

Life Is On

Schneider
Electric

Sensors, Relays & Power Supplies Catalog

NAM

Digital Buildings Division | 2023



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 

Schneider
 **Electric**

The Schneider Electric brand and any trademarks of Schneider Electric SE and its subsidiaries referred to in this guide are the property of Schneider Electric SE or its subsidiaries. All other brands may be trademarks of their respective owners.

This guide and its content are protected under applicable copyright laws and furnished for informational use only. No part of this guide may be reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), for any purpose, without the prior written permission of Schneider Electric. Schneider Electric does not grant any right or license for commercial use of the guide or its content, except for a non-exclusive and personal license to consult it on an “as is” basis.

Schneider Electric products and equipment should be installed, operated, serviced, and maintained only by qualified personnel.

As standards, specifications, and designs change from time to time, information contained in this guide may be subject to change without notice.

To the extent permitted by applicable law, no responsibility or liability is assumed by Schneider Electric and its subsidiaries for any errors or omissions in the informational content of this material or consequences arising out of or resulting from the use of the information contained herein.

Table of Contents

Applications	3
Living Space Sensors	15
Plant Room Sensors: Air Quality/Gas Detection	55
Flow Monitoring	69
Plant Room Sensors: Humidity Monitoring	97
Leak Detection	97
Pressure Monitoring	125
Plant Room Sensors: Temperature Monitoring	151
Occupancy Sensors	167
Current Monitoring	173
Relays	217
Power Sources	249

Data Centers



Server Environment

Maintain a consistent environment aisle by aisle

Occupancy Sensors

MSC, MSB SERIES

Pages 169, 171

Reduce energy consumption and control energy waste by lighting a room only when it's occupied.



Humidity Sensors

SLA, HW2 SERIES

Pages 35, 37

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.



Temperature Sensors

SLA, TW2, ETD SERIES

Pages 45, 47, 153

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



Server Panels & CRACs

Protect critical equipment
and ensure uptime

Liquid & Chemical Leak Detection

LD, SC SERIES

Pages 111, 113, 115, 119

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.



Differential Pressure or Air Velocity Sensor

EP, PX3 SERIES

Pages 127, 129

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



Note: The Bluetooth word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Any use of such marks is under license.

Food & Retail



Cooling & Refrigeration

Monitor temperature of walk-ins, pressure of parallel refrigerators and detect mechanical failures of compressors and motors

Temperature Sensors

ET SERIES

Page 153, 157, 159, 161

Accurately monitor temperature in space, refrigeration case, walk-in cooler, freezer and hot water reclaim tank temperature.



Gauge Pressure Sensors

PG SERIES

Page 147

Reliably monitor pressure in parallel refrigeration racks and hydraulic motors.



Current Sensors

H922

Page 201

Detect belt loss and mechanical failure in compressors with a self-powered analog current sensor that provides accurate load trending information.



HVAC & Physical Plant

Energize lighting contactors, monitor cooling towers

Relays

V100 SERIES

Page 219

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



Flow Meters

SDI SERIES

Page 71

Measure supply and discharge water to get credit on sewer bill for actual water discharged. Don't be billed for evaporated water.



Environments

Regulate environments, efficiently and effectively

Humidity Sensors

SLA, HW2 SERIES

Pages 35, 37

Reduce compressor run time and glass door fogging with an accurate and easy-to-use humidity sensor.



CO₂ Sensors

SLA, CW2 SERIES

Pages 25, 27

Calling for fresh air only when CO₂ levels are high saves energy. Make the SLA or CW2 Series part of your demand controlled ventilation strategy.



Gas Detection

CO, NO₂ SENSORS

Pages 61, 63

Easy parking garage monitoring with the GWN and GWNP modular platforms. Monitor CO and NO₂ separately or combined.



Refrigerant Sensors

Pages 61, 63

Ideal for variable refrigerant flow, mechanical rooms, and occupied spaces.



Hospitals



Room & Patient Care

Provide ideal environmental conditions while optimizing efficiency

Occupancy Sensors

MSC, MSB SERIES

Pages 169, 171

Reduce energy consumption and control energy waste by lighting a room only when it's occupied.



