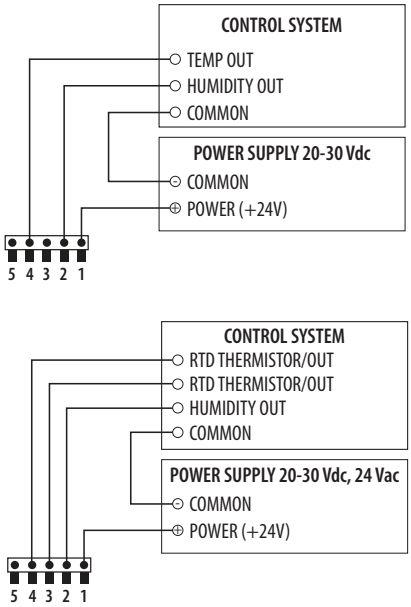
Ordering Information

User Interface	Output	RH Sensor	Temp.
HO2 X	A		
X = None	A = Analog Output	2 = 2% 3 = 3%	A = Transmitter only B = 100R platinum, RTD C = 1000 PT RTD D = 10K T2 thermistor G = 10K CPC thermistor H = 10K T3 Thermistor K = 10K curve G/11K shunt M = 20K NTC thermistor N = 1.8K TAC thermistor R = 10K curve G

Example: HO2 X A 2 A

Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Wiring Diagram
Current Mode



Replaceable RH Elements & Temperature and Humidity Calibration Modules

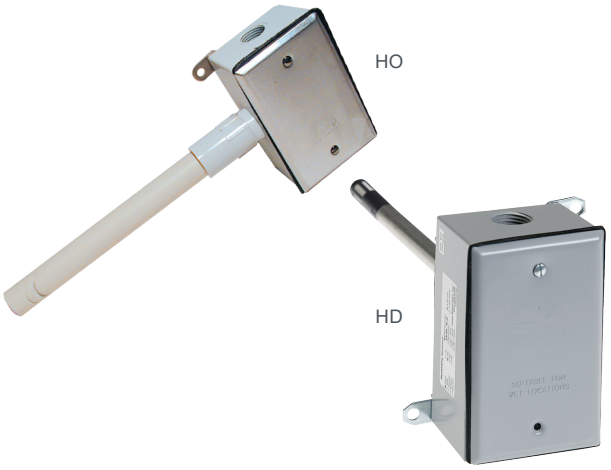
Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH Sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
TS2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
THS2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

*Not for use with HO2 Series outdoor humidity sensors. **For use on temperature transmitter models only.

Replaceable RH and Temperature Module

HD & HO Series

1% & 2% NIST, or Standard 2%, 3%, or 5% from Veris



The Veris HD and HO Series deluxe humidity transmitters provide an ideal solution for measuring relative humidity in a wide range of conditions. All devices are equipped with a thin-film capacitive sensor that is easily replaceable in the field. These sensors are calibrated to NIST standards, with certificates available (see Ordering Information; choose "N" in NIST block). Temperature sensing options are also available. The duct mounted HD is encased in a die cast metal housing for extra strength. The outdoor HO housing is completely weather proof – the most rugged sensor available. All deluxe HD and HO models come with a standard five-year warranty.†

Specifications

Input Power	
Voltage Model*	Class 2; 12 to 30 Vdc/24 Vac, 15 mA max.
mA Model	Class 2; Loop powered 12 to 30 Vdc only, 30 mA max.
Output	
Voltage Model	3-wire, observe polarity
mA Model	2-wire, not polarity sensitive (clipped and capped)
Humidity	
HS Element†	Digitally profiled thin-film capacitive (32-bit mathematics) U.S. Patent 5,844,138
Accuracy at 25°C from 10-80% RH** (Multi-point calibration, NIST traceable)	HD only: ±1% at 20 to 40% RH in mA output mode; (multi-point calibration, NIST traceable) All models: 2%, 3%, or 5% (specify)
Temperature Effect, Duct Model	±0.1% RH/°C above or below 25 °C (typical)
Temperature Effect, Outdoor Model	4 to 20 mA version: (0.0013x%RHx(T°C-25)); 0-5V/0-10V versions: (0.0015x%RHx(T°C-25))–(%RHx0.0008xabs(T°C-25))
Scaling	0 to 100% RH
Hysteresis	1.5% typical
Linearity	Included in accuracy spec.
Reset Rate***	24 hours
Stability	±1%@20 °C (68 °F) annually, for two years

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Easy servicing

Duct sensor element can be serviced without disturbing conduit

Accuracy

Fully interchangeable element to 1%, 2%, 3%, or 5% accuracy…no calibration

Potted circuitry

Prevents costly condensate shorts

Field replacable

Replace element in the field… maintain accuracy and minimize downtime

Flexibility

Polarity insensitive, two-wire 4 to 20 mA or 3-wire 0-5/0-10 Vdc versions…flexible systems compatibity…save time in the field, stock fewer devices

Applications

- Controlling HVAC systems for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

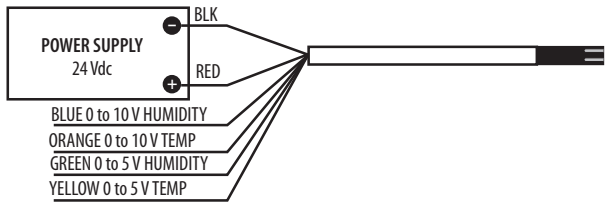
Temperature	
Optional Temp. Transmitter Output HO Transmitter Accuracy HD Transmitter Accuracy	Digital, 4 to 20 mA (clipped & capped) or 0-5/0-10 V output ±1.3 °C (±2.3 °F) typical; ±0.5 °C (1.0 °F) typical
Operating Environment	
Operating Humidity Range	0 to 100% RH non-condensing
Operating Temp. Range	-40 to 50 °C (-40 to 122 °F)
WARRANTY	
Limited Warranty	5 years †
Agency Approvals	

CE

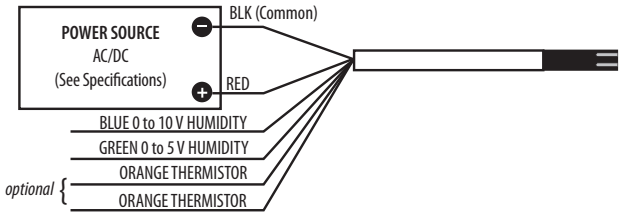
* One side of transformer secondary is connected to signal common, so an Isolation transformer or dedicated power supply may be required.
** Specified accuracy with 24 Vdc supplied power with rising humidity. RTD/Thermistors are not compensated for internal heating of product.
*** Reset Rate is the time required to recover to 50% RH after exposure to 90% RH for 24 hours.
† All deluxe models come with a standard five-year warranty. The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.

Shielded cabling is required for conformance to EMC standards. Technical information is available from the factory upon request or from the Veris website at www.veris.com.
EMC Conformance - CE Option: Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.
EMC note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

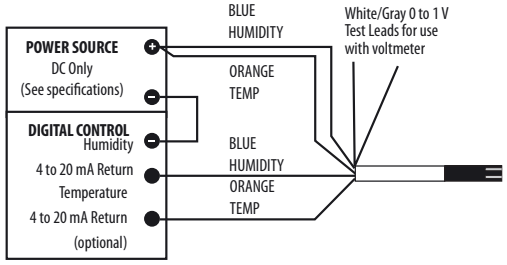
HD/HO (0-5V/0-10V Temperature Transmitter Versions)
Wiring Diagram



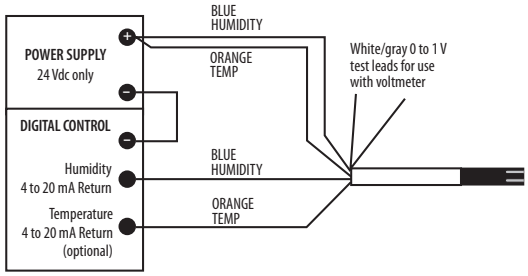
HO (0-5V/0-10V Resistance Versions)
Wiring Diagram



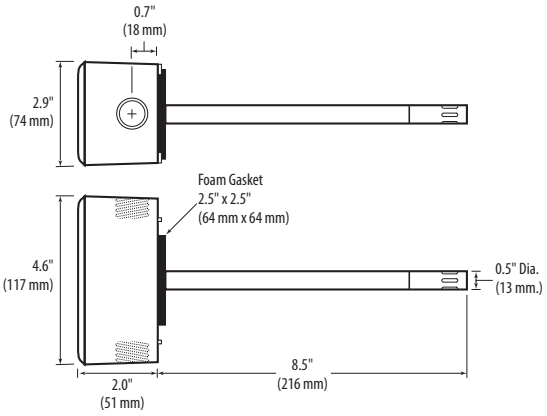
HD/HO (4-20 mA Temperature Transmitter Versions)
Wiring Diagram



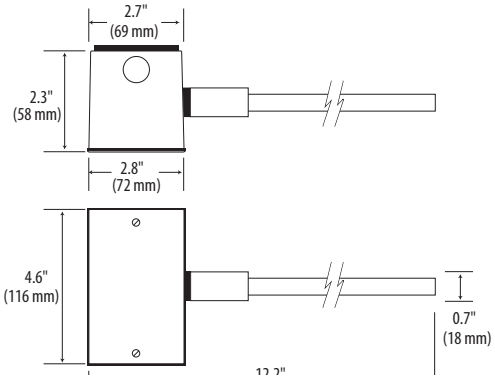
HO (4-20 mA Resistance Versions)
Wiring Diagram



HD
Dimensional Drawing



HO
Dimensional Drawing



Ordering Information

Enclosure	Accuracy	NIST	Output	US or EU	Temp.
H					
D = RH Duct O = Outdoor	1 = 1%* 2 = 2% 3 = 3% 5 = 5%	N = NIST 1% & 2% only X = None 2%, 3%, 5% only	M = 4 to 20 mA V = 0-5V/0-10 Vdc	S = Standard C = CE	T = Temp X = No Temp (Stop here)

*1% not available on HO.
** Not available with W and Y high-accuracy thermistors.

Examples

Temp:

H	D	2	N	V	C	T	C	2

No Temp:

H	O	2	X	M	S	X

Humidity Transmitter Combination

Sensor Type	Range	OPTION Temp. Cert
A = Transmitter	1 = -40 to 50 °C (-40 to 122 °F) 2 = 0 to 50 °C (32 to 122 °F)	Blank = None 1 =1pt cal 2 = 2pt cal

Humidity RTD/Thermistor Combination

Sensor Type	OPTION Temp. Cert
B = 100R Platinum, RTD C = 1k Platinum, RTD D = 10k T2, Thermistor E = 2.2k, Thermistor F = 3k, Thermistor G = 10k CPC, Thermistor H = 10k T3, Thermistor J = 10k Dale, Thermistor K = 10k with 11k shunt, Thermistor M = 20k NTC, Thermistor N = 1800 ohm TAC, Thermistor Q = 1uA/˚C, Linitemp R = 10k US, Thermistor S = 10k 3A 221, Thermistor T = 100k, Thermistor U = 20k “D”, Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor	Blank = None 1 = 1pt cal** 2 = 2pt cal**

Accessories

AA42
Water Guard, Humidity Sensor Protection Shield

SpaceLogic Sensors
EHD & EHO Series
Economy Sensors

Single-point Field Calibration

Field-selectable Output Signals

±2% Accuracy

Low Drift

Highly Repeatable

Integral Temp Sensor

The EHD and EHO economy duct and outdoor humidity sensors are a universal Relative Humidity transmitter that can be powered with either a +15 to 36 Vdc or 24 Vac supply voltage. The EH Series sensors are designed with a field-selectable 4-20 mA, 0-5 VDC, or 0-10 Vdc output signal that is equivalent to 0 to 100% RH. The EH Series is used in building automation systems, humidity chambers and OEM applications and is compatible with Vista, Continuum, I/Net and I/A systems.

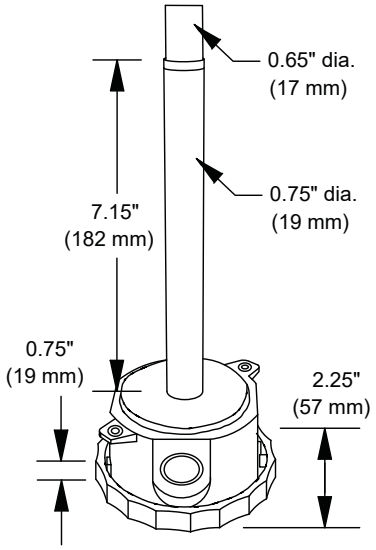
Specifications

Supply Voltage	250 Ohm Load: +15 to 36 Vdc / 21.6 to 26.4 Vac 0-5VDC: +15 to 36 Vdc / 21.6 to 26.4 Vac 500 Ohm Load: +18 to 36 Vdc / 21.6 to 26.4 Vac 0-10VDC: +18 to 36 Vdc / 21.6 to 26.4 Vac
RH Measurement Range	1VA maximum
RH Output	2-wire, 4 to 20mA (factory atandard) 3-wire, 0-5, 0-10 Vdc or 4 to 20mA
Accuracy at 77 °F (25 °C)	±2% from 20 to 95%
Long-Term Stability	Less than 2% drift / 5 years
Hysteresis	Less than 0.4% RH
Repeatability	0.5% RH
Sensitivity	0.1% RH
Response Time	110 seconds for 63% step
Storage Temperature Range	41 to 95 °F (5 to 35 °C) < 75% RH
Operating Temperature Range	-10 to 122 °F (-23.3 to 50 °C)
Operating Humidity Range	0 to 95 % RH non-condensing
Saturation Response Time	10 minutes for 63% step
Temperature sensor output at 77 °F (25 °C)	1.8K ohm (Vista), 10K ohm Type II (I/Net), 10K ohm Type III (Continuum), 10K ohm with 11K ohm shunt (I/A)

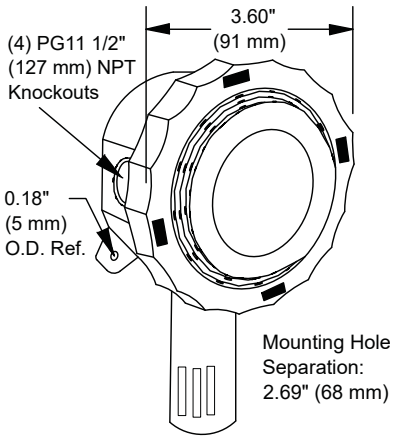
Applications

- HVAC economizer control
- Managing energy systems
- Facilitating ASHRAE standards for environmental control
- For use with Vista, I/NET, Continuum and I/A systems

EHD
Dimensional Diagram



EHO
Dimensional Diagram



Ordering Information

Display

EH [ ] 110 - [ ]

D = Duct
O = Outdoor

Temperature Option

Blank = No temp.
100 = Vista (1.8k thermistor)
200 = I/NET (1-K Type 2 thermistor)
500 = Continuum (10K Type 3 thermistor)
800 = I/A (10K thermistor with 11K shunt)

Example:

EH [D] 110- [500]

HED Series

2%, 3%, and 5% Accuracies from Veris

HED

RH & temperature

Monitor humidity and temperature with a single device…reduces installation costs

Easy hook-up

Large cage clamp terminal blocks…easy hook-up with no wire nuts

Sensor options

Semiconductor temperature transmitter, or popular thermistor/RTD sensors available

Embedded circuitry

Circuitry is embedded in the probe for durability and protection

No lost screws

Tool-less gasketed entry lid

The Veris HED Economy Series duct mount humidity transmitters offer high performance in an easy-to-install housing at an affordable price.

The thin-film capacitive sensor element provides high accuracy and performance, great long-term stability, and full recovery from saturation. Temperature sensing options are also available.

The duct-mounted HED includes a rugged all plastic housing with a tool-less gasketed entry lid, large cage clamp terminal blocks, and sturdy ABS material. All Economy models come with a standard one-year warranty.

Applications

- HVAC economizer control
- Managing energy systems
- Facilitating ASHRAE standards for environmental control

Specifications

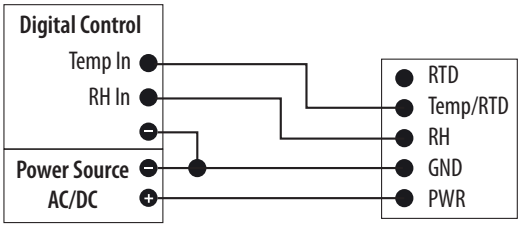
Input Power	
Voltage Version	Class 2; 12 to 24 Vdc or 24 Vac
mA Version	Class 2; 12 to 24 Vdc
AC Voltage Tolerance	±10%
AC Frequency	50/60 Hz
Max. Inrush Current after 1 msec (mA version)	25 mA
Output	
mA Output	4 to 20 mA, 2-wire, not polarity sensitive
mA Max. Loop Resistance	500 Ω at 24 Vdc input voltage; 250 Ω at 12 Vdc input voltage
Voltage Output	0 to 5 V or 0 to 10 V (jumper selectable), observe polarity
Voltage Min. Load Resistance	5 kΩ
Voltage Min. Sinking Current	0.2 mA
Humidity	
RH Element	Digitally profiled thin-film capacitive, non-removable
Accuracy	±2%, 3%, or 5% (10 to 90% RH, 20 to 30 °C)
Temp Effect (Outside 20° to 30°C)	≤0.1% RH per °C
Response Time (to 90% change at 20°C)	110 sec
Annual Drift	≤1%
Output Scaling	0 to 100% RH
Temperature option	
Active Output Accuracy	±0.5 °C (±.9 °F)
Active Output Temperature Scaling	Type 1: -40 to 50 °C (-40 to 122 °F); Type 2: 0 to 50 °C (32 to 122 °F)
Self-Heating Error (Resistive Temperature Only)	≤±0.5 °C at 20 to 30 °C (68 to 86 °F); ≤±0.75 °C outside of 20 to 30 °C (68 to 86 °F)
Operating Environment	
Operating Temperature	-40 to 50 °C (-40 to 122 °F)
Operating Humidity	0 to 100% RH non-condensing (unit will recover from saturation)
Housing	
Material	ABS plastic with UL V-0 5 VA Flame Class
Warranty	
Limited Warranty	1 year
Agency Approvals	

CE

EMC Conformance: Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU. Meets UL requirements for plenum rating.

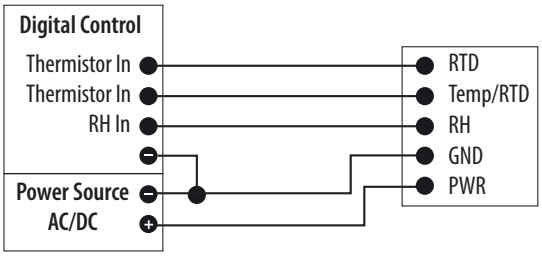
0-5V/0-10V Models, Temperature Transmitter

Wiring Diagram



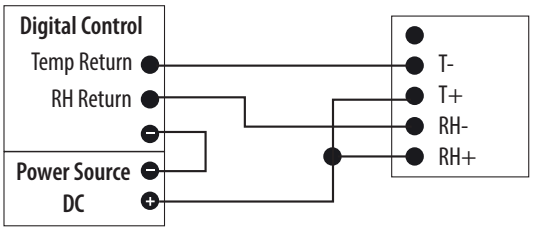
0-5V/0-10V Models, Thermistor

Wiring Diagram

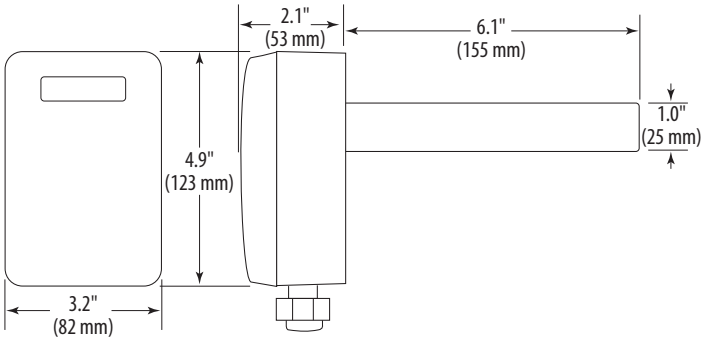


4-20 mA Models, Temperature Transmitter

Wiring Diagram

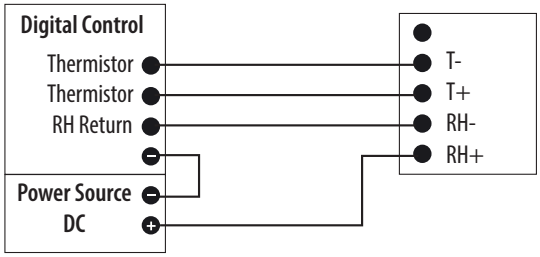


Dimensional Drawing



4-20 mA Models, Thermistor

Wiring Diagram



Ordering Information

HED □ □ □ □ □

Accuracy
- 2 = 2%
- 3 = 3%
- 5 = 5%

Output
- M = 4 to 20 mA
- V = 0-5/0-10 Vdc

US or EU
- S = Standard

Temp.
- T = Temp
- X = No Temp (Stop here)

Sensor Type A
- = Temp. transmitter

Temp Range
- 1 = -40 to 50 °C (-40 to 122 °F)
- 2 = 0 to 50 °C (32 to 122 °F)

Temp Cert
- Blank = None
- 1 = 1 pt cal
- 2 = 2 pt cal

Sensor Type
- B = 100R Platinum, RTD
- C = 1k Platinum, RTD
- D = 10k T2, Thermistor
- E = 2.2k, Thermistor
- F = 3k, Thermistor
- G = 10k CPC Thermistor
- H = 10k T3, Thermistor
- J = 10k Dale, Thermistor
- K = 10k with 11k shunt, Thermistor
- M = 20k NTC, Thermistor
- N = 1800 ohm TAC, Thermistor
- R = 10k US, Thermistor
- S = 10k 3A 221 Thermistor
- T = 100k, Thermistor
- U = 20k "D", Thermistor
- W = 10k T2 high accuracy, Thermistor
- Y = 10k T3 high accuracy, Thermistor

Temp Cert
- Blank = None
- 1 = 1 pt cal*
- 2 = 2 pt cal*

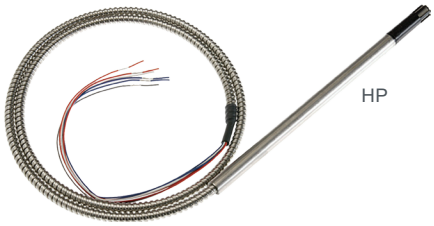
Examples:

HED	3	M	S	T	C
HED	3	V	S	X	

* Not available with W and Y high-accuracy thermistors.

HN & HP Series

Pendant and Insertion Sensors from Veris



Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Flexibile

Pendant and insertion versions for application flexibility

Corrosion resistant

Electronics are encapsulated in stainless steel probe to resist corrosion

Compatibility

Polarity insensitive two-wire 4 to 20 mA or 3-wire 0-5/0-10 Vdc versions…flexible systems compatibity

Interchangable

Fully interchangeable element to 1%, 2%, 3%, or 5% accuracy… no calibration

Calibration free

Calibration-free interchangeable NIST traceable HS element

The Veris HN and HP Series probe type humidity transmitters are easy to install and exceptionally accurate. Their long-term stability and trouble-free serviceability make them among the best in the industry. The electronics are embedded inside the probe, protecting them from condensation-related failures. The thin-film capacitive HS sensor elements are factory calibrated using NIST traceable calibration equipment, eliminating the need for field calibration. Field replacement of the sensor element is a snap with the patented removable sensor, lowering costs and reducing downtime.

Applications

- HVAC control for improved comfort and energy savings
- Museums, schools, printing shops, and other locations requiring humidity control
- Facilitating compliance with ASHRAE standards for environmental control and indoor air quality

Specifications

Input Power	
Voltage Model	Class 2; 12 to 30 Vdc/24 Vac, 15 mA max.
mA Model	Class 2; Loop powered 12 to 30 Vdc only, 30 mA max.
Output	
Voltage Model	3-wire, observe polarity
mA Model	2-wire, not polarity sensitive (clipped & capped)
Humidity	
HS Element†	Digitally profiled thin-film capacitive (32-bit mathematics) U.S. Patent 5,844,138
Accuracy @ 25°C**	±1%, 2%, 3%, or 5% (specify)@10 to 80% RH; Multi-point calibration, NIST traceable
Reset Rate***	24 hours
Stability	±1%@20 °C (68 °F) annually, for two years
Hysteresis	1.5% typical
Linearity	Included in accuracy spec.
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (typical)
Scaling	0 to 100% RH

Temperature Option	
Optional Temperature Transmitter Output	Digital, 4 to 20 mA (clipped & capped) or 0-5/ 0-10 V output; accuracy ±0.5 °C (±1 °F) typical
Operating Environment	
Operating Humidity Range	0 to 100% RH non-condensing
Operating Temp Range	-40 to 50 °C (-40 to 122 °F)
Warranty	
Limited Warranty	5 years †

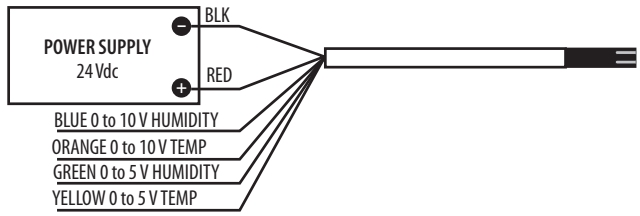
Agency Approvals

CE Available

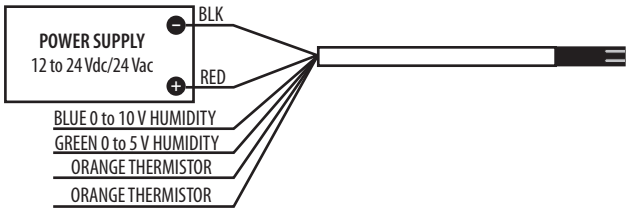
* One side of transformer secondary is connected to signal common, so an Isolation transformer or dedicated power supply may be required.
** Specified accuracy with 24 Vdc supplied power with rising humidity. RTD/ Thermistors are not compensated for internal heating of product.
*** Reset Rate is the time required to recover to 50% RH after exposure to 90% RH for 24 hours.
† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.

Shielded cabling is required for conformance to EMC standards. Technical information is available from factory upon request or is available on our website: www.veris.com.
EMC Conformance - CE Option: Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.
EMC Special Note: Connect this product to a DC distribution network or an AC/ DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

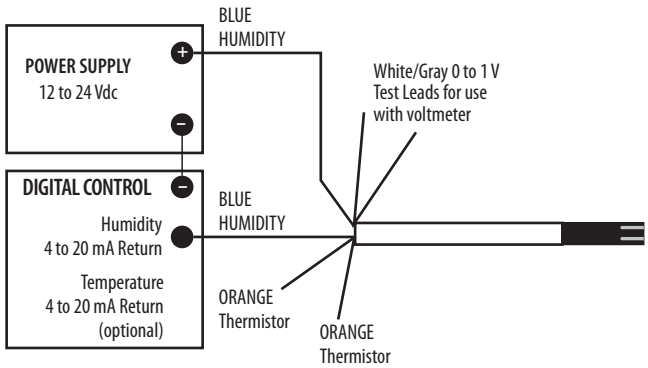
HN/HP (0-5V/0-10V Versions)
Wiring Diagram



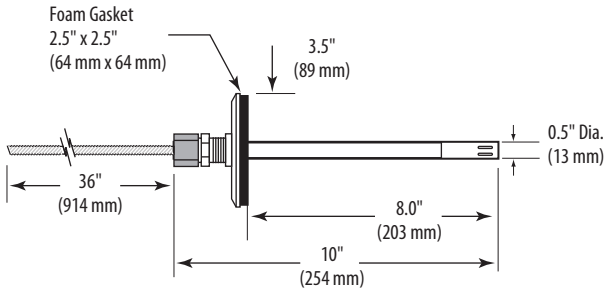
HN/HP with RTD/Thermistor (0-5V/0-10V Versions)
Wiring Diagram



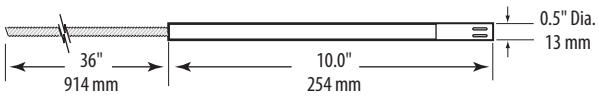
HN/HP with RTD/Thermistor (4-20 mA Versions)
Wiring Diagram



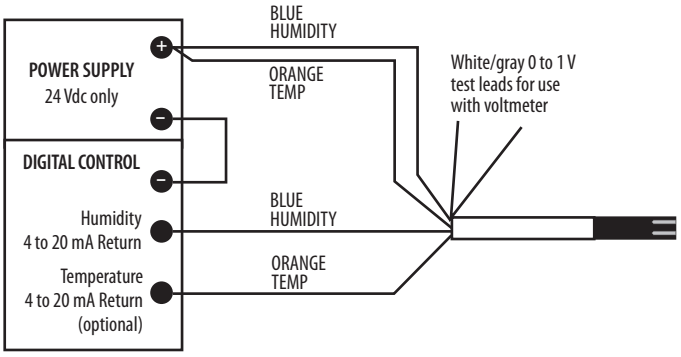
HN Series
Dimensional Drawing



HP Series
Dimensional Drawing



HN/HP (4-20 mA Versions)
Dimensional Drawing



Ordering Information

Humidity Transmitter Combination

Enclosure	Accuracy	NIST	Output	US or EU	Temp.	Sensor Type	Range	OPTION Temp Cert
H [ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[A]	[ ]	[ ]
N = RH Insertion P = RH Pendant	1 = 1% 2 = 2% 3 = 3% 5 = 5%	N = NIST 1%, & 2% only X = None 2%, 3%, 5% only	M = 4 to 20 mA V = 0-5V/0-10 Vdc	S = Standard C = CE	T = Temp X = No Temp (Stop here)	= Transmitter	1 = -40 to 122 °F (-40 to 50 °C) 2 = 32 to 122 °F (0 to 50 °C)	Blank = None 1 = 1pt Cal 2 = 2pt Cal

Humidity RTD/Thermistor Combination

Enclosure	Accuracy	NIST	Output	US or EU	Temp.	Sensor Type	OPTION Temp Cert
H [ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
N = RH Insertion P = RH Pendant	1 = 1% 2 = 2% 3 = 3% 5 = 5%	N = NIST 1%, & 2% only X = None 2%, 3%, 5% only	M = 4 to 20 mA V = 0-5V/0-10 Vdc	S = Standard C = CE	T = Temp X = No Temp (Stop here)	B = 100R Platinum, RTD C = 1k Platinum, RTD D = 10k T2, Thermistor E = 2.2k, Thermistor F = 3k, Thermistor G = 10k CPC,Thermistor H = 10k T3, Thermistor J = 10k Dale, Thermistor K = 10k with 11k shunt, Thermistor M = 20k NTC, Thermistor N = 1800 ohm TAC, Thermistor Q = 1uA/˚C, Linitemp R = 10k US, Thermistor S = 10k 3A 221, Thermistor T = 100k, Thermistor U = 20k “D”, Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor	Blank = None 1 = 1pt cal* 2 = 2pt cal*

Example: (No Temp)

H	P	2	X	V	S	X	Stop Here

Example: (With Temp)

H	N	2	X	V	S	T	C	2

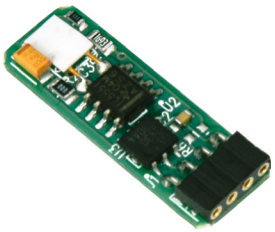
* Not available with W and Y high-accuracy thermistors.

Accessories

AA42
Water Guard, Humidity Sensor Protection Shield

HS Series

Easy Field Replacement for Veris Deluxe Humidity Sensors



HS Generation 1
U.S. Patent No. 5,844,138

HS Generation 2

The HS replaceable humidity element is designed to lower costs and reduce downtime. It features thin-film capacitive technology for superior accuracy and exceptional resistance to contaminants. It is compatible with all Veris deluxe sensors, making replacement quick and easy. No need to install a new humidity sensing device, just insert a new element into the unit and resume operation.

These humidity elements are calibrated in a high accuracy, NIST traceable, humidity generator. Each sensor is digitally calibrated at four different relative humidity levels over an eight-hour period. Calibration data is programmed into the replaceable sensing element. This computer-controlled digital calibration eliminates errors associated with manual “trimming.” A certificate of calibration is provided with NIST versions of the HS.

Veris’ calibration system produces known humidity values using the fundamental principle of the “two pressure” generator developed by NIST (H-4622). The two-pressure method involves saturating air with water vapor at a given pressure and temperature. Saturated gas then flows through an expansion valve where it is isothermally reduced to chamber pressure. Gas temperature is held constant during pressure reduction, so relative humidity at chamber pressure is calculated as the ratio of two absolute pressures.

Temperature uniformity in the chamber is maintained by circulating a temperature controlled fluid through a shell surrounding the test space. Highly accurate pressure measurements are made using NIST traceable piezoresistive transducers. The resulting system accuracy is better than 0.5% RH over all ranges and temperatures.

This system is capable of continuously supplying accurate humidity values for instrument calibration, evaluation, and verification.

Generation 1 HS elements work with HD, HN, HP, HO and legacy HWL/HWX and CWL sensors models.

Generation 2 HS elements work with the following sensor models: HW2, CW2, HD2 and SD2.

Ordering Information

Generation 1 HS elements work with HD, HN, HP, HO and legacy HWL/HWX and CWL sensors models.

	Accuracy	NIST	
HS	☐	☐	X
	1 = 1%*	N = NIST	
	2 = 2%	(1% & 2% models only)	
	3 = 3%	X = None (2%, 3%, & 5% models only)	
	5 = 5%		

Example: HS 5 X X

*1% HS sensors used in outdoor applications are limited by the device to 2% accuracy.

Note: 1-year limited warranty.

Generation 2 HS elements work with the following sensor models: HW2, CW2, HD2 and SD2.

	Accuracy	NIST	
HS	☐	☐	
	1 = 1%	N = NIST	
	2 = 2%	X = None (2% models only)	

Example: HS 2 X

Note: 1-year limited warranty.

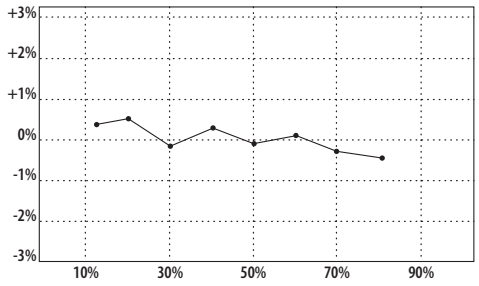
HS Digital Humidity Sensor
Certificate of Performance

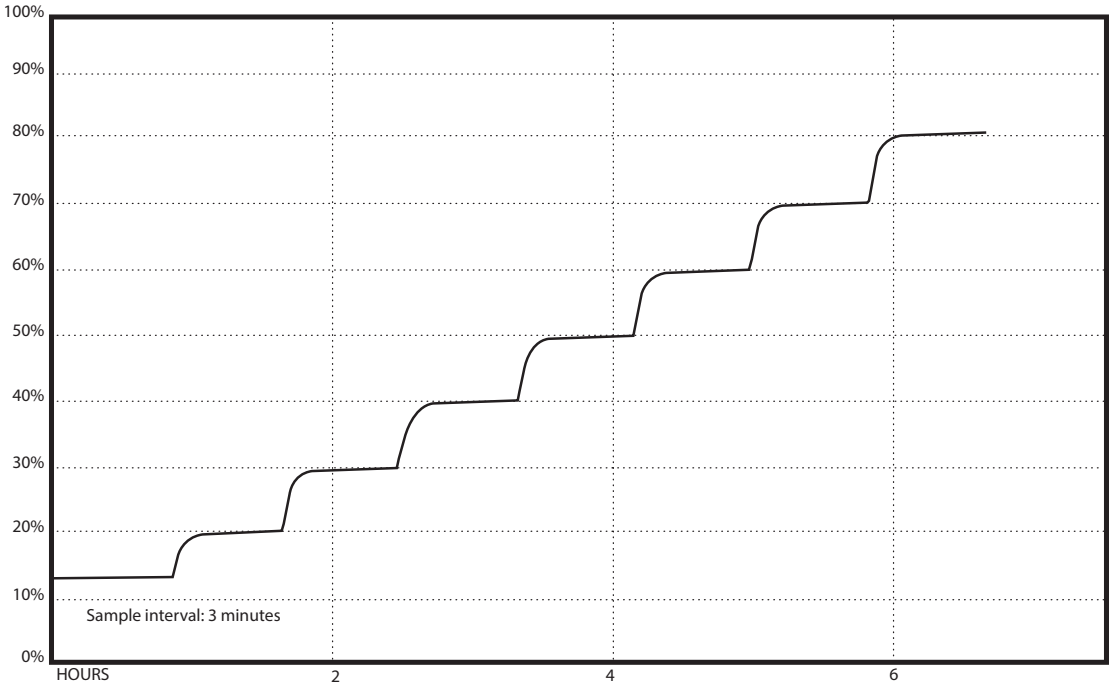
Serial Number: SAMPLE **Date:** _____ **Accepted by:** _____

This sensor has been computer profiled and calibrated at multiple relative humidity levels using standards traceable to the National Institute of Standards and Technology through test #H-4622.

The humidity standard produces atmosphere of known humidity based on the "two-pressure" principal which is to saturate an air stream with water vapor at a given pressure and temperature. The saturated air stream is then reduced to test pressure. The humidity at test pressure is then the ratio of the two absolute pressures, corrected for vapor pressure and enhancement factor ratios.

Reference	Reading	Difference
12.0%	12.39%	+0.39%
20.0%	20.43%	+0.42%
30.0%	29.93%	-0.07%
40.0%	40.21%	+0.21%
50.0%	49.98%	-0.02%
60.0%	60.05%	+0.05%
70.0%	69.87%	-0.13%
80.0%	79.67%	-0.33%





VERIS

Leak Detection

To protect expensive electronics from costly water damage, Schneider Electric offers complete leak detection systems. Monitor either a single location or a large area with our selection of highly reliable sensing devices and controller systems.

Model	Description	Page
LD310, LD1000 & LDRA6	Zone Leak Detection Panels	139
LD1500 & LD2100	Distance Read Panels	141
LD5200	Distance Read Panel, Touch Screen	143
SD, SD-R01 & MX1B	Spot Leak Detectors	145
SC & NSC	Cables	147
LC-KIT	Leak Detection Kit	149

Leak Detection Sensor Selection Guide

Sensors and Control Panels

	Spot Detection	Single Zone	Multi Zone	Distance Read
Basic Model	SD/MX1B page 145			
Leak Detection with Relay Output	SD-R01 page 145	LD310/LD1000 page 139	LDRA6 page 139	LD1500/LD2100 page 141 LD5200 page 143
Modbus Output			LDRA6 page 139	LD1500/LD2100 page 141 LD5200 page 143

Cables

	Cable Kits	Conductive Fluids	Non-Sensing Leader Cable
Basic Model	LC-KIT page 149	SC page 147	NSC page 147

LD310, LD1000 & LDRA6

Zone Leak Detection Controllers

LDRA6

LD1000

LD310

LD310, LD1000, and LDRA6 control panels continuously monitor up to 1,000 ft. (300 ft. for the LD310) of SC detection cable per zone. If the cable detects fluid at any point along its length, the detection panel illuminates the corresponding zone LED, clearly indicating which zone is affected. An alarm (visual for LD310, audible for all others) signals the presence of a leak. Additionally, if the cable loses continuity, the panel will activate a cable fault LED. The detection sensitivity can be set independently for each zone. A summary alarm relay output is standard.

The LDRA6 can interface with a computer via an RS-232 port, through which 117 days of cable current level readings and the last 100 alarms can be accessed for analysis. The LDRA6 also offers a Modbus slave port allowing other devices to communicate with it.

Specifications

Input Power: LD310 LD1000 LDRA6	 5 Vdc ±10% 24 Vac/dc (±10%)@300 mA max. (AC: 50/60 Hz) 24 Vac/dc (±10%)@600 mA max. (AC: 50/60 Hz)
Relay Output: LD310 LD1000 LDRA	 2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac 2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac 1 Form C summary alarm relay, 1 Form C relay for each zone/alarm; 1 A@24 Vdc, 0.5 A Resistive@120 Vac
Inputs	
Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable kit (LC-Kit) per zone.
Maximum Cable Length: LD310 LD1000, LDRA6	 300 ft. (91 m) 1000 ft. (305 m)
Detection Response Time: LD310 LD1000 LDRA6	 < 20 sec (10 sec typical) Configurable for 10 sec or 2 min, ± 10% 20 to 3600 sec, software adjustable in 10 sec increments, ± 2%
Communication Ports (LDRA6 only)	
RS-232 & RS-485	1200, 2400, 9600, or 19200 selectable; no parity; 8 data bits, 1 stop bit
Terminal Emulation (RS-232)	VT100 Compatible (configuration)
Modbus (RS-485) (LDRA6 only)	Slave; RTU Mode; Supports function codes 03, 04, 06 and 16

Application flexibility

Monitor up to 1,000 ft. (300 m) of water leak detection cable per zone with the LD1000 and LDRA6 or 300 ft. per zone with the LD310

LED indicators

Two LED indicators per zone, for easy troubleshooting…leak and cable fault (LD1000 and LDRA6)

Sensitivity settings

Sensitivity settings for each zone reduce false alarms… maximum detection accuracy

Output versatility

Alarm and trend logs of the last 100 alarms and 117 days of cable current levels, plus RS-232 and Modbus RS-485 ports (LDRA6 only)

Fast response

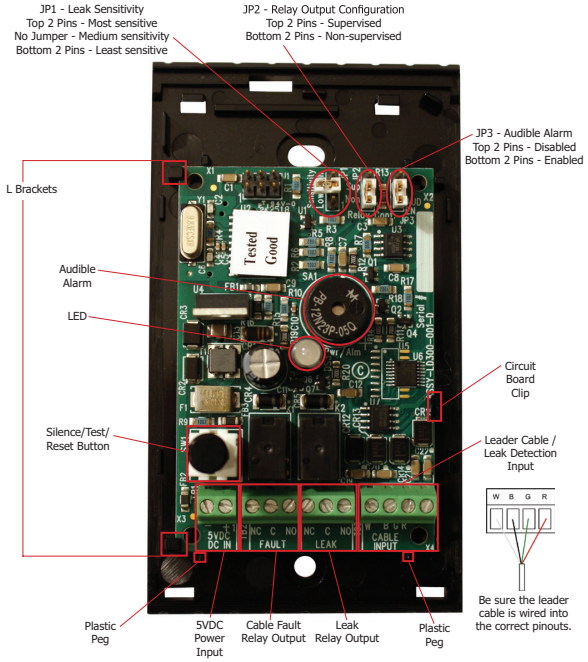
Summary alarm relay output... fast response

Applications

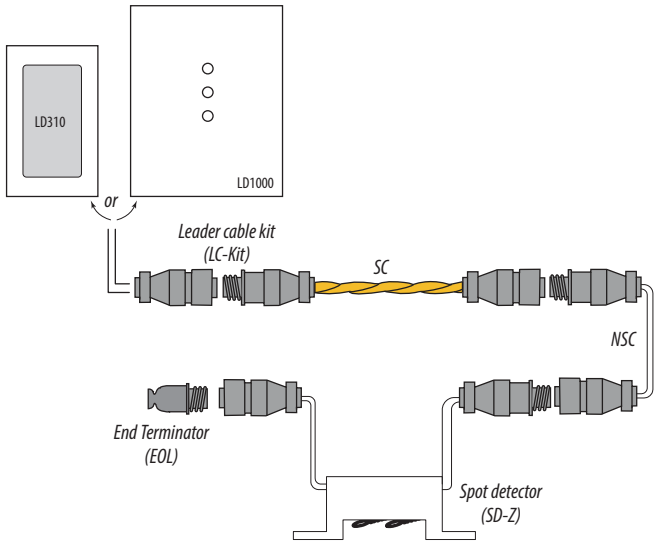
- Monitoring data centers, computer room under-floor areas, mechanical rooms, and electrical control centers
- Protecting records storage
- Monitoring plumbing
- Monitoring chilled beams
- Monitoring chemical/fuel storage

Notification	
Alarm Notification: Audible Alarm LD1000 LDRA6	 85 dBA@2 ft. (0.6 m) 85dBA@2 ft. (0.6 m) re-sound disabled, 8, 16, or 24 hrs.
Push Buttons: LD1000, LDRA6	 1 for reset, quiet, and test
Operating Environment	
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	5% to 95% RH non-condensing
Altitude	15,000 ft. (4,572 m) max
Storage Environment	-20 to 70 °C (-4 to 158 °F)
Weight: LD310 LD1000 LDRA6	 3 oz. (85 g) 27 oz. (766 g) 4 lbs. (2 kg)
Warranty	
Limited Warranty	2 years
Agency Approvals	
Agency Approvals: LD310 LD1000 LDRA6	 CE, RoHS compliant CE, ETL listed; conforms to UL 61010-1, RoHS compliant CE ETL Listed; conforms to UL 61010-1, EN 61010-1, CAN/CSA C22.2 No. 1010.1, RoHS compliant

LD310
Wiring Diagram



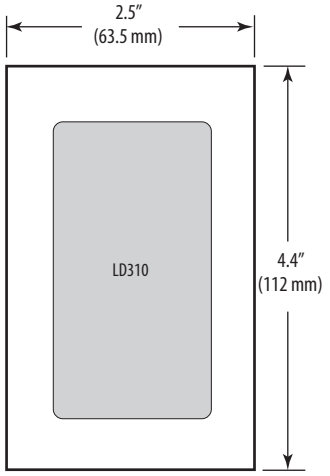
LD310 or LD1000 Basic Installation with SC Sensing Cable and SD-Z Spot Detector
Wiring Diagram



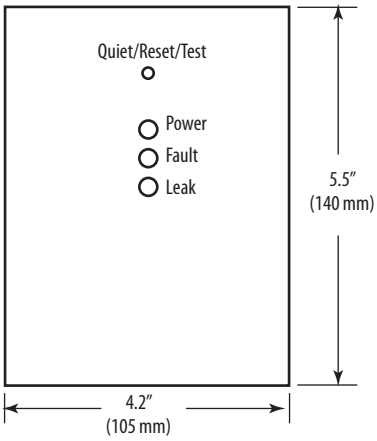
Blink Code Key

Model	LED Indication	Device Status
LD310	Solid green (on or off)	Normal operation
LD310	Flashing green (0.5 sec on/2.5 sec off)	Cable fault
LD310	Flashing green (0.5 sec on/0.5 sec off)	Leak detected
LD1000	Solid green (on or off)	Normal operation
LD1000	1 amber	Cable fault
LD1000	1 red	Leak detected
LDRA6	Solid green (on or off)	Normal operation
LDRA6	1 green	Power on
LDRA6	1 red	Leak detected
LDRA6	1 yellow	Cable fault

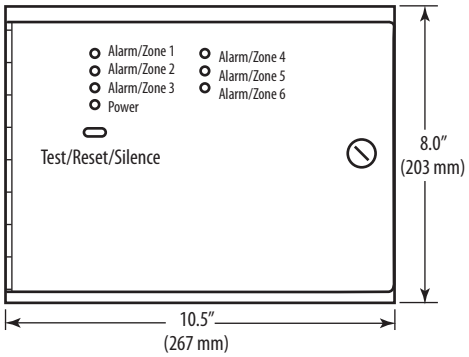
LD310
Dimensional Drawing



LD1000
Dimensional Drawing



LDRA6
Dimensional Drawing



Ordering Information

Model	Manuf. Part #	Description
U006-0080*	LD310*	Leak Panel, 1 zone, LED, 2 relay outputs
U006-0001**	LD1000**	Leak Panel/Remote Annunciator, 1 zone, supervised, relay output
U006-0036**	LDRA6**	Leak Panel, up to 6 zones, supervised, relay output, Modbus RTU
U006-0035	LC-KIT***	Leader cable kit for SC cables (connects from leak panel to SC or NSC cable)
U006-0037	WA-DC-05	Power Supply for LD300
U006-0084	PS-WA-DC-24	Power Supply for LD1000 and LDRA6

* Power supply not included; requires U006-0037 power supply.
** Power supply not included; requires U006-0084 power supply.
*** Included with LD310 and LD1000.

LD1500 & LD2100

Helps Eliminate High Humidity False Alarms

LD2100

LD1500

High detection accuracy

Adjustable leak and contamination alarm thresholds reduce false alarms due to high humidity…high detection accuracy

PC configuration

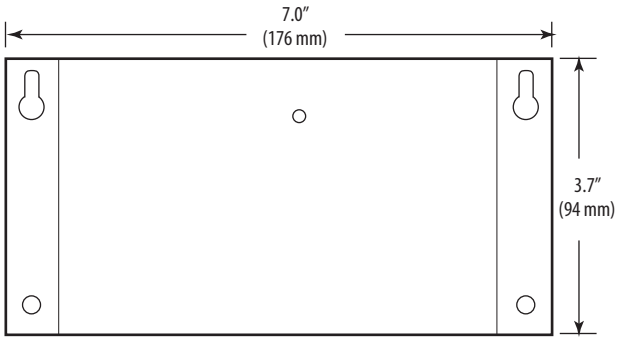
Summary alarm relay output… fast response

Together with the SC sensing cable, the LD1500 and LD2100 panels detect and report the presence and location of the cable-specific fluid. When the fluid comes in contact with the patented cable, the monitoring panel quickly pinpoints the location of the leak, triggering an alarm and displaying the location.

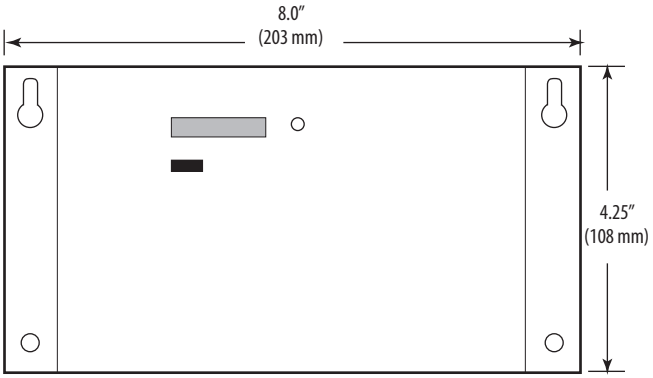
Specifications

Input Power	24 Vac@600 mA max., 50/60 Hz
Inputs	
Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable kit (LC-KIT or LC-KIT-M)
Maximum Length	LD1500: 1500 ft. (457 m); LD2100: 5000 ft. (1524 m)
Detection Accuracy	±2 ft (0.6 m) + 0.5% of the cable length
Detection Repeatability	±2 ft (0.6 m) + 0.25% of the cable length
Detection Response Time	5 to 995 sec ± 2 sec, configure in 5 steps
Outputs	
Relay (LD2100 only)	1 A@24 Vdc, 0.5 A resistive@120 Vac
Communication Ports	
RS-232	9600 baud, No parity, 8 data bits, 1 stop bit
RS-485	1200, 2400, 9600, or 19200 baud (select-able); No parity, 8 data bits, 1 stop bit
Protocols	
Terminal Emulation: RS-232	VT100 compatible
Modbus RS-485	Slave; RTU Mode; Supports function codes 03, 04, 06, and 16; Johnson N2 (LD2100 only)
Expanded Protocols	
TCP/IP, HTML, TFTP	IPv4.0
SNMP	V1: V2C MIB-2 compliant; NMS Manage-able with Get, Set, Traps
SMTP email, LD2100 only	Supports client authentication (plain and login); compatible with ESMTP servers
Modbus TCP/IP	Modbus slave; TCP/IP transmission protocol
BACnet/IP	ASHRAE Std 135-2004 Annex J
Alarm Notification	
Audible Alarm: LD2100	70 dBA@2 ft. (0.6 m); re-sound configurable (disabled, 0 to 24 hours, integer values only)
Visual Alarm: LD1500 LD2100	Red, 4-digit; 7 segment LED display; bi-color status LED Bi-color status LED
Email LD1500/LD2100	4 email recipients; email sent on Alarm and Return to Normal
SNMP Traps LD1500, LD2100	4 community strings
Logging Capabilities	
Event Log LD1500 LD2100	 Last 10 events Last 500 events
Trend Log LD2100	Cable current level every day, for the last 288 days
Login Security	
Display Access	1 Administrator (password for configuration, no password required to view panel status)
Front Panel Interface	
Display LD2100	 Green alphanumeric dot matrix
Push Buttons LD2100	 Test/Reset
LED Indicator LD1500 LD2100	 1 tri-color Power/Status (green = power on; red = alarm; yellow = cable fault 1 bi-color Power/Status (green=power on, red=alarm)
Operating Environment	
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	5 to 95% RH non-condensing
Altitude	15000 ft. (4572 m) max.
Mounting	Vertical wall mount (DIN rail mounting option available on LD2100 only)
Warranty	
Limited Warranty	2 years
Agency Approvals	
Agency Approvals	CE; ETL listed: conforms to UL 61010-1, EN 61010-1; CSA C22.2; RoHS compliant

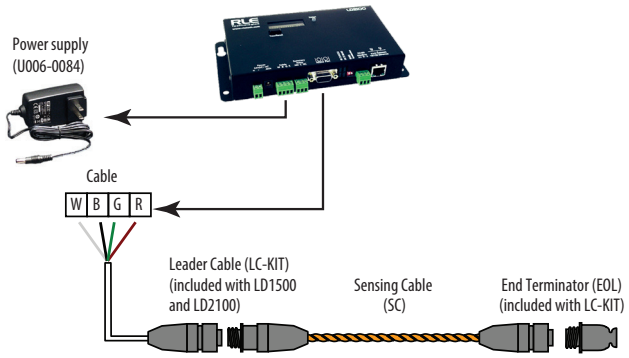
LD1500
Dimensional Drawing



LD2100
Dimensional Drawing



LD1500/LD2100 Basic SC Installation
Wiring Diagram



Ordering Information

Model	Manuf. Part #	Description
U006-0038*	LD1500*	Leak Panel, 1500’ Distance Read, Modbus, BACnet, SNMP, SMTP, and relay outputs
U006-0047*	LD2100*	Leak Panel, 5000’ Distance Read, Modbus, BACnet, SNMP, SMTP, and relay outputs
U006-0035**	LC-KIT**	Leader cable kit for SC cables (connects from leak panel to SC or NSC cable)
U006-0084	PS-WA-DC-24	24 Vdc isolated power supply for LD1500 and LD2100

* Power supply not included. Isolated power supply must be used. Use LD-ENC (U006-0045) wall mount enclosure with built-in power supply or U006-0084 power supply.
** Included with LD1500 and LD2100.

LD5200

Minimizes High Humidity False Alarms

LD5200 distance read panel has an innovative touch screen interface that accesses all basic functions. The LD5200 can operate as a stand-alone device, with the user configuring, monitoring, locating, and acknowledging leaks at the panel. It can also be connected to the building network and accessed via a web interface, which expands the capabilities of the unit, adding a convenient interactive facility mapping tool. When a leak is detected, the mapping tool displays the location in the building where the alarm occurred. Multiple communication protocols make the LD5200 readily compatible with existing building systems. Use with our SC sensing cable for a complete solution to leak detection.

Specifications

Input Power	100 to 240 Vac@500 mA max., 50/60 Hz
Inputs	
Water Leak Detection Cable LC-KIT or LC-KIT-M	Requires 15 ft. (4.5 m) leader cable kit
Maximum Length	10000 ft. (3048 m)
Minimum Length	35 ft. (1037 m)
Detection Accuracy	± 2 ft (0.6 m) + 0.5% of the cable length
Detection Repeatability	± 2 ft (0.6 m) + 0.25% of the cable length
Detection Response Time	5 to 990 sec ± 2 sec, software adjustable in 5-sec increments
Outputs	
Analog	4 to 20 mA Loop Powered, 18 to 36 Vdc, RL = 500 Ω max.
Relay	2 Form C Leak Relays, 2 Form C Cable Break Relays; 1 A @ 24 Vdc, 0.5 A resistive@120 Vac;configurable for supervised or non-supervised, latched or non-latched
Maintenance Relay	1 A@24 Vdc, 0.5 A resistive @120 Vac; configurable for supervised or non-supervised, latched or non-latched
Communications Ports	
EIA-232	9600 baud, No parity, 8 data bits, 1 stop bit
EIA-485 (Port 1, Port 2, Port 3)	9600, 19200, or 38400 baud (selectable); No parity, 8 data bits, 1 stop bit
RJ-45	10/100 Bast T Ethernet port (TCP/IP)
Protocols	
Terminal Emulation EIA-232	VT100 compatible
Modbus RTU EIA-485	Master and slave; RTU Mode; BACnet MS/TP; N2, slave
RJ-45	Ethernet, TCP/IP; Modbus/TCP/UDP, Master and slave; SNMP V1, V2, V3, NTP, SMTP, DNS, BACnet/IP
Alarm Notification	
Audible Alarm	85 dBA@2 ft. (0.6 m); re-sound 0 to 999 min.
Visible Alarm	Indicated on LCD touch screen & through web interface
Logging Capabilities	
Event Log	Last 1024 events, downloadable to .txt files
Trend Log	Cable current level every day for the last 365 days, downloadable to .txt files
Login Security	
LCD Touch Screen	No password required to view controller status & data. Administrator password limits access to configuration options.
Web Interface	Username and password can be configured
Front Panel Interface	
Display	480 x 272 pixel color backlit LCD touch screen; 95.04 mm x 53-85 mm
Operating Environment	
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	5 to 95% RH non-condensing
Altitude	15000 ft. (4572 m) max.
Mounting	NEMA 1 wall mount enclosure
WARRANTY	
Limited Warranty	2 years
Agency Approvals	
Agency Approvals	CE; ETL listed: conforms to UL 61010-1, EN 61010-1; CAN/CSA C22.2 No. 61010-1; RoHS compliant

Touch screen

Touch screen interface allows access to basic functions… stand-alone configuration and monitoring

Troubleshooting

Detailed alarm history with time and date stamps…assists in troubleshooting

Pinpoint leaks

Web interface offers expanded capabilities through the building mapping tool…pinpoint leaks quickly and accurately

One device

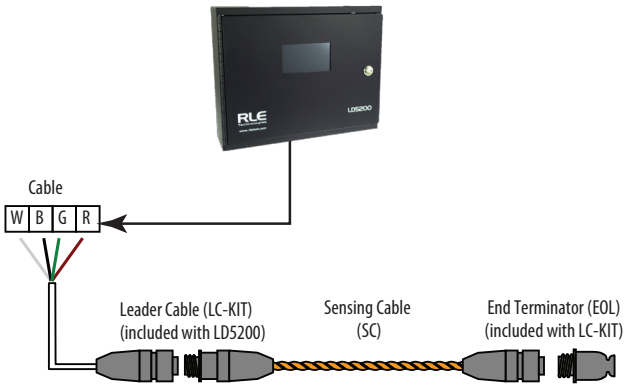
Acts as a master device for up to 127 leak detection units with up to 10,000 feet of SC cable …monitor large areas with only one device

Easy integration

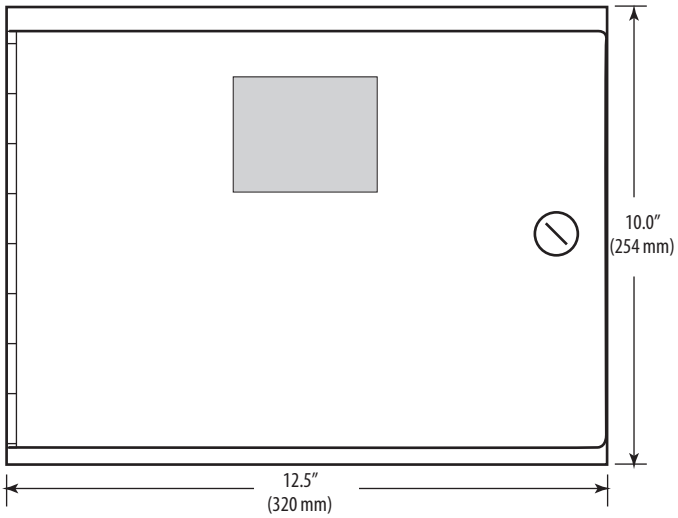
Multiple communication protocols available…easy integration into building systems

LD5200 Basic SC Installation

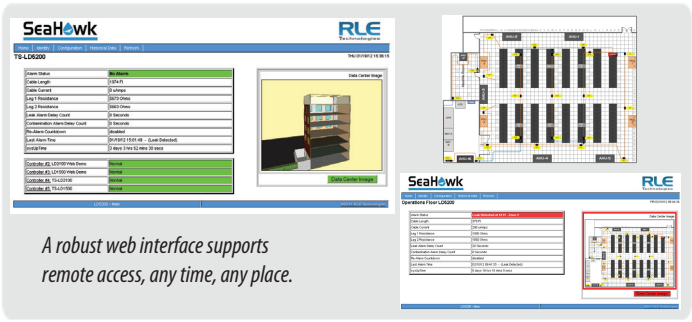
Wiring Diagrams



Dimensional Drawing



Web Interface



Ordering Information

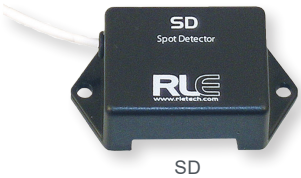
Model	Manuf. Part #	Description
U006-0079	LD5200	Leak Panel, Distance Read, supervised, multiple outputs: relay, 4 to 20 mA, Modbus RTU, leader cable and EOL terminator
U006-0035*	LC-KIT	Leader cable kit for SC cables (connects from leak panel to SC or NSC cable)

*Included with LD5200.

SD, SD-R01 & MX1B

Spot Leak Detectors

MX1B



SD

Simple installation

Simple installation – screw, or ram-set to floor (SD & SD-R01)

Polymer coated

SD & SD-R01 models have polymer-coated sensing probes...no exposed metal that will rust

Simple operation

Simple operation…no maintenance

Durability

All models are fully potted for water resistance…maximum durability

Solid-state design

No moving parts to fail

SD, SD-R01 and MX1B Spot Detectors detect conductive fluids at a single point for the most economical way to detect fluids in small, confined areas. These devices are commonly used in small rooms and in air-conditioning drip pans. Use only with SC conductive fluid leak detection cables.

Three spot detector models are available which can integrate with various Building Management Systems.

Model	Description
SD Spot Detector	• Operates on either 12 to 36 Vac or 18 to 36 Vdc power • Includes a 14 ft. (4.2 m) leader cable
SD-R01 Spot Detector with Relay Output	• Works with any system that accepts dry contacts • Operates on 24 Vac/dc ±10% • Automatically resets when conductive fluid is no longer present (AC power only; if DC power is used, device must be reset by disconnecting power momentarily) • Includes a 14 ft (4.2 m) leader cable
MX1B Spot Detector	• Battery operated

Specifications

SD & SD-R01

Input Power: SD-R01 Only	24 Vac/dc ±10%; 0.1 A max. (AC: 50/60 Hz)
Storage Environment	-20 to 70 °C (-4 to158 °F)
Outputs	
Solid-state: SD Only	12 to 36 Vac@0.01 A min., 0.1 A max., 50/60 Hz; 18 to 36 Vdc@0.01 A min., 0.1 A max.
Relay: SD-R01 Only	Dry Contact, Form C; 1 A@24 Vdc, 0.5 A @120 Vac resistive
Leader Cable (NSC)	
Length: SD SD-R01	 14 ft. (4.2 m) 14 ft. (4.2 m)
Operating Environment	
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	5% to 95% RH non-condensing
Altitude	10,000 ft. (3,048 m) max.
Warranty	
Limited Warranty	2 years

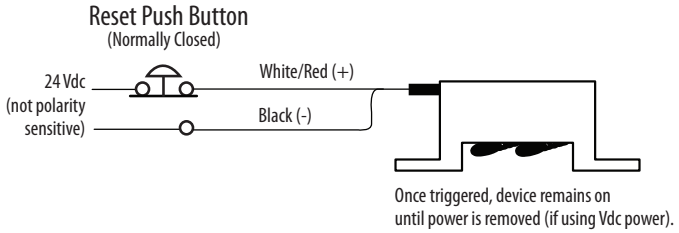
Specifications

MX1B

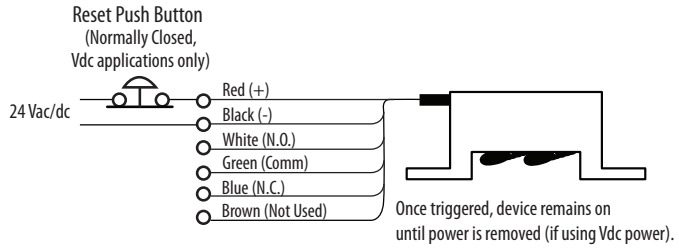
Input Power	Typical 10-year life lithium battery
Output	N.C. solid-state, (opens on alarm)
Output Rating	30 Vac/dc@0.1 A max., not polarity sensitive
Sensing Electrodes	Gold plated
Operating Environment	
Temperature	-20 to 80 °C (-4 to 176 °F)
Humidity	0 to 100% RH
Water Resistance	Not for continuous submersion
Warranty	
Limited Warranty	5 years

Agency Approvals

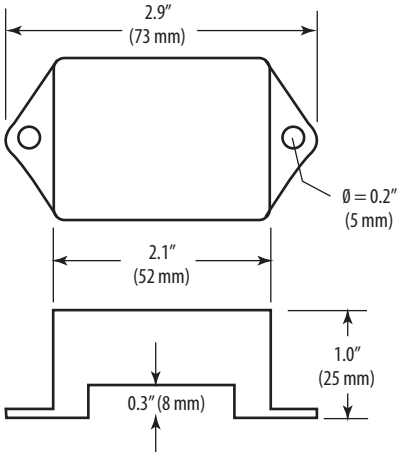
SD
Wiring Diagram



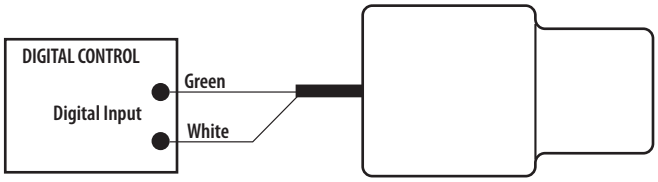
SD-R01
Wiring Diagram



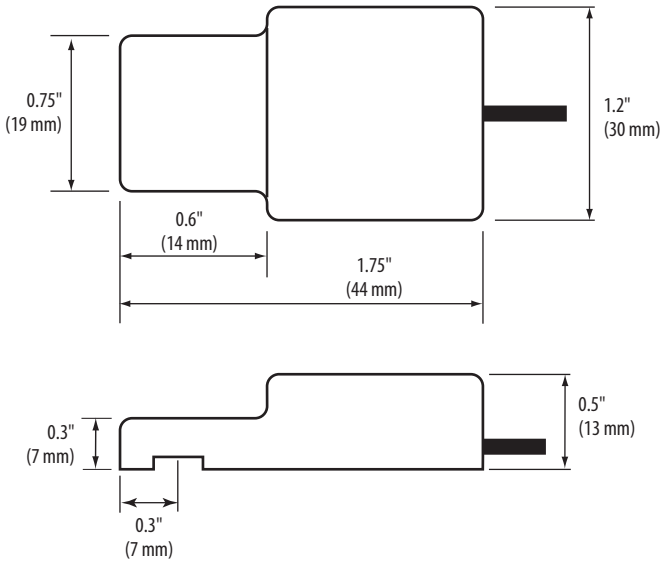
SD Series
Dimensional Drawing



MX1B
Wiring Diagram



MX1B
Dimensional Drawing



Ordering Information

Model	Manuf. Part #	Description	CE	ETL
U006-0006	SD	Spot Detector, 14’ leader cable	•	•
U006-0007	SD-R01	Spot Detector, 14’ leader cable, relay out	•	•
U006-0085	SD-R02	Spot Detector, 14’ leader cable, audible alarm, status LED, dual relay out	•	•
MX1B	MX1B	Spot Detector, battery	•	•

SC & NSC

Highly Flexible, Resists Bends and Kinks, Abrasion Resistant

Sensing and non-sensing cables are designed for use with Zone and Distance Read panels. The sensing cables detect the presence of detectable liquid, and send a signal to the panel. The panel generates an alarm and pinpoints the location of the leak or spill along the cable's length. Sensing cables are designed for high accuracy and maximum reliability.

SC water detection cable senses the presence of water or other conductive fluid.

NSC non-sensing cable is used to extend the control panel's leader cable to an area where SC detection cable is needed. It also bridges lengths of SC detection cable in areas where sensing is not required. Invisible to the control panel, the non-sensing cable does not affect the accuracy of readings or limit the amount of detection cable that can be connected to a control panel. NSC cables are only compatible with systems using SC water detection cables.

All cables are highly flexible, durable, and kink-resistant. They lie flat after installation, and are abrasion resistant. The cables are plenum rated and UL Listed, making them ideal for use under raised floors and areas where plenum rated cable is required. Choose a pre-specified cable length or a custom length for your convenience and installation flexibility.

Strong

Strong, durable, and abrasion resistant

Plenum rated

Plenum rated and UL Listed

Easy installation

Expansion with mating end connectors…easy installation

Accurate

Highly accurate alarm notification…fewer false alarms

Installation flexibility

Available in pre-measured and custom lengths with pre-installed end connectors

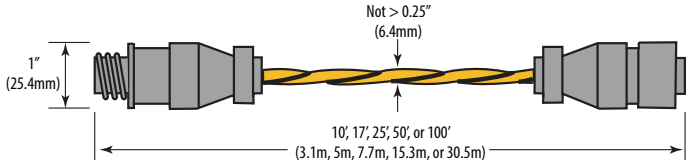
Specifications

Plenum Rating: SC NSC	 CL2P/CMP C(UL) CL3P/CMP C(UL) California State Fire Marshall approved
Shear Strength:	>180 lbs (>81.65 kg)
Cut Through Resistance	>40 lbs (>18.2 kg) with 0.005" (0.13 mm) blade
Abrasion Resistance	60 cycles per UL 719
Connector	4-pin, 1" (25.4 mm) dia., circular, locking, 4-pin
Operating Environment	
Temperature	0 to 75 °C (32 to 167 °F)
Humidity	5 to 95% RH non-condensing
Altitude	15,000 ft. (4,572 m) max.
Standard Lengths	
SC-10/NSC-10	10 ft. (3.1 m)
SC-17	17 ft. (5 .1 m)
SC-25/NSC-25	25 ft. (7.7 m)
SC-50/NSC-50	50 ft. (15.3 m)
SC-100/NSC-100	100 ft. (30.5 m)
Storage Environment	-30 to 85 °C (-22 to 185 °F)
Weight	0.02 lbs/ft (29.7 g/m)
Agency Approvals: SC NSC	 CE; UL; RoHS compliant UL E118871; UL 13, power limited circuit cable; UL 444, communication cables; NFPA 262; plenum flame test (UL 910); NEC Articles 725 and 800; RoHS compliant
Warranty	
Limited Warranty	2 years

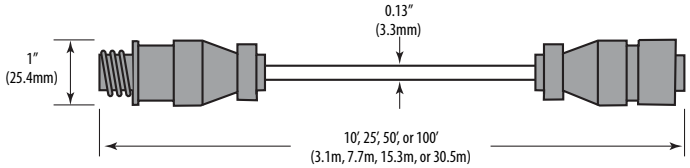
Agency Approvals

CE c UL us LISTED

SC
Dimensional Drawing



NSC
Dimensional Drawing



Ordering Information
Sensing Cable

Model	Manuf. Part #	Description
U006-0009	SC-10	Sensing Cable, Water, 10 feet
U006-0048	SC-17	Sensing Cable, Water, 17 ft
U006-0013	SC-25	Sensing Cable, Water, 25 feet
U006-0014	SC-50	Sensing Cable, Water, 50 feet
U006-0010	SC-100	Sensing Cable, Water, 100 feet

Ordering Information
Non-sensing Cable

Model	Manuf. Part #	Description
U006-0017	NSC-10	Non-Sensing Cable, 10 feet
U006-0021	NSC-25	Non-Sensing Cable, 25 feet
U006-0022	NSC-50	Non-Sensing Cable, 50 feet
U006-0018	NSC-100	Non-Sensing Cable, 100 feet

LC-KIT

Single Zone Leak Detection Controller Kit

LC-KIT

Single zone leak detection controller kits are pre-configured in popular lengths for monitoring single areas or rooms. Kits come with everything needed for a complete system, including an LD310 single zone control panel, a leader cable kit with end-of-line terminator, sensing cable, and a WA-DC-05 power supply. LD310 control panels continuously monitor up to 300 ft. of leak detection cable. If the cable detects compatible fluid at any point along its length, the detection panel LED illuminates and an alarm signals the presence of a leak. Additionally, if the cable loses continuity, the panel will activate a cable fault LED pattern.

Application flexibility

Monitor up to 10', 17', 25' or 50' of leak detection cable

LED indicator

Bi-color LED indicator for alarm status and cable fault...easy indication of leaks or equipment problems

Audible alert

Selectable on/off audible alert

Pushbutton

Pushbutton switch allows users to silence the audible alarm and to test and reset the system

Max accuracy

Sensitivity settings for each zone help reduce false alarms...maximum detection accuracy

Fast response

Summary alarm relay output

Applications

- Monitoring data centers, computer room under-floor areas, mechanical rooms, and electrical control centers
- Protecting records storage rooms
- Monitoring plumbing in facilities
- Monitoring chilled beams
- Monitoring chemical and fuel storage areas

Specifications

LD310 Controller

Input Power	5 Vdc ±10%
Storage Environment	-20 to 70 °C (-4 to 158 °F)
Weight	3 oz. (85 g)
Inputs	
Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable (kit included)
Maximum Cable Length	300 ft. (91 m)
Detection Response Time	<20 sec (10 sec typical)
Relay Output	2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac
Operating Environment	
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	5 to 95% RH non-condensing
Altitude	15,000 ft. (4,572 m) max

Specifications

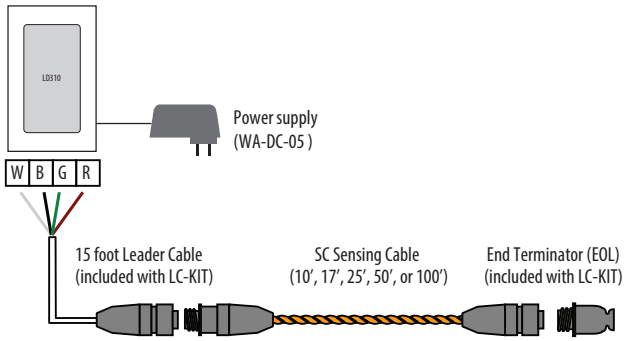
Cables

Plenum Rating (SC)	CL2P/CMP C(UL) California State Fire Marshall approved
Shear Strength	>180 lbs (>81.65 kg)
Cut Through Resistance	>40 lbs (>18.2 kg) w/0.005" (0.13 mm) blade
Abrasion Resistance	60 cycles per UL 719
Connector	4 pin, 1" (25.4 mm) dia., circular, locking,
Operating Environment	
Temperature	0 to 75 °C (32 to 167 °F) 90 °C (194 °F) max.
Humidity	5 to 95% RH non-condensing
Altitude	15,000 ft. (4,572 m) max.
Storage Environment: SC NSC	 -30 to 85 °C (-22 to 185 °F) 0 to 75 °C (32 to 167 °F)
Agency Approvals: LD300 SC NSC	 CE; RoHS compliant CE; UL; RoHS compliant UL E118871; UL 13, power limited circuit cable; UL 444, communication cables; NFPA 262; plenum flame test (UL 910); NEC Articles 725 and 800; RoHS compliant
Warranty	
Limited Warranty	2 years

Agency Approvals

Single Zone Kit with SC Sensing Cable

Wiring Diagram



Blink Code Key

LED Indication	Device Status
Solid green (on or off)	Normal operation
Flashing green (0.5 sec on/2.5 sec off)	Cable fault
Flashing green (0.5 sec on/0.5 sec off)	Leak detected

Ordering Information

Model	Description	Kit Includes these Manuf. Part Numbers
U006-0062	Kit, LeakDet, LD310, 10' Conductive Fluid	LD310, LC-Kit, SC-10 & WA-DC-05
U006-0063	Kit, LeakDet, LD310, 17' Conductive Fluid	LD310, LC-Kit, SC-17 & WA-DC-05
U006-0064	Kit, LeakDet, LD310, 25' Conductive Fluid	LD310, LC-Kit, SC-25 & WA-DC-05
U006-0065	Kit, LeakDet, LD310, 50' Conductive Fluid	LD310, LC-Kit, SC-50 & WA-DC-05

Cables, EOL and power supply only.

Accessories: Leak Detection

U006-0024
Cross connector
(1 cable input to 3 outputs)

U006-0026
Replacement cable end terminators

U006-0030 - J-clips (qty 10)
U006-0031 - J-clips (qty 25)
U006-0032 - J-clips (qty 50)
U006-0033 - J-clips (qty 200)

U006-0035
Leader cable kit for SC cables
(connects from leak panel to SC or NSC cable)

U006-0037
5 Vdc isolated power supply for LD300

U006-0084
24 Vdc isolated power supply for LD1000, LD1500, LD2100 and LDR06

Pressure Monitoring

Schneider Electric pressure sensing devices include sensors for both wet and dry media, as well as a series of electropneumatic transducers. Our products are known for their accuracy, versatility, and labor-saving installation.

Pressure Sensor Selection Guide

Feature/Option	Wet Media	Dry Media
Analog Output	PW, PW2, PH, PG pages 163, 165, 175, 177	EP, PX3 pages 155, 157, 159, 161
Differential Pressure Sensing (Uni- and Bidirectional Operation)	PW, PW2, PWR pages 163, 165, 167	EP page 155
LCD Display Option Available	PW, PW2, PWR pages 163, 165, 167	EP page 155
Duct Mount		EPD/EPU, PX3D/PX3U pages 155, 157, 159, 161
Panel Mount	PW, PW2, PWR, PASxx pages 163, 165, 167, 169	EPD/EPU page 155
Remote Mount	PWR page 167	
Transmitter Only (No local display)	PH, PG pages 175, 177	EP, PG pages 155, 177
Switch		PASxx pagepage 169
Pneumatic Systems		EP3, EP2 pages 171, 173

Electropneumatic Transducers

Feature/Option	Wet Media	Dry Media
Pneumatic Systems	PW, PW2, PH, PG pages 163, 165, 175, 177	EP3, EP2 pages 171, 173

SpaceLogic Sensors EP Series

Bluetooth® Differential Pressure/Air Velocity Transducers

The SpaceLogic EP Series pressure sensors can measure either air pressure or velocity with the flip of a switch. The EP is available in three installation configurations: duct, panel or universal. Duct and panel models have two pressure and velocity options: 0-1 in. WC/ 0-3,000 ft/min or 1-10 in. WC / 3,000-6,000 ft/min with four field-selectable sub-ranges. The universal model comes in one pressure/ velocity range: 0-10 in. WC / 0-7,000 ft/min with seven field-selectable sub-ranges for pressure and eight for velocity. All variants are available with and without display. The EP has an IP65/NEMA 4 environmental rating and a 5-year limited warranty.

The Veris Sensors App provides the ability to connect to a device and configure a variety of field-selectable parameters remotely from a smartphone via Bluetooth wireless technology. The app allows users to create and store commonly used parameters that will reduce commissioning time and provide assurance that all parameters are properly configured with no call backs. The app can also create a trend log while connected, providing important data for troubleshooting purposes. iOS® users can download the app through the iOS App Store on their smart device. Android users can download the app through the Google Play™ store.

Note: This product is not intended for life or safety applications. Do not install this product in hazardous or classified applications.

Specifications

General	
Media Compatibility	Dry air or inert gas
Input Power	Three-wire Volt mode: 24 Vac ±20% or 12-30 Vdc*, Two-wire mA mode: 12-30 Vdc*
Output Power	Field-selectable: 2-wire, loop-powered 4-20 mA Minimum input voltage for 4-20 mA operation: 250 Ω loop = 12 Vdc; 500 Ω loop = 19 Vdc (DC only, clipped and capped), 24 Vac/dc or 3-wire 0-5V/0-10V Minimum load resistance for Volt operation: 5 kΩ
Pressure Ranges	
Pressure Range 1	Pressure mode: Unidirectional: 0.1/0.25/0.5/1 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1 in. WC, switch selectable Unidirectional: 25/50/100/250 Pa, switch selectable Bidirectional: ±25/±50/±100/±250 Pa, switch selectable Velocity mode: 500/1,000/2,000/3,000 ft/min, 2.5/5/10/15 m/s
Pressure Range 2	Pressure mode: Unidirectional: 1.0/2.5/5/10 in. WC, switch selectable Bidirectional: ±1.0/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±250/±500/±1,000/±2,500 Pa, switch selectable Velocity mode: 3,000/4,000/5,000/6,000 ft/min, 15/20/25/30 m/s
Pressure Range 5	Pressure mode: Unidirectional: 0.1/0.25/0.5/1/2.5/5/10 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 25/50/100/250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±25/±50/±100/±250/±500/±1,000/±2,500 Pa, switch selectable Velocity mode: 500/1,000/2,000/3,000/4,000/5,000/6,000/7,000 ft/min, 2.5/5/10/15/20/25/30/35 m/s
Sensor	
Response Time	Standard: T95 in 20 sec, Fast: T95 in 2 sec, DIP switch selectable
Mode	Unidirectional or bidirectional, DIP switch selectable
Display (option)	Pressure mode: Signed 3-1/2 digit LCD, indicates pressure, overrange indicator Velocity mode: Signed 4-1/2 digit LCD, indicates velocity, overrange indicator
Proof Pressure	1.44 psid (9,953 Pa)
Burst Pressure	4.33 psid (29,860 Pa)
Pressure Mode Accuracy	±1% FS (combined linearity and hysteresis)
Velocity Mode Accuracy	±90 ft/min (±0.45 m/s) plus 5% of measured value**

Wireless configuration

View and configure all field-selectable parameters via smartphone. No ladder necessary for duct mount applications.

Reduce field failures

Excellent tolerance to overpressure and vibration reduces field failures

High accuracy

High accuracy digital sensor with seven selectable pressure and eight velocity sub-ranges, maintains calibration and reduces callbacks

Water-resistant housing

IP65/NEMA 4 housing allows for mounting in wash-down locations

Maintenance free

High reliability sensor technology for long-term, maintenance-free operation

Circuit protection

Circuit protection avoids damage due to incorrect input wiring

Applications

- Duct static pressure (Pressure mode)
- Building or room pressure (Pressure mode)
- Filter status (Pressure mode)
- Air flow measurement (Velocity mode)

Note: The Bluetooth word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Any use of such marks is under license.

Specifications (cont.)

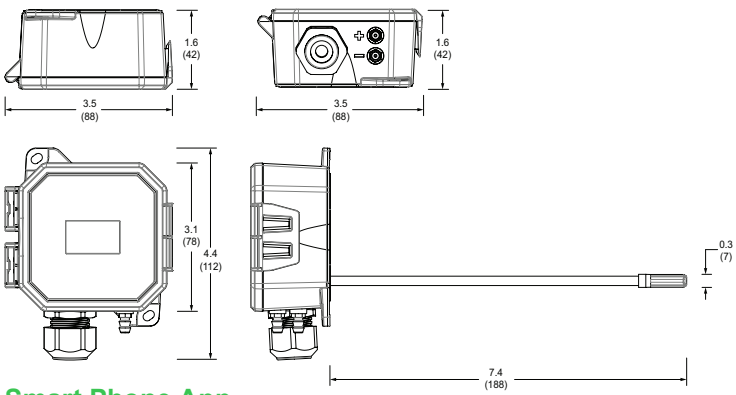
Temperature Effect	0.00048 in. WC/°C (0.12 Pa/°C) relative to 25 °C, 0 to 50 °C (32 to 122 °F)
Zero Drift (1 year)****	±5.0 Pa (±0.020 in WC) max.
Zero Adjust	Pushbutton auto-zero and digital input (2-pos terminal block)
Operating Env.	-20 to 60 °C (-4 to 140 °F)***
Altitude of Operation	0 to 3,000 m
Pollution Degree	2
Humidity Range	100% RH, non-condensing
Mounting Location	For indoor or outdoor use (display will not function below 0 °C (32 °F))
Fittings	Brass barb; 0.24" (6.1 mm) o.d.
Bluetooth Frequency Range	2.402 to 2.480 GHz (Bluetooth version 4.2, enabled by DIP switch)
Max. Output Power	0dBm
Environmental Rating	IP65, NEMA 4
Flammability Rating	UL 94 5VA fire retardant ABS, plenum rated
Warranty	
Limited Warranty	5 years

Agency Approvals

CE EMC Conformance: EN 61000-6-3 and A1, Class B, EN 61000-6-1 and EN61326-1.
* Class 2/II power source.
** For measured values between 200 and 7,000 ft/min (1 and 35 m/s).
*** Display will not function below 0 °C (32 °F).
**** Can be compensated for using the Zero Reset function.

Dimensional Drawing

in. (mm)

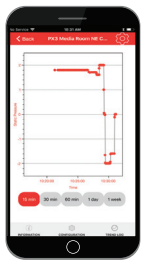


Smart Phone App

The Veris Sensors App allows for remote viewing and adjustment of settings. A great tool for reducing commissioning time.

Device Info Screen

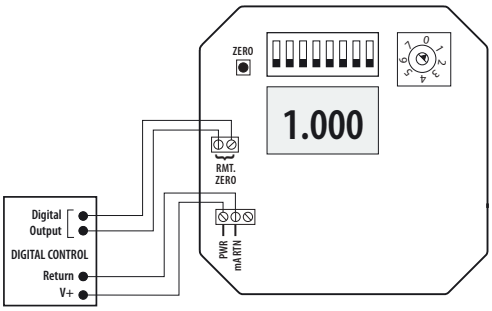
Custom Config Screen



Trend Log Tab

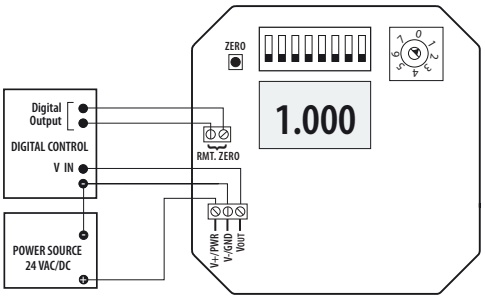
Wiring Diagram

2-wire, 4-20 mA Current Loop Output



Wiring Diagram

3-wire, 0-5 V/0-10 V Voltage Output



Ordering Information

Enclosure	Range	Local Display	Wireless Technology
EP ☐	☐	☐	☐
D = Duct P = Panel	1 = Pressure: 0 to 1 in. WC / 0 to 250 Pa Velocity: 0 to 3,000 ft/min / 0 to 15 m/s 2 = Pressure: 1 to 10 in. WC, 250 to 2,500 Pa Velocity: 3,000 to 6,000 ft/min, 15 to 30 m/s	Blank = No Display L = LCD Display	Blank = Wireless technology enabled model

Example: EP D 1 L

Enclosure	Range	Local Display	Wireless Technology
EP ☐	☐	☐	☐
U = Universal	5 = Pressure: 0 to 10 in. WC / 0 to 2,500 Pa Velocity: 0 to 7,000 ft/min / 0 to 35 m/s	Blank = No Display L = LCD Display	Blank = Wireless technology enabled model

Example: EP U 5 L

Accessories

VFXP Series Air Velocity Measurement Probe*

Velocity Pitot Tubes, 8-5/8", 12-5/8", 18-5/8" (AA18, AA19, AA20)*

Static-04 Pick-up - 4" Duct Static Pickup Probe (AA06)

Static-08 Pick up - 8" Duct Static Pickup Probe) (AA07)

Wall Plate Remote Pickup (AA56)

*For use with the PX3P (panel) and PX3U (universal) models in Velocity mode only.

VFXP Series

AA18, AA19,

AA06

AA07

AA56

SpaceLogic Sensors EP Series

Differential Pressure/Air Velocity Transducers

The SpaceLogic EP Series pressure sensors can measure either air pressure or velocity with the flip of a switch. The EP is available in three installation configurations: duct, panel or universal. Duct and panel models have two pressure and velocity options: 0-1 in. WC/ 0-3,000 ft/min or 1-10 in. WC / 3,000-6,000 ft/min with four field-selectable sub-ranges. The universal model comes in one pressure/ velocity range: 0-10 in. WC / 0-7,000 ft/min with seven field-selectable sub-ranges for pressure and eight for velocity. All variants are available with and without display. The EP has an IP65/NEMA 4 environmental rating and a 5-year limited warranty.

Note: This product is not intended for life or safety applications. Do not install this product in hazardous or classified applications.

Reduce field failures

Excellent tolerance to overpressure and vibration reduces field failures

Water-resistant housing

IP65/NEMA 4 housing allows for mounting in wash-down locations

High accuracy

High accuracy digital sensor with seven selectable pressure and eight velocity sub-ranges, maintains calibration and reduces callbacks

Maintenance free

High reliability sensor technology for long-term, maintenance-free operation

Circuit protection

Circuit protection avoids damage due to incorrect input wiring

Applications

- Duct static pressure (Pressure mode)
- Building or room pressure (Pressure mode)
- Filter status (Pressure mode)
- Air flow measurement (Velocity mode)

Specifications

General	
Media Compatibility	Dry air or inert gas
Input Power	Three-wire Volt mode: 24 Vac or 12-30 Vdc*, Two-wire mA mode: 12-30 Vdc*
Output Power	Field-selectable: 2-wire, loop-powered 4-20 mA Minimum input voltage for 4-20 mA operation: 250 Ω loop = 12 Vdc; 500 Ω loop = 19 Vdc (DC only, clipped and capped), 24 Vac/dc or 3-wire 0-5V/0-10V Minimum load resistance for Volt operation: 5 kΩ
Pressure Ranges	
Pressure Range 1	Pressure mode: Unidirectional: 0.1/0.25/0.5/1 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1 in. WC, switch selectable Unidirectional: 25/50/100/250 Pa, switch selectable Bidirectional: ±25/±50/±100/±250 Pa, switch selectable Velocity mode: 500/1,000/2,000/3,000 ft/min, 2.5/5/10/15 m/s
Pressure Range 2	Pressure mode: Unidirectional: 1.0/2.5/5/10 in. WC, switch selectable Bidirectional: ±1.0/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±250/±500/±1,000/±2,500 Pa, switch selectable Velocity mode: 3,000/4,000/5,000/6,000 ft/min, 15/20/25/30 m/s
Pressure Range 5	Pressure mode: Unidirectional: 0.1/0.25/0.5/1/2.5/5/10 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 25/50/100/250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±25/±50/±100/±250/±500/±1,000/±2,500 Pa, switch selectable Velocity mode: 500/1,000/2,000/3,000/4,000/5,000/6,000/7,000 ft/min, 2.5/5/10/15/20/25/30/35 m/s
Sensor	
Response Time	Standard: T95 in 20 sec, Fast: T95 in 2 sec, DIP switch selectable
Mode	Unidirectional or bidirectional, DIP switch selectable
Display (option)	Pressure mode: Signed 3-1/2 digit LCD, indicates pressure, overrange indicator Velocity mode: Signed 4-1/2 digit LCD, indicates velocity, overrange indicator
Proof Pressure	3 psid (20,600 Pa)
Burst Pressure	5 psid (34,500 Pa)
Pressure Mode Accuracy	±1% FS (combined linearity and hysteresis)
Velocity Mode Accuracy	±90 ft/min (±0.45 m/s) plus 5% of measured value**
Temperature Effect	1 in. WC (250 Pa) models: 0.05%/°C; 10 in. WC (2,500 Pa) models: 0.01%/°C (Relative to 25 °C) 0 to 50 °C (32 to 122 °F)
Zero Drift (1-year)	1 in. WC (250 Pa) models: 2.5% FS typ.; 10 in. WC (2,500 Pa) models: 0.25% FS typ.
Zero Adjust	Pushbutton auto-zero and digital input (2-position terminal block)

Specifications (cont.)

Operating Env.	-20 to 60 °C (-4 to 140 °F)***
Altitude of Operation	0 to 3,000 m
Polution Degree	2
Humidity Range	100% RH, non-condensing
Mounting Location	For indoor or outdoor use (display will not function below 0 °C (32 °F))
Fittings	Brass barb; 0.24” (6.1 mm) o.d.
Environmental Rating	IP65, NEMA 4
Flammability Rating	UL 94 5VA fire retardant ABS, plenum rated
Warranty	
Limited Warranty	5 years

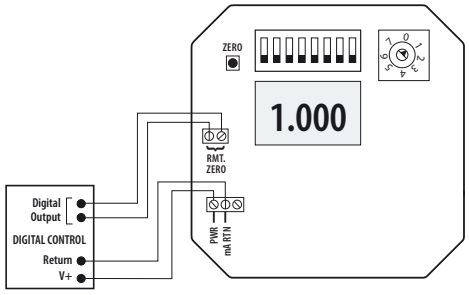
Agency Approvals

CE

EMC Conformance: EN 61000-6-3 and A1, Class B, EN 61000-6-1, EN61326-1 and EN61326-2-3.
* Class 2/II power source.
** For measured values between 200 and 7,000 ft/min (1 and 35 m/s).
*** Display will not function below 0 °C (32 °F).

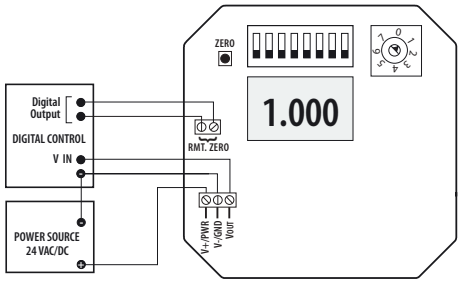
Wiring Diagram

2-wire, 4-20 mA Current Loop Output



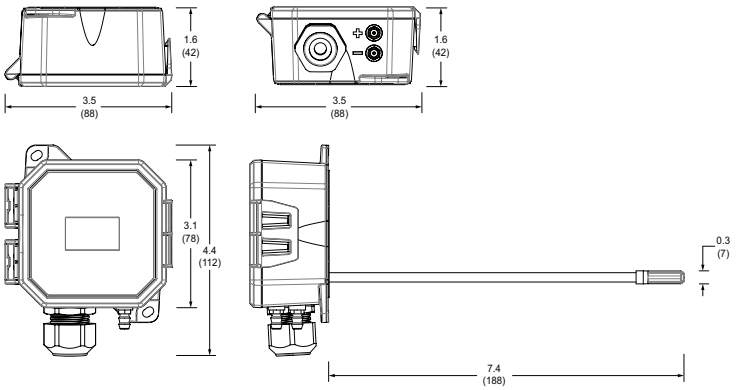
Wiring Diagram

3-wire, 0-5 V/0-10 V Voltage Output



Dimensional Drawing

in. (mm)



Accessories

VFXP Series Air Velocity Measurement Probe*

Velocity Pitot Tubes, 8-5/8”, 12-5/8”, 18-5/8” (AA18, AA19, AA20)*

Static-04 Pick-up - 4” Duct Static Pickup Probe (AA06)

Static-08 Pick up - 8” Duct Static Pickup Probe) (AA07)

Wall Plate Remote Pickup (AA56)

*For use with the PX3P (panel) and PX3U (universal) models in Velocity mode only.

VFXP Series

AA18, AA19,

AA06

AA07

AA56

Ordering Information

	Enclosure	Accuracy	Range	Local Display	Wireless Technology
EP	☐	30	☐	☐	S
	D = Duct P = Panel	30 = 1%	1 = Pressure: 0 to 1 in. WC, 0 to 250 Pa Velocity: 0 to 3,000 ft/min, 0 to 15 m/s 2 = Pressure: 1 to 10 in. WC, 250 to 2,500 Pa Velocity: 3,000 to 6,000 ft/min, 15 to 30 m/s	Blank = No Display LCD = LCD Display	S = Standard, No Wireless Technology

	Enclosure	Accuracy	Range	Local Display	Wireless Technology
EP	U	30	5	☐	S
	U = Universal	30 = 1%	5 = Pressure: 0 to 10 in. WC, 0 to 2,500 Pa Velocity: 0 to 7,000 ft/min, 0 to 35 m/s	Blank = No Display LCD = LCD Display	S = Standard, No Wireless Technology

PX3 Series

Bluetooth® Differential Pressure/Air Velocity Transducers from Veris

The PX3 transducer can measure either air pressure or velocity with the flip of a switch. The PX3 is available in three installation configurations: duct, panel or universal. Duct and panel models have two pressure and velocity options: 0-1 in. WC / 0-3,000 ft/min or 1-10 in. WC / 3,000-6,000 ft/min with four field-selectable sub-ranges. The universal model comes in one pressure/velocity range: 0-10 in. WC / 0-7,000 ft/min with seven field-selectable sub-ranges for pressure and eight for velocity. All variants are available with and without display. The PX3 has an IP65/ NEMA 4 environmental rating and a 5-year limited warranty.

The Veris Sensors App provides the ability to connect to a device and configure a variety of field-selectable parameters remotely from a smartphone via Bluetooth wireless technology. The app allows users to create and store commonly used parameters that will reduce commissioning time and provide assurance that all parameters are properly configured with no call backs. The app can also create a trend log while connected, providing important data for troubleshooting purposes.iOS® users can download the app through the iOS App Store on their smart device. Android users can download the app through the Google Play™ store.

Note: This product is not intended for life or safety applications. Do not install this product in hazardous or classified applications.

Specifications

General	
Media Compatibility	Dry air or inert gas
Input Power	Three-wire Volt mode: 24 Vac ±20% or 12-30 Vdc* Two-wire mA mode: 12-30 Vdc*
Output Power	Field-selectable: 2-wire, loop-powered 4-20 mA Minimum input voltage for 4 to 20 mA operation: 250 Ω loop = 12 Vdc; 500 Ω loop = 19 Vdc (DC only, clipped and capped), 24 Vac/dc or 3-wire 0-5V/0-10V Minimum load resistance for Volt operation: 5 kΩ
Pressure Ranges	
Pressure Range 1	Pressure Mode: Unidirectional: 0.1/0.25/0.5/1 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1 in. WC, switch selectable Unidirectional: 25/50/100/250 Pa, switch selectable Bidirectional: ±25/±50/±100/±250 Pa, switch selectable Velocity Mode: 500/1,000/2,000/3,000 ft/min 2.5/5/10/15 m/s
Pressure Range 2	Pressure Mode: Unidirectional: 1.0/2.5/5/10 in. WC, switch selectable Bidirectional: ±1.0/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±250/±500/±1,000/±2,500 Pa, switch selectable Velocity Mode: 3,000/4,000/5,000/6,000 ft/min, 15/20/25/30 m/s
Pressure Range 5	Pressure Mode: Unidirectional: 0.1/0.25/0.5/1/2.5/5/10 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 25/50/100/250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±25/±50/±100/±250/±500/±1,000/±2,500 Pa, switch selectable Velocity Mode: 500/1,000/2,000/3,000/4,000/5,000/6,000/7,000 ft/min 2.5/5/10/15/20/25/30/35 m/s
Sensor	
Response Time	Standard: T95 in 20 sec, Fast: T95 in 2 sec, DIP switch selectable
Mode	Unidirectional or bidirectional, DIP switch selectable
Display (option)	Pressure mode: Signed 3-1/2 digit LCD, indicates pressure, overrange indicator Velocity mode: Signed 4-1/2 digit LCD, indicates velocity, overrange indicator
Proof Pressure	1.44 psid (9,953 Pa)
Burst Pressure	4.33 psid (29,860 Pa)
Pressure Mode Accuracy	±1% FS (combined linearity and hysteresis)

Wireless configuration

View and configure all field-selectable parameters via smartphone. No ladder necessary for duct mount applications.

High accuracy

High accuracy digital sensor with seven selectable pressure and eight velocity sub-ranges, maintains calibration and reduces callbacks

Maintenance free

High reliability sensor technology for long-term, maintenance-free operation

Reduce field failures

Excellent tolerance to overpressure and vibration reduces field failures

Water-resistant housing

IP65/NEMA 4 housing allows for mounting in wash-down locations

Circuit protection

Circuit protection avoids damage due to incorrect input wiring

Applications

- Duct static pressure (Pressure mode)
- Building or room pressure (Pressure mode)
- Filter status (Pressure mode)
- Air flow measurement (Velocity mode)

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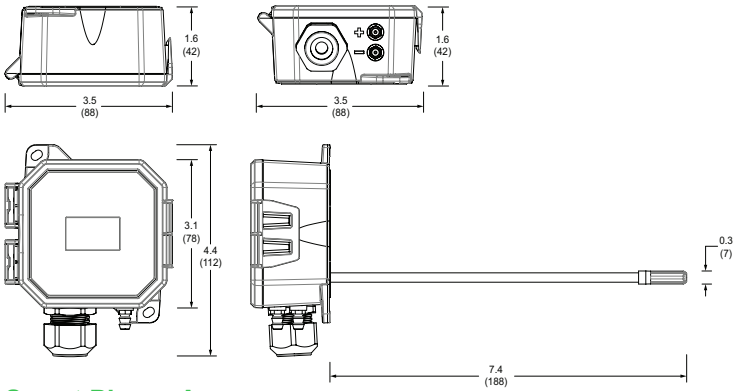
Velocity Mode Accuracy	±90 ft/min (±0.45 m/s) plus 5% of measured value**
Temperature Effect	0.00048 in. WC/°C (0.12 Pa/°C) relative to 25 °C, 0 to 50 °C (32 to 122 °F)
Zero Drift (1-year)****	+/-5.0 Pa (+/-0.020 in WC) max.
Zero Adjust	Pushbutton auto-zero and digital input (2-pos terminal block)
Operating Environment	-20 to 60 °C (-4 to 140 °F)***
Altitude of Operation	0 to 3,000 m
Humidity Range	100% RH, non-condensing
Mounting Location	For indoor or outdoor use (display will not function below 0 °C (32 °F))
Fittings	Brass barb; 0.24" (6.1 mm) o.d.
Bluetooth Frequency Range	2.402 to 2.480 GHz (Bluetooth version 4.2, enabled by DIP switch)
Environmental Rating	IP65, NEMA 4
Flammability Rating	UL 94 5VA fire retardant polycarbonate, plenum rated
Warranty	
Limited Warranty	5 years

Agency Approvals

CE EMC Conformance: EN 61000-6-3 and A1, Class B, EN 61000-6-1 and EN61326-1.
* Class 2/II power source.
** For measured values between 200 and 7,000 ft/min (1 and 35 m/s).
*** Display will not function below 0 °C (32 °F).
**** Can be compensated for using the Zero Reset function.

Dimensional Drawing

in. (mm)

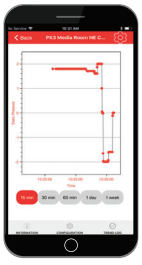


Smart Phone App

The Veris Sensors App allows for remote viewing and adjustment of settings. A great tool for reducing commissioning time.

Device Info Screen

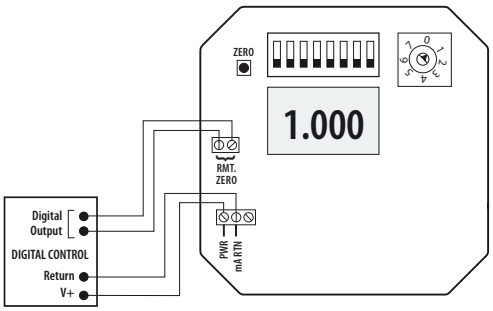
Custom Config Screen



Trend Log Tab

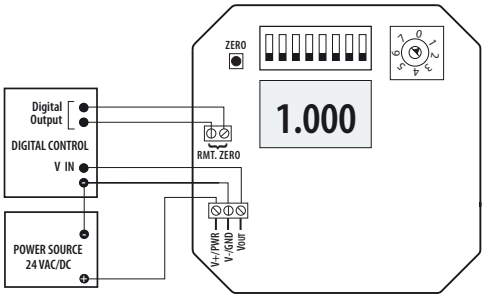
Wiring Diagram

2-wire, 4-20 mA Current Loop Output



Wiring Diagram

3-wire, 0-5 V/0-10 V Voltage Output



Ordering Information

PX3 — Enclosure: D = Duct, P = Panel; Local Display: L = LCD Display, X = No Display; NIST Certificate*: N = NIST, X = None; Range: 01 = Pressure: 0 to 1 in. WC/ 0 to 250 Pa; Velocity: 0 to 3,000 ft/min/ 0 to 15 m/s; 02 = Pressure: 1 to 10 in. WC/ 250 to 2500 Pa; Velocity: 3,000 to 6,000 ft/min/ 15 to 30 m/s; Wireless Technology: Blank = Wireless technology enabled model

*8-point calibration

Example: PX3 D L X 01

PX3U — Local Display: L = LCD Display, X = No Display; NIST Certificate*: N = NIST, X = None; Range: 05 = Pressure: 0 to 10 in. WC/ 0 to 2,500 Pa; Velocity: 0 to 7,000 ft/min / 0 to 35 m/s; Wireless Technology: Blank = Wireless technology enabled model

Example: PX3U L X 05

*16-point calibration

Accessories

VFXP Series Air Velocity Measurement Probe*

Velocity Pitot Tubes, 8-5/8", 12-5/8", 18-5/8" (AA18, AA19, AA20)*

Static-04 Pick-up - 4" Duct Static Pickup Probe (AA06)

Static-08 Pick up - 8" Duct Static Pickup Probe) (AA07)

Wall Plate Remote Pickup (AA56)

*For use with the PX3P (panel) and PX3U (universal) models in Velocity mode only.

VFXP Series

AA18, AA19,

AA06

AA07

AA56

PX3 Series

Differential Pressure/Air Velocity Transducers from Veris

The Veris PX3 transducer can measure either air pressure or velocity with the flip of a switch. The PX3 is available in three installation configurations: duct, panel or universal. Duct and panel models have two pressure and velocity ranges: 0-1 in. WC / 0-3,000 ft/min or 1-10 in. WC / 3,000-6,000 ft/min with four field-selectable sub-ranges. The universal model comes in one pressure/velocity range: 0-10 in. WC / 0-7,000 ft/min with seven field-selectable sub-ranges for pressure and eight for velocity. All variants are available with and without display. The PX3 has an IP65/ NEMA 4 environmental rating and a 5-year limited warranty.

Note: This product is not intended for life or safety applications. Do not install this product in hazardous or classified applications.

Reduce field failures

Excellent tolerance to overpressure and vibration reduces field failures

Water-resistant housing

IP65/NEMA 4 housing allows for mounting in wash-down locations

High accuracy

High accuracy digital sensor with seven selectable pressure and eight velocity sub-ranges, maintains calibration and reduces callbacks

Maintenance free

High reliability sensor technology for long-term, maintenance-free operation

Circuit protection

Circuit protection avoids damage due to incorrect input wiring

Applications

- Duct static pressure (Pressure mode)
- Building or room pressure (Pressure mode)
- Filter status (Pressure mode)
- Air flow measurement (Velocity mode)

Specifications

General	
Media Compatibility	Dry air or inert gas
Input Power	Three-wire Volt mode: 24 Vac or 12-30 Vdc* Two-wire mA mode: 12-30 Vdc*
Output Power	Field-selectable: 2-wire, loop-powered 4-20 mA Minimum input voltage for 4 to 20 mA operation: 250 Ω loop = 12 Vdc; 500 Ω loop = 19 Vdc (DC only, clipped and capped), 24 Vac/dc or 3-wire 0-5V/0-10V Minimum load resistance for Volt operation: 5 kΩ
Pressure Ranges	
Pressure Range 1	Pressure Mode: Unidirectional: 0.1/0.25/0.5/1 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1 in. WC, switch selectable Unidirectional: 25/50/100/250 Pa, switch selectable Bidirectional: ±25/±50/±100/±250 Pa, switch selectable Velocity Mode: 500/1,000/2,000/3,000 ft/min 2.5/5/10/15 m/s
Pressure Range 2	Pressure Mode: Unidirectional: 1.0/2.5/5/10 in. WC, switch selectable Bidirectional: ±1.0/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±250/±500/±1,000/±2,500 Pa, switch selectable Velocity Mode: 3,000/4,000/5,000/6,000 ft/min 15/20/25/30 m/s
Pressure Range 5	Pressure Mode: Unidirectional: 0.1/0.25/0.5/1/2.5/5/10 in. WC, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1/±2.5/±5/±10 in. WC, switch selectable Unidirectional: 25/50/100/250/500/1,000/2,500 Pa, switch selectable Bidirectional: ±25/±50/±100/±250/±500/±1,000/±2,500 Pa, switch selectable Velocity Mode: 500/1,000/2,000/3,000/4,000/5,000/6,000/7,000 ft/min 2.5/5/10/15/20/25/30/35 m/s
Sensor	
Response Time	Standard: T95 in 20 sec, Fast: T95 in 2 sec, DIP switch selectable
Mode	Unidirectional or bidirectional, DIP switch selectable
Display (option)	Pressure mode: Signed 3-1/2 digit LCD, indicates pressure, overrange indicator Velocity mode: Signed 4-1/2 digit LCD, indicates velocity, overrange indicator
Proof Pressure	3 psid (20,600 Pa)
Burst Pressure	5 psid (34,500 Pa)
Pressure Mode Accuracy	±1% FS (combined linearity and hysteresis)
Velocity Mode Accuracy	±90 ft/min (±0.45 m/s) plus 5% of measured value**

Specifications (cont.)

Temperature Effect

Temperature Effect	1" (250 Pa) models: 0.05%/°C; 10" (2,500 Pa) models: 0.01%/°C (Relative to 25 °C) 0 to 50 °C (32 to 122 °F)
Zero Drift (1-year)	1 in. WC (250 Pa) models: 2.5% FS typ.; 10 in. WC (2,500 Pa) models: 0.25% FS typ.
Zero Adjust	Pushbutton auto-zero and digital input (2-pos terminal block)
Operating Env.	-20 to 60 °C (-4 to 140 °F)***
Altitude of Operation	0 to 3,000 m
Humidity Range	100% RH, non-condensing
Mounting Location	For indoor or outdoor use (display will not function below 0 °C (32 °F))
Fittings	Brass barb; 0.24" (6.1 mm) o.d.
Environmental Rating	IP65, NEMA 4
Flammability Rating	UL 94 5VA fire retardant polycarbonate, plenum rated

WARRANTY

Limited Warranty	5 years

Agency Approvals

CE EMC Conformance: EN 61000-6-3 and A1, Class B, EN 61000-6-1, EN61326-1 and EN61326-2-3.
* Class 2/II power source.
** For measured values between 200 and 7,000 ft/min (1 and 35 m/s).
*** Display will not function below 0 °C (32 °F).

Ordering Information

	Enclosure	Local Display	NIST Cert*	Accuracy	Range	Wireless Technology
PX3	D = Duct P = Panel	L = LCD Display X = No Display	N = NIST X = None	0 = 1%	1 = Pressure: 0 to 1 in. WC/ 0 to 250 Pa Velocity: 0 to 3,000 ft/min/ 0 to 15 m/s 2 = Pressure: 1 to 10 in. WC/ 250 to 2500 Pa Velocity: 3,000 to 6,000 ft/min/ 15 to 30 m/s	S = Standard, no wireless technology

Example: PX3 D X N 0 1 S

*8-point calibration

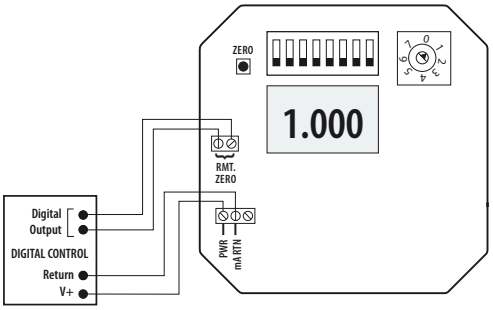
	Enclosure	Local Display	NIST Cert*	Accuracy	Range	Wireless Technology
PX3	U = Universal	L = LCD Display X = No Display	N = NIST X = None	0 = 1%	5 = Pressure: 0 to 10 in. WC/ 0 to 2,500 Pa Velocity: 0 to 7,000 ft/min/ 0 to 35 m/s	S = Standard, no wireless technology

Example: PX3 U X N 0 5 S

*16-point calibration

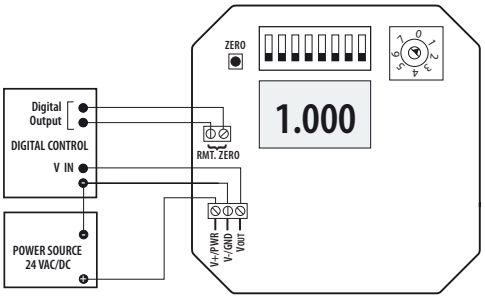
Wiring Diagram

2-wire, 4-20 mA Current Loop Output



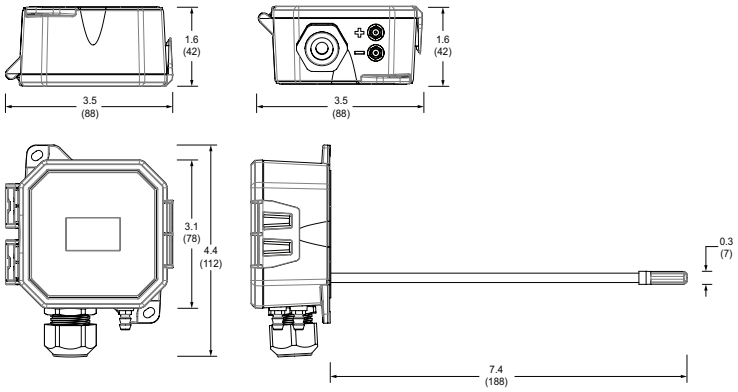
Wiring Diagram

3-wire, 0-5 V/0-10 V Voltage Output



Dimensional Drawing

in. (mm)



Accessories

VFXP Series Air Velocity Measurement Probe*

Velocity Pitot Tubes, 8-5/8", 12-5/8", 18-5/8" (AA18, AA19, AA20)*

Static-04 Pick-up - 4" Duct Static Pickup Probe (AA06)

Static-08 Pick up - 8" Duct Static Pickup Probe) (AA07)

Wall Plate Remote Pickup (AA56)

*For use with the PX3P (panel) and PX3U (universal) models in Velocity mode only.


VFXP Series


AA18, AA19,


AA06


AA07


AA56

PW Series

DIP Switch Selectable Port Swap Feature from Veris

PWxxxS

PWxxxBP

The Veris PW Series wet pressure transducers incorporate micro-processor profiled sensors for exceptional accuracy and reliability. Easy to use and designed to provide exceptional installation savings, the PW Series is ideal for measuring pressure across pumps, filters, heat exchangers, compressors, and other non-corrosive wet media applications.

The DIP switch selectable port swap feature eliminates costly replumbing when the high and low ports are improperly plumbed, allowing the DIP switch position to be changed from normal to swap.

The optional pre-assembled bypass valve is designed for easy maintenance and one-step installation.