CO₂ Sensors

SLA, CW2 SERIES

Pages 25, 27

Calling for fresh air only when CO₂ levels are high saves energy. Make the SLA or CW2 Series part of your demand controlled ventilation strategy.



Humidity Sensors

SLA, HW2 SERIES

Pages 35, 37

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.



HVAC & Physical Plant

Increase efficiency,
extend safety

Liquid & Chemical Leak Detection

LD, SC SERIES

Pages 111, 113, 115, 119

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.



Flow Monitoring

380 SERIES

Page 75

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



Power & Energy

Quantify and qualify usage

Current Monitoring

H904 VFD SWITCH

Page 187

Accurately and reliably monitor fan status. The H904 automatically compensates for the effects of frequency and amperage changes associated with VFDs, and features a self-adjusting trip point.



Parking Structures & Vehicle Bays

Monitor and balance risks

Gas Detection

CO, NO₂ SENSORS

Pages 61, 63

Easy parking garage monitoring with the GWN and GWNP modular platforms. Monitor CO and NO₂ separately or combined.



Industrial Automation



Workspaces

Maintain a comfortable environment without additional cost

CO₂ Sensors

SLA, CW2 SERIES

Pages 25, 27

Calling for fresh air only when CO₂ levels are high saves energy. Make the SLA or CW2 Series part of your demand controlled ventilation strategy.



Humidity Sensors

SLA, HW2 SERIES

Pages 35, 37

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



Temperature Sensors

SLA, TW2, ETD SERIES

Pages 45, 47, 153

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



Building Safety & Efficiency

Monitor automated material handling, measure clean room pressure, control safety barriers

Current Transducers

H971

Page 209

Accurately monitor status of DC current loads. Avoid costly equipment damage and downtime.



Differential Pressure or Air Velocity Sensor

EP, PX3 SERIES

Pages 127, 129

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



Relays

V100 SERIES

Page 219

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

380 SERIES

Page 75

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



HVAC & Physical Plant

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

Liquid & Chemical Leak Detection

LD, SC SERIES

Pages 111, 113, 115, 119

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.



Remote Pressure Transducers

PWR SERIES

Page 135

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.



Multi-Floor Office



Workspaces

Provide ideal environmental conditions, while optimizing efficiency

Occupancy Sensors

MSC, MSB SERIES

Pages 169, 171

Reduce energy consumption and control energy waste by lighting a room only when it's occupied.



Humidity Sensors

SLA, HW2 SERIES

Pages 35, 37

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



Temperature Sensors

SLA, TW2, ETD SERIES

Pages 45, 47, 153

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



Building Safety & Efficiency

Monitor parking structures, maintain optimal building and duct pressure

Gas Detection

CO, NO₂ SENSORS

Pages 61, 63

Easy parking garage monitoring with the GWN and GWNP modular platforms. Monitor CO and NO₂ separately or combined.



Differential Pressure or Air Velocity Sensor

EP, PX3 SERIES

Pages 127, 129

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



CO₂ Sensors

SLA, CW2 SERIES

Pages 25, 27

Calling for fresh air only when CO₂ levels are high saves energy. Make the SLA or CW2 Series part of your demand controlled ventilation strategy.



Sub-Tenant & Power Usage Monitoring

Accurately monitor and invoice energy consumption

Adjustable Current Switches

H308

Page 177

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

V100 SERIES

Page 219

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

380 SERIES

Page 75

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



Residential Multi-Tenant



Living & Shared Spaces

Create comfortable, energy-efficient environments

Occupancy Sensors

MSC, MSB SERIES

Pages 169, 171

Reduce energy consumption and control energy waste by lighting a room only when it's occupied.



CO₂ Sensors

SLA, CW2 SERIES

Pages 25, 27

Calling for fresh air only when CO₂ 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 111, 113, 115, 119

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

CO, NO₂ SENSORS

Pages 61, 63

Easy parking garage monitoring with the GWN and GWNP modular platforms. Monitor CO and NO₂ separately or together.



BTU Monitoring

380 SERIES

Page 75

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



Schools



Classrooms & Common Areas

Maintain a comfortable learning environment, while optimizing efficiency

Occupancy Sensors

MSC, MSB SERIES

Pages 169, 171

Reduce energy consumption and control energy waste by lighting a room only when it's occupied.