Flexible

The DIP switch selectable output switch for normal (4 to 20 mA) or reverse (20 to 4 mA) operation provides application flexibility

Switch-selectable

Switch-selectable pressure ranges…fewer models to order and stock

Rugged

Rugged, die-cast enclosure provides NEMA 4 sealing

High stability

DIP switch controlled electronic surge dampening

Zero calibration

Pushbutton and remote zero adjustment…maintain accuracy and reduce callbacks with automatic zero calibration

Applications

- Monitoring and controlling pump differential pressure
- Chiller/boiler differential pressure drop
- CW/HW system differential pressure

Specifications

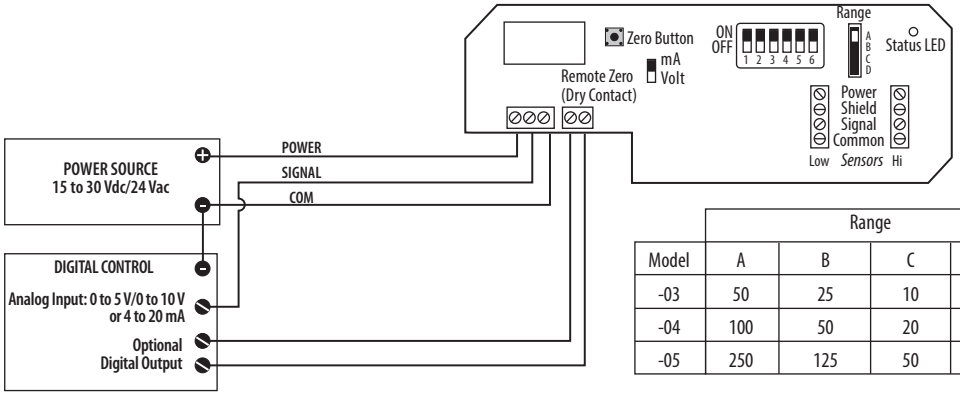
General	
Input Power	Class 2; 15 to 30 Vdc, 24 Vac nom. 50/60 Hz*
Max. Current Draw	DC: 125 mA; AC: 280 mA
Output	3-wire transmitter; user selectable 4 to 20 mA (clipped & capped)/0-5 V/0-10 V*
Surge Damping	Electronic; 1 or 5 second averaging
Test Mode	Overrides output to full-scale (20 mA, 5 V, 10 V)
Zero Adjust	Pushbutton auto-zero & digital input (2-pos terminal block)
Status Indication	Dual-color LED: Green = Normal, Green Blinking = Low > High Red = Overrange, Red Blinking = Overpressure Green/Red Blinking = Underpressure
Zero Offset (Bidirectional and Port Swap modes only)	0.5%
Housing Material	White powder-coated aluminum NEMA 4, IP65
Fittings	1/8” NPT female thread, 17 to 4 PH stainless steel
Pressure Ranges (Selectable)	
0 to 50 psig (Gauge)	0 to 5/10/25/50 psid (Differential)
0 to 100 psig (Gauge)	0 to 10/20/50/100 psid (Differential)
0 to 250 psig (Gauge)	0 to 25/50/125/250 psid (Differential)

Sensor	
Accuracy @ 25 °C**	Ranges A and B: ±1% F.S. typical***; Range C: ±1.5% F.S. typical***; Range D: ±2% F.S. typical***
Long Term Stability	±0.25% per year
Media Compatibility	Media compatible with 17 to 4 PH stainless steel
Proof Pressure	2x max. F.S. range***
Burst Pressure	5x max. F.S. range***
Temperature Compensated Range	0 to 50 °C (32 to 122 °F); TC Zero <±1.5% of product F.S.*** per sensor ; TC Span<±1.5% of product F.S.*** per sensor, (2 sensors per unit)
Media Temp. Limits	-20 to 85 °C (-4 to 185 °F); 0 to 90% RH non-condensing
Operating Environment	-10 to 50 °C (14 to 122 °F); 10 to 90% RH non-condensing
Warranty	
Limited Warranty	5 years
Agency Approvals	

CE

*VFD systems and system wiring generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor or sensor wiring.
**Accuracy combines linearity, hysteresis, and repeatability.
*** FS is defined as full span of selected range in bi-directional mode.
EMC Conformance - Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

Wiring Diagram



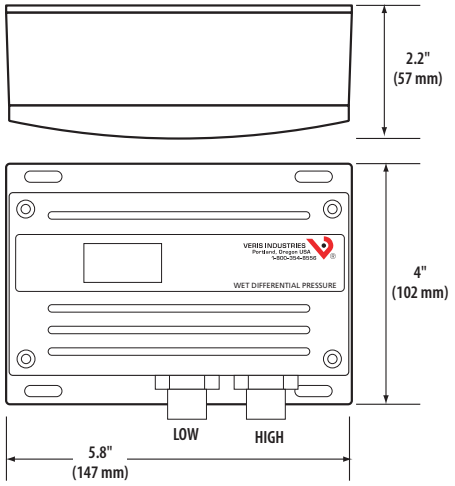
	Range			
Model	A	B	C	D
-03	50	25	10	5
-04	100	50	20	10
-05	250	125	50	25

DIP Switches		
Num	Function	Off/On[1]
1	Damping	Fast/Slow
2	Test	Operate/Test
3	Mode	Normal/Bidirec.
4	Analog	Normal/Reverse
5	Port	Normal/Swap
6	Voltage Out[2]	0 to 10 V/0 to 5 V

1. "Off" position is the default setting for all DIP switches.
2. Ignored in mA mode.

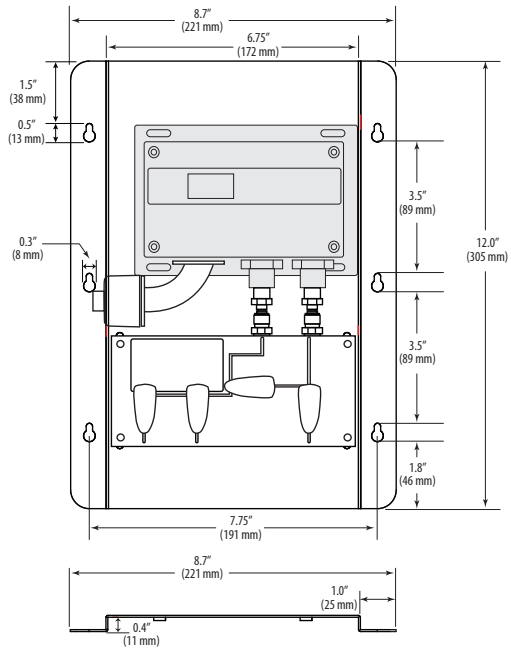
Dimensional Drawing

PW Series (PWxxxS)



Dimensional Drawing

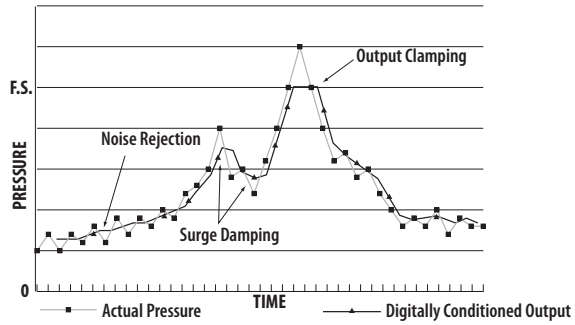
PW Series with Optional Mounted Bypass Assembly (PWxxxBP)*



* Bypass valve assembly also sold separately as AA14A.

Microprocessor Provides Digital Signal Conditioning

- Noise rejection reduces fluctuating readings due to noise or turbulence
- Surge damping prevents false alarms by averaging fast peaks



Ordering Information

Local Display	NIST	Operational Range*	Options
PW ☐	☐	☐	☐
L = LCD display X = No display	N = NIST X = None	03 = 0-50 psig 04 = 0-100 psig 05 = 0-250 psig	S = Standard BP = With mounted bypass assembly**

Example:

PW	L	X	04	S

* Select operational range according to maximum gauge pressure, NOT differential pressure.
** Bypass valve assembly also sold separately as AA14A.

Accessories

Brass Snubber, 1/8" NPT (AA11)
Brass Snubber, 1/4" NPT (AA69)
Stainless Steel Snubber, 1/8" NPT (AA12)
Stainless Steel Snubber, 1/4" NPT (AA70)
Pigtail Steam Siphon (AA13)

AA11/
AA69

AA12/
AA70

AA13

PW2 Series

4 to 20 mA, 2-Wire Devices from Veris

PW2xxxS

PW2xxxBP

The Veris PW2 Series 2-wire, 4 to 20 mA wet pressure transducers incorporate microprocessor profiled sensors for exceptional accuracy and reliability. Easy to use and designed to provide exceptional installation savings, the PW2 Series is ideal for measuring pressure across pumps, filters, heat exchangers, compressors, and other non-corrosive wet media applications.

The optional pre-assembled bypass valve is designed for easy maintenance and a one-step installation.

Specifications

General	
Input Power	Class 2; 12 to 24 Vdc, loop powered (polarity insensitive)
Maximum Current Draw	29 mA
Output	2-wire transmitter; user selectable 4 to 20 mA (clipped & capped)*
Surge Damping	Electronic; 5-second averaging
Zero Adjust	Pushbutton auto-zero terminals
Housing Material	White powder-coated aluminum
Pressure Ranges (Selectable)	
0 to 50 psi (0 to 3.45 barg) (Gauge)	0-5/10/25/50 psid (0-0.34/0.69/1.72/3.45 bard) (Differential)
0 to 100 psig (0 to 6.89 barg) (Gauge)	0-10/20/50/100 psid (Differential) (0-0.69/1.38/3.45/6.89 bard) (Differential)
0 to 250 psi (0 to 17.24 bar) (Gauge)	0-25/50/125/250 psid (Differential) (0-1.72/3.45/8.62/17.24 bard) (Differential)
Sensor	
Accuracy @ 25 °C**	Range A, B, C: ±1% F.S.; Range D: ±2% F.S.***
Media Compatibility	Media compatible with 17-4 PH stainless steel
Long Term Stability	±0.25% per year
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range
Temperature Compensated Range	0 to 50 °C (32 to 122 °F); TC Zero <±1.5% of product F.S. per sensor ; TC Span<±1.5% of product F.S. per sensor, (2 sensors per unit)
Media Temperature Limits	-20 to 85 °C (-4 to 185 °F); 0 to 90% RH non-condensing
Product Operating Environment	-10 to 55 °C (14 to 130 °F); 0 to 90% RH non-condensing

Jumper selectable

The jumper-selectable output switch for normal (4 to 20 mA) or reverse (20 to 4 mA) operation provides application flexibility

Dual sensor

Dual sensor design for improved overpressure tolerance…eliminates the requirement for a bypass valve assembly in most applications

Rugged

Rugged, die-cast enclosure provides NEMA 4 sealing

High stability

Jumper-controlled electronic surge dampening for high stability

Selectable

Selectable differential units: psid or bard

Zero calibration

Pushbutton zero calibration – no trim pots to adjust… maintain
accuracy and reduce callbacks with automatic zero calibration

Applications

- Monitoring and controlling pump differential pressure
- Chiller/boiler differential pressure drop
- CW/HW system differential pressure

Warranty	
Limited Warranty	5 years

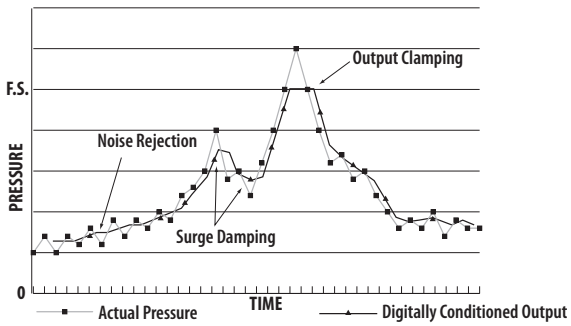
Agency Approvals

CE

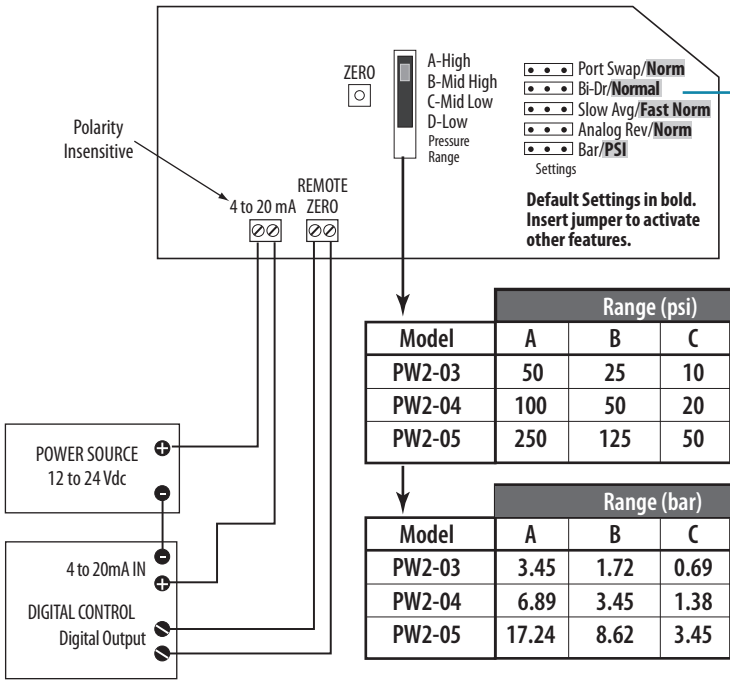
* Minimum input voltage: 250 Ω loop = 12 Vdc; 500 Ω loop = 17 Vdc
**Accuracy combines linearity, hysteresis, and repeatability.
***FS is defined as full span of selected range in bi-directional mode.
EMC Conformance - Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

Microprocessor Provides Digital Signal Conditioning

- Noise rejection reduces fluctuating readings due to noise or turbulence
- Surge damping prevents false alarms by averaging fast peaks



Wiring Diagram



Range (psi)				
Model	A	B	C	D
PW2-03	50	25	10	5
PW2-04	100	50	20	10
PW2-05	250	125	50	25

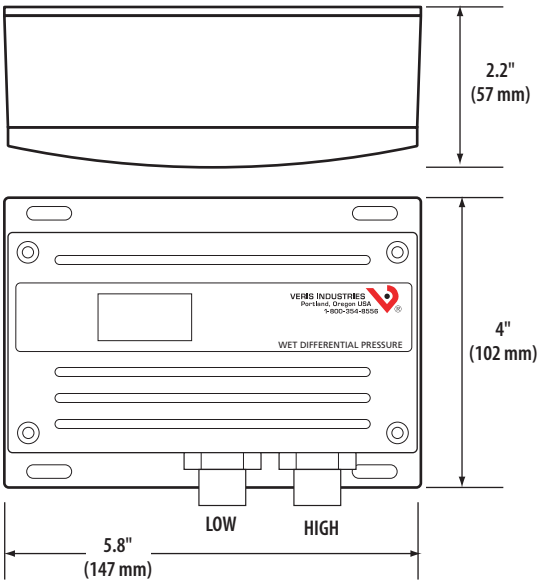
Range (bar)				
Model	A	B	C	D
PW2-03	3.45	1.72	0.69	0.34
PW2-04	6.89	3.45	1.38	0.69
PW2-05	17.24	8.62	3.45	1.72

Bidirectional Operation

Input Conditions		Result	Outputs Read
HI PORT	LO PORT	DP	4-20mA
100 psi	0 psi	+100 psi	20mA
100 psi	50 psi	+50 psi	16mA
50 psi	50 psi	0 psi	12mA
50 psi	100 psi	-50 psi	8mA
0 psi	100 psi	-100 psi	4mA

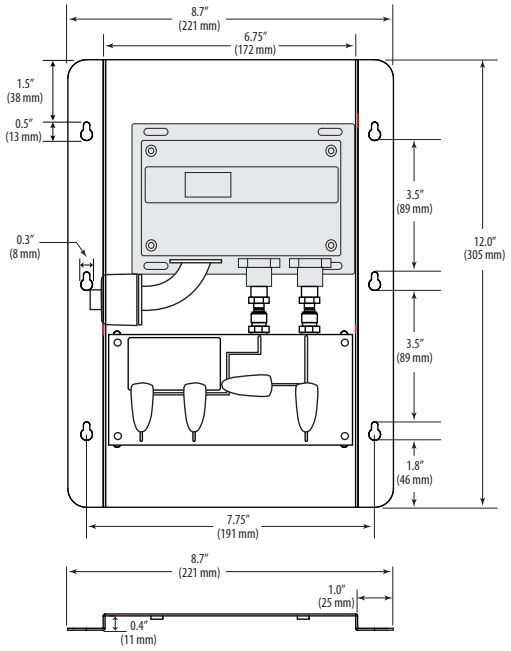
Dimensional Drawing

PW2xxxS



Dimensional Drawing

PW2xxxBP*



* Bypass valve assembly also sold separately as AA14A.

Ordering Information

Local Display	NIST	Operational Range*	Options
PW2 [ ]	[ ]	[ ]	[ ]
L = LCD Display X = No Display	N = NIST X = None	03 = 0 to 50 psig/3.45 barg 04 = 0 to 100 psig/6.89 barg 05 = 0 to 250 psig/17.24 barg	S = Standard BP = With mounted bypass assembly**

Example:

PW2	L	X	04	S

*Select operational range according to max. gauge pressure, NOT differential pressure.
Example: High gauge pressure =90 psig, Select 100 psig model (04).
** Bypass valve assembly also sold separately as AA14A.

Accessories

Brass Snubber, 1/8" NPT (AA11)

Brass Snubber, 1/4" NPT (AA69)

Stainless Steel Snubber, 1/8" NPT (AA12)

Stainless Steel Snubber, 1/4" NPT (AA70)

Pigtail Steam Siphon (AA13)

AA11/ AA69

AA12/ AA70

AA13

PWR Series

3-Wire Device, User-Selectable Output

PWR

Armor cable

Armor cable or conduit connector minimizes the need for field customization

Zero calibration

Pushbutton zero calibration – no trim pots to adjust…maintain accuracy and prevent callbacks with automatic zero calibration

Lower costs

Remote probes reduce need for plumbing or bypass assemblies…lower costs and reduced labor for installation

Switch-selectable

Switch-selectable pressure ranges…fewer models to order and stock

The PWR Series remote wet media pressure transducers allow remote pressure sensing capability using existing plumbing runs. With no need to run plumbing lines all the way to the transducer, the installation time and cost is greatly reduced. Select either armored (6 ft.) or shielded (10 or 20 ft.) cable, depending on the application.

Applications

- Monitoring and controlling pump differential pressure
- Chiller/boiler differential pressure drop
- CW/HW system differential pressure

Specifications

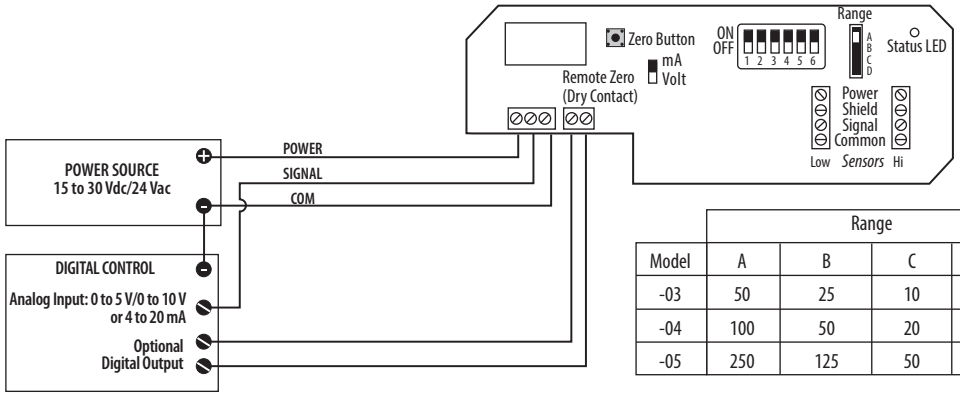
General	
Input Power	Class 2; 15 to 30 Vdc, 24 Vac nom. 50/60 Hz*
Maximum Current Draw	DC: 125 mA; AC: 280 mA
Output	3-wire transmitter; user-selectable 4 to 20mA/ 0 to 5 V/0 to 10 V
Status Indication	Dual color LED
Surge Damping	Electronic; 1 or 5 second averaging
Zero Adjust	Pushbutton auto-zero and digital input (2-position terminal block)
Fittings	1/4" NPT male thread, stainless steel 17-4 PH Overall thread length: 0.5946" (conforms to ANSI/ASME B1.20.1 standard)
SENSOR	
Media Compatibility	17-4 PH stainless steel
Proof Pressure	2x max. F.S. range**
Burst Pressure	5x max. F.S. range**
Accuracy at 25 °C***	Ranges A and B: ±1% F.S. typical; Range C: ±1.5% F.S. typical; Range D: ±2% F.S. typical. (For less than or equal to 20 ft. (6.1 m) cable length)
Long Term Stability	±0.25%
Zero Offset (Bidirectional and Port Swap Modes Only)	±0.5%
Temperature Compensated Range	0 to 50 °C (32 to 122 °F); TC Zero <1.5% of product F.S. per sensor; TC Span <1.5% of product F.S. per sensor

Pressure Ranges	
0 to 50 psig (Gauge)	5/10/25/50 psid (Differential)
0 to 100 psig (Gauge)	10/20/50/100 psid (Differential)
0 to 250 psig (Gauge)	25/50/125/250 psid (Differential)
Operating Conditions	
Sensor Operating Range	-20 to 85 °C (-4 to 185 °F)
Operating Environment	-10 to 50 °C (14 to 122 °F); 10 to 90% RH non-condensing
Warranty	
Limited Warranty	5 years
Compliance Information	
Approvals	RoHS, CE, NEMA4, IP65 at sensor

CE

*VFD systems and system wiring generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor or sensor wiring.
**F.S. is defined as full span of selected range.
***Accuracy combines linearity, hysteresis, and repeatability.

Wiring Diagram

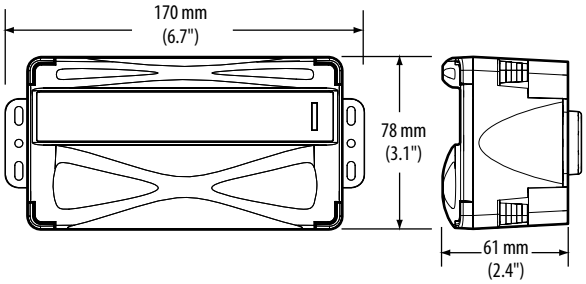


	Range			
Model	A	B	C	D
-03	50	25	10	5
-04	100	50	20	10
-05	250	125	50	25

DIP Switches		
Num	Function	Off/On[1]
1	Damping	Fast/Slow
2	Test	Operate/Test
3	Mode	Normal/Bidirec.
4	Analog	Normal/Reverse
5	Port	Normal/Swap
6	Voltage Out[2]	0 to 10 V/0 to 5 V

1. "Off" position is the default setting for all DIP switches.
2. Ignored in mA mode.

Dimensional Drawing



Ordering Information

Display	NIST	Operational Range*	Media	Cable Length	Cable
PWR [L]	[X]	[ ]	[S]	[ ]	[ ]
= LCD Display	= None	03 = 0-50 psig 04 = 0-100 psig 05 = 0-250 psig	= Water	006 = 6 ft. (1.8 m) 010 = 10 ft. (3.1 m) 020 = 20 ft. (6.1 m)	Blank = Standard** A = Armored***

Example:

PWRLX [03] [S] [006] [A]

* Select operational range according to maximum gauge pressure, NOT differential pressure.
Example: High gauge pressure=90 psig, Select 100 psig model (04).
** Standard cable available only in 10 ft and 20 ft lengths.
*** Armored cable available only in 6 ft length.
Note: Extension of total cable length greater than 20 feet may result in reduced accuracy.

Accessories

Brass Snubber, 1/4" NPT (AA69)
Stainless Steel Snubber, 1/4" NPT (AA70)
Pigtail Steam Siphon (AA13)
1/4" Ball Valve (AA68)


AA69


AA70


AA13


AA68

PASxx SERIES

Monitor Air Ducts, Filters and Fans from Veris

PASxx

Veris PASxx differential air flow switches are intended for use in air handling systems for the monitoring of air ducts, filters and fans.

The enclosure is plastic with a rating of IP54. A set-point adjustment is provided under the clip-on clear plastic cover.

Supplied complete with mounting adaptor ring, two straight duct probes and a 6-foot length of clear tubing.

Specifications

Medium		Air and neutral gases
Pressure range		See Ordering Information table
Set-point scale		Inches WC
Tolerable overload on one side		20 in. WC at -22 to +185 °F
Repeatability	PAS01	±2.5 (0.01 in. WC)
	PAS02	±5 (0.02 in. WC)
	PAS03	±5 (0.02 in. WC)
	PAS04	±5 (0.02 in. WC)
Switching load	Resistive load	5 A at 250 Vac 4 A at 30 Vdc
	Inductive	0.8 A at 250 Vac 0.7 A at 30 Vdc
Materials in contact with the medium		Case: PC 10% GF Cover: PC Diaphragm: Silicone LSR tempered 200 °C, free of gas emissions
Operating temperature	Medium/ambient	-22 to +185 °F (-30 to +85 °C)
	Storage	-40 to +185 °F (-40 to +85 °C)
Service life		Mechanical > 10^6 = 1,000,000 switching cycles
Electrical connection		Screw terminals Cable gland type PG11 (DIN 40430) complete with cable strain relief
Switch contact type		SPDT (change-over)
Protection standard	Without cover	IP00
	With cover	IP54
Pressure connections		Pipe Ø 6.2 mm

Easy cable lead-in

Case geometry allows easy cable lead-in

Integrated cable strain relief

Cable strain relief integrated in PG11 (DIN 40430)

High accuracy

High adjustment accuracy through individual laser etched scale

Snap cover

User-friendly snap cover

Stable switching points

Long-term stability of switching points through trapezoidal bead diaphragm

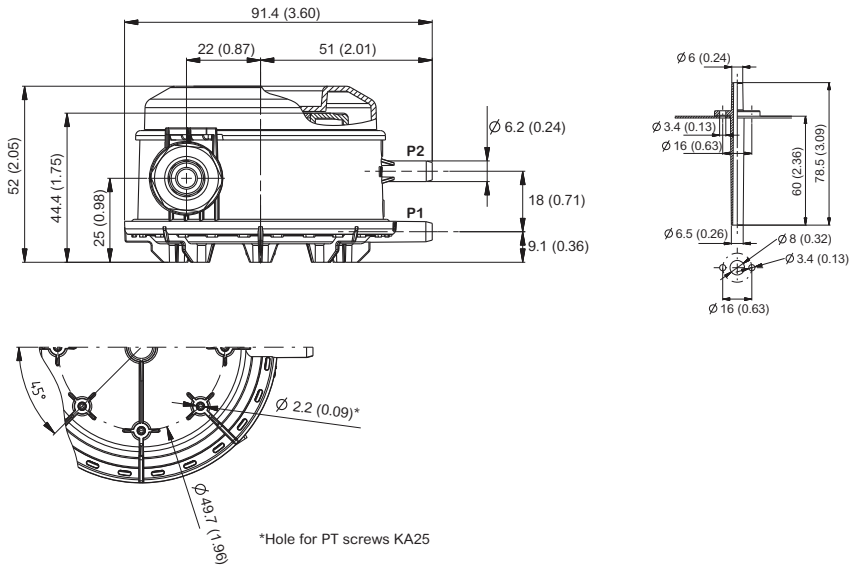
Applications

- High pressure monitoring
- Vacuum pressure monitoring
- Filter monitoring
- Fan monitoring

Tests/admissions	EU Conformity, Electromagnetic Compatibility: CE[1] conformity according to EN 60730-2-6:2008 Low Voltage Directive: 2014/35/EU Gas Appliance Directive: 2009/142/EC Pressure Sensing Devices for Gas Burners and Gas Burning Appliances: EN 1854:2010 EU Directive on RoHS: 2011/65/EU
Warranty	
Limited Warranty	5 years
Agency Approvals	

CE

Dimensional Drawing

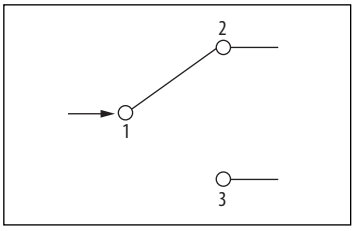


Installation

Mounting:

- Vertical with pressure connections facing downward (factory recommended)
- Horizontal with cover facing downward (switching setpoint 0.4" WC lower than scale)
- Horizontal with cover facing upward (switching setpoint 0.4" WC higher than scale)

Wiring



1 = COM (Common)
2 = NC Contact (Normally Closed)
3 = NO Contact (Normally Open)

Functionality

The pressure switch has two separate pressure chambers, each with its own connection. The switch operates when the setpoint is either exceeded or not reached.

Vacuum Monitoring

Connect the pressure switch via P2. Do not connect P1. Leave P1 open. Make sure that debris cannot get into P1.

High Pressure Monitoring

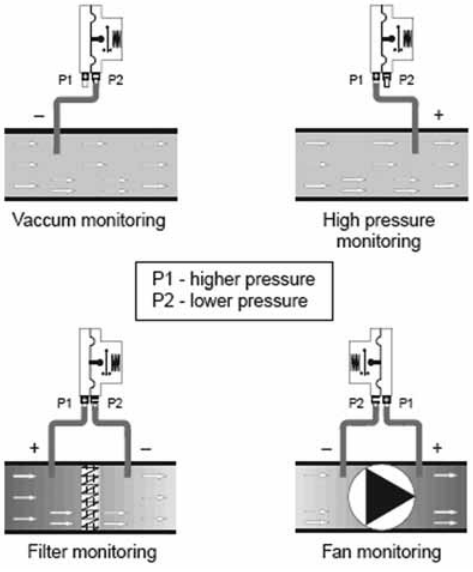
Connect the pressure switch via Pa. Do not Connect P2. Leave P2 open. Make sure that debris cannot get into P2.

Filter Monitoring

Connect P1 before the filter and P2 after it.

Fan Monitoring

Connect P1 after the fan (in blowing direction) and P2 before the fan.



Ordering Information

Part Number	Description	Pressure Range
PAS01	Differential Air Pressure Switch	0.08 to 1.2 in. WC (20 to 300 Pa)
PAS02		0.2 to 2.0 in. WC (50 to 500 Pa)
PAS03		0.4 to 4.0 in. WC (100 to 1000 Pa)
PAS04		2.0 to 8.0 in. WC (500 to 2000 Pa)

Accessories

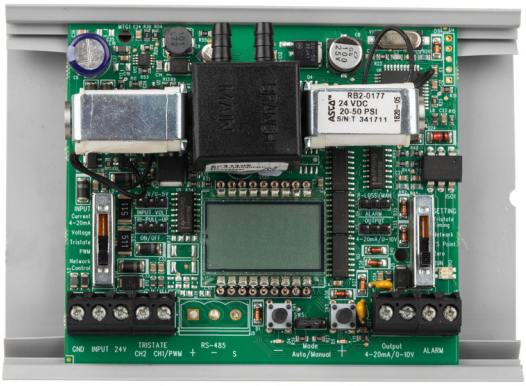
Static-04 Pick-up - 4" Duct Static Pickup Probe (AA06)

Static-08 Pick up - 8" Duct Static Pickup Probe) (AA07)

AA06 AA07

EP3 Series

Micro-Controlled with High-Performance, Low-Power Coil Poppet Valve Technology from Veris



EP3

EP Series transducers are sold as an open device. Observe handling precautions for static sensitive devices to avoid damage to the circuitry which would not be covered under the factory warranty.

Field-selectable

Field-selectable 4 to 20 mA/ 0-5 V/0-10 Vdc input for application flexibility

Multi-point calibration

3 to 15 psi (5-point calibration) and 0 to 20 psi (6-point calibration)

Quiet operation

Poppet valve technology for quiet operation

Pressure loss alarm

Pressure loss alarm provides a contact closure if the EP3 is unable to achieve the desired output within a fixed length of time

Manual override

Manual override with set and hold feature…great for commissioning leaky systems

Fail-safe vent

Fail-safe vent solenoids bleed branch pressure on power failure for added safety

The Veris EP3 Series combines a microcontroller with high performance, low power coil poppet valve technology to create a system with unparalleled accuracy and proven reliability. The poppet valves used in the EP3 consume no air, eliminating unnecessary air losses in the system and allowing for efficient, long-term operation. The EP3 permits versatility, since all models feature manual override and a tri-state control option. The LCD provides easy visibility and the LED indicators provide visual status of valve operation in manual or automatic mode. All models come with SnapTrack housing and optional covers are available.

Applications

- Hospitals
- Schools
- Pneumatic dampers/ actuators

Specifications

General	
Input Power	Class 2; 22 to 30 Vdc/20 to 30 Vac, 47 to 63 Hz,150 mA max. average, 350 mA peak
Control Input	Class 2; 4 to 20 mA/0-5 V/0-10 Vdc; switch-selectable, Tri-State, PWM
Input Impedance	4 to 20 mA, 250 Ω; 0-5 V/0-10 Vdc, 10 kΩ
Manual Override	Digital pushbutton adjust, jumper-selectable mode
Alarm Contact	100 mA@30 Vac/dc (Pressure loss, manual mode, jumper selectable)
Accuracy	1% FS; combined linearity, hysteresis, repeatability @20 °C (68 °F) ambient
Temperature Coefficient	±0.1%/°C
Operating Temp Range	41 to 140 °F (5 to 60 °C)
Operating Hum. Range	10 to 90% RH non-condensing
SCIM	523 in3/min @ 45 psi; (8570 cm3/min @ 310.3 kPa); 333 in3/min @ 20 psi (5457 cm3/min @ 137.9 kPa)
Supply Pressure	Min (0.1 psi + user F.S. pressure); Max 45 psig
Control Range	User programmable zero selectable from 0 to 25 psi: Full scale 0 to 25 psi
Pressure Differential	0.1 psig (supply to branch)
Pressure Indication	Electronic, 3-½ digit backlit LCD
Min. Tubing Length	15 feet*
Port Connection	1/8” I.D. poly tubing
Media Connection	Clean, dry air, or inert gas. Do not use with oxygen service
Warranty	
Limited Warranty	5 years

Agency Approvals

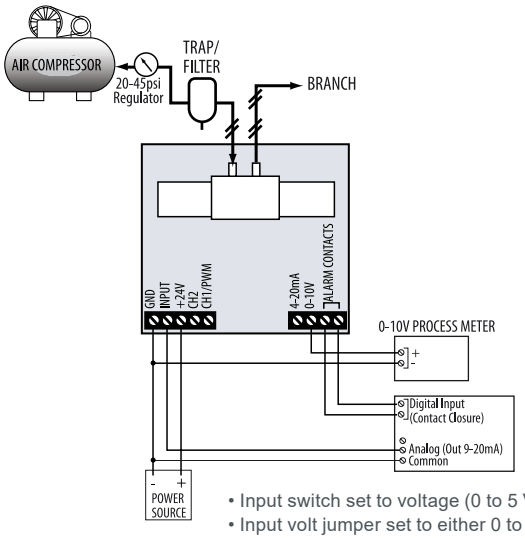
CE**

*For shorter tubing runs use the Veris AA45 Pneumatic Capacitor
EMC Conformance: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note - CE option: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

**The CE mark applies to models with cover only.

Current/Voltage Control

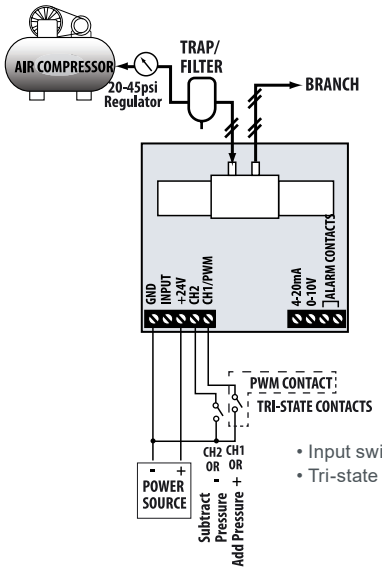
Wiring Diagrams



- Input switch set to voltage (0 to 5 Vdc or 0 to 10 Vdc)
- Input volt jumper set to either 0 to 5 Vdc or 0 to 10 Vdc
- Input switch set to 4 to 20 mA
- Output jumper set to 0 to 10 Vdc

Tri-state Control

Wiring Diagrams



- Input switch set to "TRI-STATE"
- Tri-state jumper set to "ON"

Ordering Information

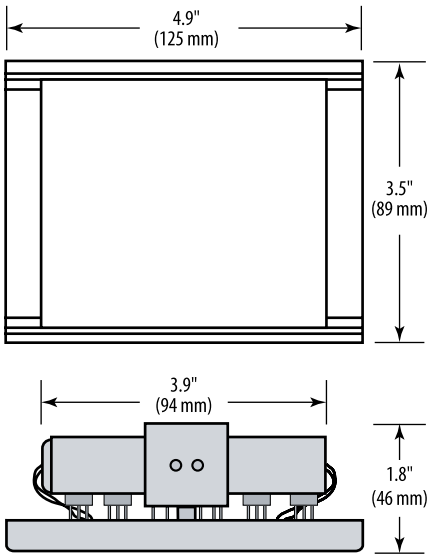
Output		Failsafe		Option
EP3 ☐	3	☐	S	☐
0 = None 3 = Analog output: 0-10VDC, or 4-20mA, selectable		0 = None 1 = Vent on Power Fail		Blank = None 2 = EP Cover Plate*

*Sold separately as AA43.

Example:

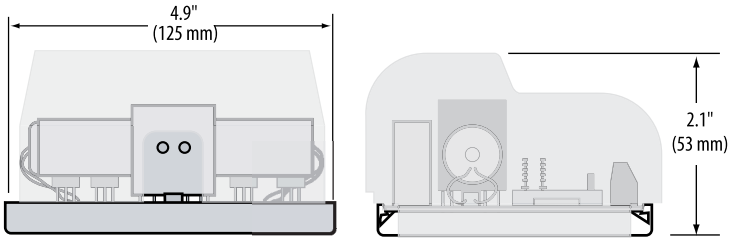
EP3 [0] [3] [0] [S] [2] Option = Cover Plate

Dimensional Drawing

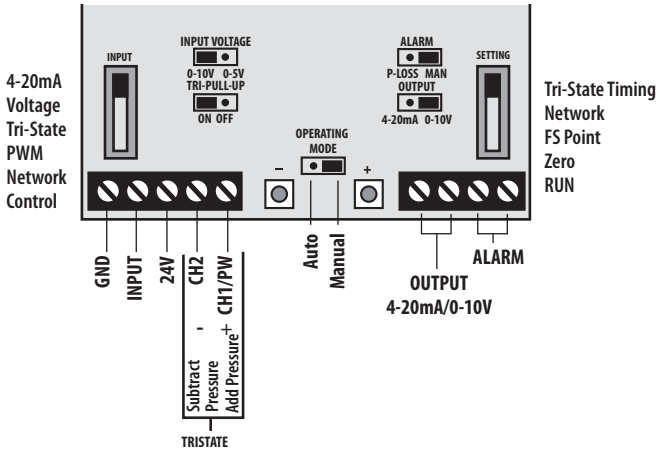


Dust Cover

Dimensional Drawings (Front View) Side View



Configuration



Accessories

Dust Cover (AA43)
Pneumatic Capacitor(AA45)
Triac adapter (AA49)

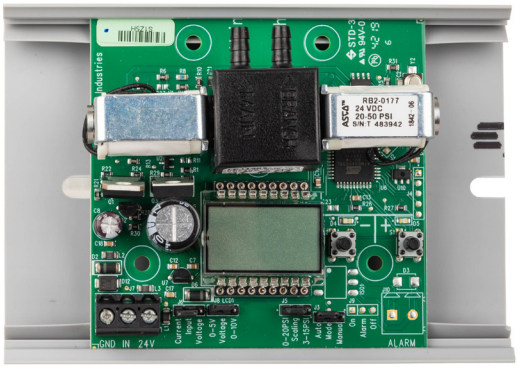

AA43


AA45


AA49

EP2 Series

Micro-Controlled with High-Performance, Low-Power Coil Poppet Valve Technology from Veris



EP2

EP Series transducers are sold as an open device. Observe handling precautions for static sensitive devices to avoid damage to the circuitry which would not be covered under the factory warranty.

The Veris EP2 Series electropneumatic pressure transducer uses micro-controlled poppet valve technology for highly accurate pressure sensing in multiple applications. The poppet valves consume no air, eliminating unnecessary air losses in the system and allowing for stable and reliable operation. The EP2 comes installed on standard SnapTrack, and an optional dust cover is available to protect from the environment. An LCD display and LED indicators make it easy to read system status at a glance.

Field selectable

Field-selectable 4 to 20 mA/ 0-5 V/0-10 Vdc input for application flexibility

Multi-point calibration

Multi-point calibration; 3 to 15 psi (5-point calibration) and 0 to 20 psi (6-point calibration)

Quiet operation

Poppet valve technology for quiet operation

Pressure loss alarm

Pressure loss alarm provides a contact closure if the EP2 is unable to achieve the desired output within a fixed length of time

Manual override

Manual override with set and hold feature…great for commissioning leaky systems

Fail-safe vent

Fail-safe vent solenoids bleed branch pressure on power failure for added safety

Applications

- Hospitals
- Schools
- Pneumatic dampers/ actuators

Specifications

General	
Input Power	Class 2; 24 Vac/dc nominal, 30 Vac max.; 150 mA max.
Control Input	Class 2; 4 to 20mA/0-5 V/0-10 Vdc; jumper-selectable
Input Impedance	4 to 20 mA, 250 Ω; 0-5 V/0-10 Vdc, 10 kΩ
Manual Override	Jumper-selectable mode, digital pushbutton adjust
Alarm Contact	100 mA@30 Vac/dc (pressure loss, manual mode, jumper selectable)
Accuracy	1% FS; combined linearity, hysteresis, repeatability
Compensated Temp Range	-4 to 65 °C (25 to 140 °F)
Temperature Coefficient	±0.05%/°C
Operating Environment	10 to 90% RH non-condensing
Air Capacity	523 in3/min @ 45 psi (8570 cm3/min @ 310.3 kPa); 333 in3/min @ 20 psi (5456 cm3/min @ 137.9 kPa)
Supply Pressure	45 psig max.
Control Range	0 to 20 psig or 3 to 15 psig, jumper-selectable
Pressure Differential	0.1 psig (supply to branch)
Pressure Indication	Electronic, 3-1/2 digit LCD
Minimum Tubing Length	15 feet*
Port Connection	1/8” I.D. poly tubing
Media Connection	Clean, dry air, or inert gas. Do not use with oxygen service
Warranty	
Limited Warranty	5 years

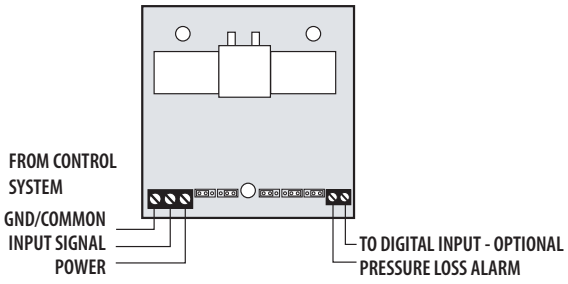
Agency Approvals

CE**

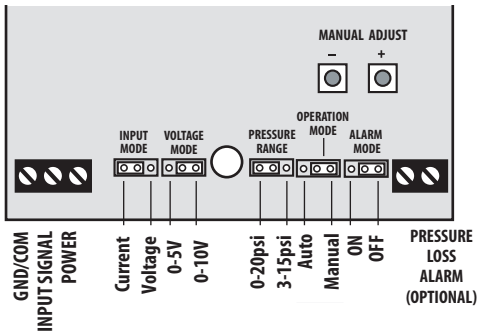
*For shorter tubing runs use AA45 Pneumatic Capacitor
EMC Conformance - CE option: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

**The CE mark applies to models with cover only.

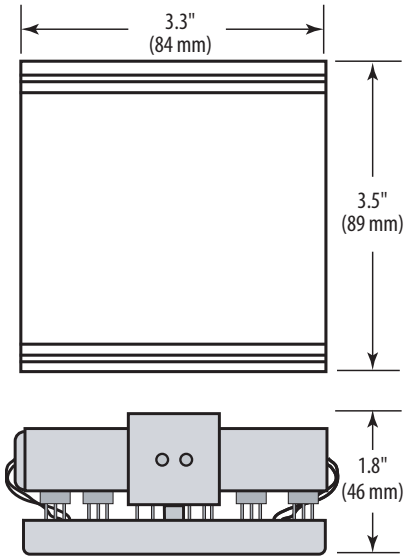
Wiring Diagram



Configuration

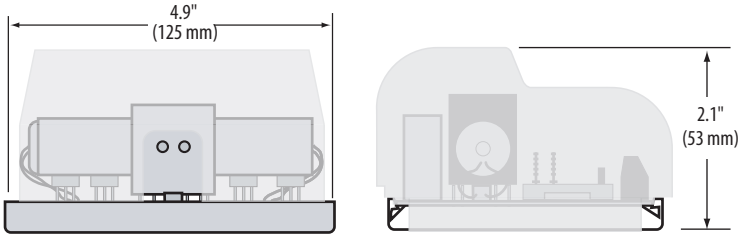


Dimensional Drawings



Dust Cover

Dimensional Drawings (Front View) Side View



If the dust cover is ordered, the EP2 is mounted to a longer Snaptrack.

Ordering Information

	Output	Feedback	Failsafe		Option
EP2	1			S	
	= Selectable 3-15/0-20 psi	0 = None 1 = Pressure Loss Alarm 2 = Manual Mode Alarm	0 = None 1 = Vent on Power Fail		Blank = none 2 = EP Cover Plate*

*Sold separately as AA43.

Example:
EP2 [1] [0] [0] [S] [2] Option = EP cover plate

Accessories

Dust Cover (AA43)
Pneumatic Capacitor(AA45)


AA43


AA45

PH Series

Three Switch-Selectable Ranges with Test Mode from Veris

PH

Reduces failures

Micromachined silicon sensor design…improves overpressure capacity and reduces failures

Switch-selectable

Switch-selectable pressure ranges…fewer models to order and stock

High stability

Electronic surge damping for high stability

Pushbutton

Pushbutton and remote zero adjustment…maintain accuracy and prevent callbacks with automatic zero calibration

Zero calibration

Pushbutton zero calibration... no trim pots to adjust, saves installation time

Microprocessor

Microprocessor controlled signal conditioning (see graph)

The Veris PH Series pressure transducers are designed for steam, air, gas, and liquid pressure measurement in all media compatible with 17-4PH N8 stainless steel. They utilize a microprocessor controlled sensor profiled for exceptional accuracy and reliability. All models feature three switch-selectable ranges and a “test mode” to verify wiring and panel input scaling. A pushbutton and digital input terminal is used to automatically zero the output, and the microprocessor guards against accidental zero adjustment during operation. The field-selectable output, offering options of 0 to 5 V, 0 to 10 Vdc, or 4 to 20 mA, ensures excellent systems compatibility. Jumper controlled surge damping is provided on all models to reduce false alarms.

Applications

- Chilled and hot water pump monitoring
- HVAC and industrial gas monitoring
- Instrument air pressure
- Hydraulic oil pressure

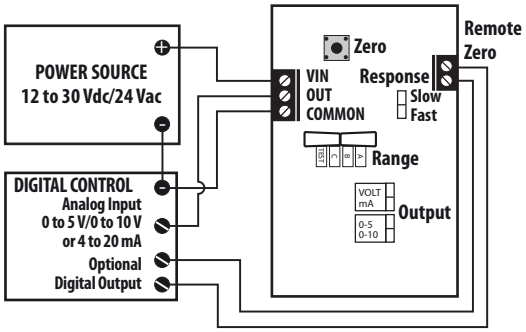
Specifications

General	
Input Power	Class 2; 12 to 30 Vdc/24 Vac
Output	3-wire transmitter; user selectable 4 to 20 mA (clipped & capped)/0-5 V/0-10 V*
Surge Damping	Electronic; 5-second averaging
Test Mode	Overrides output to full-scale (20 mA, 5 V, 10 V)
Zero Adjust	Pushbutton auto-zero and digital input (2-pos terminal block)
Status Indication	Dual-color LED: Green = Normal, Red = Overpressure, Flashing Red = Fault
Housing Material	White powder-coated steel
Pressure Ranges	
0 to 100 psi	25/50/100 psig switch selectable
0 to 250 psi	62.5/125/250 psig switch selectable
0 to 500 psi	125/250/500 psig switch selectable
0 to 1000 psi	250/500/1000 psig switch selectable
Other Specs	
Product Operating Environment	-10 to 55 °C (-4 to 130 °F); 0 to 90% RH non-condensing

Sensor	
Accuracy	±1% F.S. Combined linearity, hysteresis, and repeatability
Long Term Stability	±0.25% per year
Media Compatibility	Media compatible with 17-4 PH stainless steel
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range
Temp Compensated Range	0 to 50 °C (32 to 122 °F)
Media Temperature Limits	-20 to 85 °C (-4 to 185 °F); 0 to 90% RH non-condensing
Fittings	1/4" NPT male thread, 17-4 PH stainless
Warranty	
Limited Warranty	5 years

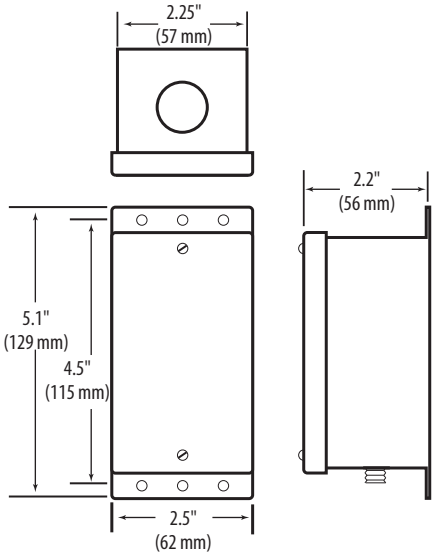
*Minimum input voltage for 4 to 20 mA operation:
250 Ω loop (1 to 5 V) = 12 Vdc
500 Ω loop (2 to 10 V) = 15 Vdc

Wiring Diagram

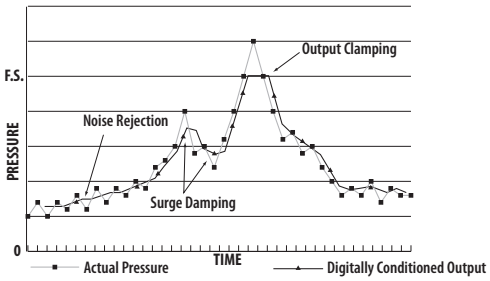


MODEL	RANGE A	B	C
07	25	50	100
08	62.5	125	250
09	125	250	500
10	250	500	1000

Dimensional Drawing



Signal Conditioning Diagram



Ordering Information

NIST	Range	
PH [ ]	[ ]	[S]
N = NIST X = None	07 = 0-100 psig 08 = 0-250 psig 09 = 0-500 psig	= Standard

Example: PH [X] [07] [S]

Accessories

Brass Snubber, 1/4" NPT (AA69)
Stainless Steel Snubber, 1/4" NPT (AA70)
Pigtail Steam Siphon (AA13)

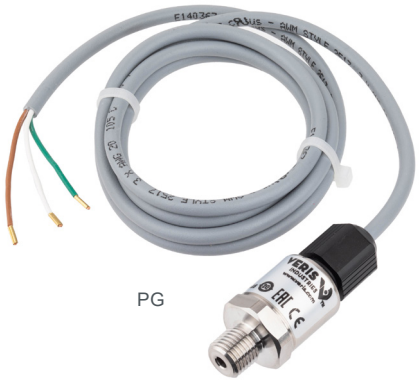
AA69

AA70

AA13

PG Series

Rugged Stainless Steel Construction



PG

Versatile

A wide operating temperature range of -40 to 85 °C (-40 to 185 °F) for operation versatility

Sturdy construction

Suitable for high shock and vibration applications

Fewer parts to fail

No silicon oil, no internal O-rings, no welds

Rugged

Stainless steel wetted construction

The PG Series pressure transducers are compatible with a variety of HVAC and industrial applications, such as refrigeration measurement, pneumatic pressure measurement, gas pressure measurement, pump inlet, and outlet fluid pressure. They are also compatible with extreme applications, such as aerospace and motor sports equipment.

Volt and mA output options ensure integration with building systems. A wide selection of pressure ranges offers application flexibility.

The PG Series offers a stainless steel housing and all models are warranted for a period of five years.

Applications

- Pump inlet/outlet and compressors
- Hydraulic/pneumatic systems
- Energy and water management
- Refrigeration equipment, fluids
- Gas pressure measurement

Specifications

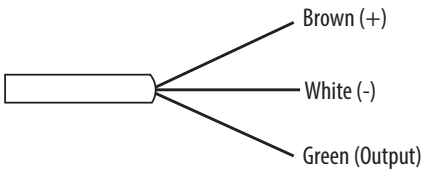
General	
Supply Voltage	Class 2; 12 to 30 Vdc
Output	0 to 5 Vdc (3-wire), 0 to 10 Vdc (3-wire) or 4 to 20 mA (2-wire)
Load Impedance	Volt models >10 kΩ mA models ≤250 Ω with 12 Vdc min. supply voltage mA models ≤500 Ω with 17 Vdc min. supply voltage
Standard Connection	Cable gland 59” (1.5 m) length
Pressure Port	1/4” NPT Male
Performance at 25 °C (77 °F)	
Accuracy *	±0.5% FS
Media Compatibility	Fluids & gases compatible with 316L stainless steel
Pressure Cycles	>100 million cycles
Over Pressure	2.5x FS with no change in calibration
Environmental	
Shock	100G, 11 msec, 1/2 sine
Vibration	20G peak, 20 to 2400 Hz
EMI/RFI Protection	Yes
Rating	IP66
Operating Temp. Range	-30 to 120 °C (-22 to 248 °F)
Compensated Temp Range	0 to 55 °C (32 to 130 °F)
Total Error Band Over Temp	<±3% of FS
Humidity	0 to 95% RH non-condensing
Warranty	
Limited Warranty	5 years
Agency Approvals	

CE

* Accuracy includes nonlinearity and hysteresis.

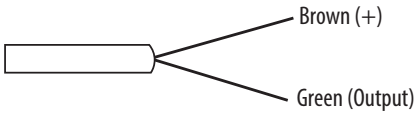
3-wire, 0-5 Vdc/0-10 Vdc

Wire Color Coding

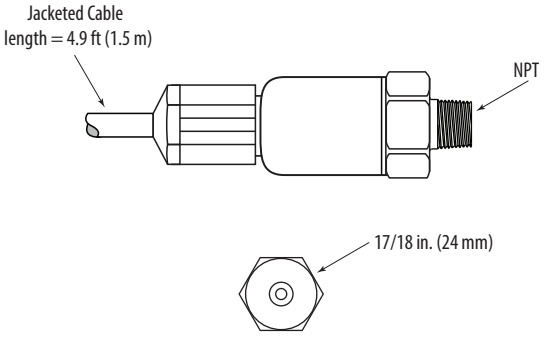


2-wire, 4 to 20 mA

Wire Color Coding



Dimensional Drawing



Ordering Information

	Range	Wetted Material	Output
PG	☐	A	☐
	03 = 0 to 15 psig 04 = 0 to 25 psig 05 = 0 to 50 psig 06 = 0 to 75 psig 07 = 0 to 100 psig 08 = 0 to 250 psig 09 = 0 to 500 psig	= 316L stainless steel	M = 4 to 20 mA V = 0-10 Vdc J = 0-5 Vdc

Call factory for ranges not shown.

Example:

PG 07 A V

Accessories

Brass Snubber, 1/4” NPT (AA69)

Stainless Steel Snubber, 1/4” NPT (AA70)

Pigtail Steam Siphon (AA13)

AA69

AA70

AA13

Accessories Selection Guide: Pressure Monitoring

Product	Description	EP/ PX3	PAS	PH	PG	EP2	EP3	PW	PW2	PWR
Dry Pressure										
AA05	Remote Wall Static Pickup Tube	•	•							
AA06	Static-04 Pick-up - 4" Duct Static Pickup Probe	•	•							
AA07	Static-08 Pick up - 8" Duct Static Pickup Probe	•	•							
AA18	Velocity Pitot Tube Kit - 8" Velocity Duct Probe	•								
AA19	Velocity Pitot Tube Kit - 12" Velocity Duct Probe	•								
AA20	Velocity Pitot Tube Kit - 18" Velocity Duct Probe	•								
AA43	Dust Cover					•	•			
AA45	Pneumatic Capacitor					•	•			
AA49	Triac Adaptor						•			
AA56	Wall Plate Remote Pickup	•								
Wet Pressure										
AA11	Brass Snubber, 1/8” NPT							•	•	
AA12	Stainless Steel Snubber, 1/8” NPT							•	•	
AA13	Pigtail Steam Siphon			•	•			•	•	•
AA14A	Bypass Valve Assembly Bracket							•	•	
AA68	1/4" Ball Valve				•					•
AA69	Brass Snubber, 1/4” NPT			•	•			•	•	•
AA70	Stainless Steel Snubber, 1/4” NPT			•	•			•	•	•

AA05
Remote Wall Static Pickup Tube

AA06
Static-04 Pick-up - 4" Duct Static Pickup Probe

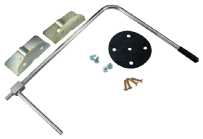
AA07
Static-08 Pick up - 8" Duct Static Pickup Probe

AA11/AA69
Brass Snubber, 1/8” NPT (AA11)
Brass Snubber, 1/4” NPT (AA69)

AA12/AA70
Stainless Steel Snubber, 1/8” NPT (AA12)
Stainless Steel Snubber, 1/4” NPT (AA70)

AA13
Pigtail Steam Siphon

AA14A
Bypass Valve Assembly and Bracket



AA18/AA19
Velocity Pitot Tube Kit 8" (AA18),
Velocity Pitot Tube Kit 12" (AA19)

AA20
Velocity Pitot Tube Kit 18".

AA43
Dust Cover

AA45
Pneumatic Capacitor

AA49
Triac Adapter

AA56
Wall Plate Remote Pickup

AA68
1/4” Ball Valve

Plant Room Sensors: Temperature Monitoring

Schneider Electric offers a wide range of temperature sensing products for commercial building applications. Control and maintain a comfortable environment with our thermistor, RTD, and transmitter devices. We offer an array of mounting options for installation flexibility, including duct, wall, ceiling, pendant, and immersion. All devices carry our reputation for accuracy and reliability, as well as an aesthetically pleasing housing, making them ideal for monitoring temperature in any setting.

Plant Room Temperature Sensor Selection Guide

	Duct Mount	Ceiling Mount	Outdoor Mount	Remote	Strap-On	Immersion	VAV
Analog Transmitter Output	ETD* page 183	TC/TS* page 193	ETO* page 192	ETB/TRA* page 189	ETS* page 189	ETI* page 187	TJ* page 185
Resistive Output	ETD page 183	TC/TS page 193	ETO page 192	ETB/TRA page 189	ETS page 189	ETI page 187	TJ page 185
Averaging Sensor	ETA page 191						

*Requires AA10 Series Temperature-to-Current Transmitter, see page 195.

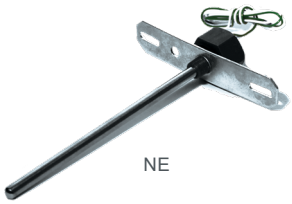
ETD Series

Corrosion Resistant Stainless Steel Probe


PB


4X


GD


NE

ETD Series temperature sensors are highly accurate and cost effective, with trouble-free installation. The sensor is encased in a sturdy corrosion-resistant stainless steel probe. A variety of RTD/thermistor sensor and probe length options are available for maximum versatility in applications.

Specifications

Wiring	22 AWG; 2-wire: RTD/Thermistor
Probe	Grade 304 stainless steel
Test Pressure	200 psi
Operating Temp	-40 to 150 °C (-40 to 302 °F)
Warranty	
Limited Warranty	5 years
Agency Approvals	

CE*

*CE compatibility is based on the RoHS standard.

Cost effective

Cost-effective, high-accuracy thermistors/RTDs

Easy selection

1/2” NPT threads standard

Durable

Corrosion resistant stainless steel probe design

Easy servicing

Thermowells available

Variety of enclosures

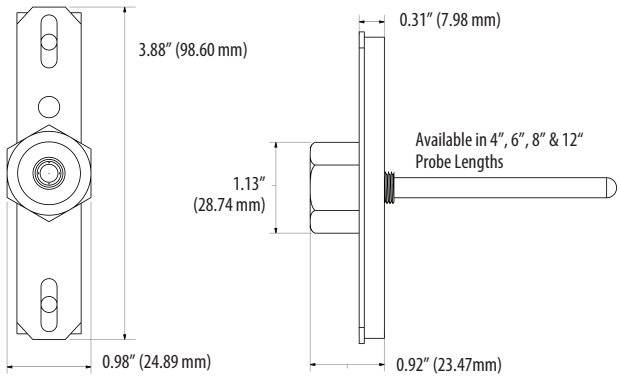
Duct mount, service entry body, threaded, and water resistant to fit your application

Applications

- Tanks
- Pipes
- Chillers

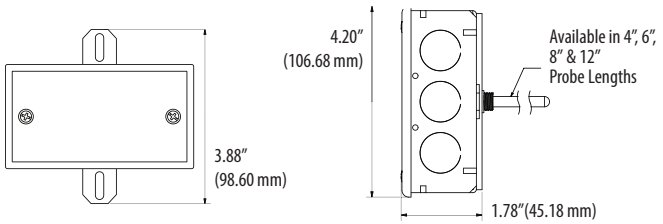
No Enclosure (NE)

Dimensional Drawing



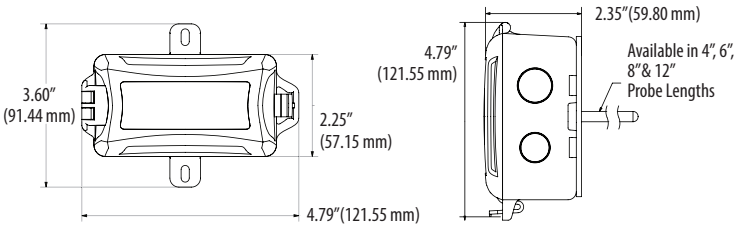
Galvanized Enclosure (GD)

Dimensional Drawing



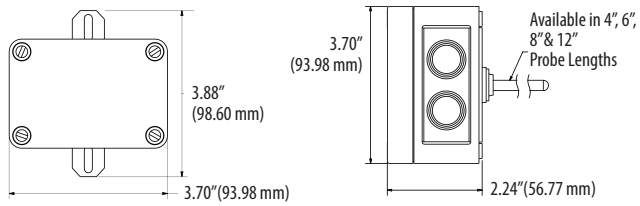
Plastic Box Enclosure (PB)

Dimensional Drawing



NEMA 4X Enclosure (4X)

Dimensional Drawing



Ordering Information

ETD [ ] - [ ] [ ]

Thermistor/ RTD Type

100 = TAC Vista (1.8K TAC Thermistor)
200 = TAC I/NET (10K T2 Thermistor)
500 = Continuum (10K T3 Thermistor)
800 = TAC I/A Series (10K Curve G/11K Shunt)
PKD = 1000 Ohm Platinum RTD
BKD = 1000 Ohm Nickel (BALCO) RTD

Probe Length

4 = 4"
6 = 6"
8 = 8"
12 = 12"

Housing Type

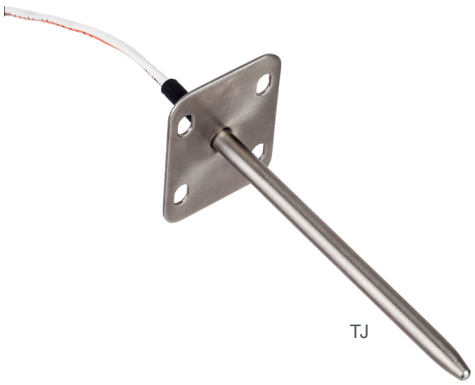
None = Galvanized Steel Enclosure
-NE = No Enclosure, Plate Only
-PB = ABS Plastic Box Enclosure
-4X = NEMA 4X (IP65) Polystyrene Plastic Enclosure

Example:

ETD [100] - [6] [-PB]

TJ Series

VAV Discharge Air Sensor for Reheat Applications from Veris



TJ

Veris TJ Series temperature sensors are highly accurate and cost effective, with trouble-free installation. The sensor is encased in a sturdy corrosion-resistant stainless steel probe. A variety of RTD/thermistor sensor and probe length options are available for maximum versatility in applications.

Specifications

Wiring	22 AWG; 2-wire: RTD/Thermistor
Probe	Stainless steel
Operating Temp	Probe: -25° to 105 °C (-13 to 221 °F) Wiring side: Up to 75 °C (167 °F)
Warranty	
Limited Warranty	5 years

Increased cable length affects the readings of lower resistance RTDs (100R platinum, RTD).
* Room temperature offset documented on each unit.

Easy installation

Stainless steel duct probe with mounting flange

Two wires

2-wire installation (optional quick disconnect)…installs in minutes

VAV systems

Installation-ready for VAV systems and plenum areas…saves money on job commissioning and warranty service

Plenum rated

Plenum rated cable standard

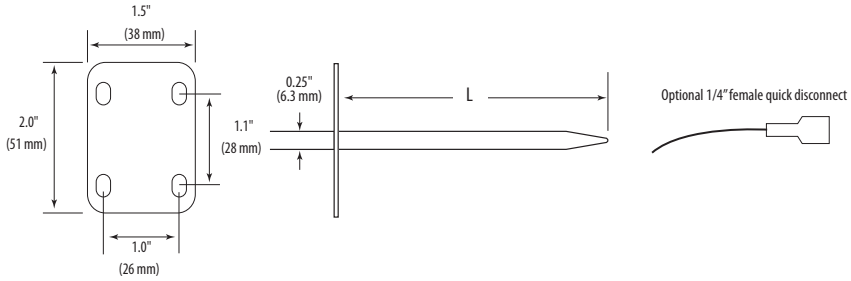
Application flexibility

4” or 8” (102 mm or 204 mm) duct probes

Applications

- VAV reheat boxes
- Dual duct boxes
- Fan coils
- Prove that hot water valve or electric heat is functioning properly
- Check individual reheating stages
- Check for hot water valve leaks
- Determine if damper actuators are functioning on dual duct boxes

Dimensional Drawing



Ordering Information

TJ [ ] [ ] [R] [ ] [ ]

Probe Length "L"
B = 4"(102mm)
D = 8" (203mm)

Sensor Type
B = 100R platinum, RTD
C = 1k platinum, RTD
D = 10k T2, Thermistor
E = 2.2k, Thermistor
F = 3k, Thermistor
H = 10k T3, Thermistor
I = 1k Balco (Nickel-iron) RTD
J = 10k Dale, Thermistor
K = 10k w/11k shunt, Thermistor
M = 20k NTC, Thermistor
N = 1800 ohm, Thermistor
W = 10k T2 high accuracy, Thermistor
Y = 10k T3 high accuracy, Thermistor

Output
R = Resistive

Cal Certificate
0 = None
2 = 3-point NIST calibration

Option
0 = Standard 5 ft. cable, No QDs
1 = 1/4" Female Quick Disconnects (QD)
2 = 1/4" QDs with 8 ft. leadwires
3 = 10 ft. cable, no QDs

Example: TJ B D R 2 1

Standard RTD and Thermistor Values

Class	Pt RTD		Balco RTD	THERMISTOR							
Type	**100 Ohm**	**1000 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**20k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±1% @70°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	Consult	±0.1°C 20/70°C	±0.1°C
	0.00385 curve	0.00385 curve		0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
										High Accuracy	

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	20k NTC	10k Type 2	10k Type 3
-50	-58	80.306	803.06	740.46	154,464	205,800	692,700	454,910	672,300	1,267,600	692,700	454,910
-40	-40	84.271	842.71	773.99	77,081	102,690	344,700	245,089	337,200	643,800	344,700	245,089
-30	-22	88.222	882.22	806.02	40,330	53,730	180,100	137,307	177,200	342,000	180,100	137,307
-20	-4	92.160	921.60	841.00	22,032	29,346	98,320	79,729	97,130	189,080	98,320	79,729
-10	14	96.086	960.86	877.46	12,519	16,674	55,790	47,843	55,340	108,380	55,790	47,843
0	32	100.000	1,000.00	913.66	7,373	9,822	32,770	29,588	32,660	64,160	32,770	29,588
10	50	103.903	1,039.03	952.25	4,487	5,976	19,930	18,813	19,900	39,440	19,930	18,813
20	68	107.794	1,077.94	991.82	2,814	3,750	12,500	12,272	12,490	24,920	12,500	12,272
25	77	109.735	1,097.35	1,013.50	2,252	3,000	10,000	10,000	10,000	20,000	10,000	10,000
30	86	111.673	1,116.73	1,035.18	1,814	2,417	8,055	8,195	8,056	16,144	8,055	8,195
40	104	115.541	1,155.41	1,077.68	1,199	1,598	5,323	5,593	5,326	10,696	5,323	5,593
50	122	119.397	1,193.97	1,120.52	811.5	1,081	3,599	3,894	3,602	7,234	3,599	3,894
60	140	123.242	1,232.42	1,166.13	561.0	747	2,486	2,763	2,489	4,992	2,486	2,763
70	158	127.075	1,270.75	1,210.75	395.5	527	1,753	1,994	1,753	3,512	1,753	1,994
80	176	130.897	1,308.97	1,254.55	284.0	378	1,258	1,462	1,258	2,516	1,258	1,462
90	194	134.707	1,347.07	1,301.17	207.4	-	919	1,088	917	1,833	919	1,088
100	212	138.506	1,385.06	1,348.38	153.8	-	682	821	679	1,356	682	821
110	230	142.293	1,422.93	1,397.13	115.8	-	513	628	511	1,016	513	628
120	248	146.068	1,460.68	1,447.44	88.3	-	392	486	389	770	392	486
130	266	149.832	1,498.32	1,496.28	68.3	-	303	380	301	591	303	380
Sensor Codes		**B**	**C**	**I**	**E**	**F**	**D**	**H**	**J**	**M**	**W**	**Y**

Z202030-0U

ETI Series

Corrosion Resistant Stainless Steel Probe

Cost effective

Cost-effective, high-accuracy thermistors/RTDs

Easy selection

1/2” NPT threads standard

Durable

Corrosion resistant stainless steel probe design

Easy servicing

Thermowells available

Variety of enclosures

Duct mount, service entry body, threaded, and water resistant to fit your application

Applications

- Tanks
- Pipes
- Chillers

ETI Series immersion probe type temperature sensors are both highly accurate and cost effective. Installation could not be easier. The sensor is encased in a corrosion-resistant stainless steel probe for durability, with a choice of service entry body, indoor junction box, or threaded enclosures. A variety of RTD or thermistor sensor options and probe lengths are available for maximum application versatility.

Specifications

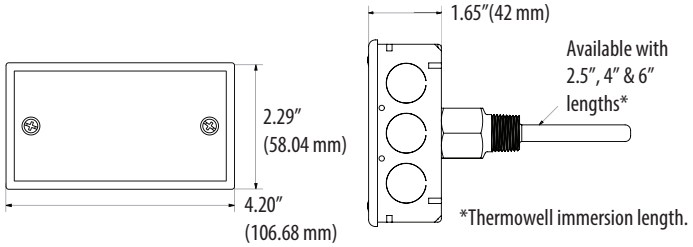
Wiring	22 AWG; 2-wire: RTD/Thermistor
Probe	Grade 304 stainless steel
Test Pressure	200 psi
Operating Temp	40 to 150 °C (-40 to 302 °F)
Warranty	
Limited Warranty	5 years
Agency Approvals	

CE*

*CE compatibility is based on the RoHS standard.

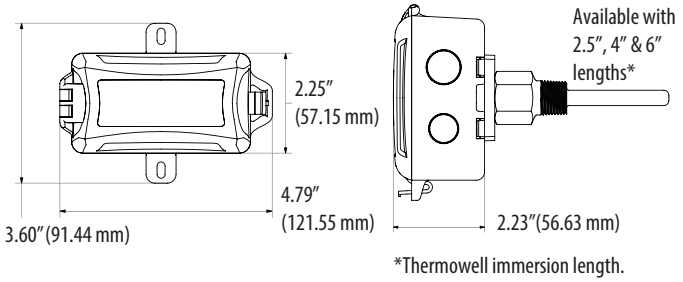
Galvanized Enclosure (GD)

Dimensional Drawing



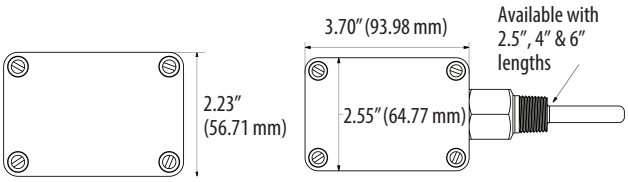
Plastic Box Enclosure (PB)

Dimensional Drawing



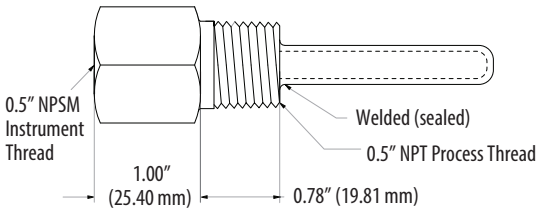
NEMA 4X Enclosure (4X)

Dimensional Drawing



Thermowell

Dimensional Drawing



Sensor Probe and Thermowell Immersion Lengths

Part Number	Thermowell Immersion Length	Sensor Probe Length	Internal Thread	External Thread
ETIxxx-2-xx	2.5” (63.5 mm)	4.3” (109.5 mm)	1/2” NPS thread	1/2” NPT thread
ETIxxx-4-xx	4.0” (101.6 mm)	5.8” (147.6 mm)	1/2” NPS thread	1/2” NPT thread
ETIxxx-6-xx	6.3” (158.8 mm)	7.8” (198.4 mm)	1/2” NPS thread	1/2” NPT thread

Ordering Information

Sensors

ETI [ ] - [ ] - [ ]

Thermistor/ RTD Type:
- 100 = TAC Vista (1.8K TAC Thermistor)
- 200 = TAC I/NET (10K T2 Thermistor)
- 500 = Continuum (10K T3 Thermistor)
- 800 = TAC I/A Series (10K Curve G/11K Shunt)
- PKD = 1000 Ohm Platinum RTD
- BKD = 1000 Ohm Nickel (BALCO) RTD

Probe Length:
- 2 = 4.3” (for use with 2.5” thermowell)
- 4 = 5.8” (for use with 4” thermowell)
- 6 = 7.8” (for use with 6.25” thermowell)

Housing Type:
- None = Galvanized Steel Enclosure
- PB = ABS Plastic Box Enclosure
- 4X = NEMA 4X (IP65) Polystyrene Plastic Enclosure

Example: ETI [100] - [6] - [PB]

Thermowells

ETI-WELL- [ ] [ ]

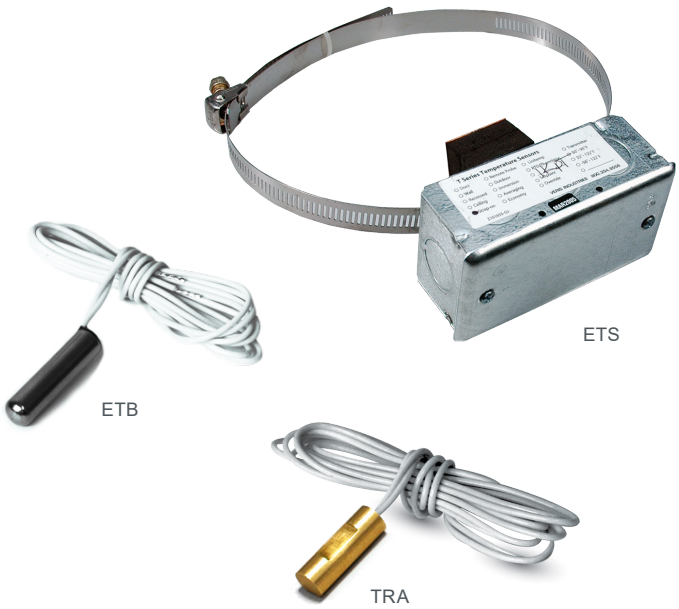
Immersion Depth:
- 2S = 2.5”
- 4S = 4”
- 6S = 6.25”

Construction:
- None = Two-piece welded
- M = One-piece machined

Example: ETI-WELL- [4S] [M]

ETS, ETB & TRA Series

High-Accuracy Specialty Sensors



Secondary measurement

Secondary measurement of water temperature…ideal for retrofit applications (ETS)

Long sensor life

Durable copper sensing probe (ETB)

Easy installation

Pipe clamps allow for easy installation on pipes up to 12” in diameter (ETS)

Multiple cable lengths

Multiple cable lengths for application flexibility (ETB)

The ETS Series strap-on sensor uses a clamp to secure the unit to a pipe and a copper sensing plate for fast temperature response. The ETS is perfect for secondary measurement of water temperature typical in retrofit applications. It includes a steel mounting box for wire termination and easy conduit connection.

The ETB Series stainless steel remote probe and TRA Series copper remote probe are designed for high accuracy in remote temperature sensing applications. These devices can be used in numerous refrigeration applications or can be mounted on pipes for chilled or heated water temperature sensing. They are easy to install and include a durable copper sensing probe with a two-wire cable. Multiple cable lengths are available for added flexibility.

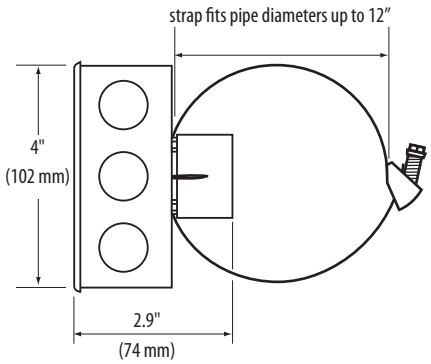
Specifications

Wiring	22 AWG; 2-wire: RTD/Thermistor
Operating Temperature ETS ETB TRA	-25 to 105 °C (-13 to 221 °F)* Probe: -25 to 105 °C (-13 to 221 °F), Wiring: -20 to 80 °C (-4 to 176 °F)
Warranty	
Limited Warranty	5 years

*Room temperature offset documented on each unit.

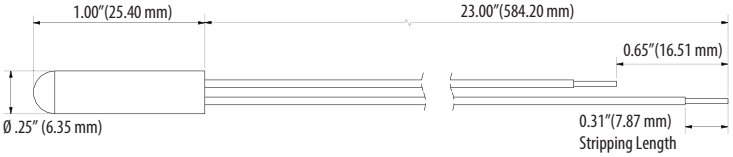
ETS

Dimensional Drawing



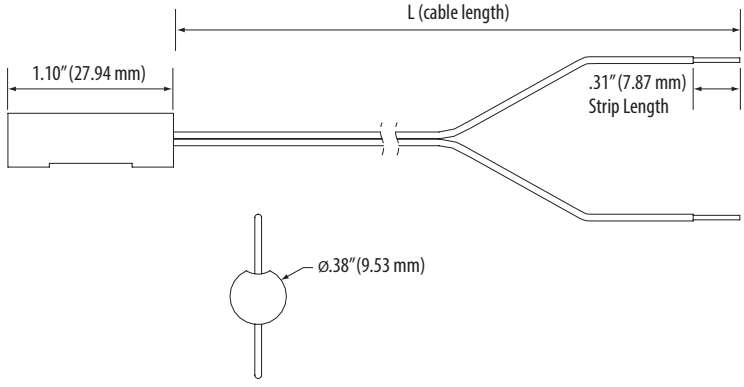
ETB

Dimensional Drawing



TRA

Dimensional Drawing



Note: The ETB Series is optimized for strapping to pipe.

Ordering Information

Strap-On Bracket

Thermistor/ RTD Type

ETS [ ]

100 = TAC Vista (1.8K TAC Thermistor)
200 = TAC I/NET (10K T2 Thermistor)
500 = Continuum (10K T3 Thermistor)
800 = TAC I/A Series (10K Curve G/11K Shunt)

Example:
ETS 500

Remote Probe (Stainless Steel)

Thermistor/ RTD Type

ETB [ ]

100 = TAC Vista (1.8K TAC Thermistor)
200 = TAC I/NET (10K T2 Thermistor)
500 = Continuum (10K T3 Thermistor)
800 = TAC I/A Series (10K Curve G/11K Shunt)

Example:
ETB 200

Remote Probe (Copper)

TRA [Sensor Type] [Calibration Certificate] [Cable Length]

Sensor Type:
B = 100R platinum, RTD
C = 1k platinum, RTD
D = 10k T2, Thermistor
E = 2.2k, Thermistor
F = 3k, Thermistor
H = 10k T3, Thermistor
I = 1k Balco (Nickel-iron) RTD
J = 10k Dale, Thermistor
K = 10k w/11k shunt, Thermistor
M = 20k NTC, Thermistor
N = 1800 ohm, Thermistor
W = 10k T2 high accuracy, Thermistor
Y = 10k T3 high accuracy, Thermistor

Calibration Certificate:
0 = None
2 = 3-point NIST calibration

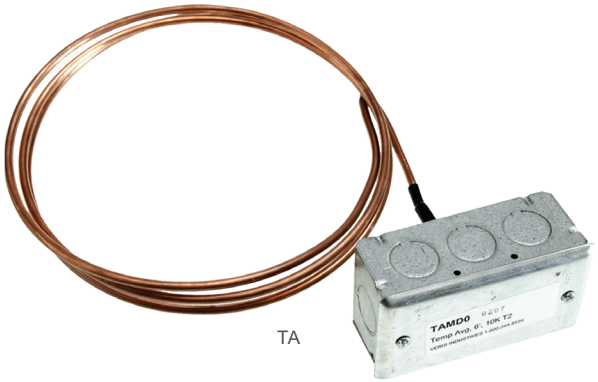
Cable Length:
None = 3 ft (0.9 m)
A = 6 ft (1.8 m)***
B = 10 ft (3.1 m)*
C = 20 ft (6.1 m)**
D = 25 ft (7.6 m)**
E = 50 ft (15 m)**
F = 100 ft (30 m)**

Examples:
TRA F 2

*Not available for sensor types B, C & P.
**Not available for sensor types B, C, E, F, N & P.
***Not available for sensor types B & P.

ETA Series

High Accuracy Averaging Sensors



The ETA Series is a flexible TA sensor which averages the temperature read across the entire length of the copper tubing, making it ideal for duct temperature measurements.

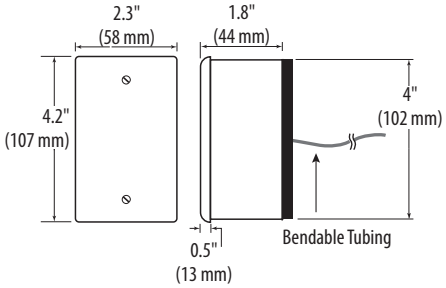
ETA Series sensors average the measured temperature across the duct in 6', 12', or 24' (1.8 m, 3.6 m, or 7.3 m) lengths. This allows you to cover all your averaging applications with one line.

Specifications

Wiring	22 AWG; 2-wire: RTD/Thermistor
Operating Temp	-25 to 105 °C (-13 to 221 °F)*
Linitemp Option	
Input Power	Class 2; 5 to 30 Vdc
Output	10mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Calibration Error	1.5 °C (2.7 °F) typical; 2.5 °C (4.5 °F) max. at 25 °C (77 °F)*
Error Over Temp	1.8 °C (3.24 °F) typical; 3.0 °C (5.4 °F) max. over 0 to 70 °C (32 to 158 °F) range; 2.0 °C (3.6 °F) typical, 3.5 °C (6.3 °F) max. over -25 to 105 °C (-13 to 221 °F) range
Warranty	
Limited Warranty	5 years

* Room temperature offset documented on each unit.

Dimensional Drawing



Applications

- Heat exachangers
- Chillers

Ordering Information

Thermistor/
RTD Type

ETA [ ]

100 = TAC Vista (1.8K TAC Thermistor)
200 = TAC I/NET (10K T2 Thermistor)
500 = Continuum (10K T3 Thermistor)
800 = TAC I/A Series (10K Curve G/11K Shunt)

Example:
ETA 800

Accessories

AA64 Klipet Mounting Clip

ETO Series

Sleek Design, Reduces Solar Heating

ETO Series outdoor temperature sensors feature a sleek, weather resistant design, and provide easy installation. The durable probe is encased in a radiation shield to reduce the effects of solar heating. Choose from a variety of RTD, thermistor, or transmitter outputs to suit any application.

Specifications

Wiring	22 AWG; 2-wire: RTD/Thermistor, 4 to 20 mA; 3-wire: voltage output models
Junction Box	Weather resistant
Mounting Location	For outdoor use
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Warranty	
Limited Warranty	5 years
Agency Approvals	

CE

Sleek design

Reduces solar heating…reliable and accurate

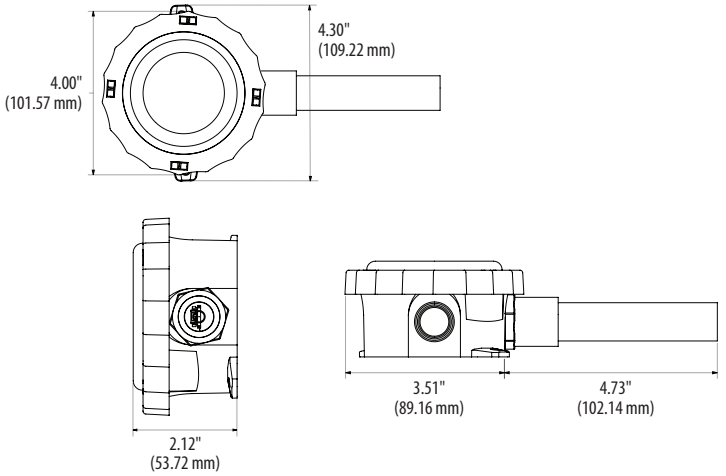
Flexibile

Available with transmitter, linitemp, RTDs, or thermistors

Applications

- Outdoor reference

Dimensional Drawing



Ordering Information

Thermistor/
RTD Type

ETO [ ]

100 = TAC Vista (1.8K TAC Thermistor)
200 = TAC I/NET (10K T2 Thermistor)
500 = Continuum (10K T3 Thermistor)
800 = TAC I/A Series (10K Curve G/11K Shunt)

Example:
ETO 100

TC & TS Series

Low Profile Housing with a Variety of RTD and Thermisor Options from Veris

Veris TC and TS sensors are ceiling-mounted in an unobtrusive housing. The easy-to-install units are ideal for office environments, as well as museums, galleries, or any other open indoor setting. These sensors are highly accurate, reliable, and come with a five-year warranty. Choose from a variety of RTD or thermistor sensor types to suit any need.

Specifications

TC & TS Series

Wiring	22 AWG; 2-wire: RTD/Thermistor; 3-wire: Linitemp
Housing	White ABS plastic (black available for TS only)
Operating Temp	-25 to 105 °C (-13 to 221 °F)*
Warranty	
Limited Warranty	5 years

* For RTD and thermistor accuracies and ranges, see the thermistor table on page 194.

**Room temperature offset documented on each unit.

Ceiling mount

Ceiling mount probe for more accurate readings…ideal for open office environments

Recessed sensor

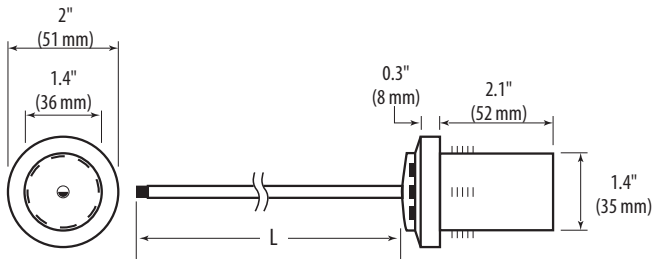
Recessed press-fit sensor virtually “disappears”…great for museums and galleries

Applications

- Hospitals and operating rooms, pharmaceutical labs
- Clean rooms
- Food processing plants
- Environmental testing facilities and other institutional applications

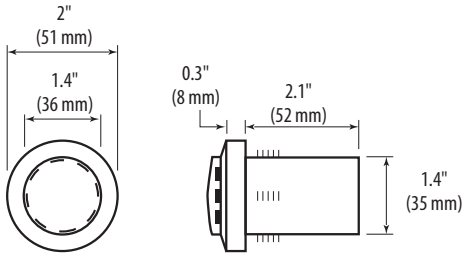
TC

Dimensional Drawing



TS

Dimensional Drawing



Ordering Information

Probe Length | **Sensor Type** | **Calibration Certificate**

TC □ □ □

Probe Length:
- B = 4" (102mm)
- C = 6" (152mm)
- D = 8" (203mm)
- E = 12" (305mm)
- F = 18" (457mm)
- G = 24" (610mm)

Sensor Type:
- B = 100R platinum, RTD
- C = 1k platinum, RT
- D = 10k T2, Thermistor
- E = 2.2k, Thermistor
- F = 3k, Thermistor
- G = 10k CPC, Thermistor
- H = 10k T3, Thermistor
- J = 10k Dale, Thermistor
- K = 10k w/11k shunt, Thermistor
- M = 20k NTC, Thermistor
- N = 1800 ohm, Thermistor
- R = 10k US, Thermistor
- S = 10k 3A221, Thermistor
- W = 10k T2 high accuracy, Thermistor
- Y = 10k T3 high accuracy, Thermistor

Calibration Certificate:
- 0 = None
- 1 = 1-point cal validation*
- 2 = 2-point cal validation*

* Not available with W and Y high-accuracy thermistors.

Example: TC D D 2

Sensor Type | **Calibration Certificate** | **Housing Color**

TS □ □ □

Sensor Type:
- B = 100R platinum, RTD
- C = 1k platinum, RTD
- D = 10k T2, Thermistor
- E = 2.2k, Thermistor
- F = 3k, Thermistor
- G = 10k CPC, Thermistor
- H = 10k T3, Thermistor
- I = 1k Balco (Nickel-iron) RTD
- J = 10k Dale, Thermistor
- K = 10k w/11k shunt, Thermistor
- M = 20k NTC, Thermistor
- N = 1800 ohm, Thermistor
- R = 10k US, Thermistor
- S = 10k 3A221, Thermistor
- W = 10k T2 high accuracy, Thermistor
- Y = 10k T3 high accuracy, Thermistor

Calibration Certificate:
- 0 = None
- 1 = 1-point cal validation*
- 2 = 2-point cal validation*

Housing Color:
- None = Cloud White
- B = Black

* Not available with W and Y high-accuracy thermistors.

Example: TS D 2

Table of Standard RTD and Thermistor Values

Class	Pt RTD		Balco RTD	THERMISTOR											
Type	100 Ohm	1000 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k	20k "D"	100k	10k Type 2	10k Type 3
Accuracy	±0.3°C	±0.3°C	±1% @70°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.00385 curve	0.00385 curve		0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
														High Accuracy	

*PTC: Positive Temperature Coefficient *NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

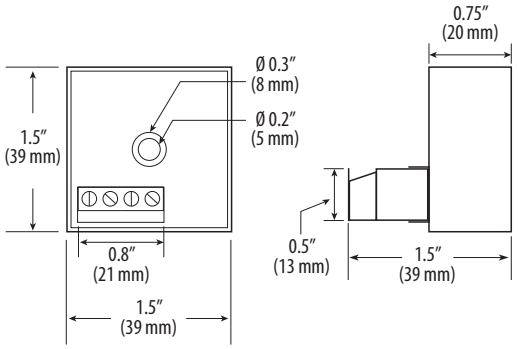
°C	°F	100 Ohm	1000 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	740.46	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	773.99	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	806.02	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	841.00	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	877.46	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1,000.00	913.66	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	50	103.903	1,039.03	952.25	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1,077.94	991.82	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1,097.35	1,013.50	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1,116.73	1,035.18	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1,155.41	1,077.68	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1,193.97	1,120.52	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1,232.42	1,166.13	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1,270.75	1,210.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1,308.97	1,254.55	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1,347.07	1,301.17	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1,385.06	1,348.38	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1,422.93	1,397.13	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1,460.68	1,447.44	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1,498.32	1,496.28	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		B	C	I	E	F	D	H	J	S	R	M	U	T	W	Y

Accessories: Temperature Monitoring

AA64
Klipet Mounting Clip

AA10
The AA10 Series temperature-to-current transmitter is designed for use with 100R platinum, 1k platinum, 10k Type 2, and 10k Type 3 external resistive output devices. When the resistive output from the external device is connected to the AA10 input terminal, the resistive value is converted to a 4-20 mA signal compatible with most building control systems.

Dimensional Drawing



Ordering Information

4-20mA Temperature Sensor Output Range*

Sensor Type	Bottom Range Temp	Temp Scale	Top Range Temp
AA10			
B = 100R platinum, RTD C = 1k platinum, RTD D = 10k T2, Thermistor H = 10k T3, Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor	= (choose a valid temp value)	C = Celsius F = Farenheit	= (choose a valid temp value)

* Temperature output range must be whole numbers where the bottom value is less than the top value in the range. Output temperature ranges:
B and C sensor types: -50° to 150°C (-58° to 302°F);
D, H, W and Y sensor types: -25° to 105°C (-13° to 221°F)

Occupancy Sensors

Schneider Electric offers a selection of motion-activated lighting control devices for commercial building applications. Keep costs down by preventing wasteful and unnecessary use of energy. With two mounting styles and an adjustable time delay, these sensors provide control over the lighting of rooms up to 2000 square feet. The installation is simple and the housings are low profile.

Model	Description	Page
MSC	Ceiling Mount Occupancy Sensors	199
MSB	Wall Switch Occupancy Sensors	201

Lighting Control Selection Guide

Ceiling Mount	Wall Mount
MSC page 199	MSB page 201

MSC Series

Uses the Latest Passive Infrared and Ultrasonic Technologies

MSC Series Occupancy Sensors replace the legacy SLSC Series Occupancy Sensors. They employ passive infrared (PIR) and/or ultrasonic technologies to accurately detect occupancy and automatically switch room lighting.

The low-profile sensor is ceiling-mounted to maximize motion sensitivity in large areas with obstructions. With a 360 degree field of view, and up to 2000 square feet of coverage area, the ceiling-mounted occupancy sensor is ideal for conference rooms, classrooms, multi-stall bathrooms, and large office areas.

The MSC series also incorporates an integral photosensor to prevent lights from switching on when sufficient ambient light is present, as commonly found in windowed areas.

Installation and configuration are simple. The sensor readily mounts to drop ceilings, and it features front adjustments for setting sensitivity and time delay. The sensor also features an auxiliary relay for use with building automation and HVAC systems.

Specifications

Standards	UL and cUL Listed; FCC part 15 (Class B) for home and office use
Input Voltage	24 Vdc
Isolated Relay	Contact rating: 1 A@24 Vdc Resistive
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	Max. 90% RH non-condensing
Current Consumption @ 24 Vdc*	
PIR	21 mA nominal
Ultrasonic	34 mA nominal
Dual	37 mA nominal
Dimensions	
MSCU	4.6” (117 mm) diameter, 1.4” (35.1 mm) high
MSCD/MSCP	4.6” (117 mm) diameter, 1.8” (45.7 mm) high
Warranty	
Limited Warranty	5 years
Agency Approvals	

c UL us LISTED

* For local line switching control, power must be provided by AA47 power pack or an approved equivalent.

Wide coverage

Up to 2000 square foot coverage area and 360-degree field of view for application versatility

Adjustable coverage

Adjustable coverage sensitivity (from 60 to 100%)

Daylight sensing

Daylight level sensing (from 0.5 to 250 foot-candles)… avoids unneccessary lighting

Auxiliary relay

Easily communicates with building control system

Adjustable time delay

Adjustable time delay (preset time delays from 15 seconds [test] to 30 minutes)…provides ultimate flexibility

Tamper resistant cover

Adjustment compartment cover…tamper resistant

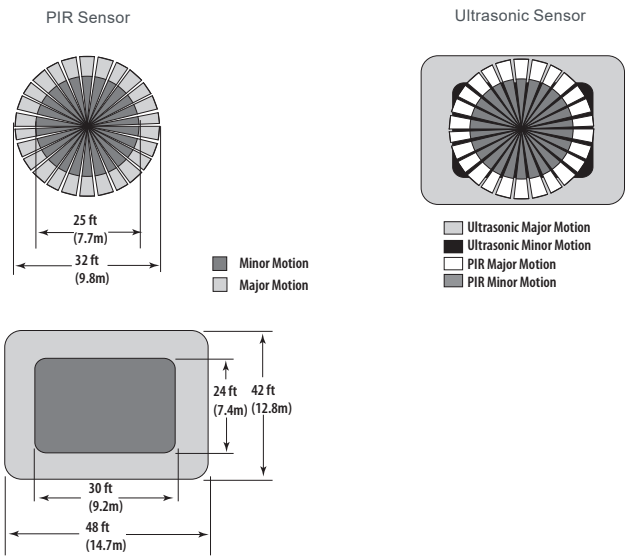
Applications

- Lighting control based on occupancy
- Reducing energy usage
- Key component for LEED* certification programs retrofit installations
- MSC1000 – best for conference rooms, classrooms, and other general applications
- MSCD2000 – best for multi-stall bathrooms, large conference rooms, and warehouses
- MSCU2000 – best for lobbies, aisles, and great for multi-stall bathrooms

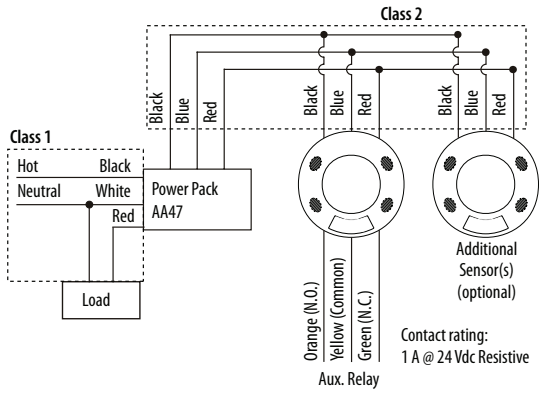
*Leadership in Energy and Environmental Design (LEED) is a registered mark of the US Green Building Council

MSC Series

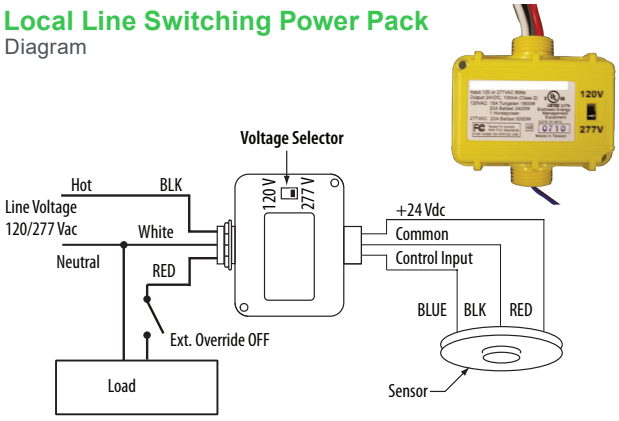
Coverage Patterns for 9 ft (2.8 m) Ceiling Height



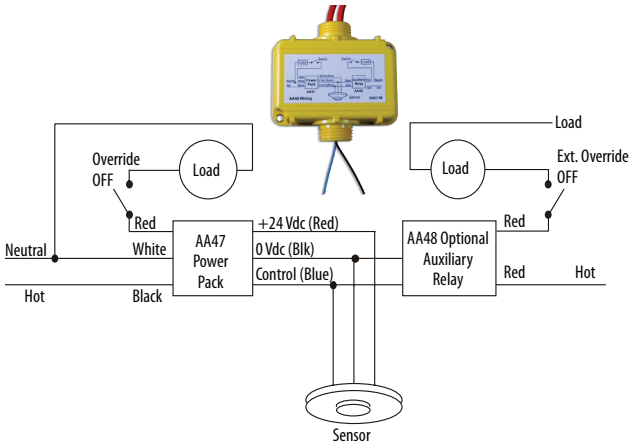
Local Line-Power Control MSC
Wiring Diagram



AA47 Local Line Switching Power Pack
System Diagram



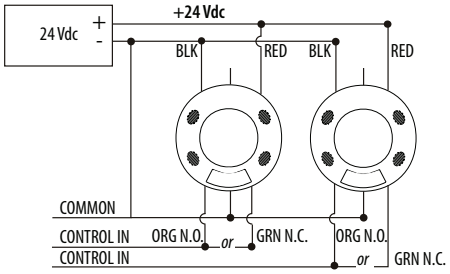
AA48 Auxiliary Relay (Optional)
System Diagram



Ordering Information

Model	Legacy Part Number	Description
MSCD2000	SLSCDS2000	Ceiling mount ultrasonic and PIR sensor with 2000 sq. ft. coverage
MSCU2000	SLSCUS2000	Ceiling mount ultrasonic sensor with 2000 sq. ft. coverage
MSCP1000	SLSCPS1000	Ceiling mount PIR sensor with 1000 sq. ft. coverage
AA47	SLSPP1277	Power supply 120/277VAC to 24VDC with switching relay
AA48	SLSSP24	Auxilliary switching relay

Building Control Panel
Wiring Diagram



The AA47 Line-Switching Power Pack provides local switching capability to control loads at a signal from MSC Series occupancy sensors, independent of any connection to building control systems. The AA47 routes 120/277 Vac, 60 Hz line power directly to a Form A relay contact (SPST) to control a load and generates full-wave, 24 Vdc to power up to four MSC sensors (dependent on model). The AA47 can be mounted either inside or outside an electrical box, and sensor power can be routed via plenum-rated cable to the sensor(s).

Specifications
AA47

Storage Temp.	-29 to 65 °C (-20 to 150 °F)
Operating Temp.	0 to 40 °C (32 to 104 °F)
Maximum Humidity	90% RH non-condensing
AC Power Input	120/277 Vac ± 10%, 60 Hz
Output Voltage	24 Vdc
Output Current	100 mA max.
Dimensions	3.2” (81.3 mm) x 3” (76.2 mm) x 1.75” (44.5 mm)
Relay Contacts	
Horsepower Rating	1HP@120 V
Switching Capacity	120 Vac, 60 Hz; 15 A tungsten 1800 W 277 Vac, 60 Hz; 20 A ballast

The AA48 Auxiliary Relay is a low-voltage relay device for expanding the switching capacity of an AA47. It can be used to control loads connected to additional circuits in response to a signal from a connected sensor. It is essentially a relay with a SPST output controlled directly by the occupancy sensor. The auxiliary relay can be mounted inside or outside of an electrical junction box.

Specifications
AA48

Storage Temperature	-29 to 65 °C (-20 to 150 °F)
Operating Tempera-ture	0 to 40 °C (32 to 104 °F)
Maximum Humidity	90% RH non-condensing
Control Input	24 Vdc, 36 mA nominal
Dimensions	3.2” (81.3 mm) x 3” (76.2 mm) x 1.75” (44.5 mm)
Relay Contacts	
Horsepower Rating	1HP@120 V
Switching Capacity	120 Vac, 60 Hz; 15 A tungsten 1800 W 120/277 Vac, 60 Hz; 20 A ballast

MSB Series

Employs a Low-Energy Switch Circuit to Maximize Contact Life

MSBP

Adjustable

Adjustable time delay

Line powered

No separate supply needed

Bypass button

Bypass button for “always on” operability…simpilifies commissioning 180-degree motion detection

Ballast compatibility

Compatible with magnetic and electronic ballasts…provides ultimate flexibility

180 degrees

180-degree motion detection

Loading

No minimum loading requirement

The MSB Series employs the latest passive infrared (PIR) technology to automatically control lighting for areas up to 1000 square feet, achieving energy savings and convenience.

Each sensor employs a special 180° multi-segmented lens and PIR motion detector circuit to sense when a person enters the area and automatically activate the lights. The sensor will automatically switch the lights off after a preset delay if motion is no longer detected.

The MSB Series fits in place of existing wall switches, connecting to existing wiring, similar to a typical wall switch. The MSB Series is the simplest way to achieve energy saving lighting control with minimal installation time.

To assure long relay life, the MSB Series employs a low energy switch circuit to assure maximum contact life. These sensors are compatible with electronic and magnectic ballast loads.

applications

- Lighting control for LEED* programs and reduced energy usage
- Use in offices, copy rooms, common building areas, storage closets, small conference rooms, and more
- Fits in place of existing wall switches connecting to the existing active line and ground wiring…great for retrofit installations

*Leadership in Energy and Environmental Design (LEED) is a registered mark of the US Green Building Council

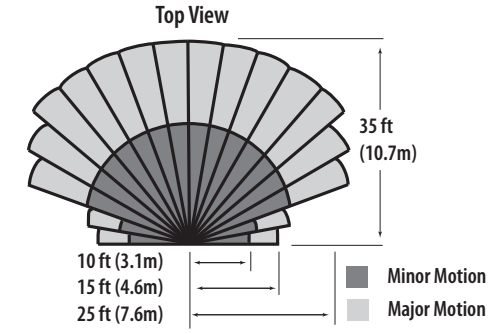
Specifications

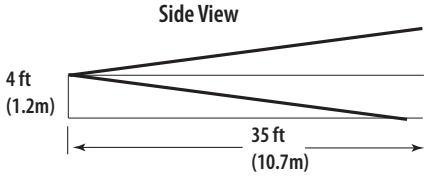
Standards	UL and cUL Listed; FCC part 15 (Class B) for home and office use
Input	120 or 277 Vac±10% 60 Hz
Output	120 Vac, 1000 W max. tungsten incandescent load; 1000 VA max. ballast load; ¼ HP max. motor load; 277 Vac; 1800 VA max. ballast load
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	Max. 90% RH non-condensing
Warranty	
Limited Warranty	5 years
Agency Approvals	

c UL us LISTED

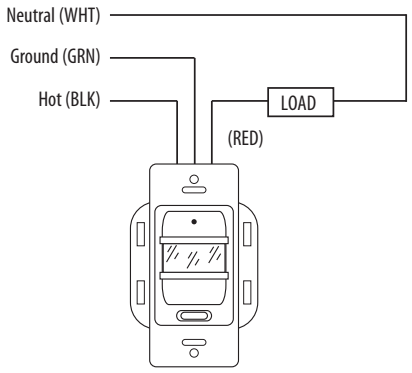
MSB Series

Coverage Patterns

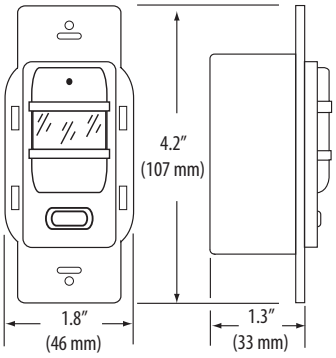


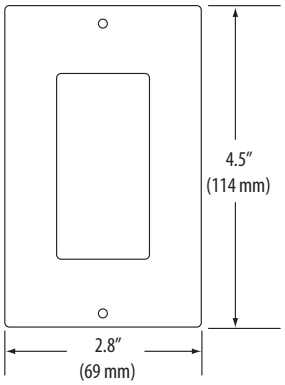


Single-Level Lighting
Wiring Diagram

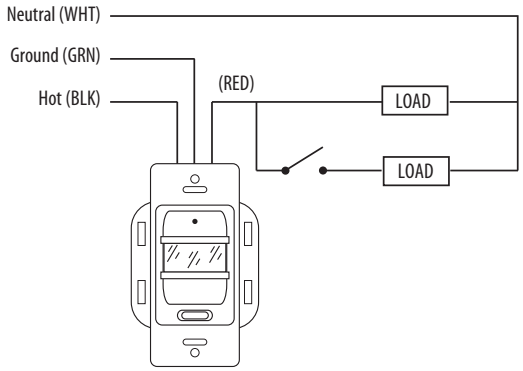


Dimensional Drawings





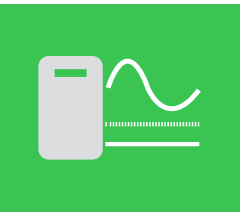
Bi-Level Lighting
Wiring Diagram



Ordering Information

Sensing Technology	Turn On	# of Circuits	Color
MSB P		1	
= Passive Infrared (PIR)	A = Automatic M = Manual		W = White V = Ivory

Example: MSB P A 1 V



Current Monitoring

The Hawkeye line of current sensors is widely known as the industry standard for proof of flow. Unlike mechanical switches, Hawkeye current sensors are solid-state, minimizing failures caused by the wear and tear of moving parts. Veris offers a full range of analog and digital current sensing devices.

Model	Description	Page
H300/600/800/800NC/800HV/900	Current Switches: Fixed Trip Point (Status)	205
H308/608/701/708/808/908	Current Switches: Adjustable Trip Point, Standard Output	207
H609/709/709HV/809/909/909HV	Current Switches: Adjustable Trip Point, High Voltage Output	209
H606/706/806/906	Current Switches: Adjustable Trip Point, N.C. Output	211
H11D	Current Switches: Auto Calibration, Automation Systems, LCD Display	213
H614	VFD Current Switch: Auto Calibration	215
H720/904/934	VFD Switches and Current Sensors	217
H6ECM	ECM-Optimized Current Switch	219
H730/740/750/930/940/950	Current Switches with Relay: Fixed Trip Point (Status)	221
H735/738/748/758/938/948/958	Current Switches with Relay: Adjustable Trip Point, Standard Output	223
H739/749/939/949/959	Current Switches with Relay: Adjustable Trip Point, High Voltage Output	225
H721HC/721LC/921	Current Transducers: 4 to 20 mA Analog Output	227
H221/221SP/321/321SP/421/421SP	Current Transducers: 4 to 20 mA Analog Output, High Current Monitoring	229
H722LC/722HC/822/822-20/922	Current Transducers: 0 to 5 Vdc Analog Output	231
H723LC/723HC/923	Current Transducers: 0 to 10 Vdc Analog Output	233
H931	Current Transducers with Relay: 4 to 20 mA Analog Output	235
H932/952	Current Transducers with Relay: 0 to 5 Vdc Analog Output	237
H971/971SP/EA20 Series	Direct Current Transducers: 4 to 20 mA and 0 to 5 Vdc Analog Output	239
H5xx Series	Field Mount Motor Control Device	241
H120/120NC	Field Mount Status Relay	243

Current Sensor Selection Guide

Current Status Switches (Digital Output)

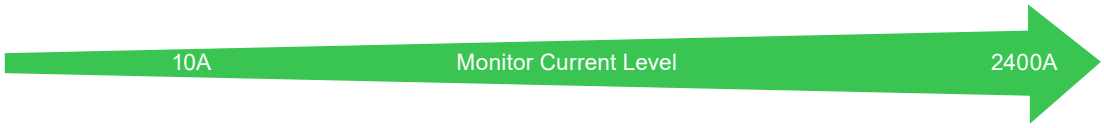
Application	Micro Split-Core (Best on Retrofits)	Mini Solid-Core (Cost Effective for New Installations)	Mini Split-Core (Best on Retrofits)	Standard Solid-Core (Cost Effective for New Installations)	Standard Split-Core (Best on Retrofits)
Detect Status (Digital On/Off)	H300 — 60A page 205	H800* — 200A page 205	H600 — 200A page 205		H900 — 200A page 205
Detect Belt Loss and Mechanical Failure (Adjustable Threshold)	H308 — 50A page 207	H808 — 50A page 207 H806 — 50A page 211 H809 — 50A page 209	H608 — 175A page 207 H606 — 50A page 211 H609 — 50A page 209	H708 — 135A page 207 H706 — 135A page 211 H709* — 135A page 209	H908 - 135A page 207 H906 - 135A page 211 H909* - 135A page 209
Self-Calibrating Switch					H11D — 200A page 213
VFD Model - Patented Technology			H614 — 150A page 215		H904 — 135A/20-75Hz page 217 H6ECM — 0.5 - 175A page 219
VFD Model - Patented Technology (Onboard Relay)					H934 — 135A/20-75Hz page 217
Exclusive Patented Technology Status & Control (Onboard Pilot Duty Relay)				H730* — 200A page 221 H738* — 135A page 223 H739* — 135A page 225	H930* — 200A page 221 H938* — 135A page 223 H939* — 135A page 225

Flying Leads and Junction Box Mounting

Power Duty Status and Control	H120* — to 20A/2HP page 243	H5xx* — to 15A/1.5HP page 241

* Indicates a series of products.

Current Transducers (Analog Output)



Load Trending 4-20mA Output		H721LC: 10-40A page 227	H921: 30-120A page 227	H721HC: 50-200A page 227	H221/321/421: 300/800/2400A page 229
Load Trending 0-5V Output	H822*: 10/20A page 231	H722LC: 10-40A page 231	H922*: 30-120A page 231	H722HC: 50-200A page 231	
Load Trending 0-10V Output		H723LC: 10-40A page 233	H923: 20-150A page 233	H723HC: 50-200A page 233	
Load Trending with Relay 4-20mA Output			H931: 30-120A page 235		
Load Trending with Relay 0-5V Output			H932/H952: 30-120A page 237		
DC Current 4-20mA Output				H971/EA20: 10-200A page 239	
VFD 4-20mA Output				H720: 0-200A page 217	

* Indicates a series of products.

Hx00 Series

On/Off Status Current Switches from Veris

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

Reliable

More reliable for status than relays across auxiliary contacts

Installation flexibility

Removable mounting bracket provides installation flexibility

Ideal for direct-drive units

Ideal for direct-drive units, unit vents, fan coil units, exhaust fans, and other fixed loads

Flexibility

Bracket on H900 can be installed in three different configurations

Low setpoint

Minimum trip point as low as 0.15 A (H600)…avoids the need for multiple wraps of the conductor through the sensor even on loads as small as 1/5 HP

Quick installation

Split-core H300, H600 and H900 for fast retrofit installation

Veris Hawkeye x00 on/off current switches provide a cost-effective solution for monitoring status on unit vents, exhaust fans, recirculation pumps, and other fixed loads where belt loss is not a concern.

Veris has applied new technology to the H300, H600, and H800 models to achieve impressive improvement in turn-on levels. The Hawkeye H300 and H600 have the lowest turn-on current in the industry at a mere 0.15 A!

Applications

- Electrical load status
- Direct-drive units, exhaust fans, process motors, and other fixed loads
- Lighting run times and status
- VFD output On/Off status
- Direct-Drive units, unit vents, fan coil units, exhaust fans, and other fixed loads

Specifications

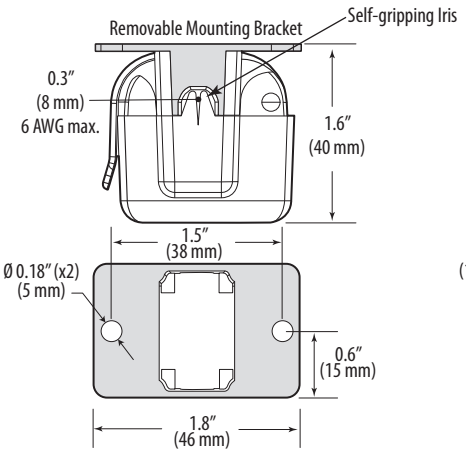
Sensor Power	N.O models: Induced from monitored current; H800NC: 5 to 30 Vdc, permanently connected
Insulation Class	600 Vac RMS (UL), 300 Vac RMS (CE)
Frequency Range	50/60 Hz, On/Off status for Variable Frequency Drive (VFD) outputs at 12 to 115 Hz (a)
Temperature Range: H800NC, H300, H900 H600 H800, H800HV	 -15 to 60 °C (5 to 140 °F) -15 to 40 °C (5 to 104 °F) (to 200 A); -15 to 60 °C (5 to 140 °F) (to 150 A) -40 to 50 °C (-40 to 122 °F) (to 200 A); -40 to 75 °C (-40 to 167 °F) (to 100 A, and 0.25 A status output)
Humidity Range	10 to 90% RH non-condensing
Off State Leakage (H800NC Only)	34 µA @ 5 Vdc, 200 µA @ 30 Vdc
On State Voltage Drop (H800NC Only)	1.9 Vdc (max.) @ 0.1 A
Terminal Block Wire Size H600, H800, H900 H300	 24 to 14 AWG (0.2 to 2.1 mm²); 22 to 16 AWG (0.3 to 1.3 mm²)
Terminal Block Torque H600, H800, H900 H300	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m); 7 in-lbs (0.8 N-m)
Warranty	
Limited Warranty	5 years
Agency approvals	
Agency approvals	UL 508 open device listing; CE: EN61010, CAT III, Pollution Degree 2, basic insulation

CE c UL us LISTED E150462

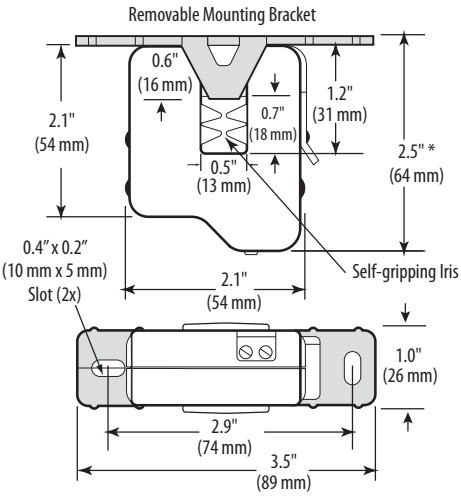
Note: Do not use the LED status indicators as evidence of applied voltage.