Humidity Sensors

SLA, HW2 SERIES

Pages 35, 37

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



Temperature Sensors

SLA, TW2, ETD SERIES

Pages 45, 47, 153

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



Building Safety & Efficiency

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

Gas Detection

CO, NO₂ SENSORS

Pages 61, 63

Easy parking garage monitoring with the GWN and GWNP modular platforms. Monitor CO and NO₂ separately or combined.



Differential Pressure or Air Velocity Sensor

EP, PX3 SERIES

Pages 127, 129

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



CO₂ Sensors

SLA, CW2 SERIES

Pages 25, 27

Calling for fresh air only when CO₂ levels are high saves energy. Make the SLA or CW2 Series part of your demand-controlled ventilation strategy.



HVAC & Physical Plant

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

Adjustable Current Switches

H308

Page 177

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



Flow Monitoring

380 SERIES

Page 75

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





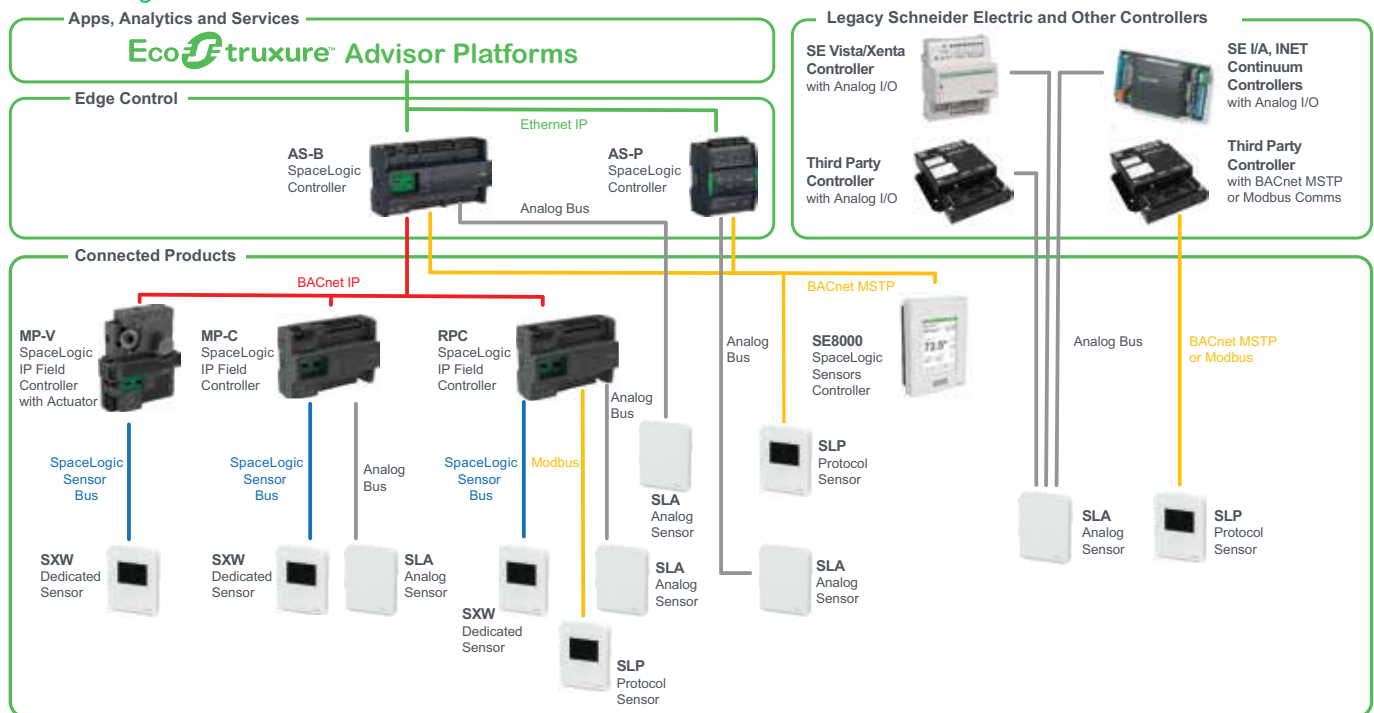
Living Space Sensors

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	35
SLA – Temp.	X	X	X	X	2	2	2	2	45
SLP		X	3	X				2	21
SLP – Humidity		X	3	X				X	31
SLP – Temp.		X	3	X				X	41
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	37
HW2 Protocol									33
HEW	1	1	X	X				X	39
TW2 – Temp.	X	X	X	X	X	X	X	X	47
TW2 Protocol									43
TE & TP	X	X	X	X	X	X	X	X	49
TTS					X				51
MN-S						X			53

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 CO₂, RH and Temperature with Touch-screen, 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. CO₂, 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 CO₂/VOC, CO₂, 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 CO₂/VOC, CO₂, Relative Humidity, and Temperature sensors.