(a) VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.

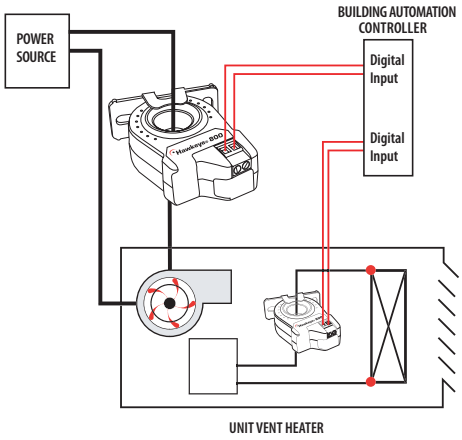
H300
Dimensional Drawing



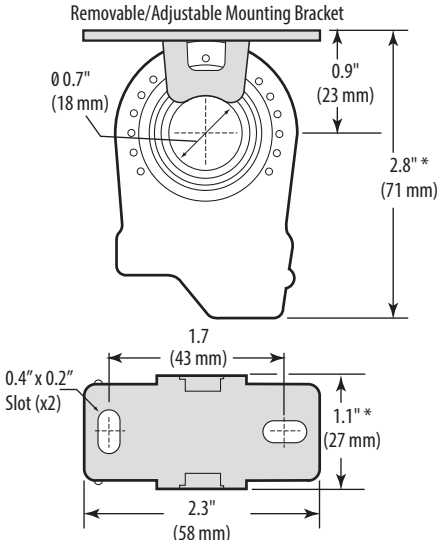
H600
Dimensional Drawing



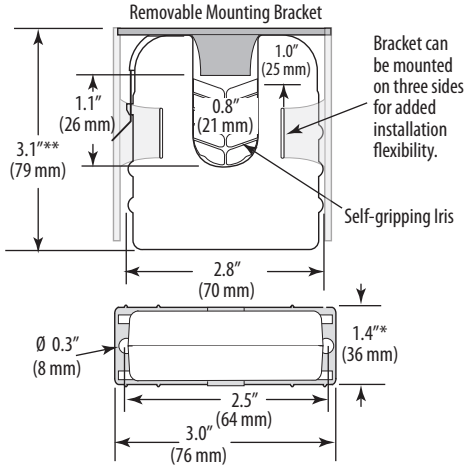
Unit Vent Heater Control
Wiring Diagram



H800, H800HV, H800NC
Dimensional Drawing



H900
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Ordering Information

Model	Amperage Range @ 50/60 Hz Only	Status Output (Max.)	Trip Point	Housing	UL	CE	Lead Free
H300	0.15 to 60 A	N.O. 1.0 A @ 30 Vac/dc	0.15 A or less	Split-core	•[2]	•	
H600	0.15 to 200 A	N.O. 1.0 A @ 30 Vac/dc	0.15 A or less	Split-core	•[1]	•	
H800	0.25 to 200 A	N.O. 1.0 A @ 30 Vac/dc	0.25 A or less	Solid-core	•[1]	•	
H800NC	0.5 to 200 A	N.C. 0.1 A @ 30 Vdc	0.5 A or less	Solid-core	•[1]		•
H800HV	0.75 to 200 A	N.O. 0.5 A @ 250 Vac/dc	0.75 A or less	Solid-core	•[3]		
H900	1.5 to 200 A	N.O. 1.0 A @ 30 Vac/dc	1.5 A or less	Split-core	•	•	

1. Listed for use on 75°C insulated conductors.
2. Product provides functional insulation only.
3. Listed for use on 90°C insulated conductors.

Hx08 Series & H701

Detect Belt Loss, Coupling Shear, and Mechanical Failure from Veris


H908


H708


H608


H808


H308

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

Veris Hx08 Series and H701 adjustable current switches offer high performance, with a wide array of amperage range options. These products can accurately detect belt loss, coupling shear, or other mechanical failure on unit vents, exhaust fans, recirculation pumps, and other fixed loads down to as little as 1/5 HP.

Specifications

Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS (UL), 300VAC RMS (CE)
Frequency Range [2]	50/60 Hz, On/Off status for Variable Frequency Drive (VFD) outputs at 12 to 115 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% (typical)
Terminal Block Wire Size	H308: 22-16 AWG (0.3 to 1.3 mm²) Others: 24-14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	H308: 3.5 to 7 in-lbs (0.8 N-m) Others: 3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency approvals	
Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

CE c UL us LISTED E150462

Retrofit or new construction

High performance devices in split- and solid-core housings

Small size

Fits easily inside small enclosures

Adjustable trip point

Precise current trip point setting

Self-gripping iris

Self-gripping iris on split-core housings for easy installation

Low setpoint

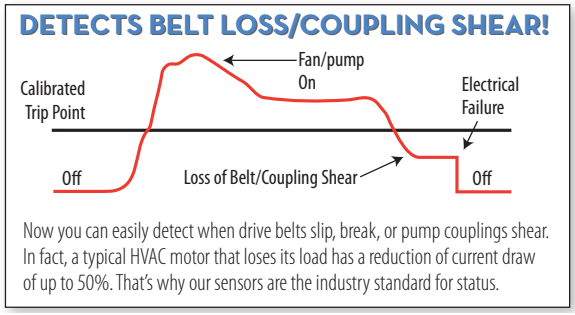
Minimum trip point as low as 0.5 A (H608)…no need for multiple wraps of the conductor through the sensor, even on loads as small as 1/5 HP

Status LEDs

Status LEDs available for easy setup and local indication

Applications

- Detecting belt loss, coupling shear, and mechanical failure
- Verifying lighting circuit and other electrical service run times
- Monitoring status of industrial process equipment
- Monitoring status of critical motors (compressor, fuel, etc.)
- VFD output on/off status

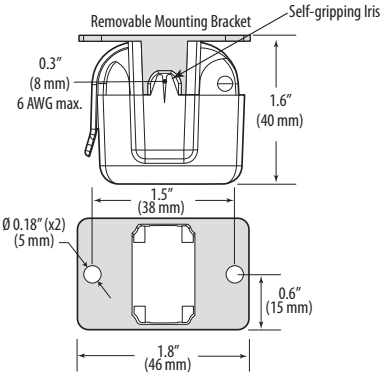


Notes: Do not use the LED status indicators as evidence of applied voltage.

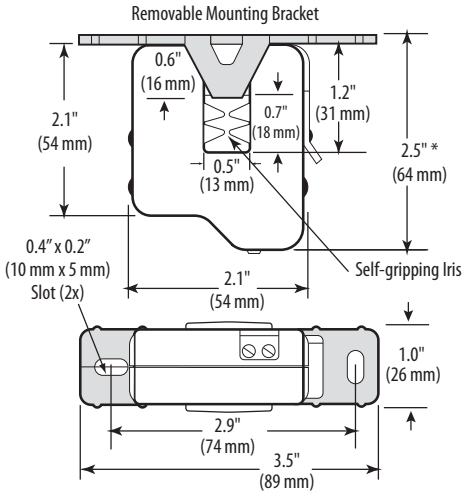
If using this switch in an application that includes an electronically commutated motor (ECM), see Veris Application Note VN61 - *Using Current Sensing Devices to Monitor Electronically Commutated Motors (ECMs)*, at https://ecoexpert.se.com.

VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.

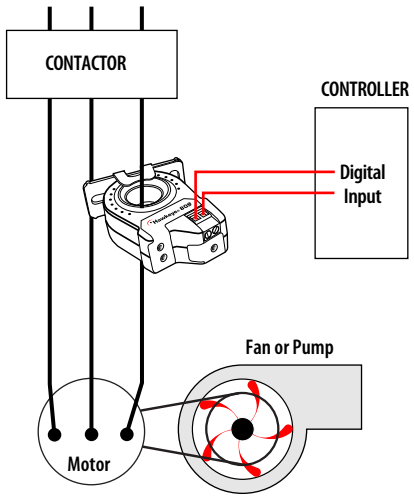
H308
Dimensional Drawing



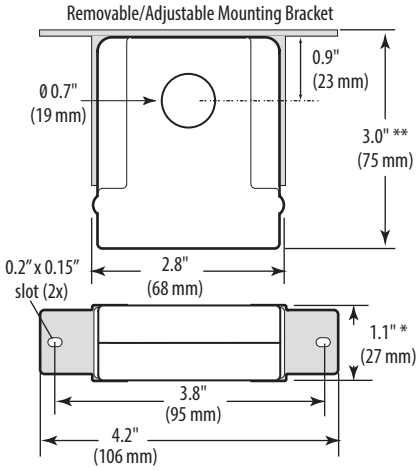
H608
Dimensional Drawing



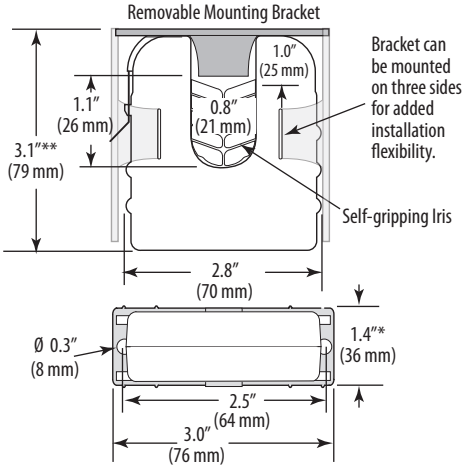
Monitoring Fan /Pump Motors for Positive Proof of Flow
Wiring Diagram



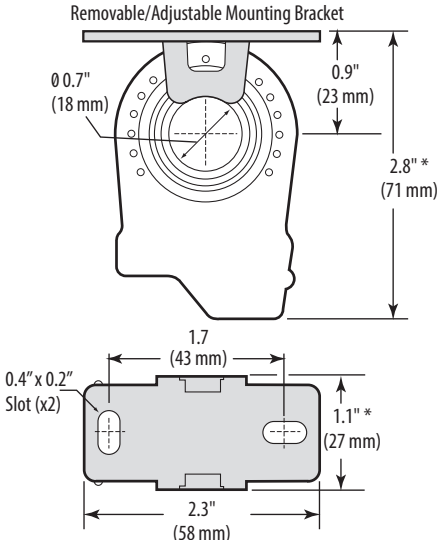
H708/701
Dimensional Drawing



H908
Dimensional Drawing



H808
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Ordering Information

Model	Amperage Range @ 50/60 Hz Only	Status Output (max.)	Min. Trip Point	Housing	Status LED	UL	CE
H308	0.75 to 50 A	N.O. 1.0 A @ 30 Vac/dc	0.75 A or less	Split-Core	•	•[2]	•
H608	0.5 to 175 A		0.5 A or less	Split-Core	•	•[1]	•
H701	1 to 135 A		1.0 A or less	Solid-Core		•	
H708	1 to 135 A		1.0 A or less	Solid-Core	•	•	
H808	0.75 to 50 A		0.75 A or less	Solid-Core	•	•	•
H908	2.5 to 135 A		2.5 A or less	Split-Core	•	•	•

1. Listed for use on 75 °C insulated conductors.
2. Product provides functional insulation only.

Hx09 Series

Detect Belt Loss, Coupling Shear, and Mechanical Failure from Veris

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

Veris Hawkeye x09 Series are high performance current switches, ideal for line voltage loads. The devices are powered by the current being monitored. They are ideal for monitoring performance on unit vents, exhaust fans, recirculation pumps, and other fixed loads.

Specifications

Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS (UL), 300 Vac RMS (CE[1])
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% (typical)
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency approvals	
Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

CE c UL us LISTED E150462

Note: Do not use the LED status indicators as evidence of applied voltage.

If using this switch in an application that includes an electronically commutated motor (ECM), see Veris Application Note VN61 - *Using Current Sensing Devices to Monitor Electronically Commutated Motors (ECMs)*, at https://ecoexpert.se.com.

Low setpoint

The H809 has a low (0.75 A) minimum setpoint…no need for multiple wraps of the conductor through the sensor, even on loads as small as 1/5 HP

Adjustable trip point

Precise current trip point setting

Small in size

H609 and H809 are small in size to fit easily inside small starter enclosures

Status LEDs

For easy setup and local indication

Versatility

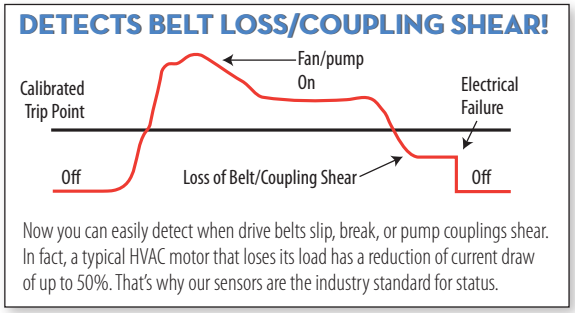
Removable mounting bracket optimizes field versatility

Flexibility

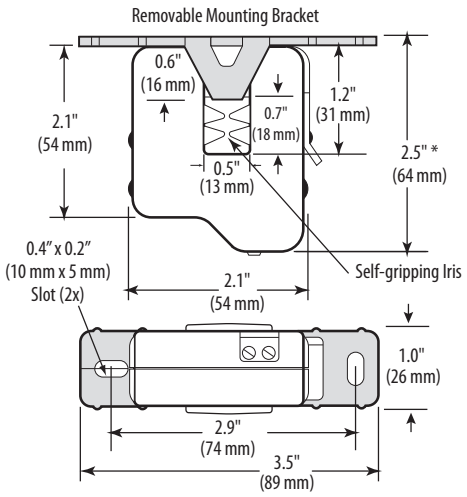
Bracket on H909 can be installed in three different configurations

Applications

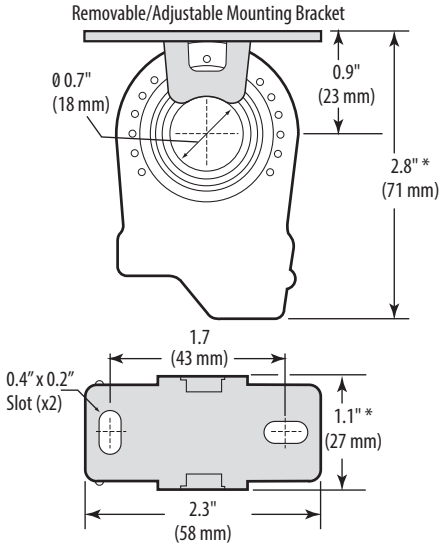
- Detecting belt loss, coupling shear, mechanical failure, and interlocking loads
- Verifying lighting circuit and other electrical service run times
- Monitoring status of industrial process equipment
- Monitoring status of critical motors (compressor, fuel, etc.)
- VFD output On/Off status
- Fan/pump status monitoring



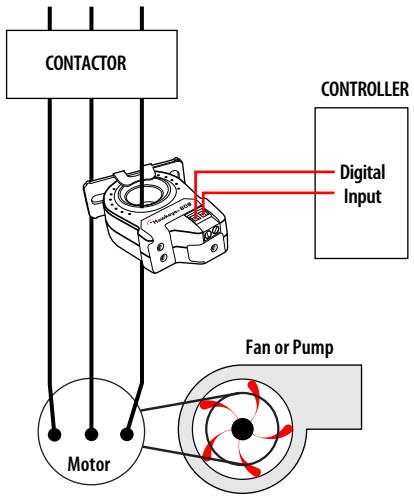
H609
Dimensional Drawing



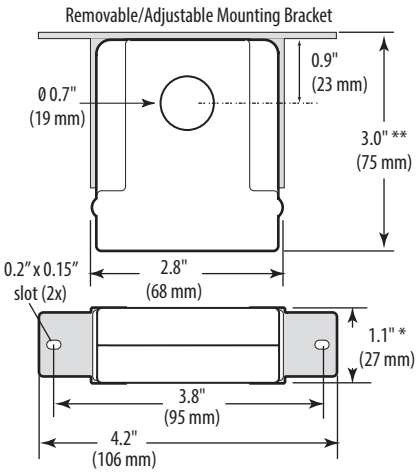
H809
Dimensional Drawing



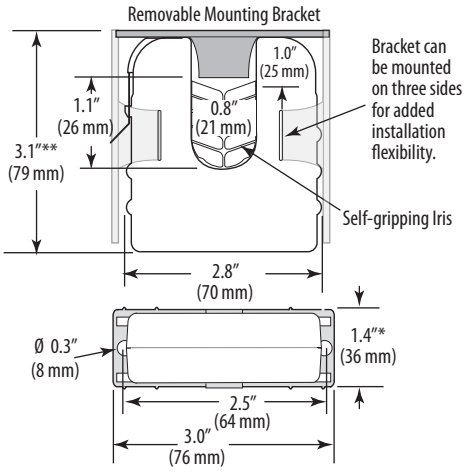
Monitoring Fan /Pump Motors for Positive Proof of Flow
Wiring Diagram



H709/H709HV
Dimensional Drawing



H909/H909HV
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Ordering Information

Model	Amperage Range @ 50/60 Hz Only	Status Output (max.)	Min. Trip Point	Status LED	Housing	UL	CE	Lead Free
H609	1.25 to 50 A	N.O. 0.2 A @ 120 Vac/dc	1.25 A or less	•	Split-core	•[1]		•
H709	1 to 135 A	N.O. 0.2 A @ 120 Vac/dc	1.0 A or less	•	Solid-core	•		
H709HV	1 to 135 A	N.O. 1.0 A @ 250 Vac	1.0 A or less		Solid-core		•	
H809	0.75 to 50 A	N.O. 0.2A @ 120 Vac/dc	0.75 A or less	•	Solid-core	•[1]		•
H909	2.5 to 135 A	N.O. 0.2 A @ 120 Vac/dc	2.5 A or less	•	Split-core	•		
H909HV	2.5 to 135 A	N.O. 1.0A @ 250 Vac	2.5 A or less		Split-core		•	

1. Listed for use on 75°C insulated conductors.

Hx06 Series

Detect Belt Loss, Coupling Shear, and Mechanical Failure from Veris

H706

H906

H606

H806

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

Veris Hawkeye x06 Series solid- and split-core current switches provide accurate, reliable, and maintenance-free fan and pump status indication where an NC output is needed.

Adjustable trip point

Versatility with four available amperage ranges

Status LEDs

Output status LEDs for fast set up

No tubing needed

Easier to install than differential pressure switches

Easy placement

Adjustable mounting bracket on the solid-core housing

100% solid-state

No moving parts to fail

Self-gripping iris

Self-gripping iris on split-core housings for easy installation

Applications

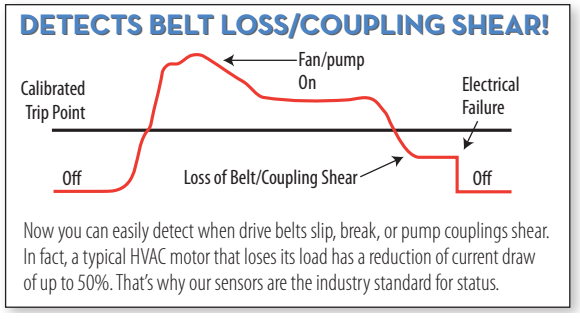
- Monitoring fans, pumps, motors, and other electrical loads for proper operation
- Detecting belt loss and motor failure…ideal for fan and pump status
- Verifying lighting circuit loads
- Monitoring critical motors (compressor, fuel, etc.)
- Monitoring industrial process equipment status (OEM)

Specifications

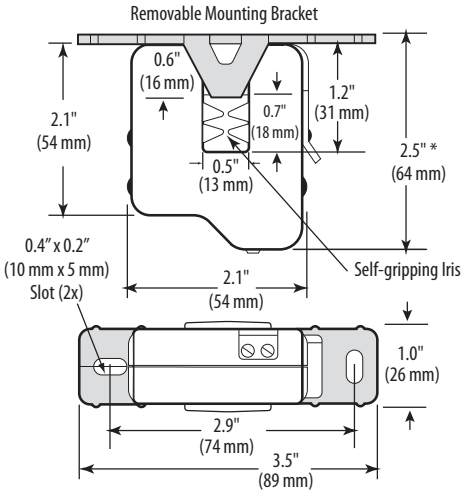
Sensor Power	5 to 30 Vdc
Insulation Class	600 Vac RMS (UL), 300 Vac RMS (CE)
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% Typical
Off State Leakage	34 µA @ 5 Vdc, 200 µA @ 30 Vdc
On State Voltage Drop	1.9 Vdc max@ 0.1 A
Terminal Block Wire Size	H300: 22 to 16 AWG (0.3 to 1.3 mm^2) Others: 24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	H300: 7 in-lbs (0.8 N-m) Others: 3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

CE c UL us LISTED

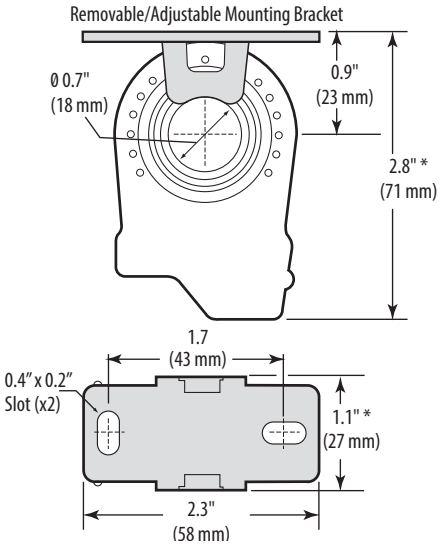
Note: Do not use the LED status indicators as evidence of applied voltage. (a) VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.



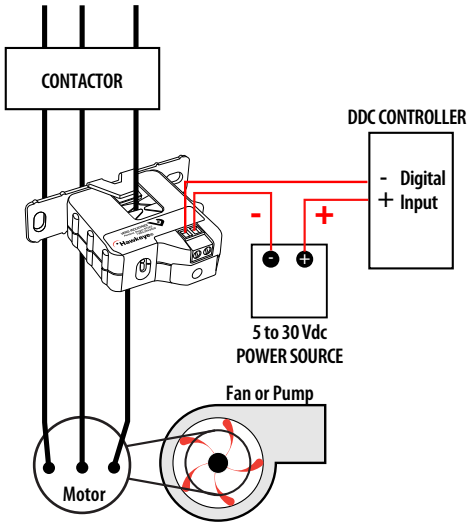
H606
Dimensional Drawing



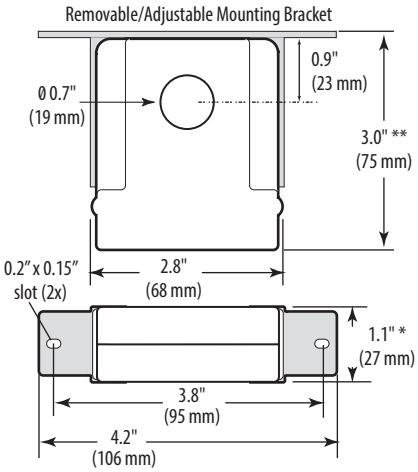
H806
Dimensional Drawing



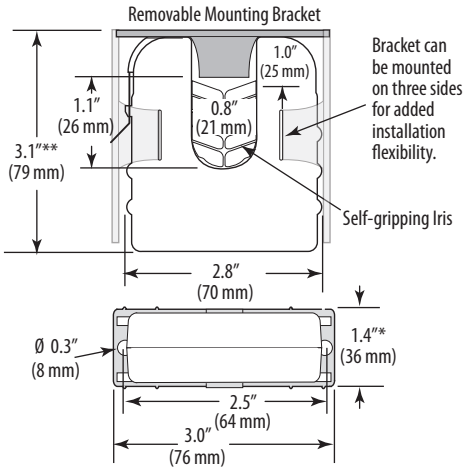
Monitoring Fan/Pump Motors for Positive Proof of Flow (H606 & H806)
Wiring Diagram



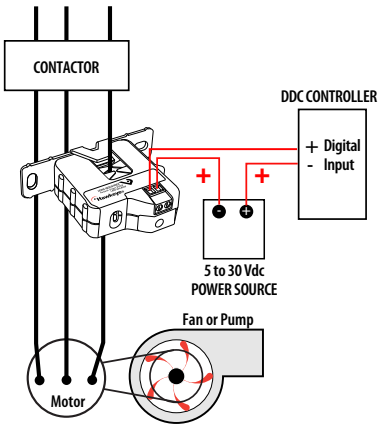
H706
Dimensional Drawing



H906
Dimensional Drawing



Monitoring Fan/Pump Motors for Positive Proof of Flow (H706 & H906)
Wiring Diagram



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Ordering Information

Model	Amperage Range	Status Output (max.)	Min. Trip Point	Housing	Status LED	UL	CE
H606	1.25 to 50 A	N.C. 0.1 A @ 30 Vdc	1.25 A or less	Split-Core	•	•[1]	•
H706	1 to 135 A		1.0 A or less	Solid-Core	•	•	•
H806	0.75 to 50 A		0.75 A or less	Solid-Core	•	•	•
H906	2.5 to 135 A		2.5 A or less	Split-Core	•	•	•

1. Listed for use on 75°C insulated conductors.

H11D

LCD Display from Veris

H11D

CURRENT SENSING
THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

The Veris Hawkeye TruStat H11D is a microprocessor based, self-learning, self-calibrating current switch. It is designed for user ease, providing calibration-free status for both under and overcurrent, an LCD display, and slide-switch selectable trip point limits. At initial power-up, the H11D automatically learns the average current on the line with no action required by the installer. Once a current is learned, the switch monitors for changes in current greater than the selected range.

Backlit LCD

View the monitored current (up to 200 A)…no need for expensive handheld meters and offers easy visibility in dark enclosures

Versatility

Slide-switch selectable trip point limits

Simplified troubleshooting

Records and displays the amperage level that trips the alarm

Automatic calibration

Reduced errors and installation costs

Microcontroller-based learning technology

Automatically learns load upon initial power-up…minimizes calibration labor

Reset function

Reset function can be used when unpowered…reduces the possibility of an arc flash incident

Applications

- HVAC fans, pumps, and blowers
- Monitoring status of industrial process equipment

Specifications

Sensor Power	Induced from monitored conductor
Response Time	1 sec.
Accuracy	±2% of full scale
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
LCD Backlight	Off at low currents; illuminates when monitored current exceeds 4.5 A; flashes during an alarm state while current remains above 4.5 A
On-State Resistance	≤1.0 Ω
Off-State Resistance	≥1.0 MΩ
Setpoint Target Range, Switch Setting A[1]	±40% of learned nominal current; max. learned current of 142 A to enable an upper trip limit at or below 200 A
Setpoint Target Range, Switch Setting B[1]	±60% of learned nominal current;- max. learned current of 125 A to enable an upper trip limit at or below 200 A
Switch Setting C[1]	On/Off Status; contacts are closed while amperage is above 2.5 A
Alarm Reset Range[2]	±5% of learned nominal current
Setpoint Calibration Learn Period	30 sec.; self-learning, pushbutton reset
Normal-to-Alarm Output Delay	1 sec. maximum
Alarm-to-Normal Output Delay	30 sec. nominal
Insulation Class	600 Vac RMS (UL); 300 Vac RMS (CE)
Hysteresis	10% (typical)
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

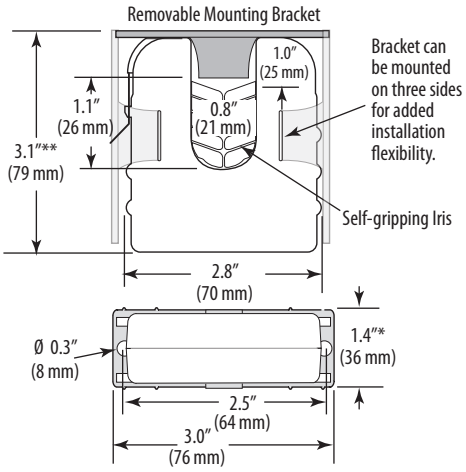
CE c UL us LISTED

1. Trip point switch positions A and B are not for use in applications where the current will fluctuate by more than 40% (A) or 60% (B) of the nominal current. If the current will fluctuate by more than 60%, use the H11D for on/off status (position C) only.
2. The upper trip limit alarm resets when the current drops by 5% of the learned nominal current limit. The lower trip limit alarm resets when the current rises by 5% of learned nominal current limit.

Specification Note: For CE compliance, conductor shall be insulated according to IEC 61010-1.

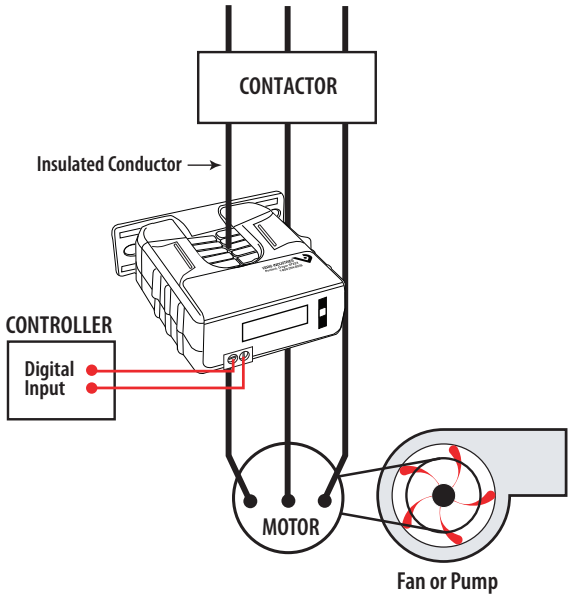
Do not use the LCD as evidence of applied voltage.

Dimensional Drawing

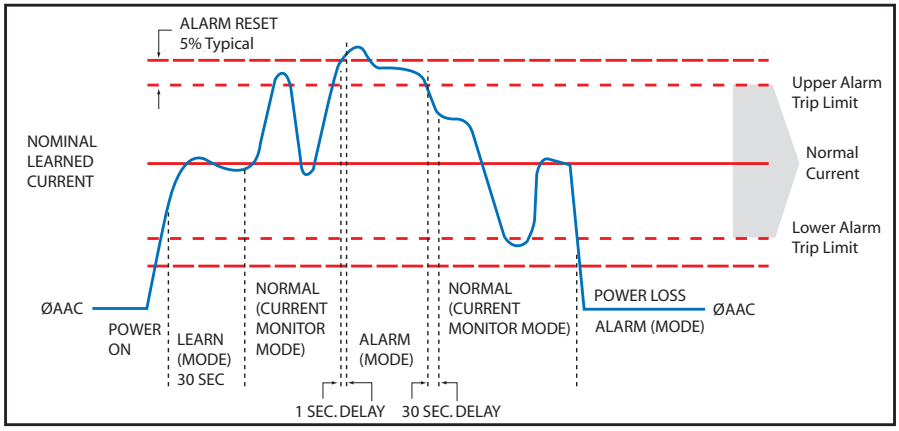


* Terminal block may extend up to 1/8" over the height dimensions shown.

Wiring Diagram



Functional Drawing



Ordering Information

Model	Amperage Range	Status Output	Nominal Trip Point Target Range	Housing	Status LED	UL	CE
H11D	2.5 to 200 A @ 60 Hz 3.0 to 200 A @ 50 Hz	N.O. 1.0 A @ 30 Vac/dc	±40%, ±60%, or on/off (user selectable)	Split-core	•	•[2]	•

1. To enable the upper trip limit alarm, the max. learned current for switch setting "A" is 142 A, and the max. learned current for switch setting "B" is 125 A. Switch setting "C" is for on/off status only, so the upper trip limit alarm does not apply.
2. Listed for use on 75 °C insulated conductors.

H614

Automatically Learns At Initial Power-Up from Veris

H614

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

The Veris Hawkeye H614 is a microprocessor based, self-learning, self-calibrating current-sensitive switching device designed for use with VFD systems. At initial power-up, the H614 automatically learns the average current on the line with no action required by the installer. Once a current is learned, the switch monitors for changes in current greater than ±20% of the learned load. When calibrated for a given VFD system, the H614 is tolerant of gradual drifts in frequency due to expected conditions, such as an accumulation of debris in a filter, while still detecting a sudden drop due to a potential abnormal system condition (e.g., belt loss or other mechanical failure).

Microcontroller based learning technology

Automatically learns load upon initial power-up…minimizes calibration labor

Saves space

Small size fits easily inside small starter enclosures

Automatic trip point

Automatic trip point (1.5 to 150 Amps, 12 to 115 Hz)…detect abnormal events

100% solid state

100% solid state…no moving parts to fail

Under- and over-load

Microcontroller based learning technology…automatically learns load

Flexibility

Removable mounting bracket for installation flexibility

Applications

- Monitoring fans, pumps, motors, and other electrical loads for proper operation
- Detecting belt loss and motor failure…ideal for fan and pump status
- Verifying lighting circuit loads
- Monitoring critical motors (compressor, fuel, etc.)
- Monitoring industrial process equipment status (OEM)

Specifications

Sensor Power	Induced from monitored conductor
Response Time	1 sec.
Learn Time	15 sec. learn period after frequency stabilizes
Frequency Range in Conductor	12 to 115 Hz[1]
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Alarm Limits	±20% of learned current in every 5 Hz freq. band[2]
Normal-to-Alarm Status Output Delay	Approx. 7 sec.
Alarm-to-Normal Status Output Delay	1 sec. nominal[3]
Off Delay	<30 sec. nominal
Contact Ratings	30 Vac/dc, 1 A
Insulation Class	600 Vac (UL); 300 Vac RMS (CE)
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)

Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL508 open device, CE: EN61010-1, CAT III, Pollution Degree 2

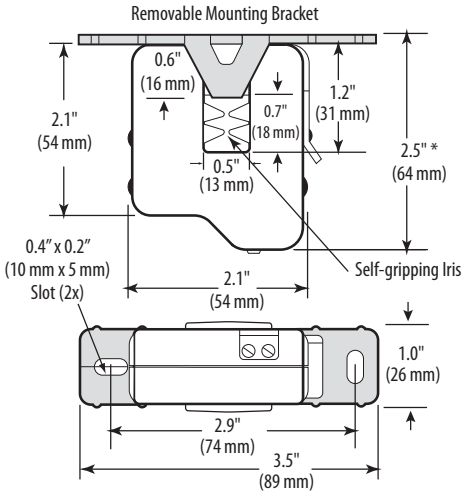
CE c UL us LISTED

1. VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.
2. The H614 is not intended for use in applications where the current is expected to fluctuate by more than 20% due to acceptable causes other than VFD driven changes.
3. If the H614 experiences a momentary loss of power, the Alarm-to-Normal output delay may exceed 1 sec.

Specification Note: For CE compliance, conductor shall be insulated according to IEC 61010-1

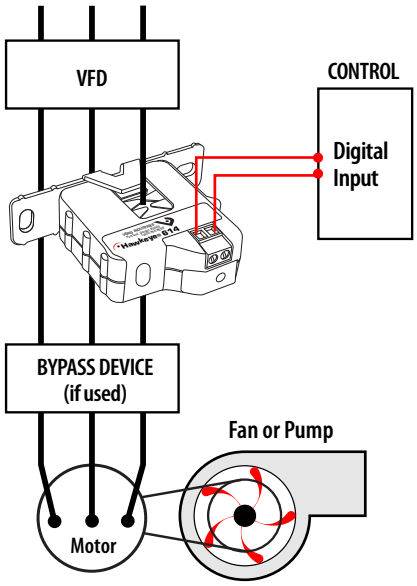
The product design provides for basic insulation only. Use wire with minimum 75°C rated insulation. Do not use the LED status indicators as evidence of applied voltage. This sensor detects abnormal operation by looking for sudden changes in current across the entire frequency range. In Learn mode, the sensor calculates a margin 20% above and 20% below the learned frequency curve. An abnormal condition in the circuit is one that falls outside this margin.

Dimensional Drawing



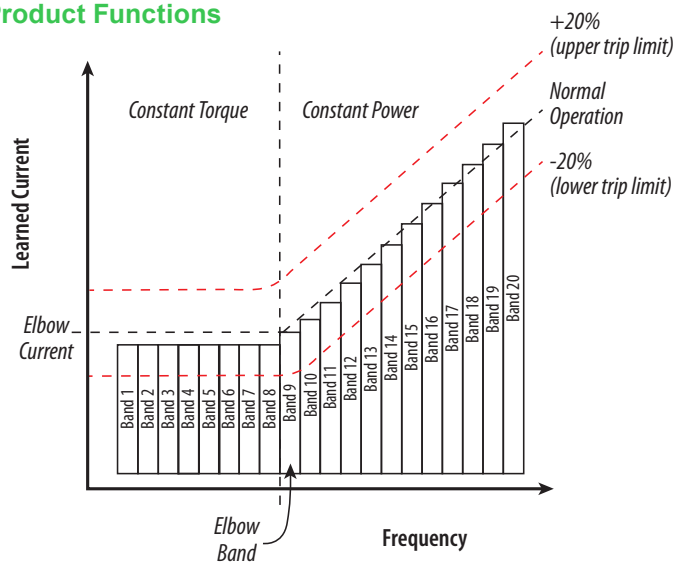
* Terminal block may extend up to 1/8" over the height dimensions shown.

Wiring Diagram



NOTE: The H614 is not intended for use in staged pump, variable inlet vane, and other applications in which the amperage changes under normal operation, independent of frequency.
NOTE: (Optional) For added sensitivity in detecting amperage changes, use H614 devices on all three phases of the VFD

Product Functions



Sensor Mode		Status LED Blink Pattern	Contacts
Learning Mode (first 15 sec of operation after frequency stabilizes)		Alternating Red/Green (1 per sec.)	Closed
On/Off Status only	Learn mode incomplete. VFD system does not meet abnormal condition detection criteria	Green blink (5 times per sec. after 15 sec of stable frequency)	Closed
	Current is not adequate for the device to detect abnormal conditions	No LED	Closed
Status OK		Green blink (1 per sec.)	Closed
Alarm		Red blink (1 per sec.)	Open

How it Works

During setup, the H614 automatically determines the normal amperage and frequency profile and stores it in memory. Then the microprocessor monitors for amperage changes greater than ±20% of this learned curve, indicating a potential system failure.

Usage Example

The H614 is designed for HVAC fan and blower systems, as well as some single stage pumping systems involving consistent viscosity liquids. If an H614 is installed on one phase of the VFD, it detects changes in that phase that result from the VFD compensating for changes elsewhere in the system. Alternatively, for increased sensitivity, H614s can be used on all three phases for immediate detection of phase balance changes anywhere in the system.

Ordering Information

Model	Amperage Range	Frequency Range	Status Output	Nominal Trip Point Target Range	Housing	Status LED	UL	CE
H614	1.5 to 150 A[1]	12 to 115 Hz	N.O. 1.0 A @ 30 Vac/dc	±20% in each of 20 bands	Split-core	•	•[2]	•

1. If the current is above 1.5 A, but neither LED is illuminated, the H614 is considered to be in on/off status mode.
2. Listed for use on 75°C insulated conductors.

H720, H904 & H934

Variable Frequency Drive Monitoring and Control from Veris

Also see H614.


H904


H720


H934

U.S. Patent No. 5,705,989

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

Veris Hawkeye 720, 904 and 934 current monitoring devices provide unique solutions for accurately monitoring status of motors controlled by variable frequency drives.

The microprocessor-based H904 and H934 store the sensed amperage values for normal operation at various frequency ranges in non-volatile memory. This information allows the device to distinguish between a reduced amp draw due to normal changes in the frequency and an abnormal amp drop due to belt loss or other mechanical failures. The relay on the H934 is isolated from the current switch, and all relay connections are externally accessible on the device.

The H720 analog output corresponds to current in the monitored conductor from 10 to 80 Hz.

Load side monitoring

Suitable for llad side monitoring of VFDs (H720)

Automatically compensates

Automatically compensates for the effects of frequency and amperage changes in monitored conductor associated with VFDs (H901/934)

Precise scaling

Adjustable zero and span for precise scaling (H720)

Nuisance reduction

Provides a secondary setpoint option of 50% of the originally measured current (H901/934)

0.5% accuracy

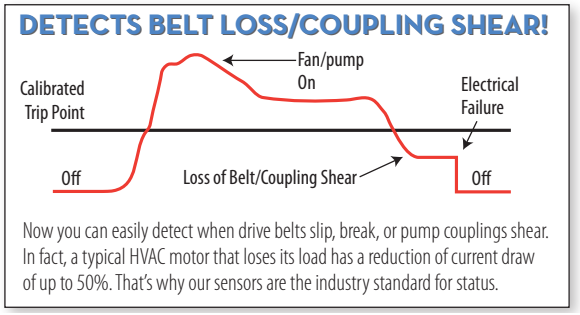
Accurate to 0.5% of full scale (H720)

Rapid troubleshooting

LED indicates normal and alarm conditions (H901/934)

Applications

- Monitoring positive status on motors controlled by variable frequency drives
- Replacing pressure switches
- Measuring current and load trending



Now you can easily detect when drive belts slip, break, or pump couplings shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

Specifications

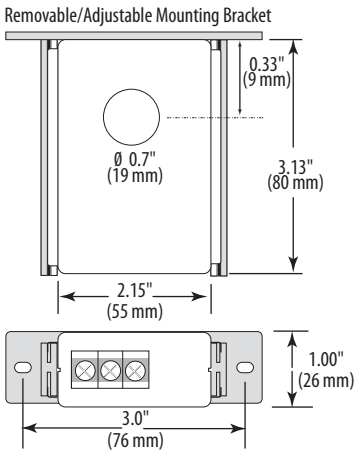
Sensor Power	H904/H934: Induced from monitored conductor; H720: 12 to 30 Vdc
Insulation Class	600 Vac RMS
Frequency Range: H720 H904/H934	 10 to 80 Hz; 20 to 34 Hz for on/off status, 34 to 75 Hz for belt loss indication On/Off status for Variable Frequency Drive (VFD) outputs[1]
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Off Delay (H904/H934)	0 sec to 2 min.
Accuracy (H720)	0.5% of 200 A (combined linearity, hysteresis, and repeatability)
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing CAT III, Pollution Degree 2, basic insulation

c UL us LISTED
E150462

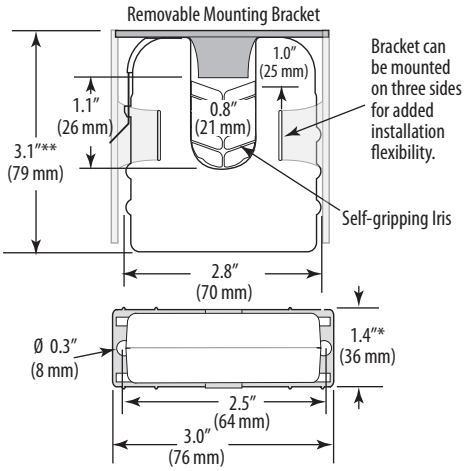
Note: Do not use the LED status indicators as evidence of applied voltage.

1. VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.

H720
Dimensional Drawing

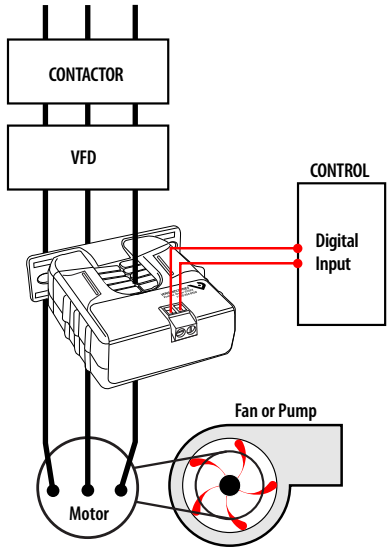


H904/934
Dimensional Drawing



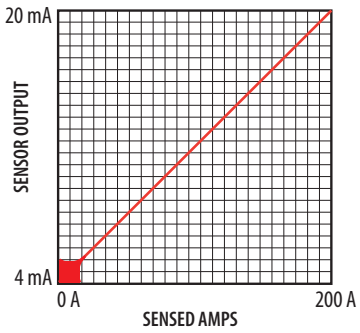
* Terminal block may extend up to 1/8" over the height dimensions shown.

Monitoring Fan /Pump Motors for Positive Proof of Flow
Wiring Diagram



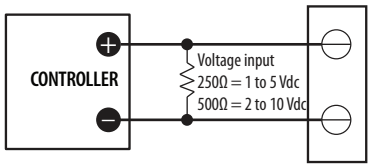
Note: The H904 is not intended for use in staged pump or variable inlet vane applications.

Example Linear Output (H720)
Scale software as shown
Requires 12 to 30 Vdc for sensor power



H934 Relay Contact Ratings		
Resistive - 5A @ 250 Vac, 30 Vdc		
Typical Coil Performance		
Voltage	AC	DC
24V	10 mA	10 mA

Voltage Output



Ordering Information

Model	Amperage Range	Status Output	Min. Trip Point	Relay Type	Housing	Status LED	Relay Power LED	UL
H720	Lower limit: 0 A Upper limit: 20 to 200 A	4 to 20mA	n/a	none	Solid-core	•	•	•
H904	3.5 to 135 A, 20 to 75 Hz	Max. N.O. 0.1 A @ 30 Vac/dc	3.5 A or less	none	Split-core	•	•	•
H934				SPST, N.O.		•	•	•

Note: For auto-calibrating model see H614.

H6ECM

Split-core Current Switch, Proof of Rotation (Flow) for ECM Systems from Veris

H6ECM05

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

High performance

High performance device, split-core housing

Self-gripping iris

Self-gripping iris for easy installation

Precise

Precise current trip point setting

Status LEDs

Status LEDs for easy setup and local indication

Small size

Fits easily inside small enclosures

Up to 1 Amp status output

Increased application flexibility

The Veris H6ECM is a current-sensitive switching device that monitors current (amperage) in the conductor passing through it. A change in amperage in the monitored conductor that crosses the switch (setpoint) causes the resistance of the FET status output to change state, similar to the action of a mechanical switch. The status output is suitable for connection to building controllers or other appropriate data acquisition equipment operating at up to 30 V. The product requires no external power supply to generate its output.

Electrically Commutated Motors (ECMs) are increasingly common as more energy conservation measures are implemented. The ECM is a brushless DC motor that is supplied AC power, converts that power to DC current and uses electronic switching to control the motor rotation. The ECM motor shaft speed can be reduced to save energy, resulting in lower cost and less component wear. The H6ECM is optimized to provide meaningful proof of rotation which verifies that the ECM motor is operating as expected.

Applications

- Systems with Electrically Commutated Motors such as cooling fans or compressor motors with off-state (keep alive) current less than 0.5 A

Specifications

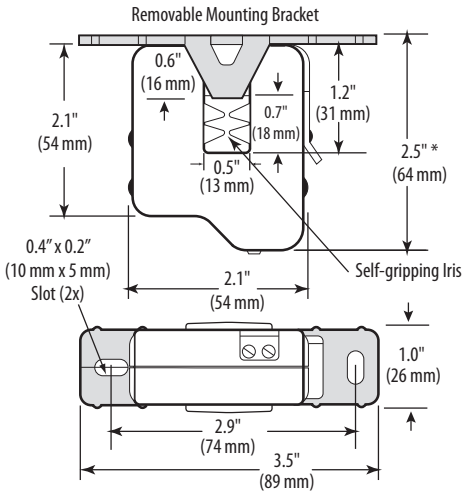
Sensor Power	Induced from the monitored conductor
Insulation Class	600 Vac RMS
Frequency Range	60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% typical
Accuracy	±10%
Amperage Range	0.5 to 175 A continuous
Status Output Ratings	N.O. 1.0A @ 30 Vac/dc, not polarity sensitive
Setpoint	0.5 A (keep alive current < 0.5 A)
Off State Resistance	Open switch represents > 1 MΩ
On State Resistance	Closed switch represents < 200 mΩ

Terminal Block Max. Wire Size	24 to 14 AWG (0.2 to 2.1mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL508 open device listing
Installation Category	CAT III, Pollution Degree 2

c UL us LISTED

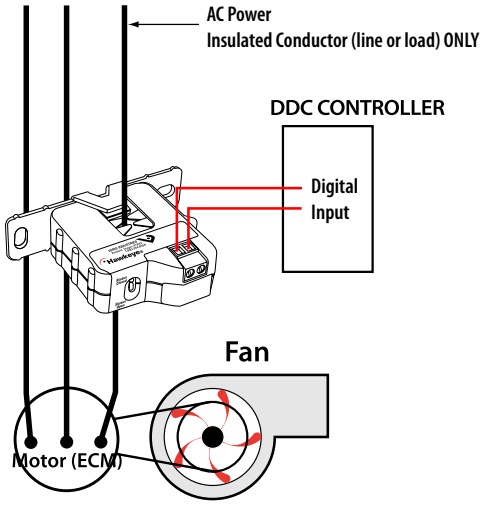
Notes:
The product design provides basic insulation only.
Do not use the LED indicators as evidence of applied voltage.

Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.

Wiring Diagram



Ordering Information

Model	Amperage Range	Status Output	Trip Point	Status LED	UL
H6ECM05	0.5 to 175 A	N.O. 1.0 A @ 30 Vac/dc	0.5 A	•	•

Hx30/40/50 Series

On/Off Status and Control in One Package from Veris

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

On/off status

On/off status and command relay in a single labor and space saving device

SPDT command relay

H740 and H940 feature a SPDT command relay

Detect belt loss

Cost-effectively monitor start/stop, unit vents, fan coils, exhaust fans, and other loads where belt loss is not a concern

No tubing necessary

Easier to install than differential pressure switches

Easy setup

No calibration required…easy setup and operation

The Veris Hawkeye Relay Combination Series combines an on/off status sensor and command relay in one package, saving the labor, wire runs, and space required to mount a separate relay. The switch and relay (not electrically connected) are in the same housing, saving space and cost. It is ideal for monitoring and controlling motors where belt loss is not a concern.

Applications

- Monitoring direct drive units, exhaust fans, and other fixed loads
- Monitoring on/off status of electrical loads
- Starting/stopping motors

Specifications

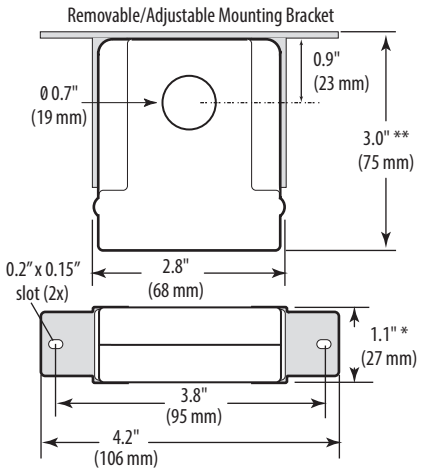
Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation

c UL us LISTED

Note: Do not use the LED status indicators as evidence of applied voltage.

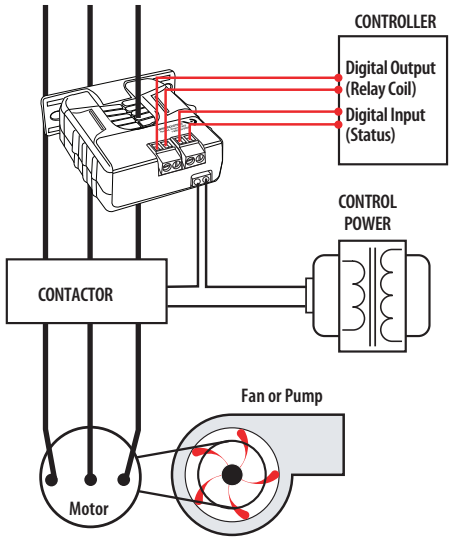
Relay Contact Ratings		
Hx30, Hx50 (SPST, N.O.)		
Resistive	10 A @ 250 Vac, 30 Vdc	
Inductive	5 A @ 250 Vac, 30 Vdc	
Hx40 (SPDT)		
Resistive	8 A @ 250 Vac, 30 Vdc	
Inductive	3.5 A @ 250 Vac, 30 Vdc	
Typical Coil Performance		
Voltage	AC	DC
24V	10 mA	10 mA
Pull In Voltage		
Hx30		20.1 Vdc
Hx40		20.1 Vdc
Hx50		8.4 Vdc
Drop Out Voltage		
Hx30		5.2 Vdc
Hx40		5.2 Vdc
Hx50		3.0 Vdc

H730/740/750
Dimensional Drawing

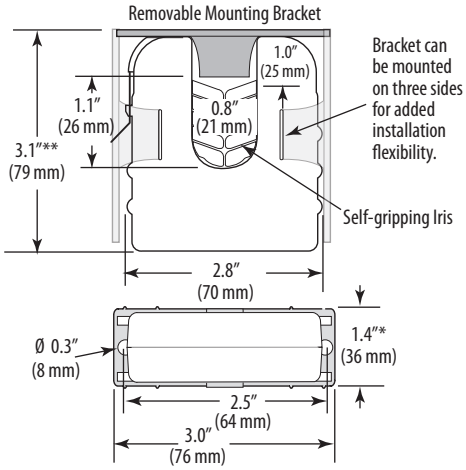


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Start/Stop Monitoring of Fan/Pump Motors
Wiring Diagram

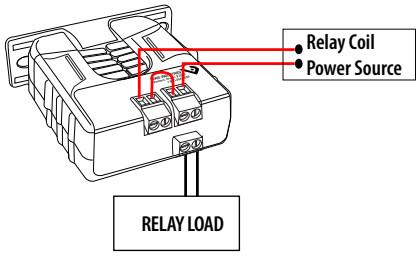


H930/940/950
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.

Relay Controlled Directly by Status Contacts
Wiring Diagram



Ordering Information

Model	Amperage Range	Status Output (max.)	Trip Point	Relay	Relay Coil	Housing	Relay Power LED	UL
H730	0.5 to 200 A	N.O. 1.0 A @ 30 Vac/dc	0.5 A or less	SPST, N.O.	24 Vac/dc	Solid-core	•	•
H740	0.5 to 200 A		0.5 A or less	SPDT	24 Vac/dc	Solid-core	•	•
H750	0.5 to 200 A		0.5 A or less	SPST, N.O.	12 Vdc nom.	Solid-core	•	•
H930	1.5 to 200 A		1.5 A or less	SPST, N.O.	24 Vac/dc	Split-core	•	•
H940	1.5 to 200 A		1.5 A or less	SPDT	24 Vac/dc	Split-core	•	•
H950	1.5 to 200 A		1.5 A or less	SPST, N.O.	12 Vdc nom.	Split-core	•	•

H735, Hx38,Hx48, Hx58 Series

Status and Control in One Package from Veris

H938

H738

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

The Veris Hawkeye Relay Combination Series is the ideal solution for the automation installer. These units combine a current switch and relay into a single package, reducing the space required for total control of fans and pumps. The current switch and relay operate independently of one another. These devices allow start/stop control and status monitoring with one device instead of two.

Combined relay & status

Combines command relay and fan/pump status sensor in a single, easy-to-install unit

Fan & pump status

Detect belt loss and motor failure…ideal for fan and pump status

Polarity insensitive

Polarity insensitive status outputs…fast and easy installation

Two outputs

H748 and H948 feature a SPDT command relay…control two outputs with a single relay

Added flexibility

Bracket on H938, H948, and H958 can be installed in three different configurations

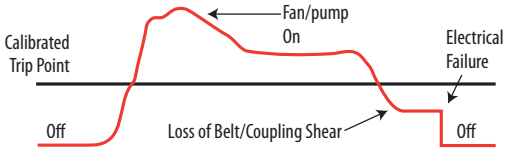
Easy setup

Relay and status LEDs

Applications

- Starting/stopping and monitoring positive status of motors
- Detecting belt loss and coupling shear

DETECTS BELT LOSS/COUPLING SHEAR!



Now you can easily detect when drive belts slip, break, or pump couplings shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

Specifications

Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% Typical
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation

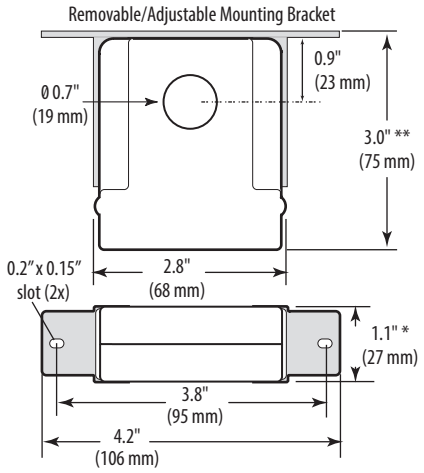
c UL us LISTED
E150462

Note: Do not use the LED status indicators as evidence of applied voltage.