SXWS, SLA, SLP Sensors



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.



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



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. CO₂, 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 CO₂ (if equipped), RH (if equipped), and temperature of air in a living space application. The CO₂ sensor operates within accuracy specifications for an interval of two years and can be field calibrated.

Specifications

CO₂ 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	Thin-film 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 watts, 24 Vdc over sensor bus

Wiring Terminals

Non-communicating Models	Screw, 2-wire, 18-24 AWG
Communicating Models	RJ-45 female sensor bus

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.)

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)
------------------	---



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

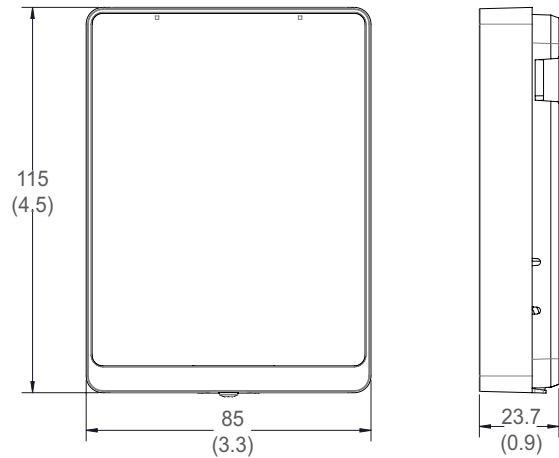
IP Controller Sensor Bus

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.).

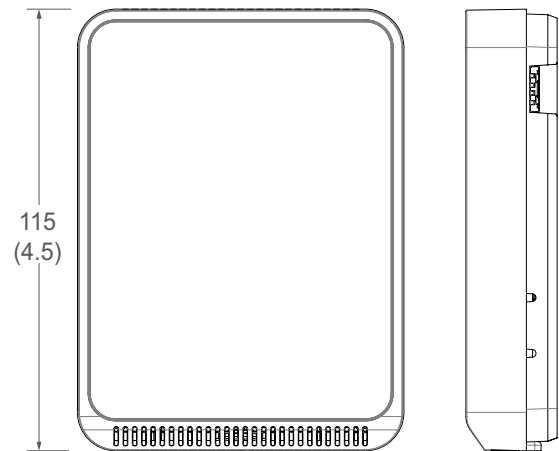
*Due to power constraints, limitations exist for the number of sensors the Sensor Bus can support. For specific sensor combinations supported, see the Sensor Bus Configuration Calculator on the last page of this document.

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



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
SXWSBTXXXSXX	X		
SXWSBTHXSXX	X	X	
SXWSBTXCXSXX	X		X
SXWSBTHCXSXX	X	X	X

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

Air Quality Sensors – BACnet and Modbus

Individual or 4-in-1 CO₂, 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 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

CO₂ 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

Communicating

Embedded BACnet and Modbus communication protocols...easy systems integration

Self-calibrating

Innovative self-calibration algorithm...easy to maintain

Dual-beam NDIR CO₂ sensor

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

Applications

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

Configurable baud rates

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

Easy to install

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

Visual CO₂ indication

Spotlight feature for visual indication at user-configurable CO₂ threshold levels (touchscreen models only)

RH Transmitter Option

HS Sensor	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis	1.5% typical
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:
EN61000-6-2
EN61000-6-3
EN61000 Series - industrial immunity
EN 61326-1
FCC Part 15 Class B, REACH, RoHS, RCM (Australia),
ICES-003 (Canada)



* Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization)