Relay Contact Ratings	
H735 (SPST, N.O.)	
Resistive	5 A @ 250 Vac, 30 Vdc
Inductive	3 A @ 250 Vac, 30 Vdc
Hx38, Hx58 (SPDT N.O.)	
Resistive	10 A @ 250 Vac, 30 Vdc
Inductive	5 A @ 250 Vac, 30 Vdc
Hx48 (SPDT)	
Resistive	8 A @ 250 Vac, 30 Vdc
Inductive	3.5 A @ 250 Vac, 30 Vdc

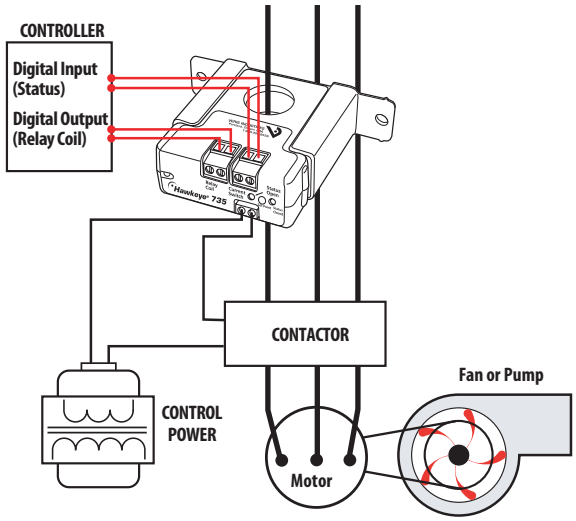
Typical Coil Performance		
Voltage	AC	DC
24V	10 mA	10 mA
12V (Hx58)		20 mA
Pull-in Voltage		
Hx3x		20.1 Vdc
Hx48		20.1 Vdc
Hx58		8.4 Vdc
Drop-out Voltage		
Hx3x		5.2 Vdc
Hx48		5.2 Vdc
Hx58		3.0 Vdc

H735/738/748/758
Dimensional Drawing

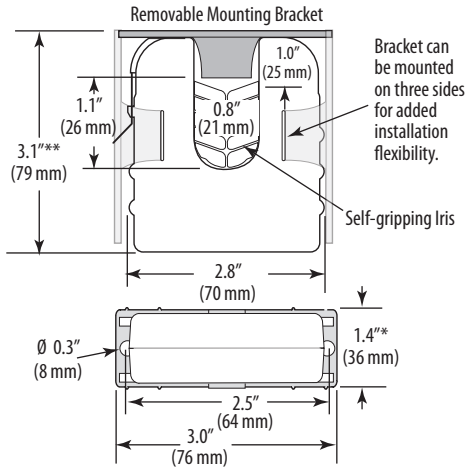


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Start/Stop Monitoring of Fan /Pump Motors
Wiring Diagram

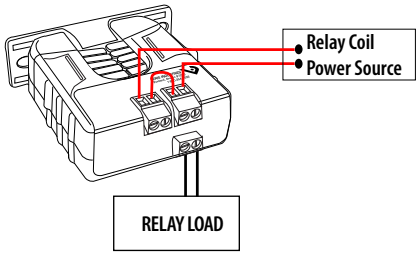


H938/948/958
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Relay Controlled Directly by Status Contacts
Wiring Diagram



Ordering Information

Model	Amperage Range	Status Output (max.)	Min. Trip Point	Relay	Coil Voltage	Housing	Status LED	Relay Power LED	UL
H735	1 to 135 A	0.1 A @ 30 Vac/dc	1 A or less	SPST, N.O.	24 Vac/dc	Solid-core	•	•	•
H738	1 to 135 A	1.0 A @ 30 Vac/dc	1 A or less	SPST, N.O.	24 Vac/dc	Solid-core	•	•	•
H748	1 to 135 A		1 A or less	SPDT	24 Vac/dc	Solid-core	•	•	•
H758	1 to 135 A		1 A or less	SPST, N.O.	12 Vdc nom.	Solid-core	•	•	•
H938	2.5 to 135 A		2.5 A or less	SPST, N.O.	24 Vac/dc	Split-core	•	•	•
H948	2.5 to 135 A		2.5 A or less	SPDT	24 Vac/dc	Split-core	•	•	•
H958	2.5 to 135 A		2.5 A or less	SPST, N.O.	12 Vdc nom.	Split-core	•	•	•

Hx39, Hx49 & Hx59 Series

Status and Control in One Package from Veris

H939

H739

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

Veris Hawkeye Relay Combination Series high voltage output current switches are the ideal solution for the automation installer. These units combine a current switch and relay into a single package, reducing the space required for total control of fans and pumps.

The integrated current switch and relay operate independently of one another. All relay connections are externally available for maximum flexibility.

These products perform the functions of start/stop and status monitoring with one device instead of two.

Specifications

Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% Typical
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation
Agency Approvals	
Limited Warranty	5 years

c UL us LISTED

Do not use the LED status indicators as evidence of applied voltage.

Combined relay & status

Combines command relay and fan/pump status sensor in a single, easy-to-install unit

No tubing

Easier to install than differential pressure switches…no tubing needed

Polarity insensitive

Polarity insensitive status outputs…fast and easy installation

Detect belt loss

Detect belt loss & motor failure...ideal for fan and pump status

Easy setup

Relay and status LEDs

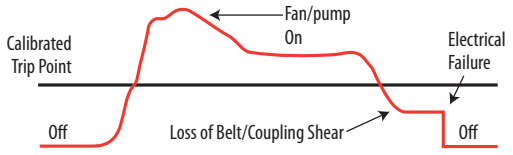
Added flexibility

Bracket on H939, H949, and H959 can be installed in three different configurations

Applications

- Starting/stopping and monitoring positive status of motors
- Detecting belt loss and coupling shear

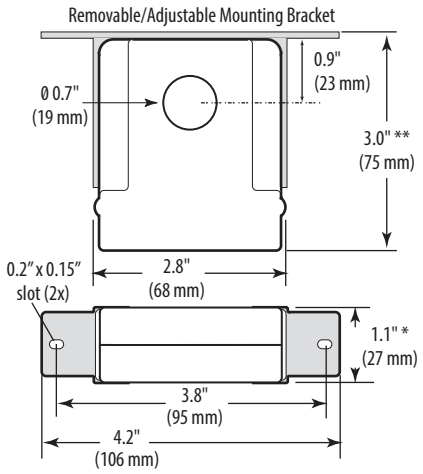
DETECTS BELT LOSS/COUPLING SHEAR!



Now you can easily detect when drive belts slip, break, or pump couplings shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

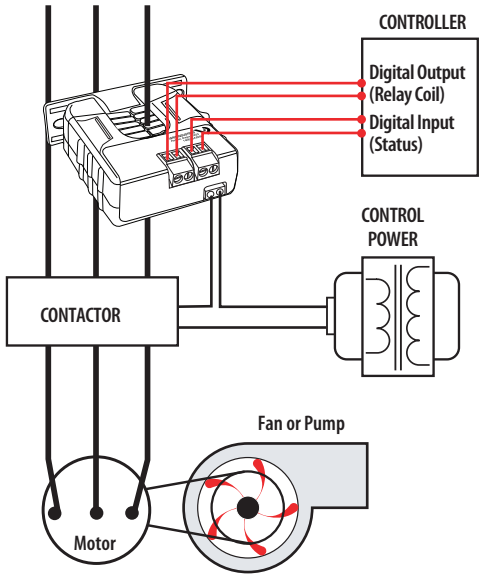
Relay Contact Ratings		
Hx39, Hx59 (SPST, N.O.)		
Resistive	10 A @ 250 Vac, 30 Vdc	
Inductive	5 A @ 250 Vac, 30 Vdc	
Hx38, Hx58 (SPDT)		
Resistive	8 A @ 250 Vac, 30 Vdc	
Inductive	3.5 A @ 250 Vac, 30 Vdc	
Typical Coil Performance		
Voltage	AC	DC
24V	10 mA	10 mA
12V (Hx58)		20 mA
Pull-in Voltage		
Hx39		20.1 Vdc
Hx49		20.1 Vdc
Hx59		8.4 Vdc
Drop-out Voltage		
Hx39		5.2 Vdc
Hx49		5.2 Vdc
Hx59		3.0 Vdc

H739/H749
Dimensional Drawing

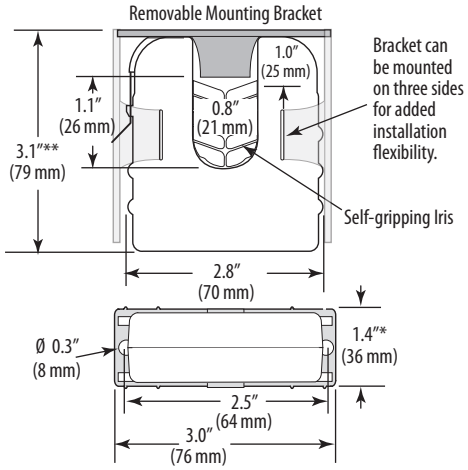


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Start/Stop Monitoring of Fan /Pump Motors
Wiring Diagram

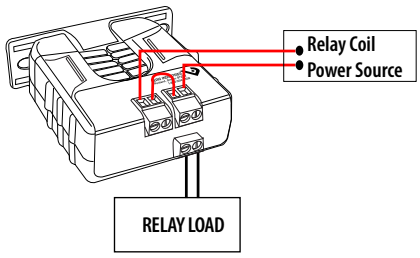


H939/H949/H959
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Relay Controlled Directly by Status Contacts
Wiring Diagram



Ordering Information

Model	Amperage Range	Status Outpus (max.)	Min. Trip Point	Relay Type	Relay Coil	Housing	Status LED	Relay Power LED	UL
H739	1 to 135 A	N.O. 0.2 A @ 120 Vac/dc	1 A or less	SPST, N.O.	24 Vac/dc	Solid-core	•	•	•
H749	1 to 135 A		1 A or less	SPDT	24 Vac/dc	Solid-core	•	•	•
H939	2.5 to 135 A		2.5 A or less	SPST, N.O.	24 Vac/dc	Split-core	•	•	•
H949	2.5 to 135 A		2.5 A or less	SPDT	24 Vac/dc	Split-core	•	•	•
H959	2.5 to 135 A		2.5 A or less	SPST, N.O.	12 Vdc nom.	Split-core	•	•	•

H721xC Series & H921

Load Trending with 4 to 20 mA Output from Veris

H721HC

H921

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability Minimize Installed Cost

Veris Hawkeye Relay Combination Series high voltage output current switches are the ideal solution for the automation installer. These units combine a current switch and relay into a single package, reducing the space required for total control of fans and pumps.

The integrated current switch and relay operate independently of one another. All relay connections are externally available for maximum flexibility.

These products perform the functions of start/stop and status monitoring with one device instead of two.

Lower costs

Power the sensor, and receive the signal with only two wires...lower cabling and commissioning costs than with traditional 3-wire sensors

Factory calibrated

Factory calibrated switch-selectable ranges for high resolution and installation ease

Retrofit

Self-gripping, split-core design for fast retrofit installation… no need to remove conductor (H921)

3 field-selectable

Three field-selectable ranges per unit…fewer versions to choose from, stock, and install

New construction

Economical solid-core features adjustable bracket for easy alignment (H721 Series)

Installation flexibility

Removable mounting bracket for installation flexibility

Specifications

Sensor Power	30 mA (max) @ 12 to 30 Vdc
Insulation Class	600 Vac RMS (UL), 300 Vac RMS (CE)
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% of selected range, but not less than ±0.4 A
Response Time	2 sec.
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

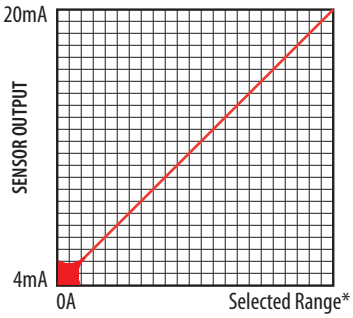
CE c UL us LISTED

Applications

- Load trending
- Motor control
- Fan/pump status

Example Linear Output

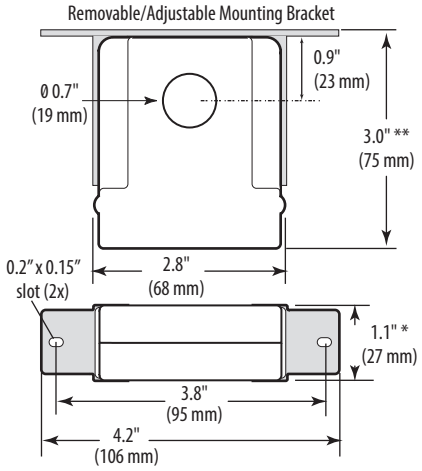
Scale software as shown



SENSED AMPS

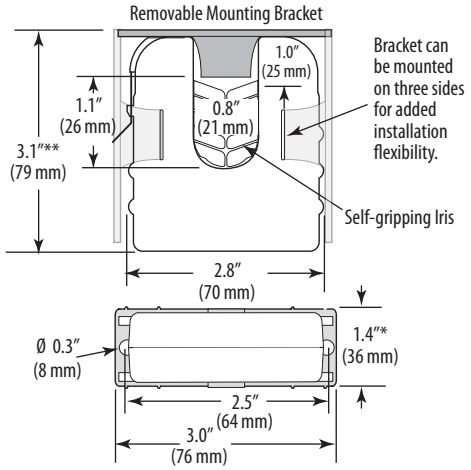
**Factory calibrated ranges selected with the amperage range switch*

H721LC/H721HC
Dimensional Drawing



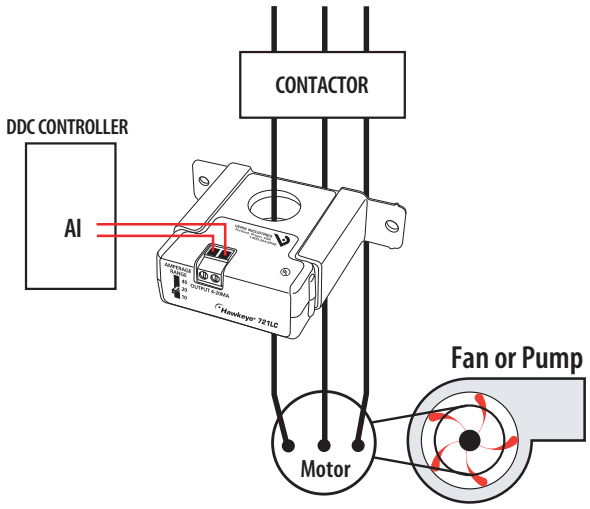
* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

H921
Dimensional Drawing



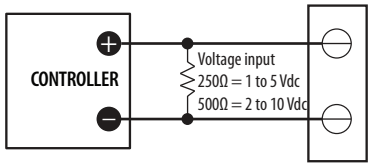
* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Monitoring Fan /Pump Motors for Positive Proof of Flow
Wiring Diagram



Note: This example diagram refers to the H721xC. Please see the H721xC and H921 installation guides for specific wiring information.

Voltage Output



Ordering Information

Model	Amperage Range	Sensor Output	Housing	UL	CE
H721LC	0 to 10/20/40 A	4 to 20 mA DC	Solid-Core	•	•
H721HC	0 to 50/100/200 A		Solid-Core	•	•
H921	0 to 30/60/120 A		Split-Core	•[1]	•

1. Listed for use on 75 °C insulated conductors.
Note: For 10 to 80 Hz applications, see the H720 VFD sensor.

Hx21 & Hx21SP Series

Large Load Trending with 4 to 20 mA Output from Veris

H321

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

Veris Hawkeye x21/x21SP analog current transducers provide reliable load trending information for large motor loads (up to 2400 A), with a proportional 4 to 20 mA signal. Three devices are available, each with a different amperage range. The Hx21 versions include a span potentiometer that allows each sensor to be calibrated for maximum resolution. The Hx21SP versions are factory-calibrated at a range specified by the customer.

Specifications

Sensor Power	30 mA (max) @ 12 to 30 Vdc
Insulation Class	600 Vac RMS (UL), 300 Vac RMS (CE)
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH, non-condensing
Accuracy	±2% from 10 to 100% of full scale
Response Time	2 sec.
Terminal Block Wire Size	12 AWG (3.3 mm²) - 22 AWG (0.33 mm²)
Terminal Block Torque	7 to 8 in-lbs (0.8 to 0.9 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing, CE: EN61010-1, (H221, H321 only)CAT III, Pollution Degree 2, basic insulation

CE c UL us LISTED

Split-core design

Split-core design for easy installation and fast retrofits

Loop powered

Loop powered 4 to 20 mA output

No need for external CTs

No need for external CTs on large conductors

Two-wire design

Two-wire design reduces wiring cost

Large openings

Large openings for heavy conductors

Field flexibility

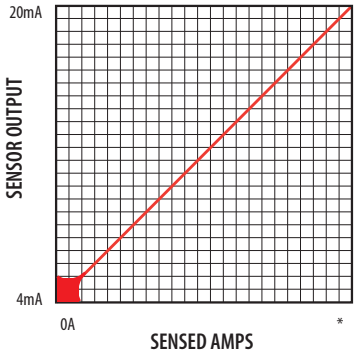
Hx21 models offer zero and span adjustments for field flexibility

Applications

- Load trending of large motors and other loads up to 2400 A
- Monitor critical motors (compressor, fuel, etc.)

Example Linear Output

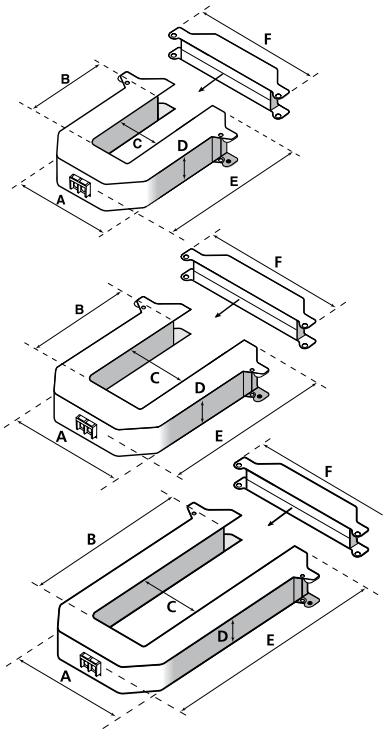
Scale software as shown



**Adjusted with Span Potentiometer for Hx21 models; Factory-set per customer specification for Hx21SP models*

100 to 300A (H221/H221SP)
300 to 800A (H321/H321SP)
1000 to 2400A (H421/H421SP)

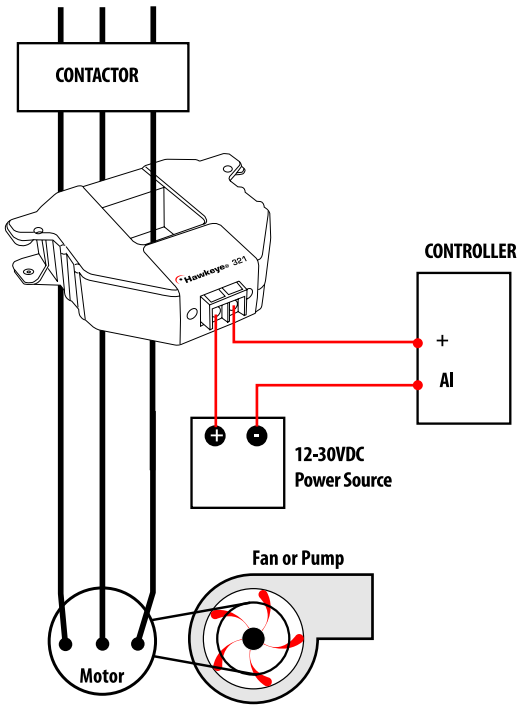
Dimensional Drawing



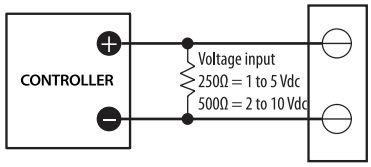
H221			H321			H421		
A	=	3.7" (94 mm)	A	=	4.9" (124 mm)	A	=	4.9" (124 mm)
B	=	1.6" (40 mm)	B	=	2.9" (75 mm)	B	=	5.5" (141 mm)
C	=	1.4" (35 mm)	C	=	2.5" (63 mm)	C	=	2.5" (63 mm)
D	=	1.1" (29 mm)	D	=	1.2" (29 mm)	D	=	1.1" (29 mm)
E	=	4.2" (106 mm)	E	=	5.5" (140 mm)	E	=	8.1" (206 mm)
F	=	4.7" (120 mm)	F	=	6.0" (151 mm)	F	=	6.0" (151 mm)

Monitoring Fan /Pump Motors Loads

Wiring Diagram



Voltage Output



Ordering Information

Model	Amperage Range		Sensor Output	Housing	UL	CE	Lead Free
	4 mA (Lower Limit)	20 mA (Upper Limit)					
H221	0 A	100 to 300 A	4 to 20 mA DC	Split-core	•[1]	•	
H221SP		100, 150, 200, 250, or 300 A[2]			•[1]	•	
H321		300 to 800 A			•[1]	•	
H321SP		300, 400, 500, 600, 700, or 800 A[2]			•[1]	•	
H421		1000 to 2400 A					•
H421SP		1000, 1200, 1400, 1600, 1800, 2000, 2200, or 2400 A[2]					•

1. Listed for use on 75 °C insulated conductors.
2. Factory calibrated - not field adjustable.

Note: When ordering HxxxSP versions, specify upper current limit for factory calibration (device is not field adjustable).

Hx22 Series

Load Trending with 0 to 5 Vdc Output from Veris

H722 LC

H922

H822

H622-xx

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

Self-powered analog

Self-powered analog current sensor simplifies installation

New construction

Economical solid-core models feature adjustable bracket for easy alignment (H722xC)

No external power required

No external power required for sensor

Factory calibrated

Factory calibrated ranges for increased flexibility and resolution

Retrofit

Self-gripping, split-core design for fast retrofit installation… no need to remove conductor (H622-xx, H922)

No jumpers

No jumpers on unit…reduces installation error

The Veris Hawkeye 622-xx, 722, 822, and 922 provide accurate load trending information with a proportional 0 to 5 Vdc output signal. Slide-switches provide easy field selection of monitored amperage range without jumpers (available on some models).

Specifications

Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS (UL), 300 Vac RMS (CE)
Frequency Range	50/60 Hz nominal
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% (range)
Response Time	2 sec.
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

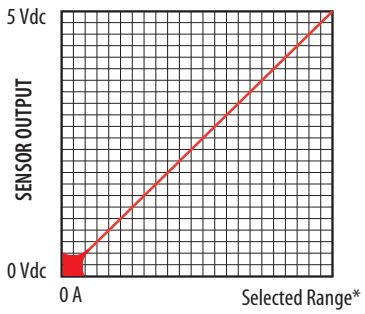
CE c UL us LISTED

Applications

- Load trending
- Motor control
- Positive proof of flow

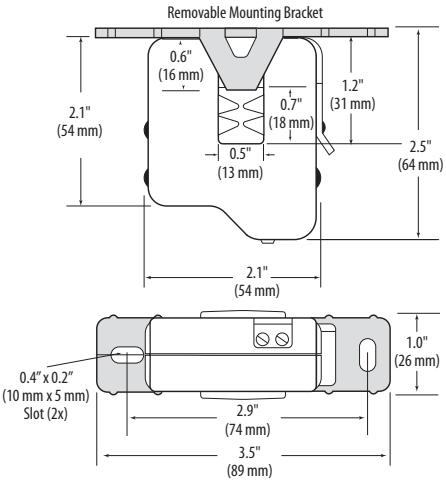
Example Linear Output

Scale software as shown

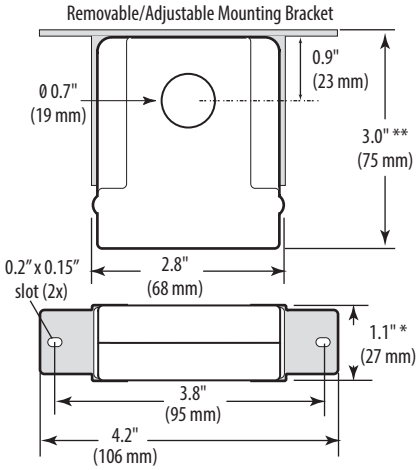


**Factory calibrated ranges selected with the amperage range switch*

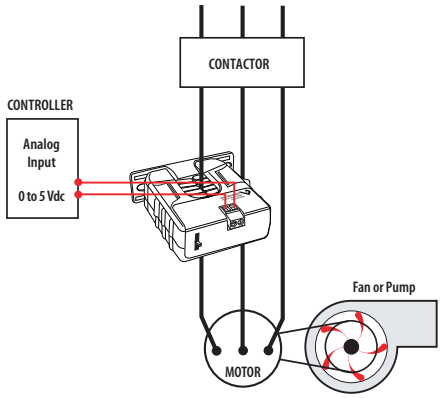
H622-xx
Dimensional Drawing



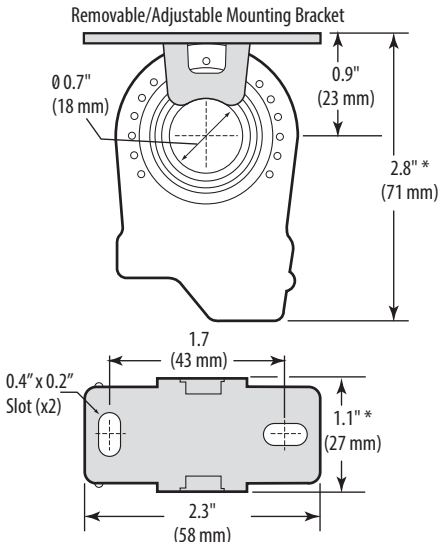
H722LC/H722HC
Dimensional Drawing



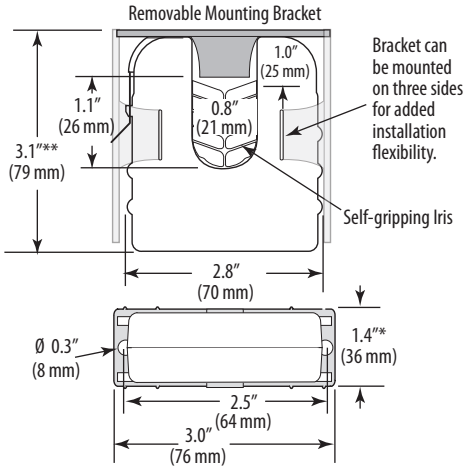
Monitoring Fan /Pump Motors for Positive Proof of Flow
Wiring Diagram



H822/H822-20
Dimensional Drawing



H922
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Ordering Information

Model	Amperage Range	Sensor Output	Housing	UL	CE	Lead Free
H622-10	0 to 10 A	0 to 5 Vdc	Split-core	•	•	
H622-20	0 to 20 A		Split-core	•	•	
H722LC	0 to 10/20/40 A		Solid-core	•	•	
H722HC	0 to 50/100/200 A		Solid-core	•	•	
H822	0 to 10 A		Solid-core	•		•
H822-20	0 to 20 A		Solid-core	•		•
H922	0 to 30/60/120 A		Split-core	•[1]	•	
H922030A	0 to 30 A		Split-core		•	
H922060A	0 to 60 A		Split-core		•	
H922120A	0 to 120 A		Split-core		•	

1. Listed for use on 75°C insulated conductors.

Hx23 Series

Load Trending with 0 to 10 Vdc Output from Veris

H923

H723

H623-xx

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

The Veris Hawkeye 623-xx, 723LC, 723HC, and 923 Series provide accurate load trending information with a proportional 0 to 10 Vdc output signal. Devices offer three amperage range options, with slide-switch selection for easy field adjustment – no need for jumpers.

Specifications

Sensor Power	Induced from monitored current
Insulation Class	600 Vac RMS (UL) (H623-xx) 300 Vac RMS (CE) (H623-xx , H723, H923)
Frequency Range	50/60 Hz nominal
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH, non-condensing
Accuracy	±2% F.S. from 10% to 100% (range)
Response Time	2 sec.
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing (H623-xx only); CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation

CE c UL us LISTED

Self-powered analog

Self-powered analog current transducer 0 to 10 Vdc output

Retrofit

Self-gripping, split-core design for fast retrofit installation… no need to remove conductor (H623-xx and H923)

No jumpers

No jumpers on unit…reduces installation error

No external power required

No external power required for sensor

Factory calibrated

Factory calibrated ranges for high resolution and installation ease

Field-selectable ranges

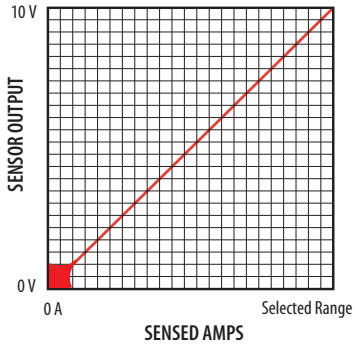
Some models available with field-selectable ranges

Applications

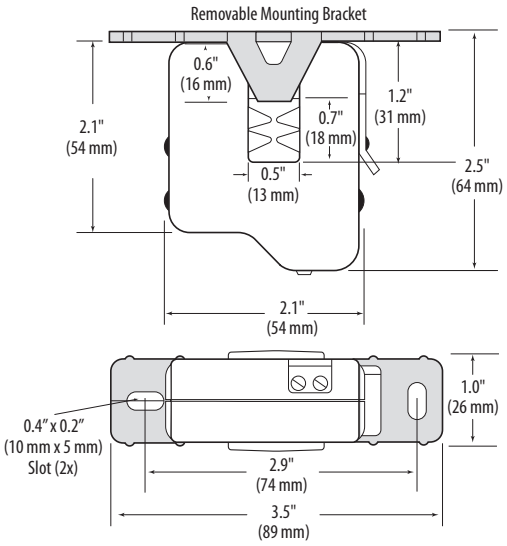
- Load trending
- Motor control
- Fan/pump status

Example Linear Output

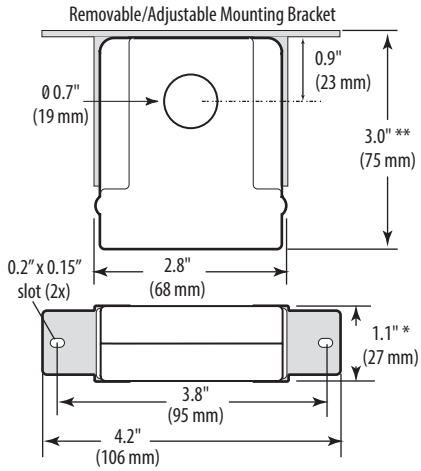
Scale software as shown



H623-xx
Dimensional Drawing

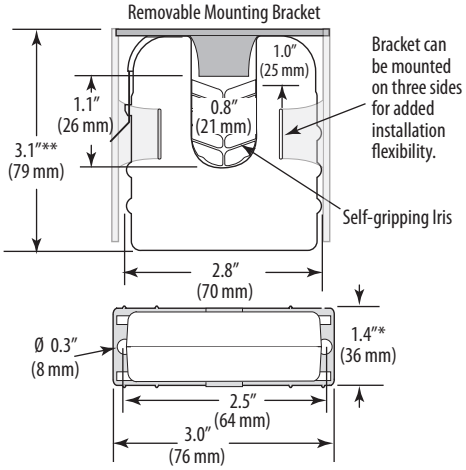


H723LC/H723HC
Dimensional Drawing



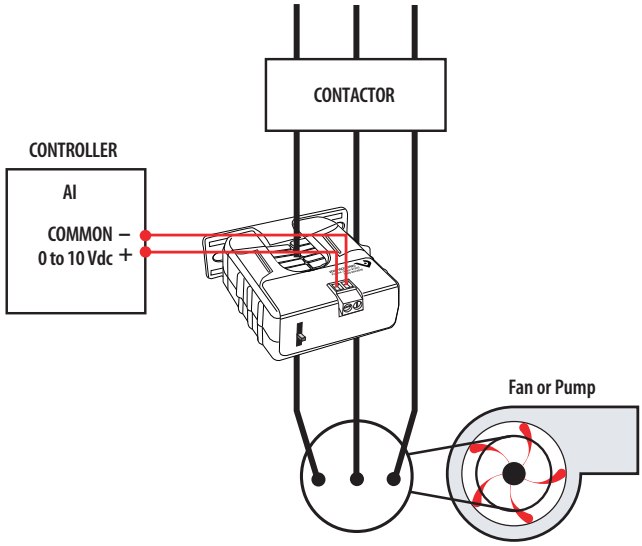
* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

H923
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Monitoring Fan/Pump Motors for Positive Proof of Flow
Wiring Diagram



Ordering Information

Model	Amperage Range	Sensor Output	Housing	UL	CE
H623-10	0 to 10 A	0 to 10 Vdc	Split-core	•	•
H623-20	0 to 20 A		Split-core	•	•
H723LC	0 to 10/20/40 A		Solid-core		•
H723HC	0 to 50/100/200 A		Solid-core		•
H923	0 to 20/100/150 A		Split-core		•

H931

Load Trending and Control Relay in One Package from Veris

H931

CURRENT SENSING THE ULTIMATE PROOF OF FLOW
Maximize Reliability
Minimize Installed Cost

Loop-powered

Loop-powered analog current transducer with integral start/stop command relay

Reduces installation charges

One device to install for start/stop and status

Saves time

Reduces the number of installed components…saves time and space

Fewer wires

Power the current sensor and receive the 4 to 20 mA signal with only two wires

Retrofit

Self-gripping, split-core design for fast retrofit installation…no need to remove conductor

Factory calibrated

Selectable factory calibrated ranges up to 120 A for increased flexibility and resolution

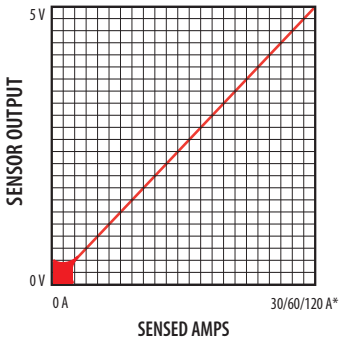
The Veris Hawkeye 931 provides accurate load trending information with a proportional 4 to 20 mA output signal. These devices offer three amperage ranges for versatility, with easy slide-switch selection. The command relay is fully integrated in the device, but it is isolated from the current transducer. This combination makes these products ideal for start/stop control and status monitoring of motors, using one device instead of two.

Applications

- Load trending
- Motor control
- Positive proof of flow

Example Linear Output

Scale software as shown



**Factory calibrated ranges selected with the amperage range switch*

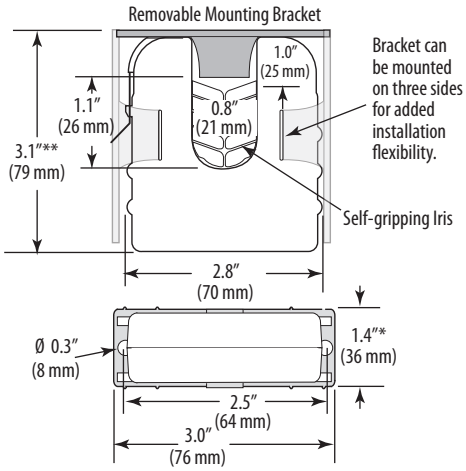
Specifications

Sensor Power	30 mA (max.) @ 12 to 30 Vdc
Insulation Class	600 Vac RMS
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% (selected range)
Response Time	2 sec.
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation

c UL us LISTED

Note: Do not use LED status indicators as evidence of applied voltage

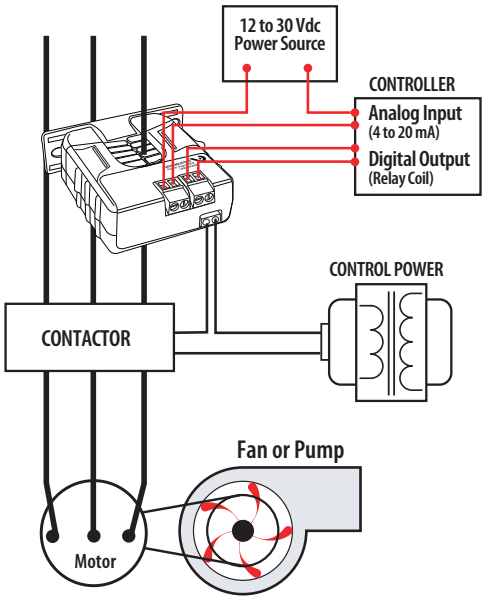
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Trending and Controlling Motor Loads

Wiring Diagram



Relay Contact Ratings (N.O.)	
Resistive	5 A @ 250 Vac, 30 Vdc
	5 A @ 30 Vac, 30 Vdc
Inductive	2 A @ 250 Vac, 30 Vdc
	2 A @ 30 Vac, 30 Vdc

Typical Coil Performance		
Voltage	AC	DC
24	15	15

Ordering Information

Model	Amperage Range	Sensor Output	Relay Type	Relay Coil	Relay	Relay Power LED	UL
H931	0 to 30/60/120 A	4 to 20 mA	SPST, N.O.	24 Vac/dc	•	•	•

H932 & H952

Load Trending and Control Relay in One Package from Veris

H932

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

The Veris Hawkeye 932 and 952 Series provide accurate load trending information with a proportional 0 to 5 Vdc output signal. This feature combined with an integrated command relay makes these products ideal for start/stop and status monitoring of motors.

The relay is fully isolated from the current sensor, and all relay connections are externally available for maximum flexibility.

Specifications

Sensor Power	Induced from monitored conductor
Insulation Class	600 Vac RMS
Frequency Range	50/60 Hz
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% (selected range)
Response Time	2 sec.
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation

c UL us LISTED

Note: Do not use LED status indicators as evidence of applied voltage

Self-powered

Self-powered analog current transducer with integral start/stop command relay

Saves time

Reduces the number of installed components…saves time and space

Retrofit

Self-gripping, split-core design for fast retrofit installation…no need to remove conductor

Reduces installation

One device to install for start/stop and status

No external power

No external power required for current sensor

Increased flexibility

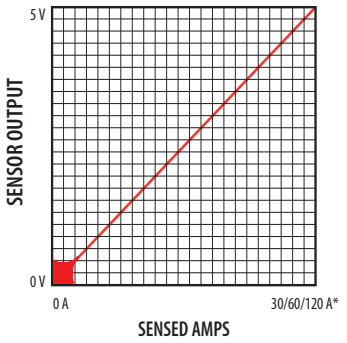
Selectable factory calibrated ranges up to 120 A for increased flexibility and resolution

Applications

- Load trending
- Motor control
- Fan/pump status

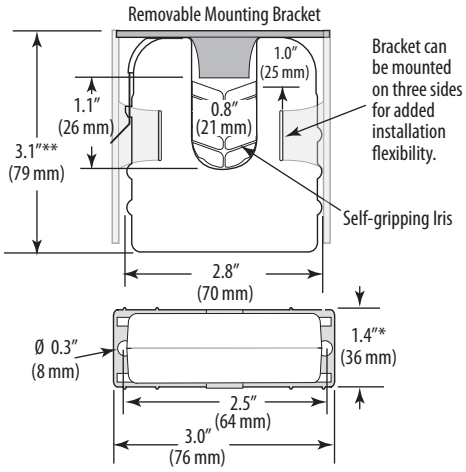
Example Linear Output

Scale software as shown



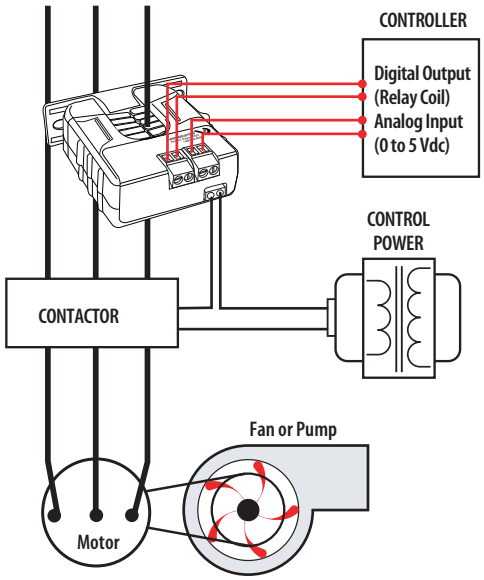
**Factory calibrated ranges selected with the amperage range switch*

H932/H952
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Trending & Controlling Motor Loads with the Hawkeye 932
Wiring Diagram



Relay Contact Ratings (N.O.)	
Resistive	5 A @ 250 Vac, 30 Vdc
	5 A @ 30 Vac, 30 Vdc
Inductive	2 A @ 250 Vac, 30 Vdc
	2 A @ 30 Vac, 30 Vdc

Typical Coil Performance		
Voltage	AC	DC
24 (H932)	15	15
12 (H952)		20
Pull In Voltage (H952 only)		
12 Vdc		8.4 Vdc
Drop Out Voltage (H952 only)		
12 Vdc		3.0 Vdc

Ordering Information

Model	Amperage Range	Sensor Output	Relay Type	Relay Coil	Housing	UL
H932	0 to 30/60/120 A	0 to 5 Vdc	SPST, N.O.	24 Vac/dc	Split-core	•
H952				12 Vdc		•

H971 & EA20 Series

DC Applications from Veris

H971

Veris Hawkeye DC Transducers provide accurate load level monitoring of DC loads. The H971 and EA20 use Pulse Reset Technology™ with field proven circuitry to provide a superior solution for DC applications with minimal risk of permanent magnetization, providing longer life and better accuracy.

The EA20 and the H971 have 4 to 20 mA output only. The H971 also offers bi-directional sensing capability and a user-adjustable span to allow greater application flexibility.

Retrofit

Self-gripping iris for easy installation

HOA

Bi-directional model…user-adjustable span from ±20 to ±200 A (H971)

Flexibility

Bracket can be installed in three different configurations

Status LED

Status LED ensures proper wiring

Pulse Reset Technology™

Patented Pulse Reset Technology significantly increases accuracy…sensor is not affected by stray magnetic fields, minimize magnetization from over-current faults

100, 150 and 200 Amp span

100, 150, and 200 A versions available…application flexibility (EA20 uni-directional model)

Applications

- Battery chargers
- Motor armature current
- Motor field current
- Automotive loads
- Marine equipment
- Solar energy applications
- Telecom
- Electroplating

Specifications

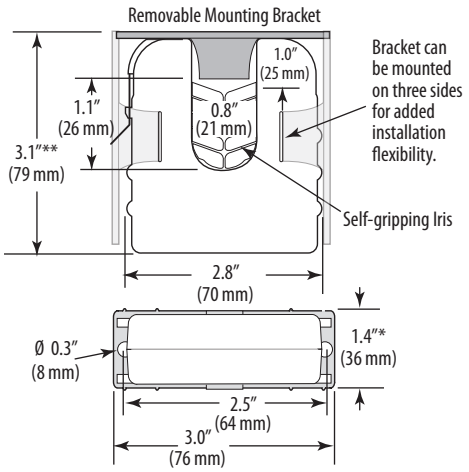
System Technology	Exclusive Pulse Reset Technology™
Amperage Range	H971: ±200 ADC; EA20: 0 to 100 ADC/0 to 150 ADC/0 to 200 ADC
Sensor Supply Voltage	12 to 24 Vdc[1]
Supply Current	35 mA[2]
Insulation Class	H971: 600 Vdc, EA20: 1000 Vdc
Temperature Range	-30 to 60 °C (-22 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Output	H971: Bidirectional 4 to 20mA (adjust. span); EA20: Unidirectional 4 to 20 mA
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Response Time	Less than 150 msec
Accuracy	
Accuracy at Ranges Below 100 A	±0.5 A (combined linearity, hysteresis, and repeatability)[3]
Accuracy at Ranges Above 100 A	±0.5% full scale (combined linearity, hysteresis, and repeatability)[3]
Withstand Current	25,000 ADC
Warranty	
Limited Warranty	5 years

Agency Approvals	
Agency Approvals	CE 4: EN61010-1, CAT III, Pollution Degree 2, basic insulation

Note: Do not use the LED status indicators as evidence of applied voltage.

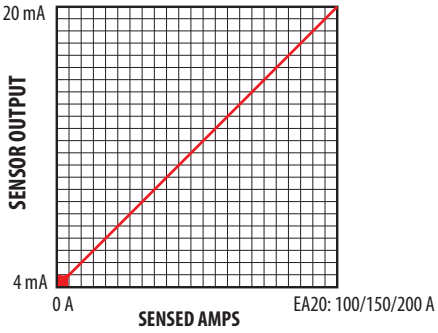
1. For currents over 120A, supply voltage must be at least 15V.
2. For H971, at zero monitored current: 35mA max.; at 200A monitored current: 55mA to 100mA depending on supply voltage and current polarity.
3. For single conductor through product (no wraps).

H932/H952
Dimensional Drawing

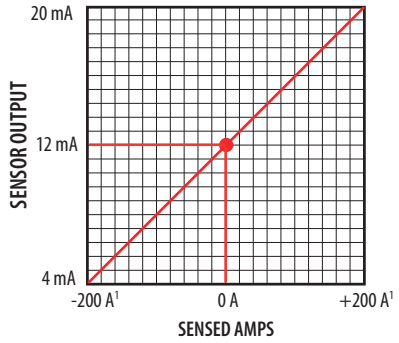


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

EA20 Linear Output
Scale software as shown

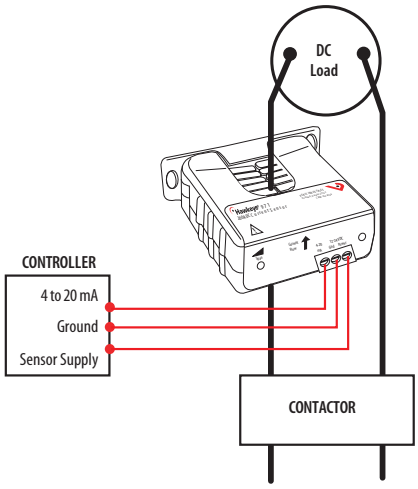


H971 Bidirectional Output
Scale software as shown



1. Field Adjustable from ±20 A to ±200 A (not applicable to customer-specified factory scaled models)

H971/EA20
Wiring Diagram



Ordering Information

Model	Pulse Reset Technology	Amperage Range (DC)	Sensor Output	Housing	Status LED	UL	CE	RoHS
Hawkeye Series								
H971	•	0 to 200 A	Bidirectional 4 to 20 mA	Split-core	•	•	•	•
EA Series								
EA20BB010	•	0 to 100 A	Unidirectional 4 to 20 mA	Split-core	•	•[1]	•	•
EA20BB015	•	0 to 150A	Unidirectional 4 to 20 mA	Split-core	•	•[1]	•	•
EA20BB020	•	0 to 200A	Unidirectional 4 to 20 mA	Split-core	•	•[1]	•	•

1. UL Recognized.

H5xx Series

Combination Switching Relay, Current Status Switch, and HOA Switch* from Veris

Remote mounted

Remote mounted current status sensor* and command relay with or without HOA switch

HOA

HOA provides true relay control…ideal for troubleshooting control wiring

Status sensor

Combines status sensor,* command relay, and HOA switch in a single series circuit…one line connection for three devices

SPST

SPST relay is field-selectable for N.O. or N.C. operation

Gang box mounting

Mounts directly onto gang box, flush to existing enclosures and standalone

Up to 1 HP

All models rated up to 1 HP @ 120 Vac, NS Versions 1 HP @ 120 Vac and 1.5 HP @ 277 Vac…one product for all fractional HP motor control and status applications

The Veris Hawkeye 5xx Series combines an industrial grade load-switching relay, current status switch*, and Hand-Off-Auto (HOA) switch* in an easy-to-install remote enclosure, making the series ideal for monitoring, directly controlling, and troubleshooting the control wiring of fractional horsepower motors.

In some models, the relay, current sensor, and HOA switch are combined in a series circuit. Once an H5xx is wired in series between the power source and motor, all three components are installed. The housing provides physical separation and multiple wiring exits to isolate control and high voltage wiring. An H5xx can be mounted directly on 2- or 4-gang junction boxes, nippled to a field enclosure, or stand alone.

Applications

- Monitoring status and controlling small motor loads that are not driven by a motor starter or contactor
- Exhaust fans
- Unit ventilators
- Fan terminal units
- Fan coil units
- Recirculating pumps

Specifications

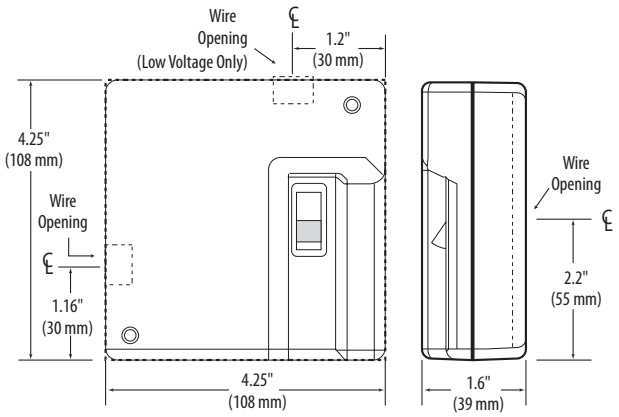
Sensor Power	Induced from monitored conductor
Frequency Range	50/60 Hz
Humidity Range	10 to 90% RH non-condensing
Temperature Range	-15 to 50 °C (5 to 122 °F)
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 closed type device listing, CAT III, Pollution Degree 2, basic insulation

c UL us LISTED

*Some models

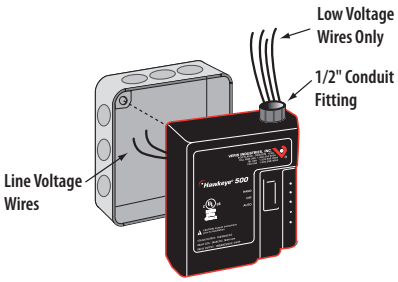
Relay Contact Ratings		
SPDT (NS) Models		
Resistive	15 A @ 277 Vac	
Motor	1 HP @ 120 Vac	
	1.5 HP @ 277 Vac	
SPST (HOA) Models		
Resistive	15 A @ 250 Vac	
Motor	1 HP @ 120 Vac	
Typical Coil Performance		
Voltage	AC	DC
24 V	36 mA	36 mA

Dimensional Drawing



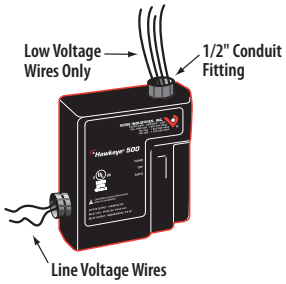
Mounts Directly on 4-Gang Junction Box

Mounting Options

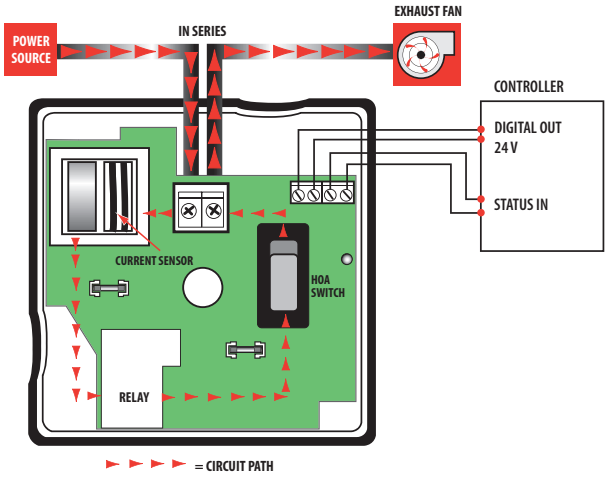


Mounts Directly on Wall or Panel

Mounting Options

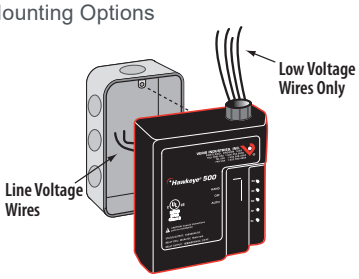


Wiring Diagram

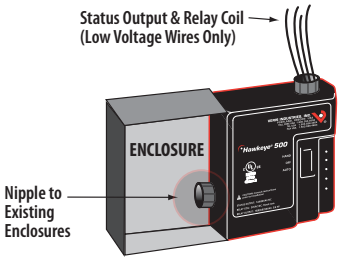


Mounts Directly on 2-Gang Junction Box

Mounting Options



Enclosure Mount

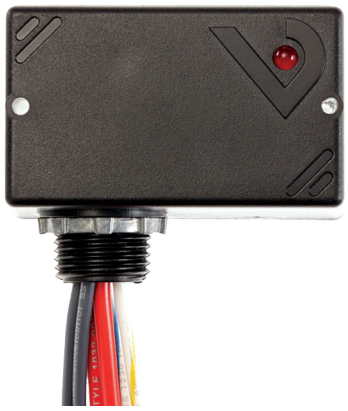


Ordering Information

Model	Amperage Range	Status Output	Trip Point	Relay	Relay Coil	HOA Switch	Status LEDs	Relay Power LED	UL
H535	0.25 to 15A	Relay Only		SPST, Field-Selectable N.O/N.C.	24 Vac/dc	•		•	•
H535NS	0.25 to 15 A	Relay Only		SPDT				•	•
H540	0.25 to 15 A	N. O., 1.0 A @ 30 Vac/dc	0.25 A or Less, Fixed	SPST, Field-Selectable N.O/N.C		•		•	•
H540NS	0.25 to 15 A	N. O., 1.0A @ 30 Vac/dc	0.25 A or Less, Fixed	SPDT				•	•
H548	0.5 to 15 A	N. O., 1.0A @ 30 Vac/dc	0.5 A or Less, Adjustable	SPST, Field-Selectable N.O/N.C		•	•	•	•
H548NS	0.5 to 15 A	N. O., 1.0 A @ 30 Vac/dc	0.5 A or Less, Adjustable	SPDT			•	•	•

H120 Series

SPST Status Relay with Integral Current Switch from Veris



2-in-1

Current switch and relay are in series…connect the contacts to the load and your current switch is automatically installed

HP ratings

HP ratings make the H120 ideal for control and status of fractional HP motors

Nipple mount

The nipple mount housing can be connected to any 1/2” conduit knockout for installation versatility

0.1A turn-on

Easily monitors the smallest loads

Relay coil LED

Relay coil LED streamlines job commissioning and check out

NEMA 1 rated

NEMA 1 rated housing may be used in plenum spaces

The Veris H120 and H120NC offer a fixed current switch and SPST relay in a single externally mounted housing. Combining the current sensor and relay in one easy-to-install package eliminates the need to fit multiple devices into small electrical enclosures and simplifies the installation. Remove the labor associated with installing a separate current sensor.

Applications

- Unit ventilators
- Fan coil units
- Exhaust fans
- Fan terminal units
- Fractional HP motors
- Light resistive loads

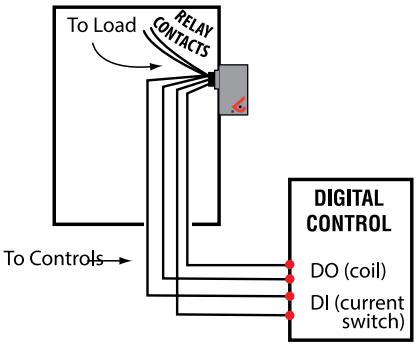
Specifications

Sensor Power	Induced from relay coil power
Operating Temperature	-15 to 60 °C (5 to 140 °F) (13.8 A max.), -15 to 50 °C (5 to 12 °F) (2 A max.)
Frequency Range	50/60 Hz
Operating Humidity	10 to 90% RH non-condensing
Expected Relay Life (mechanical)	10 million cycles
Relay Status	LED ON=energized
Lead Wire Specifications	
Lead Length	14” (356 mm) min.
Style and Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; Status: 16 AWG
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 closed type device listing, CAT III, Pollution Degree 2, basic insulation

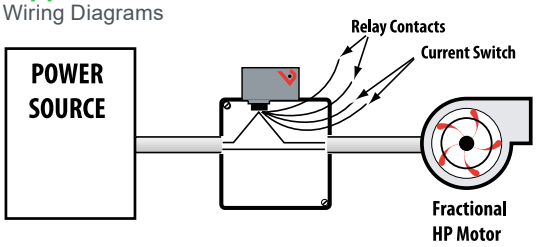
c UL us LISTED

Note: Do not use the LED status indicators as evidence of applied voltage.

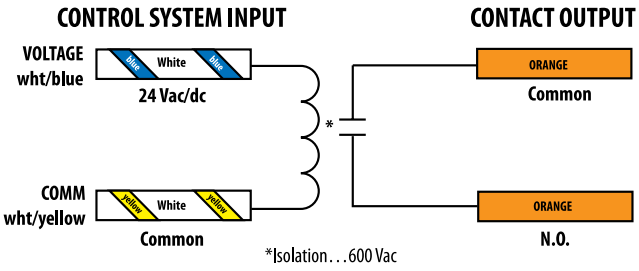
Nipple Mount Directly to a Panel
Wiring Diagrams

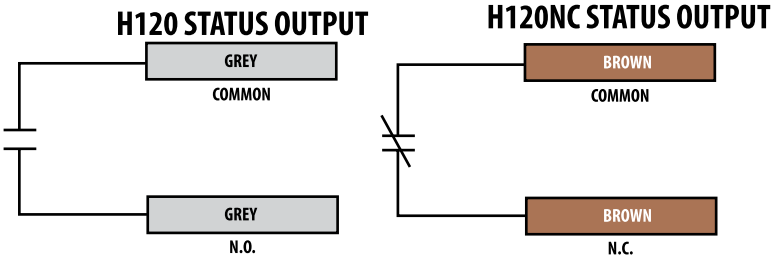


Nipple Mount to 4x Electrical Box
Wiring Diagrams

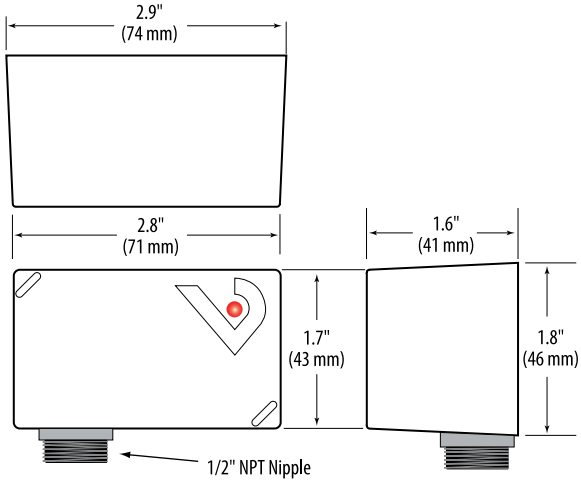


Wire Code Colors





Dimensional Drawing



Relay Contact Ratings	
Resistive	20 A (r)* @ 277 Vac/28Vdc
	(250,00 Cycles)
Motor	120 Vac, 1HP
	208 Vac, 1HP
	250 Vac, 2HP
	277 Vac, 2HP
Ballast	277 Vac, 20 A
Tungsten	120 Vac, 10 A

Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24V	75 mA	32 mA

*See operating temperature specifications

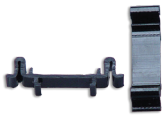
Ordering Information

Model	Amperage Range	Coil	Relay	Status Output	Trip Point	Housing	Relay Power LED	UL
H120	0.1 to 20 A	24 Vac/dc	SPST, N.O.	N.O. 100 mA @ 30 Vac/dc	0.1 A or Less	Nipple Mount	•	•
H120NC				N.C. 100 mA @ 30 Vac/dc			•	•

Accessories Selection Guide: Current Monitoring

Product	Description	Hx00	Hx08 & H701	Hx09	Hx06	H11D	H10F	H614	H904, H934, H720	H6ECM	Hx30/40/50	H735, Hx38, Hx48, Hx58	Hx39, Hx49, Hx59	H721xC & H921	Hx21 & Hx21SP	Hx22	H723xC & H923	H931 & H 951	H932 & H952	H971 & EA20
AH01	DIN Rail Clip Set	•[1]	•[1]	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
AH06	CT Mounting Brackets														•					
AH27	DIN Rail Clip Set	•[2]	•[2]																	
AV01	35 mm DIN Rail - 1 Meter Length	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
AV02	DIN Rail Stop Clip	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•

1. For H6xx, H8xx, H9xx.
2. For H3xx.

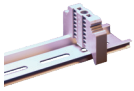


AH01
DIN Rail Clip Set

AH06
CT Mounting Brackets

AH27
DIN Rail Clip Set

AV01
35 mm DIN Rail - 1 Meter Length



AV02
DIN Rail Stop Clip

Relays

Schneider Electric offers a complete line of relays for motor control, relay logic and other automation system applications, including nipple mount, DIN mount and other options.

Model	Description	Page
V100/200	10 A SPDT Enclosed Relay10 A@277 Vac, 28 Vdc	249
V101/102/103 and V201	10 A SPST Enclosed Relay with HOA Switch 10 A@250 Vac or 277 Vac	251
V300/400	10 A DPDT Enclosed Relay10 A@277 Vac, 30 Vdc	253
V120/V220	20 A SPDT Enclosed Relay 20 A@277 Vac, 28 Vdc	255
V121/122/123 and V221/222/223	20 A SPST Enclosed Relay with HOA Switch 20 A@240 Vac, 8 A@28 Vdc	257
V320/V420	20 A DPDT Enclosed Relay 20 A@277 Vac, 28 Vdc	259
V321/V421	20 A DPST Enclosed Relay with HOA Switch 20 A@240 Vac or 8 A@240 Vdc	261
V645	10 A SPDT Enclosed Mini Command Relay 10 A@250 Vac N.O., 7 A@250 Vac N.C.	263
VMD1B	Socket SPDT Relays	265
VMD2B	Socket DPDT Relays	267
VMD3B	Socket 3PDT Relays	269
VMD4B	Socket 4PDT Relays	271
VS861	Solid State Relays	273
VTD	Time Delay Relays	275

Relay Selection Guide

Relays and Sockets

	Nipple Mount	Socket Mount	DIN Mount
SPDT, 10A	V100*/V200* page 249	VMB1B-S* (3A) page 265	V645, VMB1B-S* (3A) page 263, page 265
SPDT, 20A	V120/V220 page 255	VMD1B-C*/VMD1B-F* page 265	VMD1B-C*/VMD1B-F* page 265
DPDT, 10A	V300/V400 page 253	VMD2B-S* page 267	VMD2B-S* page 267
DPDT, 20A	V320/V420 page 259	VMD2B-C*/VMD2B-F* page 267	VMD2B-C*/VMD2B-F* page 267
3PDT, 15A		VMD3B-C*/VMD3B-F* page 269	VMD3B-C*/VMD3B-F* page 269
4PDT, 15A		VMD4B-C*/VMD4BF* page 271	VMD4B-C*/VMD4BF* page 271
Time Delay, 12A		VTD2P-F50 page 275	VTD1P-UNI/VTD2P-UNI page 275
Solid State, 8A			VS861* page 273

* Indicates a series of products.

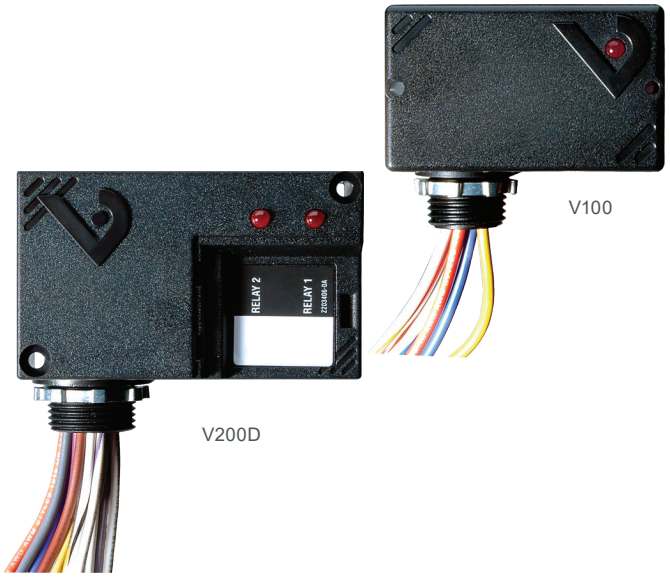
Relays with HOA Switch

	No HOA Monitoring	Resistive HOA Monitoring	Digital HOA Monitoring
SPST, 10A	V101*/V201* page 251	V102 page 251	V103 page 251
SPST, 20A	V121/V221 page 257	V122/V222 page 257	V123/V223 page 257
DPST, 20A	V321/V421 page 259		

* Indicates a series of products.

Victory 100 & 200 Series

Great for External Mount Applications from Veris



Veris Victory 100 and 200 Series 10 A enclosed relays are pilot-duty relays in an easy-to-use nipple mount enclosure. The V100/V200 Series provide quick relay mounting without a dedicated field enclosure, making them ideal for retrofit projects. Field-selectable high and low voltage coil inputs provide on-site versatility.

Specifications

Operating Humidity Range	10 to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Insulation Class	600 Vac RMS
Operating Temperature Range	
V100, V100DC, V200	-34 to 60 °C (-29 to 140 °F)
V100D, V200D	-40 to 55 °C (-40 to 131 °F)
Wire Specifications	
Lead Length	14” (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508

c UL us LISTED
E150462

Sleek enclosure

Reduces the need for panel space

UL508 Listed

Designed and listed for field installation…makes electrical inspection a snap

Nipple mount

Victory Series products can be mounted to any electrical enclosure, easing installation

Eliminate conduit

Run low voltage instead of line voltage…eliminates conduit in some applications

Flexible wire

Flexible tinned stranded wire… fits easily in tight spaces, provides secure connections to wire nuts

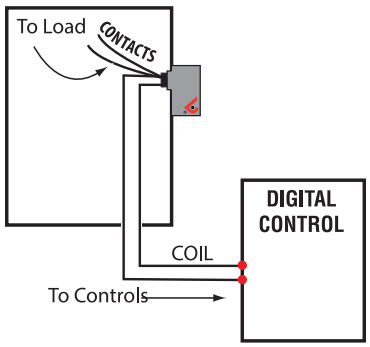
Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

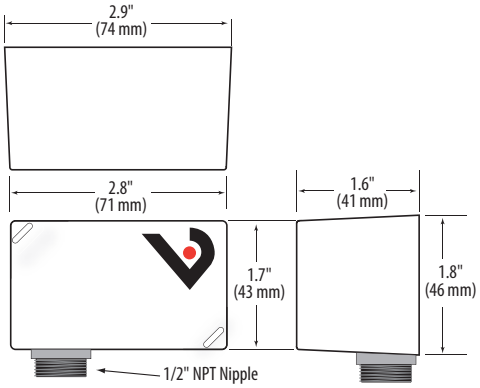
Typical Coil Performance		
Pull in Voltage	AC	DC
10 to 30 V	8	9
120 V	78	
208 to 277 V	154	
Drop Out Voltage		
10 to 30 V	2	3
120 V	18	
208 to 277 V	36	
Voltage	Coil Current	
	AC	DC
10 V	25 mA	14 mA
12 V	25 mA	14 mA
24 V	31 mA	16 mA
30 V	39 mA	18 mA
120 V	22 mA	
208 V	19 mA	
277 V	25A	

Contact Ratings	
Resistive	10 A @ 277 Vac, 28 Vdc
Motor	120 Vac, 1/3 HP N.O. & 1/6 HP N.C.
	240 Vac, 1/3 HP N.O. & 1/6 HP N.C
	277 Vac, 1/4 HP N.O. * 1/8 HP N.C.
Pilot Duty	277 Vac (1.7 A), 480 VA N.O.
Ballast	277 Vac, 1.7 A
Tugsten	120 Vac, TV3 N.O. TV2 N.C.
Gold Flash	yes

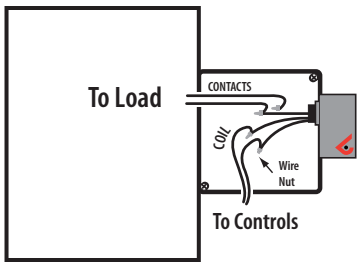
Nipple Mount Directly to a Panel
Wiring Diagram



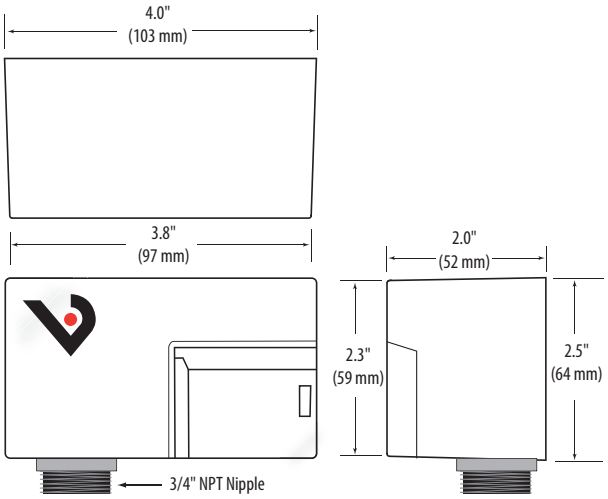
V100/V100DC/V200
Dimensional Drawing



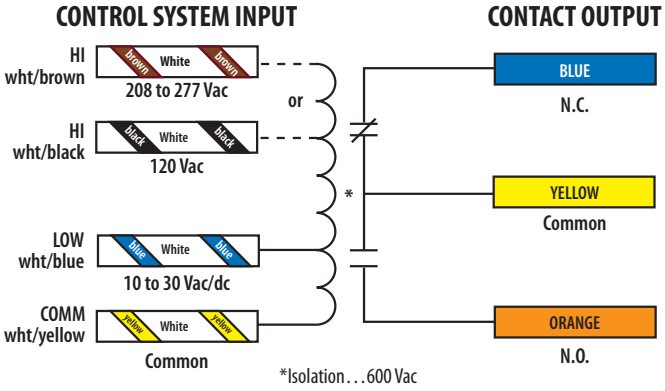
Nipple Mount to Any 2x or 4x Electrical Box
Wiring Diagram



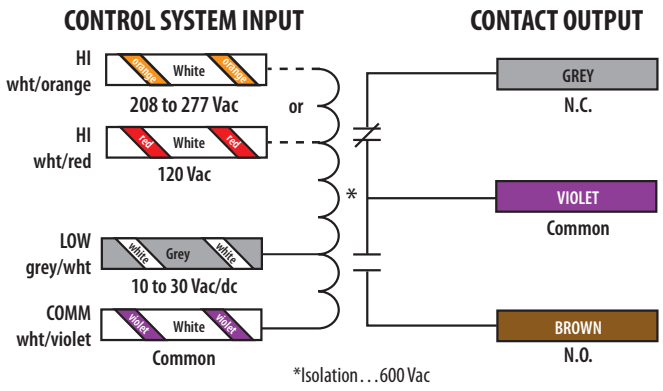
V100D/V200D
Dimensional Drawing



Primary
Wire Color Codes



Relay 2 on V100D and V200D Only
Wire Color Codes

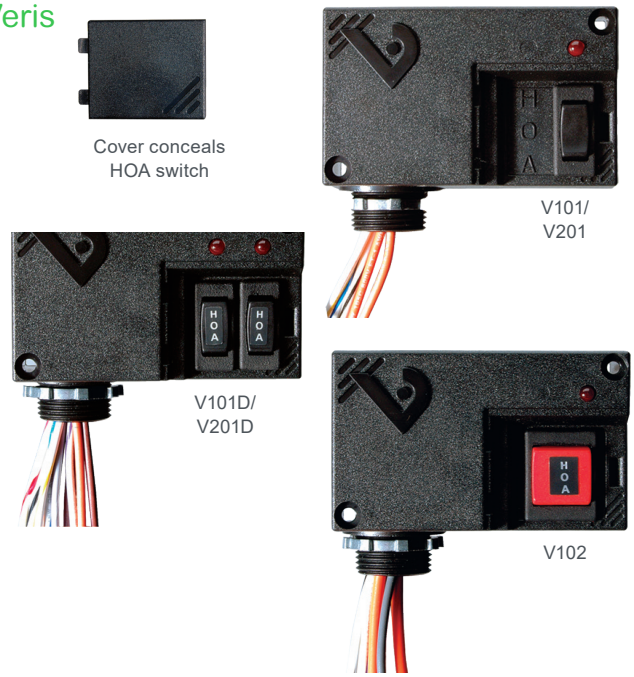


Ordering Information

Model	Relay	Coil	Amperage Rating	Relay Power LED	UL
V100	SPDT	10 to 30 Vac/dc, 120 Vac	10 A	•	•
V100D	2x SPDT	10 to 30 Vac/dc, 120 Vac		•	•
V100DC	SPDT	10 to 30 Vdc		•	•
V200	SPDT	10 to 30 Vac/dc, 208 to 277 Vac		•	•
V200D	2x SPDT	10 to 30 Vac/dc, 208 to 277 Vac		•	•

Victory 101, 102, 103 & 201 Series

Relays with HOA Switches for Local Control from Veris



With a concealed HOA switch for local control and troubleshooting, the Veris Victory 101, 102, and 103 Series relays provide HOA flexibility while limiting unauthorized switch manipulation. To further guard against control system override, some relays are equipped with a monitored HOA.

The V102 provides a two-wire resistive output and the V103 offers a three-wire digital monitor. Now your customers and technicians can enjoy the benefit of local control without the problems often caused by override.

Specifications

Operating Temp Range	-40 to 55 °C (-40 to 131 °F)
Operating Humidity Range	10 to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Insulation Class	600 Vac RMS
Wire Specifications	
Lead Length	14” (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG; HOA monitor wires: 16 AWG
V102 Resistive Monitor Maximums	
Voltage Max.	13.4 Vac/dc
Current Max.	4mA AC/DC
V103 Digital Monitor Maximums	
Dry Circuit Contact Rating (Max.)	24 Vac/dc@100 mA
Warranty	
Limited Warranty	5 years

Nipple mount

Can be mounted to any electrical enclosure, easing installation

Flexible wire

Flexible tinned stranded wire… fits easily in tight spaces, provides secure connections to wire nuts

Protective cover

Conceals and protects the HOA switch, reducing the likelihood of tampering

UL508 Listed

Designed and listed for field installation…makes electrical inspection a snap

Sleek enclosure

Reduces the need for panel space

Switch position monitors

Allows the control system to notify personnel when a load is inadvertently left ON or OFF (V102 and V103 models)

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

Typical Coil Performance		
Pull in Voltage	AC	DC
10 to 30 V	8	9
120 V	78	
208 to 277 V	154	
Drop Out Voltage		
10 to 30 V	2	3
120 V	18	
208 to 277 V	36	
Voltage	Coil Current	
	AC	DC
10 V	25 mA	14 mA
24 V	31 mA	16 mA
30 V	39 mA	18 mA
120 V	22 mA	
208 V	19 mA	
277 V	25A	

Contact Ratings	
V101, V201, V101D*, V201D*	
Resistive	10 A @ 250 Vac
Motor	1/3 HP @ 120Vac
Gold Flash	Yes
V101, V201, V101D*, V201D*	
Resistive	10 A @ 277 Vac
Motor	1/3 HP @ 240 Vac
Gold Flash	Yes

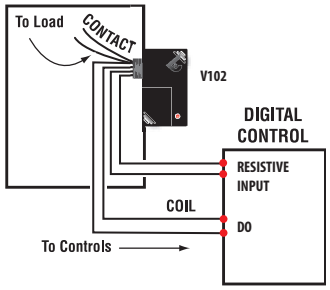
*each relay

Agency Approvals

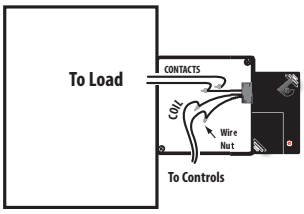
Agency Approvals	UL 508

c UL us LISTED E150462

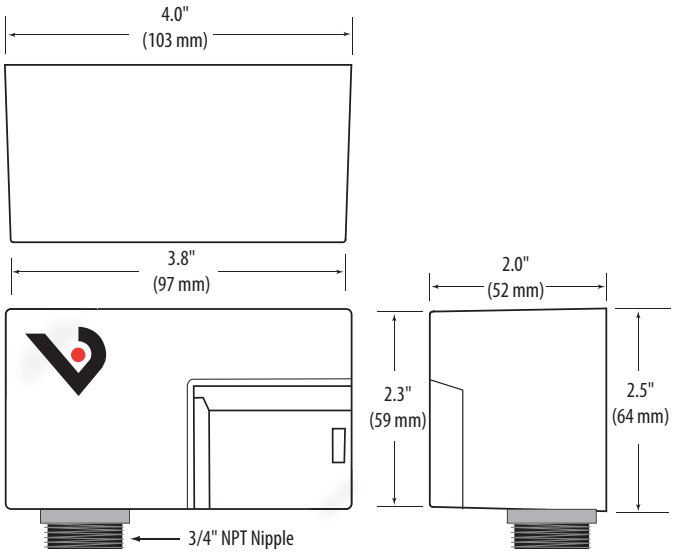
Nipple Mount Directly to a Panel
Wiring Diagram



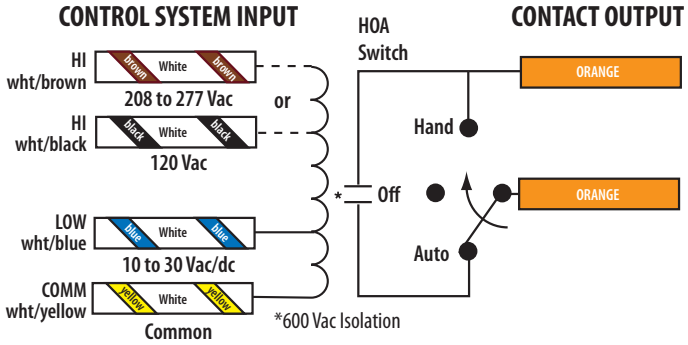
Nipple Mount to Any 2x or 4x Electrical Box
Wiring Diagram



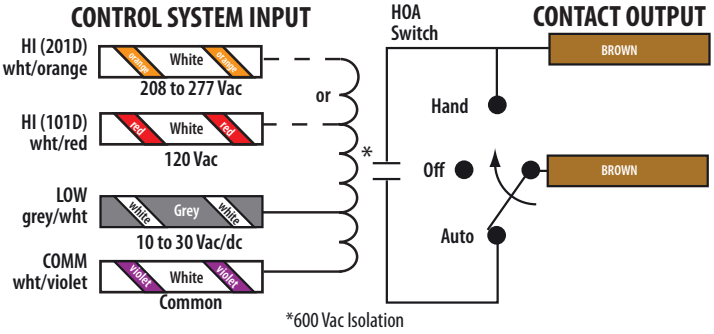
Dimensional Drawing



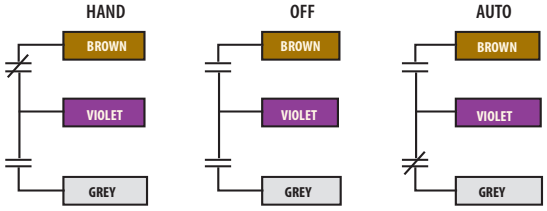
Primary
Wire Color Codes



Relay #2 for V101D/V201D Only
Wire Color Codes



V103 Digital HOA Position Monitor
Wire Color Codes

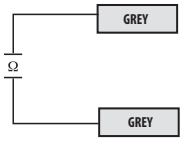


Switch Positions:
HAND = Brown wire closed to Common
OFF = Both wires open to Common
AUTO = Grey wire closed to Common
VIOLET = Common

V102 Resistive HOA Position Monitor

Switch Positions:
HAND ~ 1.4 kΩ
OFF ~ 6.2 kΩ
AUTO ~ 3.4 kΩ

Cable Faults:
OPEN = Infinite Ω
SHORT ~ 0 Ω



Ordering Information

Model	Relay	Coil	Amperage Rating	HOA	HOA Monitor	Relay Power LED	UL
V101	SPST, N.O.	10 to 30 Vac/dc, 120 Vac	10 A	•	None	•	•
V101D	2x SPST, N.O.	10 to 30 Vac/dc, 120 Vac		•	None	•	•
V102	SPST, N.O.	10 to 30 Vac/dc, 120 Vac		•	Resistive	•	•
V103	SPST, N.O.	10 to 30 Vac/dc, 120 Vac		•	Digital	•	•
V201	SPST, N.O.	10 to 30 Vac/dc, 208 to 277 Vac		•	None	•	•
V201D	2x SPST, N.O.	10 to 30 Vac/dc, 208 to 277 Vac		•	None	•	•

Victory 300 & 400

DPDT Relays Provide Versatility from Veris

The Veris Victory 300 and 400 Series 10A DPDT pilot duty enclosed relays combine industrial strength and ease of use. The nipple mount enclosure makes installation easy. With no need for a dedicated field enclosure, they are the ideal retrofit devices. One coil input controls the state of two pilot rated contacts for the simultaneous control of two devices or both poles of a single-phase circuit, e.g. motor loads. Field-selectable high and low voltage coil inputs provide on-site versatility.

Nipple mount

Can be mounted to any electrical enclosure, easing installation

Flexible wire

Flexible tinned stranded wire… fits easily in tight spaces and provides secure connections to wire nuts

Sleek enclosure

Reduces the need for panel space

UL508 Listed

Designed and listed for field installation…makes electrical inspection a snap

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

Contact Ratings	
Resistive	10 A total of both poles, 250 Vac & 28 Vdc
Motor	1/8 HP @ 120 Vac

Specifications

Operating Temp Range	-34 to 60 °C (-29 to 140 °F)
Operating Humidity Range	10 to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Insulation Class	600 Vac RMS
Wire Specifications	
Lead Length	14” (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508

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Life Is On | Schneider Electric

Schneider Electric
800 Federal Street
Andover, MA 01810 USA

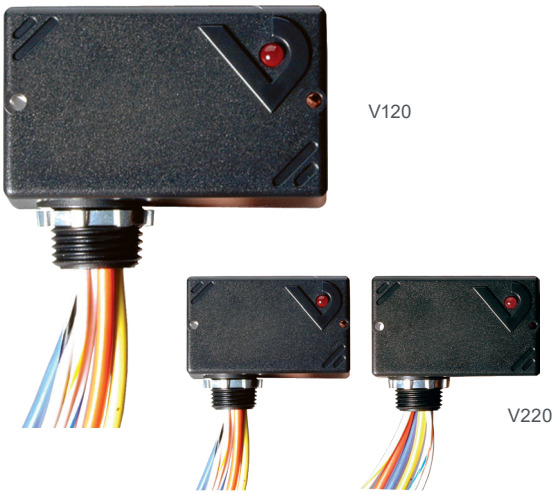
Phone: 1-888-444-1311
www.se.com

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.

F-28296-5
August 2024

Victory 120 & 220

Great for External Mount Applications from Veris



Nipple mount

Can be mounted to any electrical enclosure, easing installation

Flexible wire

Flexible tinned stranded wire… fits easily in tight spaces and provides secure connections to wire nuts

HP ratings

Ideal for control of fractional HP motors

UL508 Listed

Designed and listed for field installation…makes electrical inspection a snap

Sleek enclosure

Reduces the need for panel space

The Veris Victory 120 and 220 20 A SPDT enclosed relays combine a power duty relay with a high level of field-selectability and versatility. The devices are quick and easy to install using the threaded nipple mount. With no need for a dedicated field enclosure, this series is ideal for retrofit projects.

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

Specifications

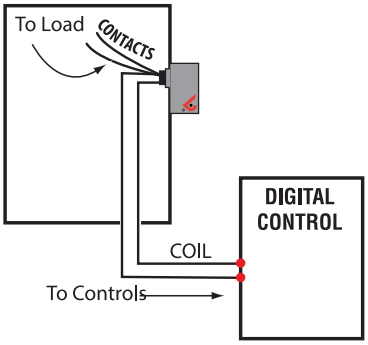
Operating Temp. Range	-34 to 55 °C (-29 to 131 °F)
Operating Humidity Range	10 to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Insulation Class	600 Vac RMS
Wire Specifications	
Lead Length	14” (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508

c UL us LISTED E150462

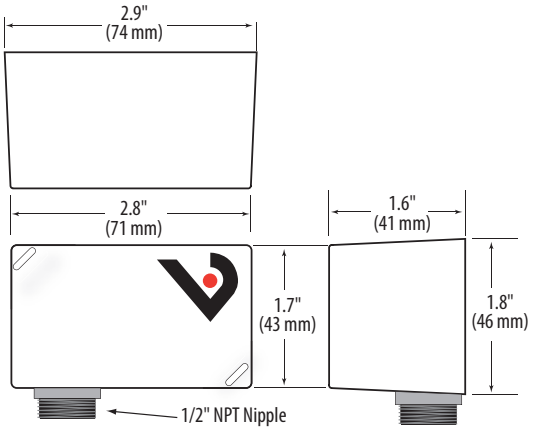
Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24 V	75 mA	32 mA
120 V	42 mA	
208 V	36 mA	
277 V	49 mA	

Contact Ratings	
Resistive	20 A @ 277 Vac, 28 Vdc
Motor	120 Vac, 1 HP
	277, 2 HP
Pilot Duty	A300
Ballast	277 Vac, 20 A N.O.
	277 Vac, 10 A N.O.
Tungsten	120 Vac, 10 A N.O.
	120 Vac, 2 A N.O.

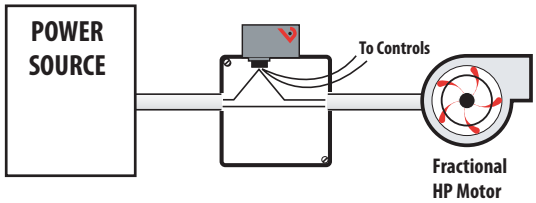
Nipple Mount Directly to a Panel
Wiring Diagram



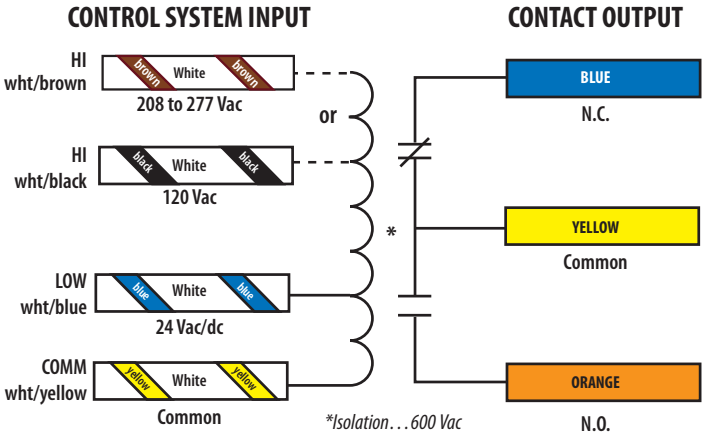
Dimensional Drawing



Nipple Mount to a 4x Electrical Box
Wiring Diagram



Wire Color Codes

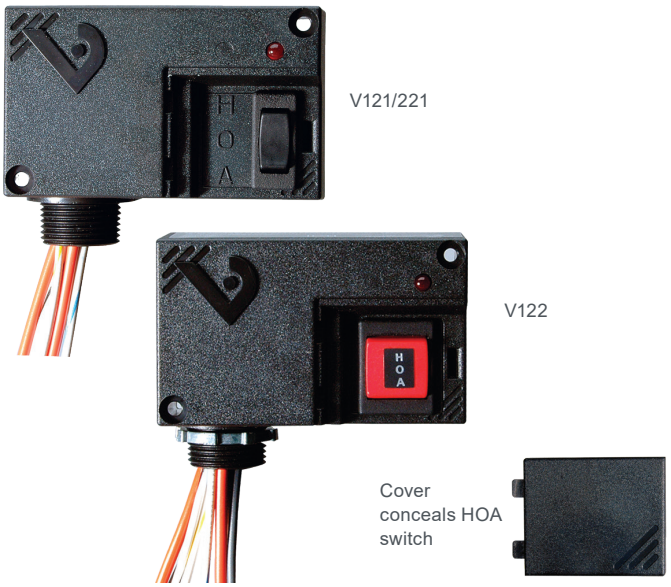


Ordering Information

Model	Relay	Coil	Amperage Rating	Relay Power LED	UL
V120	SPDT	24 Vac/dc, 120 Vac	20 A	•	•
V220		24 Vac/dc, 208 to 277 Vac		•	•

Victory 121, 122, 123 & 221 Series

HOA Switch Provides Local Control from Veris



Protective cover

Conceals and protects the HOA switch, reducing the likelihood of tampering

Flexible wire

Flexible tinned stranded wire… fits easily in tight spaces and provides secure connections to wire nuts

Nipple mount

Allows the V121 Series to be mounted to any electrical enclosure easing installation

UL508 Listed

Designed and listed for field installation…makes electrical inspection a snap

Switch position monitors

Allows the control system to notify personnel when a load is inadvertently left ON or OFF (V122 & V123 models)

Sleek enclosure

Reduces the need for panel space

The Veris Victory 121, 122, and 123 Series HOA relays have a concealed HOA switch for local control and troubleshooting with limited unauthorized switch manipulation. To further guard against control system override, the V122 and V123 are equipped with a monitored HOA. The V122 provides a two-wire resistive output and the V123 offers a three-wire digital monitor. Now you can enjoy the convenience of local control with none of the drawbacks.

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

Specifications

Operating Temp. Range	-40 to 60 °C (-40 to 131 °F)
Operating Humidity Range	10 to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Insulation Class	277 Vac RMS
Wire Specifications	
Lead Length	14” (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; HOA monitor wires: 16 AWG
V122/V222 Resistive Monitor Maximums	
Voltage Max.	13.4 Vac/dc
Current Max.	4 mA AC/DC
V123/V223 Digital Monitor Maximums	
Dry Circuit Contact Rating (Max.)	24 Vac/dc@100 mA
Warranty	
Limited Warranty	5 years

Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24 V	75 mA	32 mA
120 V	42 mA	
208 V	36 mA	
277 V	39 mA	

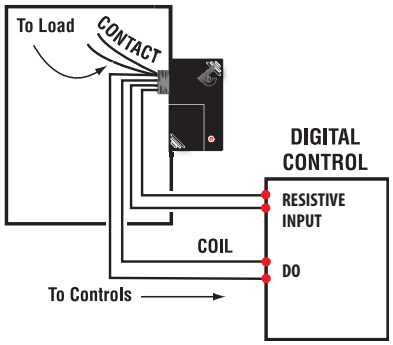
Contact Ratings	
V121, V221	
Resistive	20 A @ 240 Vac
	8 A @ 28 Vdc
	12 A @ 14 Vdc
Motor	1 HP ! 120 Vac
V122, V123	
Resistive	20 A @ 240 Vac
	8 a @ 28 Vdc
	14 A @ 14 Vdc
Motor	1 HP @ 250 Vac

Agency Approvals

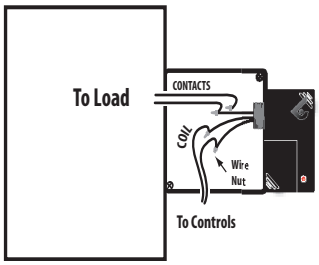
Agency Approvals	UL 508

c UL us LISTED E150462

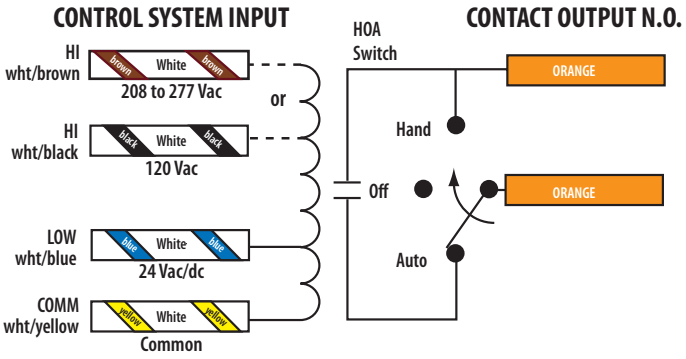
Nipple Mount Directly to a Panel
Wiring Diagram



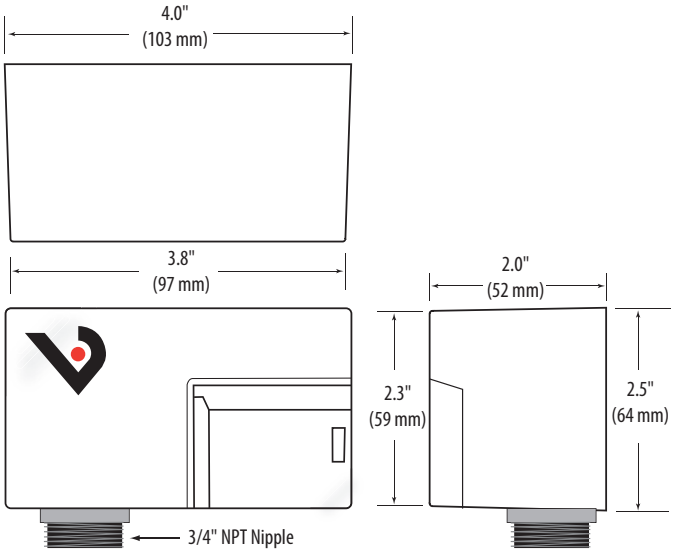
Nipple Mount to Any 2x or 4x Electrical Box
Wiring Diagram



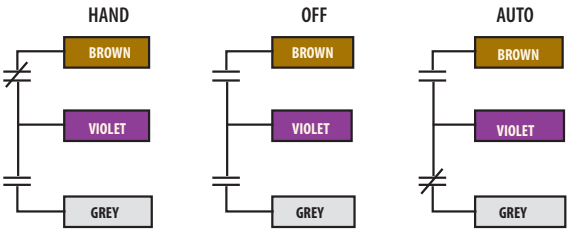
Wire Color Codes



Dimensional Drawing



V123 Digital HOA Position Monitor

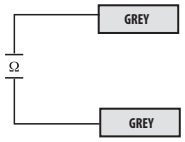


Switch Positions:
HAND = Brown wire closed to Common
OFF = Both wires open to Common
AUTO = Grey wire closed to Common
VIOLET = Common

V122 Resistive HOA Position Monitor

Switch Positions:
HAND ~ 1.4 kΩ
OFF ~ 6.2 kΩ
AUTO ~ 3.4 kΩ

Cable Faults:
OPEN = Infinite Ω
SHORT ~ 0 Ω

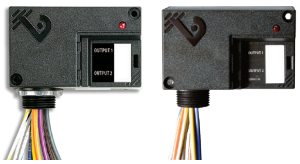


Ordering Information

Model	Relay	Coil	Amperage Rating	HOA	HOA Monitor	Relay Power LED	UL
V121	SPST, N.O.	24 Vac/dc, 120 Vac	20 A	•	None	•	•
V122		24 Vac/dc, 120 Vac		•	Resistive	•	•
V123		24 Vac/dc, 120 Vac		•	Digital	•	•
V221		24 Vac/dc, 208 to 277 Vac		•	None	•	•

Victory 320 & 420

DPDT Relays Provide Versatility from Veris



V320

V420

Sleek enclosure

Reduces the need for panel space

Flexible wire

Flexible tinned stranded wire… fits easily in tight spaces and provides secure connections to wire nuts

Nipple mount

Can be mounted to any electrical enclosure, easing installation

UL508 Listed

Designed and listed for field installation…makes electrical inspection a snap

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

The Veris Victory 320 and 420 DPDT power duty enclosed relays combine industrial strength and ease of use. With the nipple mount enclosure, installation could not be easier. The V320/V420 need no dedicated field enclosure, so they are the ideal retrofit devices. One coil input controls the state of two power rated contacts for the simultaneous control of two devices or both poles of a single-phase circuit, e.g. motor loads. Field-selectable high and low voltage coil inputs provide on-site versatility.

Specifications

Operating Temp Range	-40° to 40°C (-40° to 104°F)
Operating Humidity Range	10 to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Insulation Class	277 Vac RMS
Wire Specifications	
Lead Length	14” (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; HOA monitor wires: 16 AWG
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508

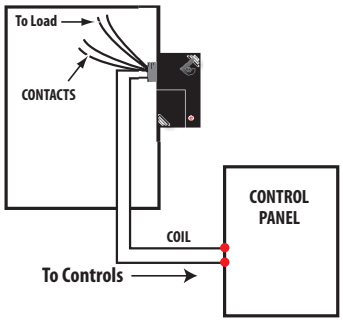
c UL us
LISTED
E150462

Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24 V	150 mA	64 mA
120 V	84 mA	
277 V	102 mA	

Contact Ratings	
Resistive	20 A @ 277 Vac, 28 Vdc
Motor	120 Vac, 1 HP
	277 Vac, 2 HP
Pilot Duty	A300
Ballast	20 A @ 277 Vac N.O.
	10 A @ 277 Vac N.C.
Tungsten	10 A @ 120 Vac N.O.
	2 A @ 120 Vac N.C.

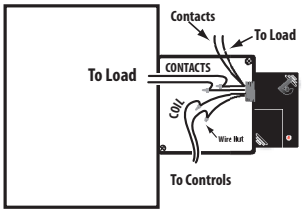
Nipple Mount Directly to a Panel

Wiring Diagram

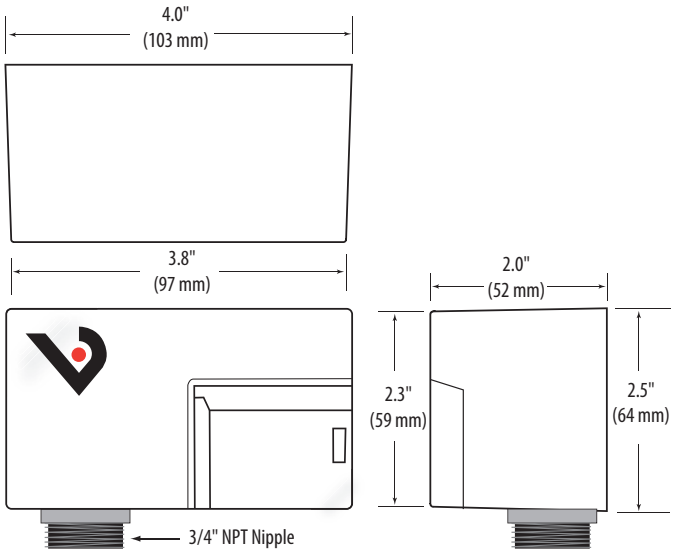


Nipple Mount to Any 2x or 4x Electrical Box

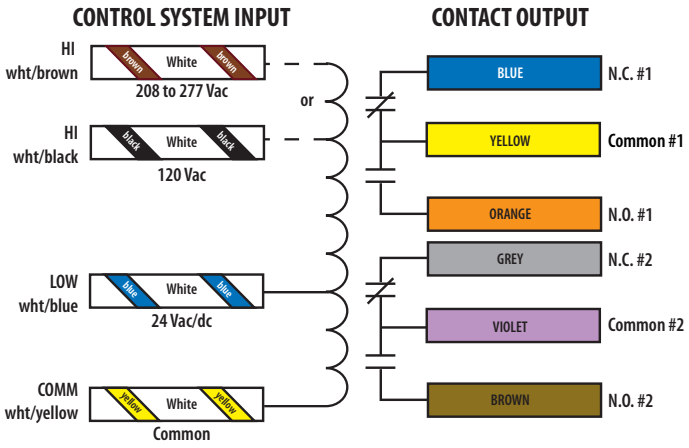
Wiring Diagram



Dimensional Drawing



Wire Color Codes

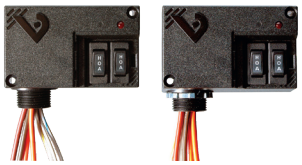


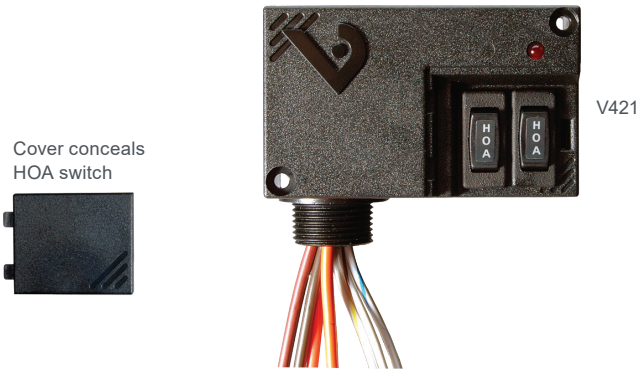
Ordering Information

Model	Relay	Coil	Amperage Rating	Relay Power LED	UL
V320	DPDT	24 Vac/dc,120 Vac	20 A	•	•
V420		24 Vac/dc, 208 to 277 Vac		•	•

Victory 321 & 421

HOA Switch Provides Local Control from Veris





Nipple mount

Can be mounted to any electrical enclosure, easing installation

Flexible wire

Flexible tinned stranded wire… fits easily in tight spaces and provides secure connections to wire nuts

Versatile ratings

Versatile coil and contact ratings minimize the number of models to choose

UL508 Listed

Designed and listed for field installation…makes electrical inspection a snap

Protective cover

Conceals and protects the HOA switch, reducing the likelihood of tampering

Sleek enclosure

Reduces the need for panel space

The Veris Victory 321 and 421 DPST power duty enclosed relays combine an industrial strength relay with installation flexibility. Use the nipple mount to attach to any enclosure. One coil input controls the state of two power rated contacts for simultaneous control of two devices or both poles of a single phase load. Each output is enabled with a Hand-Off-Auto switch for local control. The Victory series does not require a dedicated field enclosure, so it is ideal for retrofit projects. Field-selectable high and low voltage coil inputs provide on-site versatility.

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

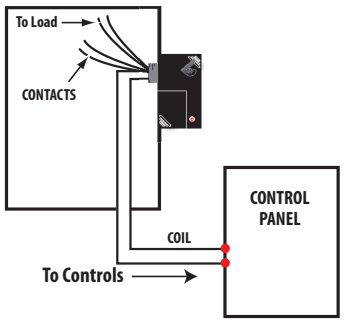
Specifications

Operating Temp. Range	-40 to 40 °C (-40 to 104 °F)
Operating Humidity Range	10 to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Insulation Class	277 Vac RMS
Wire Specifications	
Lead Length	14” (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; HOA monitor wires: 16 AWG
WARRANTY	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508

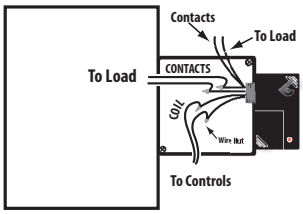
c UL us LISTED E150462

Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24 V	120 mA	64 mA
120 V	84 mA	
277 V	102 mA	
Contact Ratings		
Resistive	20 A @ 240 Vac	
	8 A @ 28 Vac	
	14 A @ 14 Vac	
Motor	120 Vac, 1 HP	

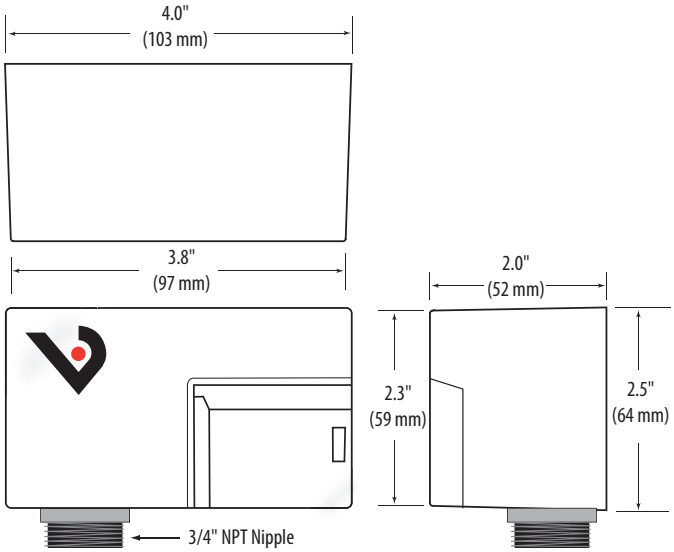
Nipple Mount Directly to a Panel
Wiring Diagram



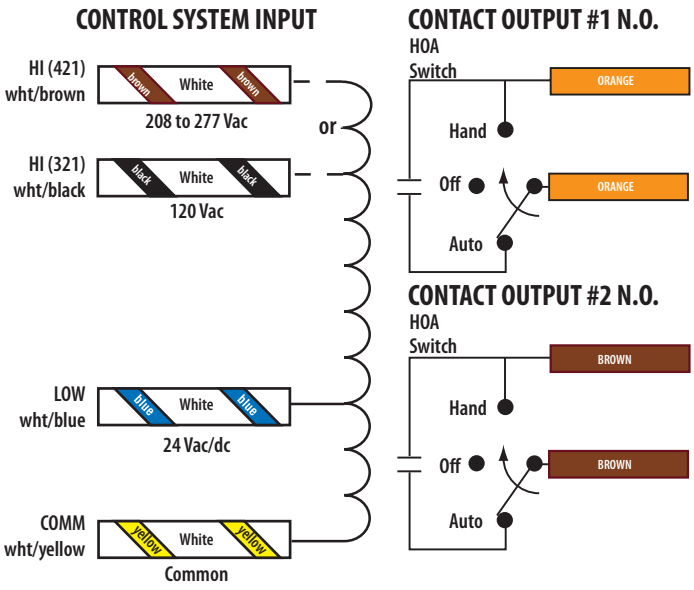
Nipple Mount to Any 2x or 4x Electrical Box
Wiring Diagram



Dimensional Drawing



Wire Color Codes



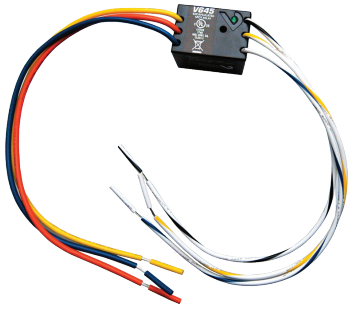
Ordering Information

Model	Relay	Coil	Amperage Rating	HOA	Relay Power LED	UL
V321	DPST	24 Vac/dc,120 Vac	20 A	•	•	•
V421		24 Vac/dc, 208 to 277 Vac		•	•	•

Victory 645

10 A Relay in a Small Package for Tight Spaces from Veris

V645



The Veris Victory 645 is an economical, multi-purpose relay designed for control of loads up to 10 A. Its small size allows for space saving utility in panels and field enclosures.

Economical

Economical multi-voltage relay

Switching

Switch up to 10 A@250 Vac

Flexible

24 to 30 Vac/dc or 120 Vac coil input provides application flexibility

Mounting options

Ships with foam tape, mounting screw, and DIN rail clip

Easy diagnostics

Status LED for visual indication

Applications

- Sense voltages for alarm conditions
- Relay logic
- Isolation
- For start/stop of small motors & contactors
- Device interlocking

Specifications

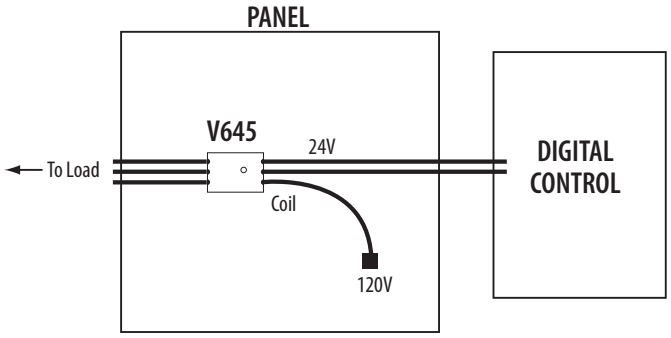
Operating Temp. Range	0 to 60 °C (32 to 140 °F)
Operating Humidity Range	10% to 90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON = Energized
Dielectric Strength	1500 Vac RMS
Wire Specifications	
Lead Length	10” (254 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG
WARRANTY	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508

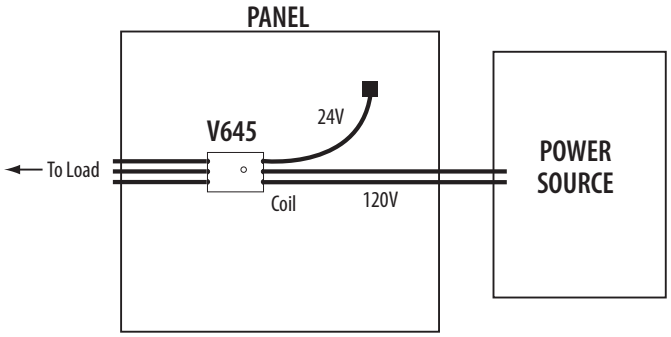
c UL us LISTED E150462

Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24 to 30 V	32 mA	13 mA
120 V	17 mA	

Contact Ratings	
Resistive	10 A @ 250 Vac, N.O.
	7 A @ 250 Vac, N.C.
	6 A @ 277 Vac
	7 A @ 30 Vdc
Motor	125 Vac, 1/4 HP, H.P.

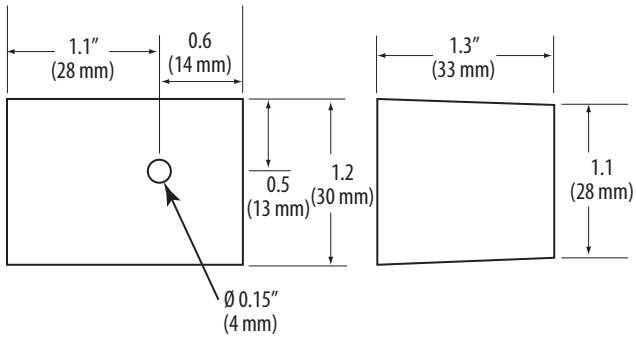
Wiring Diagrams



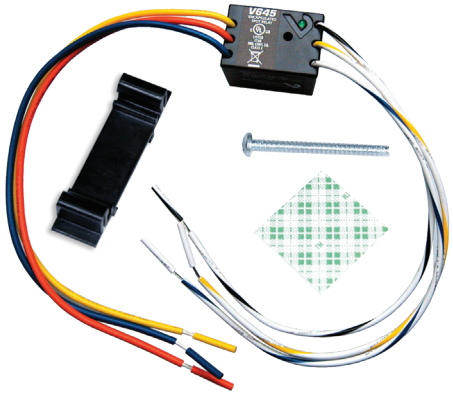


* Wire is capped on unused option.

Dimensional Drawing

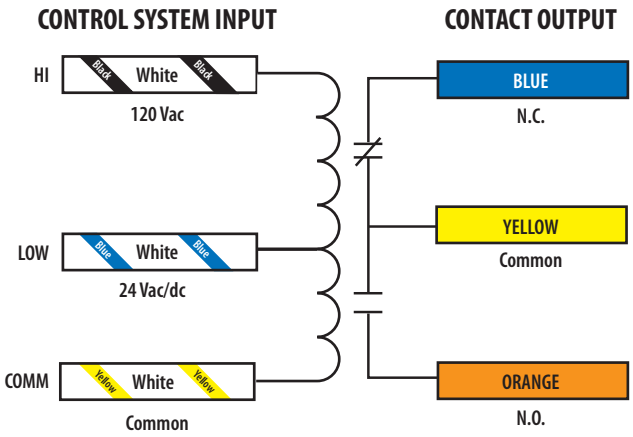


Mounting Method



The V645 comes with a DIN rail clip, screw, and foam tape for a variety of mounting methods.

Wire Color Codes

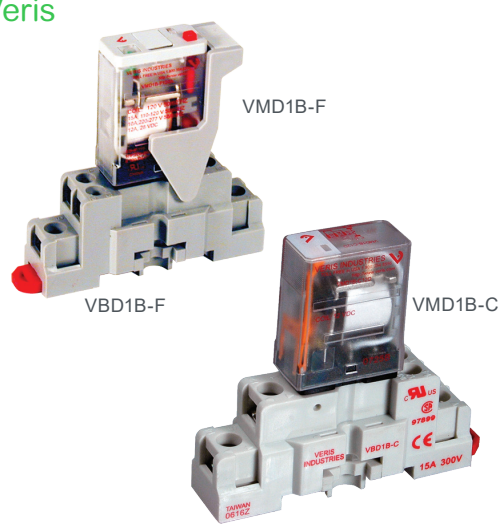


Ordering Information

Model	Relay	Coil	Amperage Rating	Relay Power LED	UL
V645	SPDT	24 to 30 Vac/dc, 120 Vac	10 A	•	•

VMD1B-C & VMD1B-F Series

Socket Relays in a Wide Range of Coil Voltages from Veris



The Veris VMD1B-C Series are SPDT blade-style relays for socket/DIN mounting. The DIN-rail compatible VBD1B-C sockets feature finger-safe terminals in a slim, attractive design.

The Veris VMD1B-F Series are full-featured SPDT blade style relays for socket/DIN mounting. The VMD1B-F Series are equipped with an LED for coil proof, a flag for contact proof, an override lever, and a push-to-test button for momentary contact control. The VMD1B-F allows for instant and conclusive troubleshooting. Never wonder if the relay, control system, or wiring is the cause of a problem. The DIN-rail-compatible VBD1B-F sockets feature a slim design with finger-safe terminals and a removable hold-down clip. Never struggle with wire clips again.

Color-coded pushbutton

Allows manual operation of relay, AC coils red or DC coils blue
(-F Series only)

Override lever

When activated, locks push-button and contacts in the powered position
(-F Series only)

LED status lamp

Shows coil “ON” or “OFF” status
(-F Series only)

Flag indicator

Shows relay status in manual or powered condition
(-F Series only)

2-way mounting

Side or DIN rail mounting system…retrofits existing panel mounting and 35 mm DIN rail

Flexible ordering

Relays and sockets sold individually or in kits

Typical Coil Performance	
	Power Consumption
AC Coils	0.9 VA
DC Coils	0.7 VA
Contact Ratings	
Standard (F & C Series)	
Resistive	15 A @ 120 Vac
	15 A @ 277 Vac
	15 A @ 28 Vdc
Motor	1/3 @ 120 Vac
	3/4 @ 277 Vac
Pilot Duty	B300

Specifications

Operating Temp. Range	-40 to 55 °C (-40 to 131 °F)
Coil Operating Range	85% to 110% of rated voltage
Coil Drop-out Voltage Threshold	15% of rated voltage
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Operating Time	20 msec typical
Dielectric Strength	1500 Vac RMS
Warranty	
Limited Warranty	5 years
Agency Approvals	

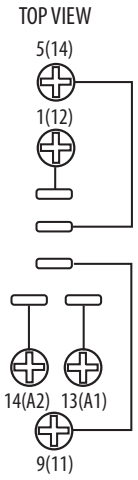
E198453

VBD1B Socket

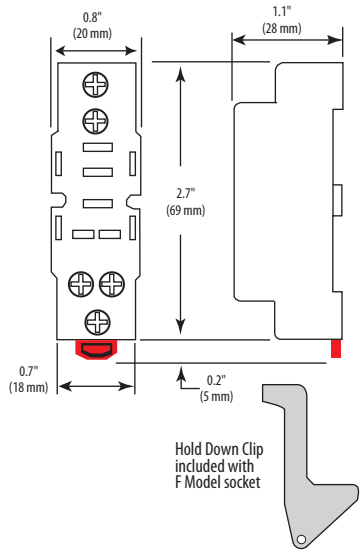
Wiring Diagram

Function	NEMA (IEC) Terminal
Coil (+)*	14 (A2)
Coil (-)*	13 (A1)
COMM	9 (11)
N.O.	5 (14)
N.C.	1 (12)

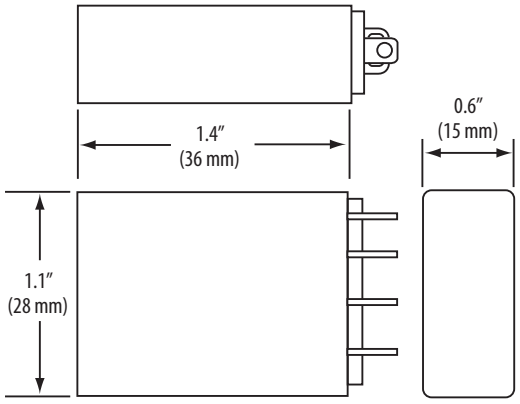
* NOTE: Observe polarity for relays with DC coil voltages only.