Housing Finishes



Optimum White



Optimum Black



Medium White

User Interface Types



Touchscreen

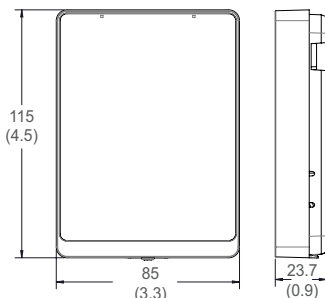


LCD with Buttons

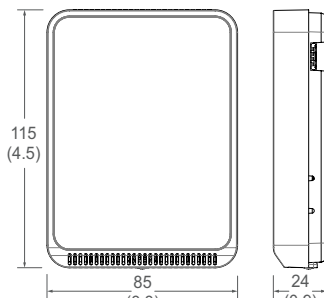


Blank

Dimensional Drawings – mm (in.)

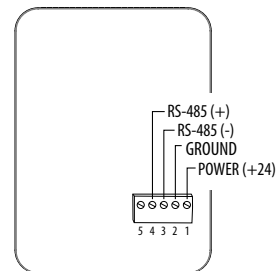


Optimum Housing



Medium Housing

Wiring Diagram



Ordering Information

SLP 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	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

CW2 Protocol Series

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



CW2Txxx

CW2Lxxx

CW2Xxxx

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. CO₂ 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

CO₂ 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)

Communicating

Embedded BACnet and Modbus communication protocols...easy systems integration

Self-calibrating

Innovative self-calibration algorithm...easy to maintain

Dual-beam NDIR CO₂ sensor

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

Applications

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

Configurable baud rates

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

Easy to install

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

Visual CO₂ indication

Spotlight feature for visual indication at user-configurable CO₂ threshold levels (touchscreen models only)

	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	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis	1.5% typical
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
-------------	--

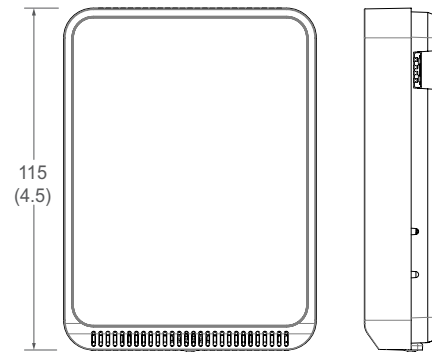
Specifications (cont.)

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: EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)



* Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization)

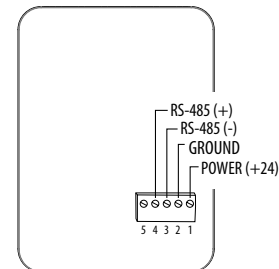
Dimensional Drawing – mm (in.)



User Interface Types



Wiring Diagram



Ordering Information

CW2	User Interface	Output	RH Accuracy*	A	VOC Sensor	Example:
						CW2 T P 2 A V
	T = Color touchscreen L = 3-button LCD X = display None***	P = BACnet/Modbus	2 = 2% X = None		V = NDIR CO2 / VOC = None	
* Replaceable 1% with NIST certificate, 2% with NIST certificate and 2% elements available.						

Replaceable RH Elements

Model	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

SpaceLogic Sensors

Air Quality Sensors – Analog

Individual or 4-in-1 CO₂, 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. CO₂ 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

CO₂ 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

Self-calibrating

Innovative self-calibration algorithm...easy to maintain

Dual-beam NDIR CO₂ sensor

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

Applications

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

Easy to install

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

Field selectable

Field-selectable outputs for operation flexibility

Visual CO₂ indication

Stoplight feature for visual indication at user-configurable CO₂ threshold levels (touchscreen models only)

RH Transmitter Option

HS Sensor	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25 °C (77 °F)
Hysteresis	1.5% typical
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
------------------	---------

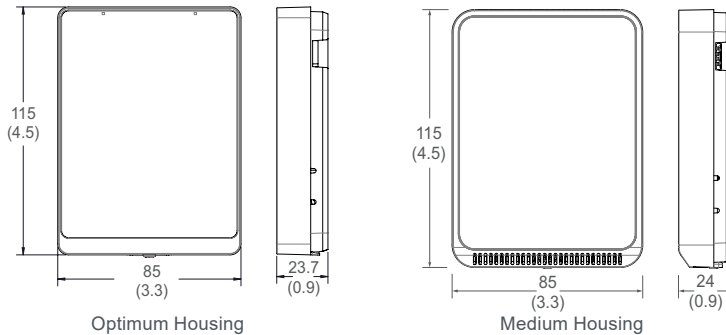
Compliance Information

Agency Approvals	UL 916, European conformance CE: EN61000-6-2, EN61000-6-3, EN61000 Series - industrial immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)
------------------	---