VMD1B Socket
Dimensional Drawing



VMD1B Relays
Dimensional Drawing



Relay Ordering Information

Model	Relay Type	Amperage Rating	Coil Voltage	Min. Switching Current	Full Featured	UL	CE
VMD1B-C12D	SPDT	15 A	12 Vdc	100 mA@5 Vdc		•	•
VMD1B-C24D		15 A	24 Vdc	100 mA@5 Vdc		•	•
VMD1B-C24A		15 A	24 Vac	100 mA@5 Vdc		•	•
VMD1B-C120A		15 A	120 Vac	100 mA@5 Vdc		•	•
VMD1B-F12D		15 A	12 Vdc	100 mA@5 Vdc	•	•	•
VMD1B-F24D		15 A	24 Vdc	100 mA@5 Vdc	•	•	•
VMD1B-F24A		15 A	24 Vac	100 mA@5 Vdc	•	•	•
VMD1B-F120A		15 A	120 Vac	100 mA@5 Vdc	•	•	•

Socket Ordering Information

Model	Amperage Rating	Voltage Rating	Finger Safe	Hold Down Clip	UL	CE
VBD1B-C	15 A	300 V	•		•	•
VBD1B-F			•	•	•	•

Relay and Socket Kit Ordering Information

Kit Model	Relay Included	Socket Included	Relay Type	Amperage Rating	Coil Voltage	Min. Switching Current	UL	CE
FKIT-VMD1B-C12D	VMD1B-C12D	VBD1B-F	1PDT	15 A	12 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD1B-C24D	VMD1B-C24D	VBD1B-F	1PDT		24 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD1B-C24A	VMD1B-C24A	VBD1B-F	1PDT		24 Vac	100 mA@5 Vdc	•	•
FKIT-VMD1B-C120A	VMD1B-C120A	VBD1B-F	1PDT		120 Vac	100 mA@5 Vdc	•	•
FKIT-VMD1B-F12D	VMD1B-F12D	VBD1B-F	1PDT		12 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD1B-F24A	VMD1B-F24A	VBD1B-F	1PDT		24 Vac	100 mA@5 Vdc	•	•
FKIT-VMD1B-F24D	VMD1B-F24D	VBD1B-F	1PDT		24 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD1B-F120A	VMD1B-F120A	VBD1B-F	1PDT		120 Vac	100 mA@5 Vdc	•	•
FKIT-VMD1B-F240A	VMD1B-F240A	VBD1B-F	1PDT		240 Vac	100 mA@5 Vdc	•	•
CKIT-VMD1B-C12D	VMD1B-C12D	VBD1B-C	1PDT		12 Vdc	100 mA@5 Vdc	•	•
CKIT-VMD1B-C24D	VMD1B-C24D	VBD1B-C	1PDT		24 Vdc	100 mA@5 Vdc	•	•
CKIT-VMD1B-C24A	VMD1B-C24A	VBD1B-C	1PDT		24 Vac	100 mA@5 Vdc	•	•
CKIT-VMD1B-C120A	VMD1B-C120A	VBD1B-C	1PDT		120 Vac	100 mA@5 Vdc	•	•

VMD2B-C & VMD2B-F Series

Socket Relays in a Wide Range of Coil Voltages from Veris

Veris VMD2B Series are DPDT blade-style relays for socket/DIN mounting.

The VMD2B-F is the full-featured model in a slim housing. The LED, the flag indicator, and the test button allow for worry-free operation and easy troubleshooting with minimal downtime. Never wonder where the problem is!

Specifications

Operating Temp. Range	-40 to 55 °C (-40 to 131 °F)
Coil Operating Range	85% to 110% of rated voltage
Coil Drop-out Voltage Threshold	15% of rated voltage
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Operating Time	20 msec typical
Dielectric Strength	1500 Vac (RMS)
Warranty	
Limited Warranty	5 years
Agency Approvals	

E198453
E150462

Color-coded push button

Allows manual operation of relay, AC coils red or DC coils blue
(-F Series only)

Override lever

When activated, locks push-button and contacts in the powered position
(-F Series only)

LED status lamp

Shows coil “ON” or “OFF” status
(-F Series only)

Flag indicator

Shows relay status in manual or powered condition (F Series only)

2-way mounting

Side or DIN rail mounting system…retrofits existing panel mounting and 35 mm DIN rail

Flexible ordering

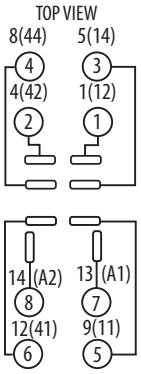
Relays and sockets sold individually or in kits

Typical Coil Performance	
	Power Consumption
AC Coils	1.2 VA
DC Coils	0.9 W
Contact Ratings	
Standard (F & C Series)	
Resistive	15 A @ 120 Vac
	12 A @ 277 Vac
	12 A @ 28 Vdc
Motor	1/2 HP @ 120 Vac
	1 HP @ 250 Vac
Pilot Duty	B300

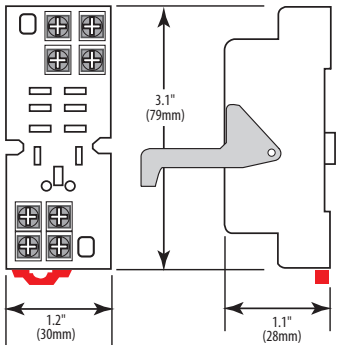
VBD2B Socket

Wiring Diagram

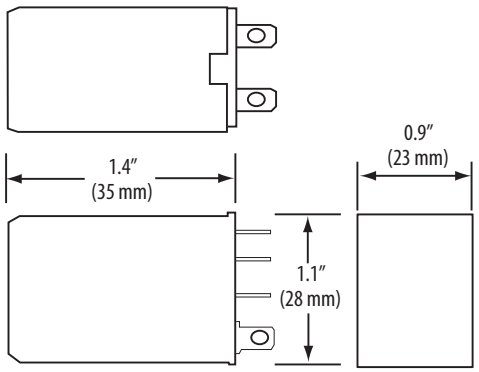
Function	Terminal	NEMA (IEC)
Coil (+)**	8	14 (A2)
Coil (-)**	7	13 (A1)
COMM1	5	9 (11)
N.O.1	3	5 (14)
N.C.1	1	1 (12)
COMM2	6	12 (41)
NO.2	4	8 (44)
N.C.2	2	4 (42)



VBD2B-F Socket
Dimensional Drawing



VMD2B Relay
Wiring Diagram



Relay Ordering Information

Model	Relay Type	Amperage Range	Coil Voltage	Min. Switching Current	Full Featured	UL	CE
VMD2B-C12D	DPDT	15 A	12 Vdc	100 mA@5 Vdc		•	•
VMD2B-C24D		15 A	24 Vdc	100 mA@5 Vdc		•	•
VMD2B-C24A		15 A	24 Vac	100 mA@5 Vdc		•	•
VMD2B-C120A		15 A	120 Vac	100 mA@5 Vdc		•	•
VMD2B-F12D		15 A	12 Vdc	100 mA@5 Vdc	•	•	•
VMD2B-F24D		15 A	24 Vdc	100 mA@5 Vdc	•	•	•
VMD2B-F24A		15 A	24 Vac	100 mA@5 Vdc	•	•	•
VMD2B-F120A		15 A	120 Vac	100 mA@5 Vdc	•	•	•
VMD2B-F240A		15 A	240 Vac	100 mA@5 Vdc	•	•	•

Socket Ordering Information

Model	Amperage Rating	Voltage Rating	Finger Safe	Hold Down Clip	UL	CE
VBD2B-F	20 A	300 V	•	•	•	•

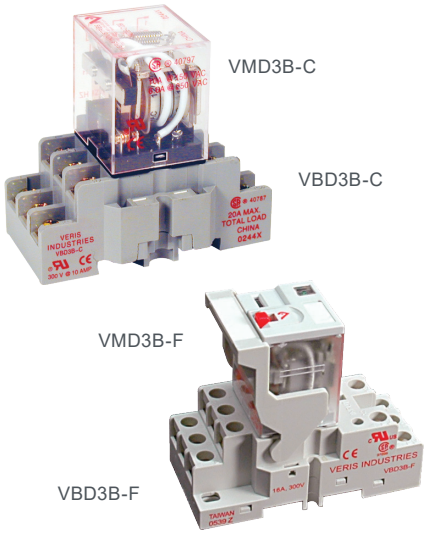
Note: When relays and sockets are used together, the amperage rating is the lesser of the two ratings.

Relay and Socket Kit Ordering Information

Kit Model	Relay Included	Socked Included	Relay Type	Amperage Range	Coil Voltage	Min. Switching Current	UL	CE
FKIT-VMD2B-C12D	VMD2B-C12D	VBD2B-F	DPDT	15 A	12 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD2B-C24D	VMD2B-C24D	VBD2B-F	DPDT		24 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD2B-C24A	VMD2B-C24A	VBD2B-F	DPDT		24 Vac	100 mA@5 Vdc	•	•
FKIT-VMD2B-C120A	VMD2B-C120A	VBD2B-F	DPDT		120 Vac	100 mA@5 Vdc	•	•
FKIT-VMD2B-F12D	VMD2B-F12D	VBD2B-F	DPDT		F12 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD2B-F24D	VMD2B-F24D	VBD2B-F	DPDT		F24 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD2B-F24A	VMD2B-F24A	VBD2B-F	DPDT		F24 Vac	100 mA@5 Vdc	•	•
FKIT-VMD2B-F120A	VMD2B-F120A	VBD2B-F	DPDT		120 Vac	100 mA@5 Vdc	•	•
FKIT-VMD2B-F240A	VMD2B-F240A	VBD2B-F	DPDT		240 Vac	100 mA@5 Vdc	•	•
CKIT-VMD2B-F240A	VMD2B-F240A	VBD2B-C	DPDT		240 Vac	100 mA@5 Vdc	•	•
CKIT-VMD2B-C12D	VMD2B-C12D	VBD2B-C	DPDT		12 Vdc	100 mA@5 Vdc	•	•
CKIT-VMD2B-C24D	VMD2B-C24D	VBD2B-C	DPDT		24 Vdc	100 mA@5 Vdc	•	•
CKIT-VMD2B-C24A	VMD2B-C24A	VBD2B-C	DPDT		24 Vac	100 mA@5 Vdc	•	•
CKIT-VMD2B-C120A	VMD2B-C120A	VBD2B-C	DPDT		120 Vac	100 mA@5 Vdc	•	•

VMD3B & VMD3B-C Series

Socket Relays with a Wide Range of Features and Coil Voltages from Veris



Color-coded push buttons

Allows manual operation of relay. AC coils red, DC coils blue.
(-F Series only)

2-way mounting

Side or DIN rail mounting system…retrofits existing panel mounting and 35 mm DIN rail

Override lever

When activated, locks push button and contacts in the powered position (-F Series only)

I.D. tag

I.D. tag/write-on plastic label… used for identification of relays in multi-relay circuits (-F Series only)

Flag indicator

Shows relay status in manual or powered condition (-F Series only)

LED status lamp

Shows coil “ON” or “OFF” status
(-F Series only)

The VerisVMD3B Series are 3PDT blade-style relays for socket/DIN mounting.

The standard VMD3B-C model is economical and reliable. The full-featured VMD3B-F includes an LED and a flag indicator for convenient status viewing and a push-button test feature for easy troubleshooting. The finger-safe sockets reduce risk, and the hold-down clip keeps the device secure. Enhanced safety and dependability.

Typical Coil Performance	
	Power Consumption
AC Coils	1.2 VA
DC Coils	1.4 W
Contact Ratings	
Resistive	15 A @ 120 Vac
	12 A @ 277 Vac
	12 A @ 28 Vdc
Motor	1/2 HP @ 120 Vac
	3/4 HP @ 250 Vac
Pilot Duty	B300

Specifications

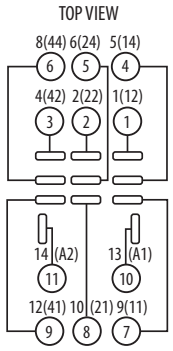
Operating Temp. Range	-40 to 55 °C (-40 to 131 °F)
Coil Operating Range	85% to 110% of rated voltage
Coil Drop-out Voltage Threshold	15% of rated voltage
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Operating Time	20 msec typical
Dielectric Strength	1500 Vac RMS
WARRANTY	
Limited Warranty	5 years

Agency Approvals

E198453
E150462

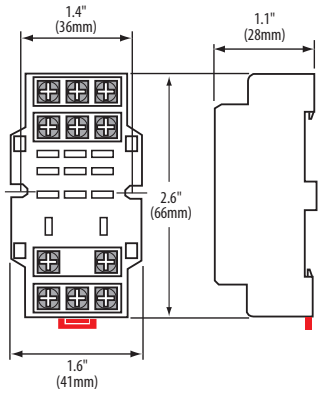
VBD3B Socket
Wiring Diagram

Function	Terminal	NEMA/(IEC)
Coil (+)*	11	14 (A2)
Coil (-)*	10	13 (A1)
COMM1	7	9 (11)
N.O.1	4	5 (14)
N.C.1	1	1 (12)
COMM2	8	10 (21)
N.O.2	5	6 (24)
N.C.2	2	2 (22)
COMM3	9	12 (41)
N.O.3	6	8 (44)
N.C.3	3	4 (42)

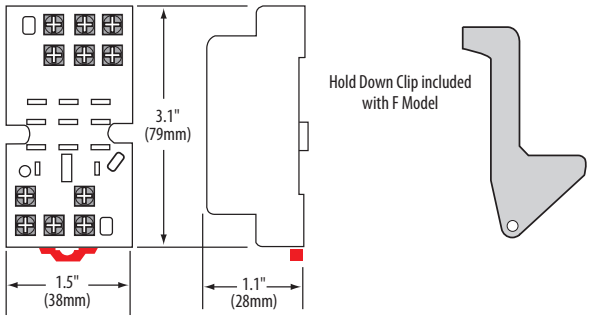


*Observe polarity for relays with DC coil voltages only

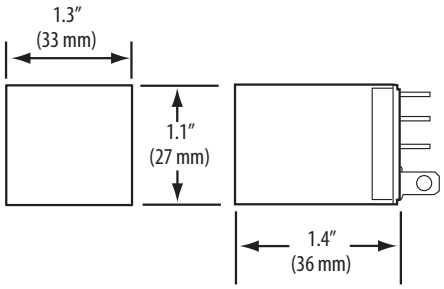
VBD3B-C Socket
Wiring Diagram



VBD3B-F Socket
Wiring Diagram



VMD3B Relay
Wiring Diagram



Relay Ordering Information

Model	Relay Type	Amperage Range	Coil Voltage	Min. Switching Current	Full Featured	UL	CE
VMD3B-C24D	3PDT	10 A	24 Vdc	100 mA@5 Vdc		•	•
VMD3B-C24A			24 Vac			•	•
VMD3B-C120A			120 Vdc			•	•
VMD3B-F24D		15 A	24 Vdc		•	•	•
VMD3B-F24A			24 Vac		•	•	•
VMD3B-F120A			120 Vac		•	•	•

Socket Ordering Information

Model	Amperage Rating	Voltage Rating	Finger Safe	Hold Down Clip	UL	CE
VBD3B-F	16 A	300 V	•	•	•	•

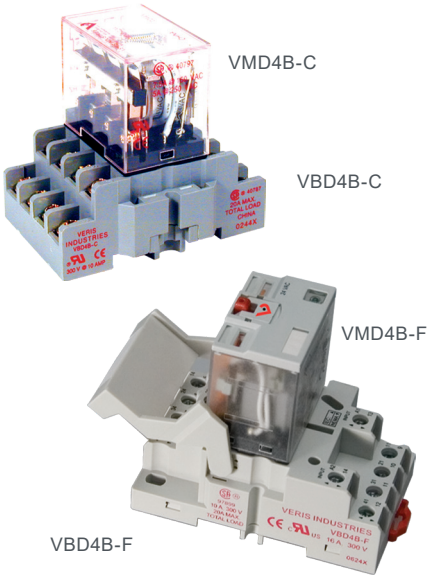
Note: When relays and sockets are used together, the amperage rating is the lesser of the two ratings.

Relay and Socket Kit Ordering Information

Kit Model	Relay Included	Socket Included	Relay Type	Amperage Rating	Coil Voltage	Min. Switching Current	UL	CE
FKIT-VMD3B-C24A	VMD3B-C24A	VBD3B-F	3PDT	10 A	24 Vac	100 mA@5 Vdc	•	•
FKIT-VMD3B-C24D	VMD3B-C24D	VBD3B-F	3PDT		24 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD3B-C120A	VMD3B-C120A	VBD3B-F	3PDT		120 Vac	100 mA@5 Vdc	•	•
FKIT-VMD3B-F24A	VMD3B-F24A	VBD3B-F	3PDT	15 A	24 Vac	100 mA@5 Vdc	•	•
FKIT-VMD3B-F24D	VMD3B-F24D	VBD3B-F	3PDT		24 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD3B-F120A	VMD3B-F120A	VBD3B-F	3PDT		120 Vac	100 mA@5 Vdc	•	•
CKIT-VMD3B-C24D	VMD3B-C24D	VBD3B-C	3PDT	10 A	24 Vdc	100 mA@5 Vdc	•	•
CKIT-VMD3B-C24A	VMD3B-C24A	VBD3B-C	3PDT		24 Vac	100 mA@5 Vdc	•	•
CKIT-VMD3B-C120A	VMD3B-C120A	VBD3B-C	3PDT		120 Vac	100 mA@5 Vdc	•	•

VMD4B & VMD4B-C Series

Socket Relays with a Wide Range of Features and Coil Voltages from Veris



Color-coded pushbuttons

Allows manual operation of relay. AC coils red, DC coils blue.
(-F Series only)

2-way mounting

Side or DIN rail mounting system…retrofits existing panel mounting and 35 mm DIN rail

Override lever

When activated, locks pushbutton and contacts in the powered position (-F Series only)

ID tag

ID tag/write-on plastic label… used for identification of relays in multi-relay circuits (-F Series only)

Flag indicator

Shows relay status in manual or powered condition (-F Series only)

LED status lamp

Shows coil “ON” or “OFF” status
(-F Series only)

The Veris VMD4B Series are 4PDT blade-style relays for socket/DIN mounting. Both the full-featured and standard DIN rail sockets are compatible with both the VMD4B-C and VMD4B-F relays and feature a slim, attractive design.

The standard VMD4B-C model is economical and reliable. The full-featured VMD4B-F includes an LED and a flag indicator for convenient status viewing and a push-button test feature for easy troubleshooting. The finger-safe sockets reduce risk, and the hold-down clip keeps the device secure. Enhanced safety and dependability.

Typical Coil Performance	
	Power Consumption
AC Coils	1.5 VA
DC Coils	1.5 W
Contact Ratings	
Resistive	10 A @ 120 Vac
	10 A @ 277 Vac
	10 A @ 28 Vdc
Motor	1/3 HP @ 120 Vac
	1/2 HP @ 250 Vac
Pilot Duty	B300

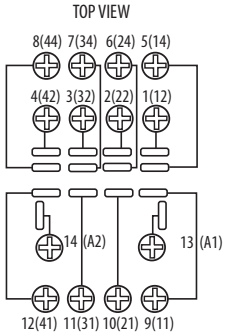
Specifications

Operating Temp. Range	-40 to 55 °C (-40 to 131 °F)
Coil Operating Range	85% to 110% of rated voltage
Coil Drop-out Voltage Threshold	15% of rated voltage
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Operating Time	20 msec typical
Dielectric Strength	1500 Vac RMS
Warranty	
Limited Warranty	5 years
Agency Approvals	

E198453
E150462

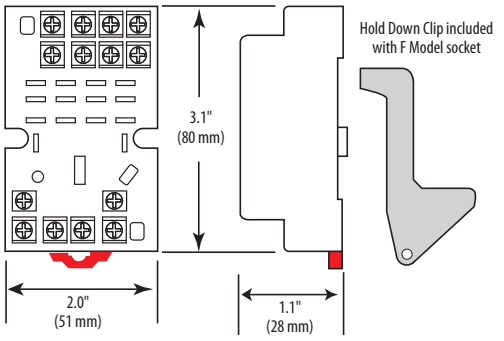
VBD4B Socket
Wiring Diagram

Function	NEMA (IEC) Terminal
Coil (+)*	14 (A2)
Coil (-)*	13 (A1)
COMM1	9 (11)
N.O.1	5 (14)
N.C.1	1 (12)
COMM2	10 (21)
N.O.2	6 (24)
N.C.2	2 (22)
COMM3	11 (31)
N.O.3	7 (34)
N.C.3	3 (32)
COMM4	12 (41)
N.O.4	8 (44)
N.C.4	4 (42)

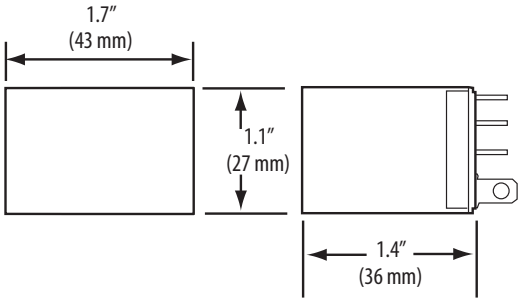


*Observe polarity for relays with DC coil voltages only

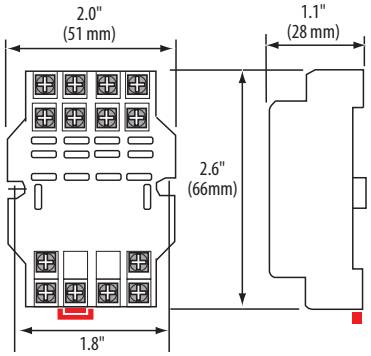
VBD4B-F Socket
Dimensional Drawing



VMD4B Relay
Dimensional Drawing



VBD4B-F Socket
Dimensional Drawing



Relay Ordering Information

Model	Relay Type	Amperage Range	Coil Voltage	Min. Switching Current	Full Featured	UL	CE
VMD4B-C24D	4PDT	10 A	24 Vac	100 mA@5 Vdc		•	•
VMD4B-C24A			24 Vac			•	•
VMD4B-C120A			120 Vac			•	•
VMD4B-F24D			24 Vdc		•	•	•
VMD4B-F24A			24 Vac		•	•	•
VMD4B-F120A			120 Vac		•	•	•

Socket Ordering Information

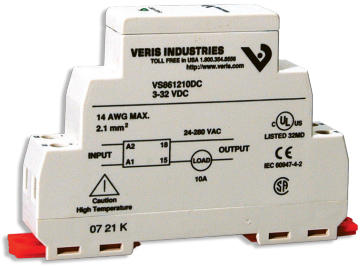
Model	Amperage Rating	Voltage Rating	Finger Safe	Hold Down Clip	UL	CE
VBD4B-C	10 A	300 V			•	•
VBD4B-F	10 A		•	•	•	•

Relay and Socket Kit Ordering Information

Kit Model	Relay Included	Socket Included	Relay Type	Amperage Range	Coil Voltage	Min. Switching Current	UL	CE
FKIT-VMD4B-C24D	VMD4B-C24D	VBD4B-F	4PDT	10 A	24 Vdc	100 mA@5 Vdc	•	•
FKIT-VMD4B-C24A	VMD4B-C24A	VBD4B-F	4PDT		24 Vac	100 mA@5 Vdc	•	•
FKIT-VMD4B-C120A	VMD4B-C120A	VBD4B-F	4PDT		120 Vac	100 mA@5 Vdc	•	•
CKIT-VMD4B-C24D	VMD4B-C24D	VBD4B-C	4PDT		24 Vdc	100 mA@5 Vdc	•	•
CKIT-VMD4B-C24A	VMD4B-C24A	VBD4B-C	4PDT		24 Vac	100 mA@5 Vdc	•	•
CKIT-VMD4B-C120A	VMD4B-C120A	VBD4B-C	4PDT		120 Vac	100 mA@5 Vdc	•	•

VS861 Series

Higher Reliability than Electromagnetic Relays from Veris



VS861210DC

The DIN-mountable Veris VS861 Series Solid State Relay with an internal heat sink is the first complete solid state relay available in a modular package.

A SSR (solid state relay) can perform many of the same tasks as an electromechanical relay. The SSR differs in that it contains no moving mechanical parts. It is essentially an electronic device that relies on the electrical, magnetic, and optical properties of semiconductors and electrical components to achieve its isolation and relay switching function.

No moving parts

No moving parts to wear or fail

EMI

Reduced EMI

Contacts

No contact bounce or arcing contacts

Long life

Longer life than electromechanical relays

Superior performance

Fast response time and high frequency of on/off cycling

Applications

- Lighting
- Instrumentation systems and alarm systems
- Traffic control
- Industrial automation

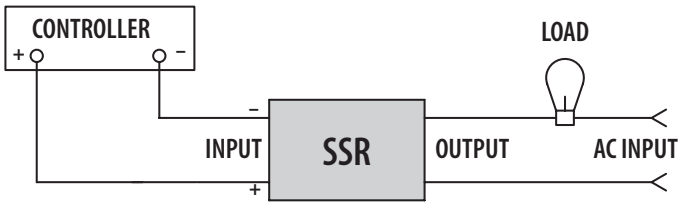
Specifications

Output Characteristics	
Switching Voltage	VS861210DC(AC) & VS861208DC(AC): 24 to 280 Vac, VS861208DD: 3 to 150 Vdc
Maximum Zero Turn-on Voltage (Vpk)	VS861210DC(AC) & VS861208DC(AC): 35 V
Maximum Rate of Rise Off State Voltage (dv/dt)	VS861210DC(AC): 500 V/µS, VS861208DC: 475 V/µS, VS861208AC: 350 V/µS
Incandescent Lamp Ampere Rating (RMS)	VS861210DC(AC): 8 A, VS861208DC(AC): 5 A
Motor Load Rating (RMS)	VS861210DC(AC): 4.5 A, VS861208DC(AC): 3 A
Min. Load Current to Maintain On	VS861210DC(AC): 50 mA, VS861208DC(AC): 150 mA, VS861208DD: 20 mA
Non-Repetitive Surge Current (1 cycle)	VS861210DC(AC): 500 A, VS861208DC(AC): 200 A, VS861208DD: 35 A
Max. RMS Overload Current (1 sec.)	VS861210DC(AC) & VS861208DC: 24 A, VS861208(DD): 17 A
Max. Off State Leakage Current (RMS)	10 mA
Typical On State Voltage Drop (RMS)	1.25 Vac
Max. On State Voltage Drop (RMS)	VS861210DC(AC) & VS861208DC(AC): 1.6 Vac, VS861208DD: 1.6 Vdc
Input Characteristics	
Must Release Voltage	VS861210DC, VS861208DC, & VS861208DD: 1 Vdc, VS861210AC & VS861208AC: 10 Vac
SP (Nominal) Input Impedance	VS861210DC, VS861208DC, & VS861208DD: Current Regulator; VS861210AC & VS861208AC: 16 to 25 kΩ
Typical Input Current @ 5 Vdc or 240 Vac	VS861210DC: 16 mA, VS861210AC, VS861208DC(AC), & VS861208DD: 12 mA
Reverse Polarity Protection	VS861210DC, VS861208DC, & VS861208DD: Yes
Other Characteristics	
Operating Time (Response Time)	VS861210DC & VS861208DC: 8.3 msec; VS861210AC & VS861208AC: 40 msec; VS861208DD: 5 msec
Release Time	VS861210DC & VS861208DC: 8.3 msec; VS861210AC & VS861208AC: 80 msec; VS861208DD: 5msec
Rated Insulation Voltage/ Dielectric Strength	2500 Vac
Operating Temp Range	-30 to 80 °C (-22° to 176 °F)
Thermal Resistance (Junction to Case)	VS861210DC(AC): 0.66 °C/W, VS861208DC(AC): 2.0 °C/W, VS861208DD: 0.5 °C/W
Integral Heat Sink	4.0 °C/W
Warranty	
Limited Warranty	5 years

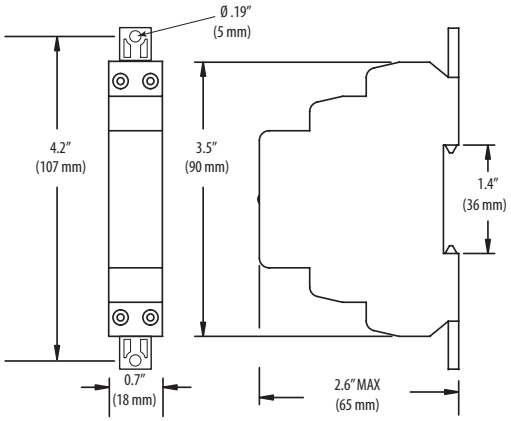
Agency Approvals

CE SP c UL us LISTED E150462

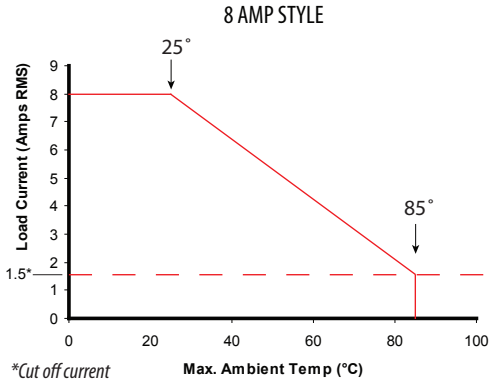
Wiring Diagram

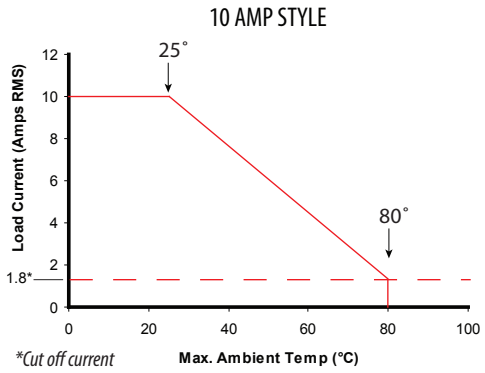


Dimensional Drawings



Amperage Derating for Temperature





Load Considerations

The primary concern when using SSRs is improper heat sinking. The type of load current should be evaluated when considering an SSR as a switching option. SSRs alone are not compatible with high inrush currents, but cautionary measures can be taken in high inrush applications to increase the SSR's versatility, see table at right.

Load Type	Cautionary Action
All Load Types	Verify that the inrush current does not exceed the surge specifications of the SSR.
Steady-state Resistance	Consider thermal management. Assure device temperature will remain in safe operating area.
DC (Inductive)	Place a diode across the load to absorb surges during turnoff.
Incandescent Lamp	Use a zero voltage turn-on type.
Capacitive	Verify that the rate of current rise capabilities are not exceeded. Zero voltage turn-on is an effective method for limiting this rate.
Motors and Solenoids	Use a current shunt and oscilloscope to examine the duration of the inrush current. Verify that back EMF does not create an overvoltage situation during turn-off.
Transformers	Use a zero cross turn-on device; verify that the half cycle surge capability is not exceeded. Rule of thumb: select an SSR with a half cycle current surge rating greater than the maximum applied line voltage divided by the transformer primary resistance.

Ordering Information

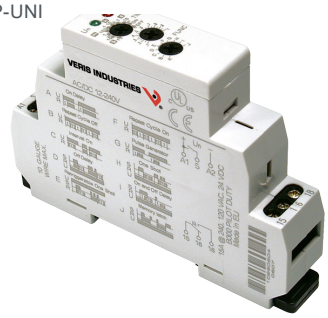
Model	Relay	Amperage Rating	Input Voltage	Switching Device	Switching Voltage	Switching Type	UL	CE
VS861210DC	SPST, N.O.	10 A	3 to 32 Vdc	SCR	24 to 280 Vac	Zero Cross	•	•
VS861210AC		10 A	90 to 280 Vac, 80 to 140 Vdc	SCR	24 to 280 Vac	Zero Cross	•	•
VS861208DC		8 A	3 to 32 Vdc	Triac	24 to 280 Vac	Zero Cross	•	•
VS861208AC		8 A	90 to 280 Vac, 80 to 140 Vdc	Triac	24 to 280 Vac	Zero Cross	•	•
VS861208DD		8 A	3.5 to 32 Vdc	MOSFET	3 to 150 Vdc	DC Switching	•	•

VTD Series

Subhead from Veris

VTD2P-F50

VBD3P-C



VTD2P-UNI

Thumb wheel adjustment

VTD2P-F50 has thumb wheel adjustment for function and timing accuracy

Housing options

Two different housings provide multiple mounting options

Solid state relays

VTD1P/2P-UNI models are made with solid state relays for greater reliability

The Veris VTD Series are multi-function time delay relays equipped with an external control switch input and designed for easy socket/ DIN mounting. The VTD2P-F50 includes five functions shown at left, while the VTD1P-UNI and VTD2P-UNI include the same five as the VTD2P-F50 plus five more, for the most versatile relay available. Save inventory costs by purchasing one relay for all the functions you need.

Specifications

Operating Range	85% to 110% of nominal voltage
Drop-Out Voltage Threshold	15% of nominal voltage
Expected Relay Life	Electrical (resistive @ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Dielectric Strength	1000 Vac RMS
Operating Temp Range	-20 to 55 °C (-4 to 131 °F)
Warranty	
Limited Warranty	5 years

Agency*Approvals

E198453
E310313

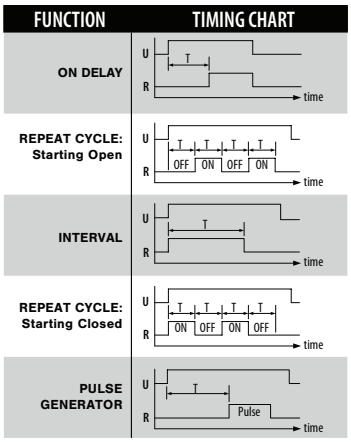
*The CE mark indicates RoHS2 compliance.

Typical Coil Performance	
	Power Consumption
AC Coils	1.5 VA
DC Coils	2 w

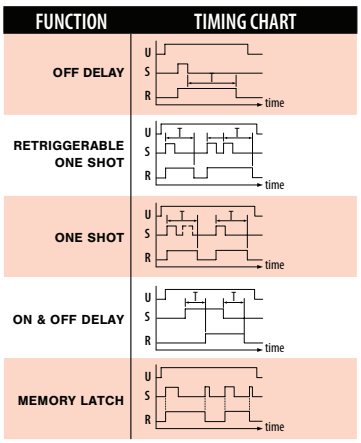
Contact Ratings	
(VTDP-F50)	
Resistive	12 A @ 240 Vac, 30 Vdc
Pilot Duty	B300
(VTD1p-UNI, VTD2P-UNI)	
Resistive	15A @ 240 Vac, 24 Vdc
Motor	1/2 HP @ 120 Vac; 1 HP @ 240 Vac

Timing Characteristics		
	VTD2P-F50	VTD1P-UNI, VT-D2P-UNI
Function Available	5	10
Time Ranges		
0.1 sec sec	0 to 999 0 to 999	1 to 10 1 to 10
0.1 min min	0 to 999 0 to 999	1 to 10 1 to 10
0.1 hr hr	0 to 999 0 to 999	1 to 10 1 to 10
10 hr	0 to 999	---
0.1 day day	--- ---	1 to 10 1 to 10
Tolerance (mechanical setting)	0%	5%
Repeatability	0.1%	0.2%
Operate Time (max)	25ms	no spec
Rest Time (max)	150 ms	150 ms
Trigger Pulse Length (min)	---	50 ms

Power Trigger

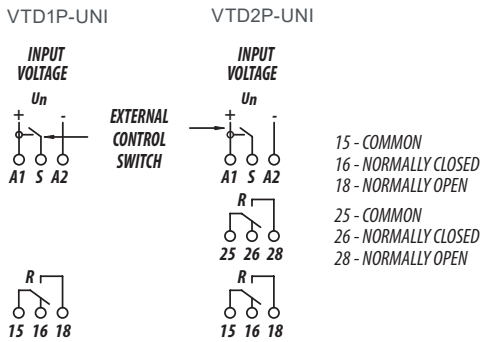


Switch Trigger

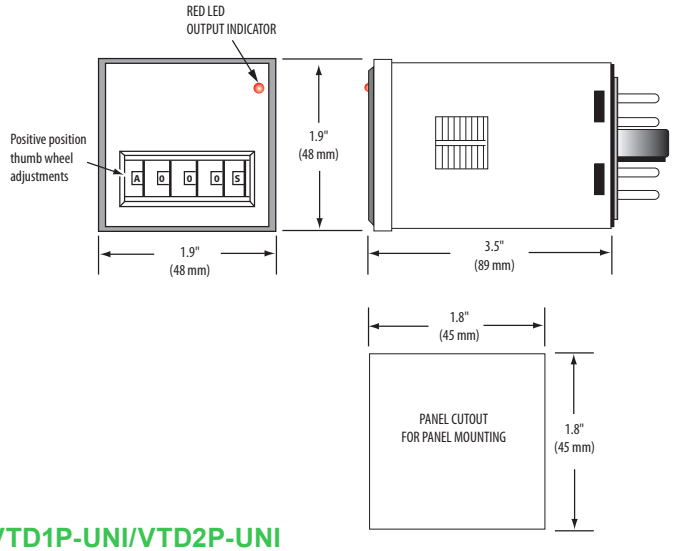


U: Input voltage (power supply)
R: Relay contacts (on or off)
S: Control switch (open or closed)
T: Setting time

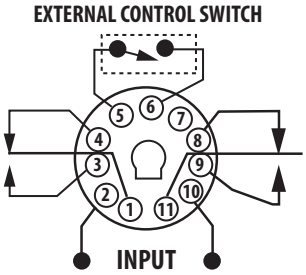
VTD1P-UNI/VTD2P-UNI
Dimensional Drawing



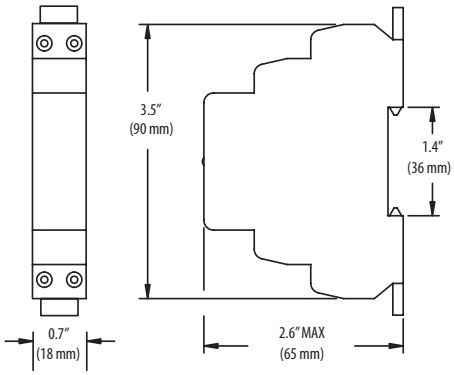
VTD2P-F50
Dimensional Drawing



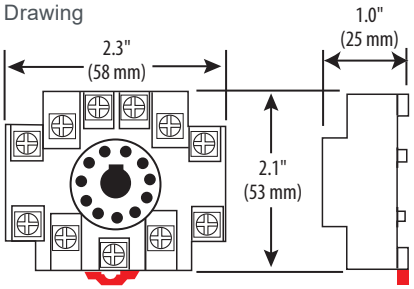
VTD2P-F50
Wiring Diagram



VTD1P-UNI/VTD2P-UNI
Dimensional Drawing



VBD3P-C
Dimensional Drawing



Relay Ordering Information

Model	Relay Style	Number of Functions	Amperage Range	Coil Voltage	Min. Switching Current	UL	CE
VTD2P-F50	DPDT	5	12	24 to 240 Vac/dc	100 mA@5 Vdc	Recognized*	•
VTD1P-UNI	SPDT	10	15	24 to 240 Vac/dc		Listed	•
VTD2P-UNI	DPDT	10	15	24 to 240 Vac/dc		Listed	•

*UL Listed when used with Veris sockets.

Socket Ordering Information

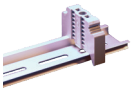
Model	Amperage Rating	Voltage Rating	UL	CE
VBD3P-C	15 A	300	•	•

When relays and sockets are used together, the overall amperage rating is the lesser of the two ratings.

Accessories Selection Guide: Relays

Product	Description	VST10 & 100	VST120	VMD1B-C & VMD1B-F	VMD2B-C & VMD2B-F	VMD3B-C & VMD3B-F	VMD4B-C & VMD4B-F
AV01	35 mm DIN Rail - 1 Meter Length			•	•	•	•
AV02	DIN Rail Stop Clip			•	•	•	•
AV05	2.75" SNAPTRACK, 2" Length	•	•				

AV01
35 mm DIN Rail - 1 Meter Length



AV02
DIN Rail Stop Clip

AV05 (2.75")
2.75" SNAPTRACK, 2" Length

Power Sources

Schneider Electric provides a wide range of AC or DC output power supplies. AC transformers are available with or without a circuit breaker and with single or dual threaded hubs. All come standard with foot mounting flanges and flying lead terminations. Capacities range from 20 to 375 VA. Schneider Electric offers a line of low heat generating, fully enclosed DC power supplies as well. These sleek DIN mount units are available in 12 or 24 Vdc outputs from 7.5 to 90 Watts in capacity.

Power Sources Selection Guide

DC Power Supply	PS* page 281
Control Transformers	X* page 283

* Indicates a series of products.

PS Series

PS Series Switching Power Supplies

PS Series
Capable of supplying up to 90 Watts
(AV01 DIN rail not included)

Up to 90 W

High efficiency switching power supply capable of supplying up to 90 W

DIN rail mounting

Easy installation

Loop power

Ideal for supplying loop power to Veris power transducers and current sensors

Small size

Saves panel space

Universal voltage input

Universal voltage input from 100 to 240 Vac/110 to 340 Vdc

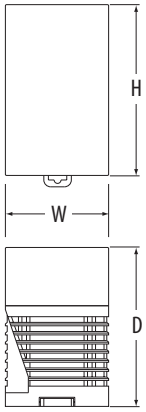
High efficiency

Won't generate excessive heat in control panel

Specifications

Input Voltage (except PSxx-100W)	100 to 240 Vac (85 to 264 Vac), 50/60Hz (47 to 63 Hz); 110 to 340 Vdc (105 to 370 Vdc)
Input Voltage (PSxx-100W)	100 to 120/200 to 240 Vac, Jumper Select-able 50/60 Hz (47 to 63 Hz); 240 to 370 Vdc
Input Current (Typical @100 Vac) 7.5 W (12 and 24 Vdc) 15 W (12 and 24 Vdc) 30 W (12 and 24 Vdc) 60 W 90 W	 0.18 A 0.35 A 0.7 A 1.3 A 1.1 A
Inrush Current (100 Vac)	15 A (7.5 W) 18 A (15 W and up)
Overcurrent Protection	105% min. auto-reset
Ripple	24 V, 4% P-P 12 V, 6% P-P
Leakage Current	120 Vac, 0.5 mA max. 230 Vac, 1.0 mA max.
Output Current (12 V Models) 7.5 W 15 W 30 W	 0.6 A 1.3 A 2.5 A
Output Current (24 V Models) 7.5 W 15 W 30 W 60 W 90 W	 0.3 A 0.65 A 1.3 A 2.5 A 3.75 A
Operating Temperature	-25 to 75 °C (-13 to 167 °F)
Operating Humidity	20 to 90% RH non-condensing
Storage Temperature	-25 to 75 °C (-13 to 167 °F)

Dimensional Drawing



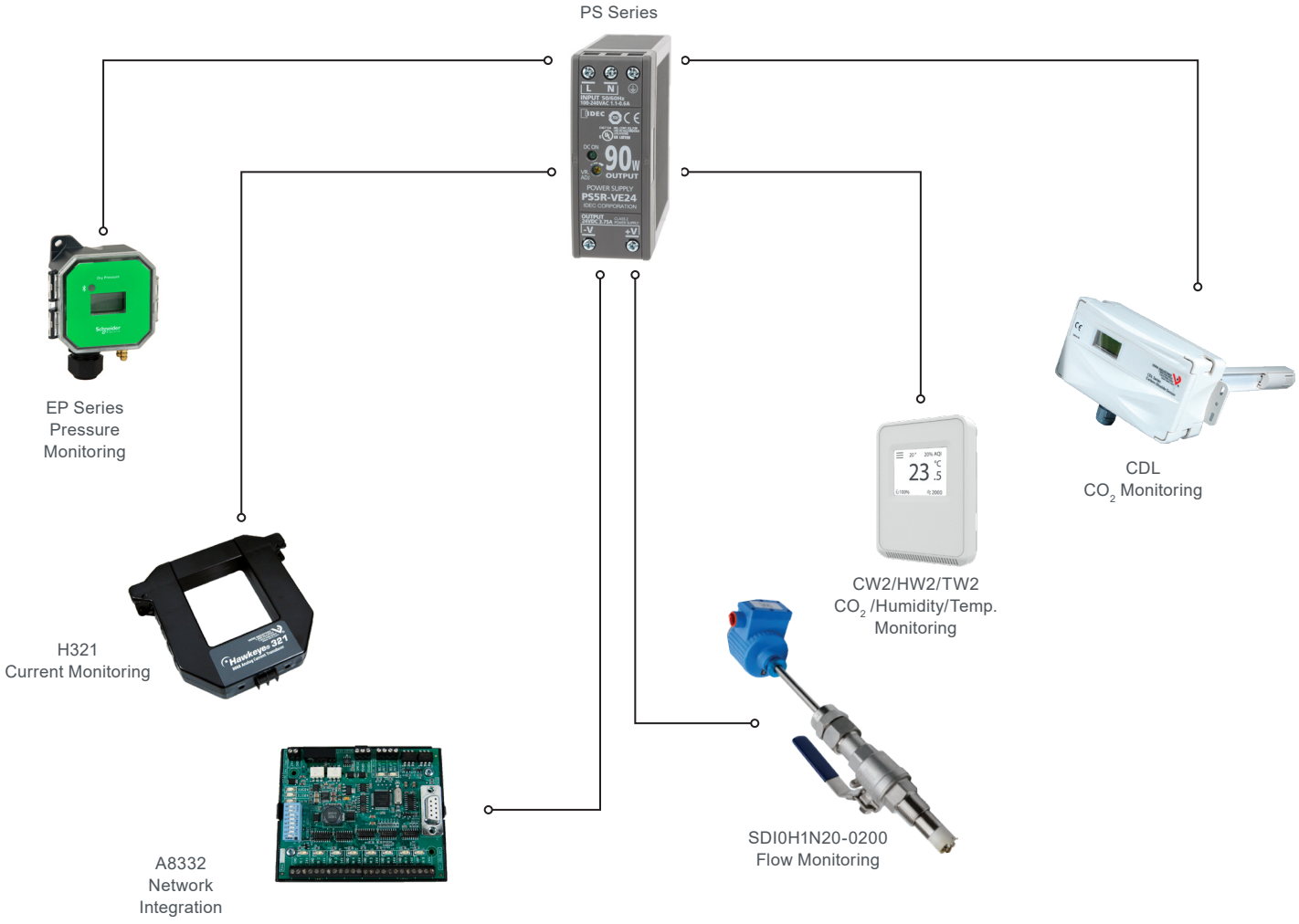
	H	W	D	Weight
7.5 W	3.0″ (75 mm)	1.9″ (45 mm)	2.8″ (70 mm)	130 g
15 W	3.6″ (90 mm)	0.9″ (22.5 mm)	3.8″ (95 mm)	140 g
30 W	3.6″ (90 mm)	0.9″ (22.5 mm)	3.8″ (97 mm)	150 g
60 W	3.8″ (95 mm)	1.5″ (36 mm)	4.3″ (108 mm)	260 g
90 W	3.8″ (95 mm)	1.5″ (36 mm)	4.3″ (108 mm)	310 g

Terminals	Spring-up, finger-safe (when tightened); captive M3.5 screws Phillips/flat heads

Agency Approvals

c UL us LISTED CE

Supplying Power for All Your DC Needs



Ordering Information

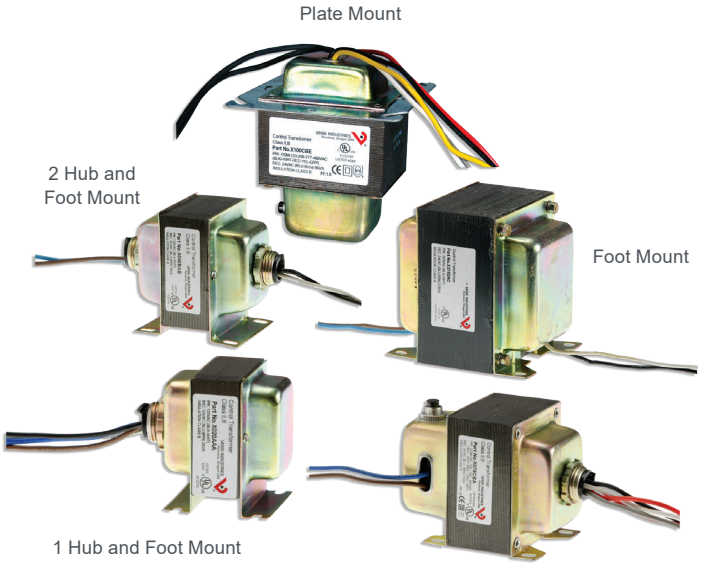
Output		Watts	
PS	–	S	W
12 =12 Vdc 24 = 24 Vdc		7.5 = 7.5 Watts 15 = 15 Watts 30 = 30 Watts 60* = 60 Watts 90* = 90 Watts	

Example: PS 12 – S 7.5 W

*Available in 24 V only.

X Series

Control transformers from Veris



Veris X Series Control Transformers are a convenient source of control power for HVAC control and building automation applications. A wide variety of UL Listed transformers are available with single and dual threaded hub mounting options. Multiple current limiting options are available, including a circuit breaker in some models. Save ordering time and purchase order costs when buying other sensors by including transformers in your order.

Specifications

Frequency	50/60 Hz
Operating Temperature	-40 to 65 °C (-40 to 149 °F)
No Load Voltage	27 to 28 Vac
Hub Style	Fits 1/2" electrical k.o.
Wire	UL 1015, 18 AWG*
Wire Length	8 inches
Warranty	
Limited Warranty	5 years
AGENCY APPROVALS	

*X085AAA, X375DAC have 14 AWG secondary wires.

UL Listings

UL Listings for all models simplify panel building requirements

Threaded hub options

Threaded hub options maximize installation flexibility

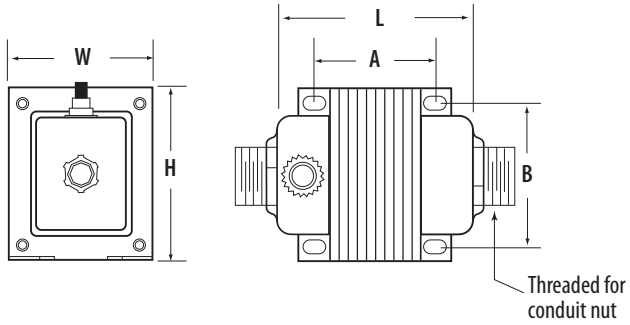
One-stop shopping

Save time by ordering along with other products

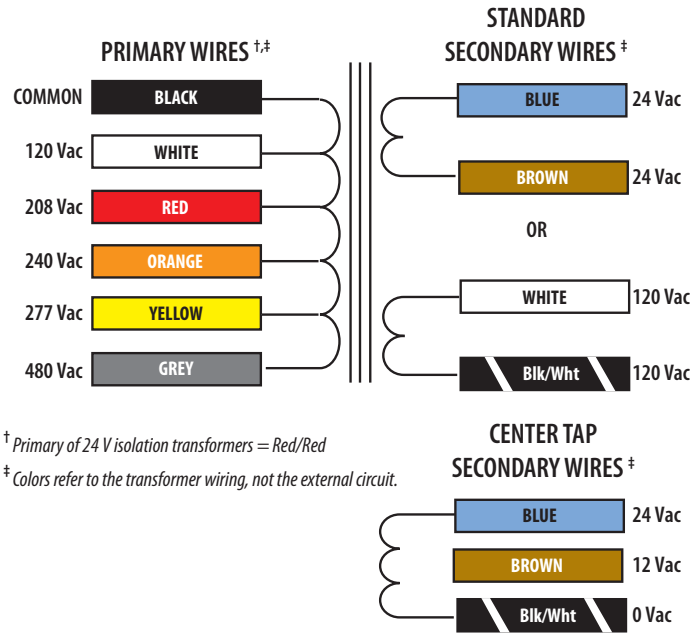
Applications

- Controller power
- Driving relays and other digital I/O circuits
- Powering sensors

Dimensional Drawing



Wire Colors



† *Primary of 24 V isolation transformers = Red/Red*

‡ *Colors refer to the transformer wiring, not the external circuit.*

Ordering Information

TAC Part Number*	Part Number	VA	Primary Voltage (VAC)	Secondary Voltage (VAC)	Current Limiting Method	Class	Mounting	Separated Primary & Secondary Wires	UL	CE	L	W	H	A	B
Standard															
T-255-120	X020AAA	20	120	24	Inherent	2	1HUB+FT		•	•	2.3	1.9	2.6	1.59	1.69
T-255-277	X020ACA		277		Inherent	2	1HUB+FT		•	•	2.3	1.9	2.6	1.59	1.69
T-255-24	X020ADA		24		Inherent	General	1HUB+FT		•	•	2.3	1.9	2.6	1.59	1.69
	X040AAA	40	120		Inherent	2	1HUB+FT		•	•	2.7	2.2	2.9	1.98	1.81
	X040AAB		120		Inherent	2	2HUB+FT	•	•	•	2.7	2.2	2.9	1.98	1.81
	X040ACA		277		Inherent	2	1HUB+FT		•	•	2.7	2.2	2.9	1.98	1.81
	X040ADA		24		Inherent	2	1HUB+FT		•	•	2.7	2.2	2.9	1.98	1.81
	X040AMB		120/208/240/277		Fuse	2	2HUB+FT	•	•	•	2.7	2.2	2.9	1.98	1.81
	X040BNA		120/208/240		Fuse	2	1HUB+FT		•	•	2.7	2.2	2.9	1.98	1.81
	X040BPC		24	12/24	Fuse	2	Foot	•	•	•	2.7	2.2	2.9	1.98	1.81
T-201-1	X050BAA	50	120	24	Fuse	2	1HUB+FT		•	•	2.8	2.2	2.9	2.06	1.81
	X050BAB		120		Fuse	2	2HUB+FT	•	•	•	2.8	2.2	2.9	2.06	1.81
T-240	X050BCA		277		Fuse	2	1HUB+FT		•	•	2.8	2.2	2.9	2.06	1.81
T-258	X050BGB		208/240		Fuse	2	2HUB+FT	•	•	•	2.8	2.2	2.9	2.06	1.81
	X050CAA		120		Circuit Breaker	2	1HUB+FT		•	•	3.5	2.5	3.1	1.91	2.03
	X050CBA		120/240/277/480		Circuit Breaker	2	1HUB+FT		•	•	3.5	2.5	3.1	1.91	2.03
T-245	X050CBB		120/240/277/480		Circuit Breaker	2	2HUB+FT	•	•	•	3.5	2.5	3.1	1.91	2.03
	X050CCA		277		Circuit Breaker	2	1HUB+FT		•	•	3.5	2.5	3.1	1.91	2.03
	X050CEB		208/240/277/480	120	Circuit Breaker	General	2HUB+FT	•	•	•	3.5	2.5	3.1	1.91	2.03
T-249	X050CEG		208/240/277/480		Circuit Breaker	General	Plate, 90° Sec Elbow	•	•	•	3.5	4.0	4.0	3.38	3.38
	X050CHA		120/208/240/480	24	Circuit Breaker	2	1HUB+FT		•	•	3.5	2.5	3.1	1.91	2.03
	X050CHB		120/208/240/480		Circuit Breaker	2	2HUB+FT	•	•	•	3.5	2.5	3.1	1.91	2.03
	X050CNA		120/208/240		Circuit Breaker	2	1HUB+FT		•	•	3.5	2.5	3.1	1.91	2.03
	X050CNB		120/208/240		Circuit Breaker	2	2HUB+FT	•	•	•	3.5	2.5	3.1	1.91	2.03
	X050COA		120/208/240/277/480		Circuit Breaker	2	1HUB+FT		•	•	3.5	2.5	3.1	1.91	2.03
	X050COB		120/208/240/277/480		Circuit Breaker	2	2HUB+FT	•	•	•	4.3	2.5	3.1	2.70	2.00
	X050DLB		220		None	2	2HUB+FT	•	•	•	2.8	2.2	2.9	2.06	1.81
T-207	X075CAA	75	120		Circuit Breaker	2	1HUB+FT		•	•	3.9	2.5	3.1	2.31	2.03
	X075CAB		120		Circuit Breaker	2	2HUB+FT	•	•	•	3.9	2.5	3.1	2.31	2.03
	X075CBA		120/240/277/480		Circuit Breaker	2	1HUB+FT		•	•	3.9	2.5	3.1	2.31	2.03
	X075CHA		120/208/240/480		Circuit Breaker	2	1HUB+FT		•	•	3.9	2.5	3.1	2.31	2.03
T-202	X085AAA	85	120		Inherent	General	1HUB+FT		•	•	3.2	3.8	3.2	2.2	3.14
T-208	X100CAA	99	120		Circuit Breaker	2	1HUB+FT		•	•	4.1	2.5	3.1	2.51	2.03
	X100CAB		120		Circuit Breaker	2	2HUB+FT	•	•	•	4.1	2.5	3.1	2.51	2.03
	X100CBA		120/240/277/480		Circuit Breaker	2	1HUB+FT		•	•	4.3	2.5	3.1	2.70	2.03
	X100CBB		120/240/277/480		Circuit Breaker	2	2HUB+FT	•	•	•	4.3	2.5	3.1	2.70	2.03
	X100CBE		120/208/277/480		Circuit Breaker	2	Plate		•	•	4.3	4.0	4.0	3.38	3.38
	X100CHB		120/208/240/480		Circuit Breaker	2	2HUB+FT	•	•	•	4.3	2.5	3.1	2.70	2.03
	X100CKB		480	120	Circuit Breaker	General	2HUB+FT	•	•	•	4.1	2.5	3.1	2.51	2.03
	X100CLB		220	24	Circuit Breaker	2	2HUB+FT	•	•	•	4.1	2.5	3.1	2.51	2.03
	X150CAA	150	120		Circuit Breaker	General	1HUB+FT	•	•	•	3.5	3.8	3.2	2.08	3.26
T-203	X175BAB	175	120		Fuse	General	2HUB+FT	•	•	•	4.1	3.8	3.2	3.19	3.14
	X175CAB		120		Circuit Breaker	General	2HUB+FT	•	•	•	4.1	3.8	3.2	3.19	3.14
	X175DGC		208/240		None	General	Foot	•	•	•	4.1	3.8	3.2	3.19	3.14
T-204	X240DAA	240	120		None	General	1HUB+FT	•	•	•	3.7	3.8	4.5	3.24	3.18
T-205	X375DAC	375	120		None	General	Foot	•	•	•	4.3	3.8	4.5	3.83	3.18
Center Tap															
	X020APC	20	24	12/24	Inherent	2	Foot	•	•	•	2.3	1.9	2.6	1.59	1.69
	X040BQC	40	120/208/240		Fuse	2	Foot	•	•	•	2.7	2.2	2.9	1.98	1.81
	X100CRC	100	120/240		Circuit Breaker	2	1HUB+FT	•	•	•	4.3	2.5	3.1	2.70	2.03

*Transformers with both TAC Part Number and Part Number are orderable with either number. These are the same actual part, as they are dual numbered.

Life Is On | Schneider Electric

Schneider Electric
800 Federal Street
Andover, MA 01810 USA

Phone: 1-888-444-1311
www.se.com

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.

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