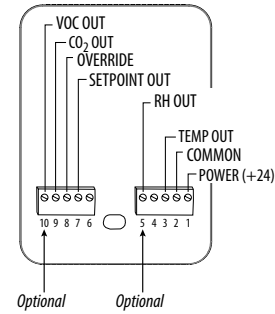
* Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).
**DIP switch selectable.
*** One setpoint type is selectable via DIP switch on display models only.

Dimensional Drawings – mm (in.)



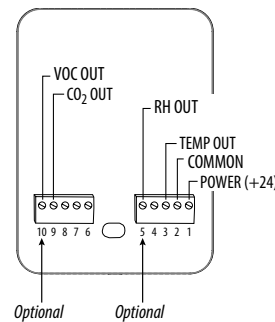
SLABTCxx/SLABxxx Display Models with Temp. Transmitter

Wiring Diagram



SLABXCxx with Temp. Transmitter

Wiring Diagram



Housing Finishes



User Interface Types



Ordering Information

SLA	Housing Finish	User Interface	VOC Sensor	RH Accuracy*
	B = Optimum housing, black W = Optimum housing, white S = Medium housing, white	TC = Color touchscreen LC = 3-button LCD display XC = None***	V = NDIR CO2 / VOC** Blank = None	2 = 2% RH Sensor X = None***

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

Example:

SLA	B	L	C	V	2
-----	---	---	---	---	---

Replaceable RH Elements

Model	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

CW2 Series

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



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

CO₂ 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

Self-calibrating

Innovative self-calibration algorithm...easy to maintain

Dual-beam NDIR CO₂ sensor

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

Applications

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

Easy to install

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

Field selectable

Field-selectable outputs for operation flexibility

Visual CO₂ indication

Stoplight feature for visual indication at user-configurable CO₂ threshold levels (touchscreen models only)

RH Transmitter Option

HS Sensor	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25 °C (77 °F)
Hysteresis	1.5% typical
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: EN61000-6-2, EN61000-6-3, EN61000 Series - industrial immunity, EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)
------------------	---

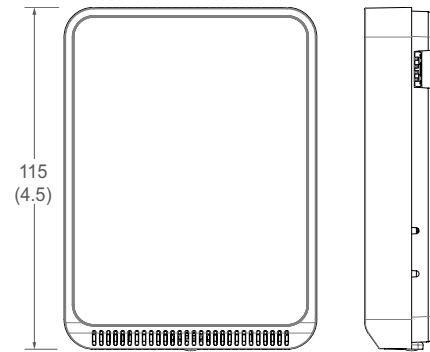


* Air Quality Index for VOC aligns with TVOC levels for IAQ as specified by the WHO (World Health Organization).

**DIP switch selectable.

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

Dimensional Drawing – mm (in.)

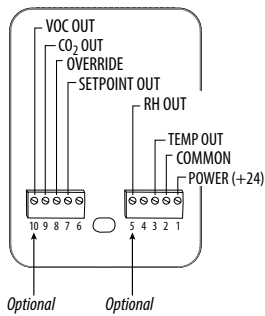


User Interface Types



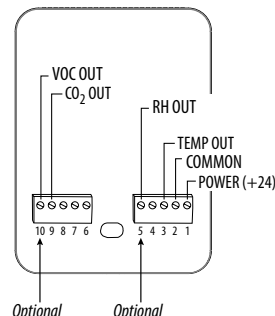
CW2L/CW2T Display Models with Temp Transmitter

Wiring Diagram



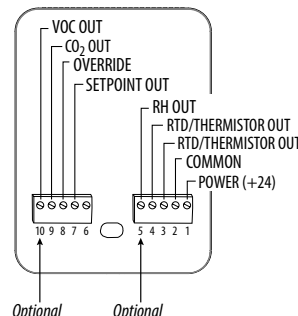
CW2x with Temp Transmitter

Wiring Diagram



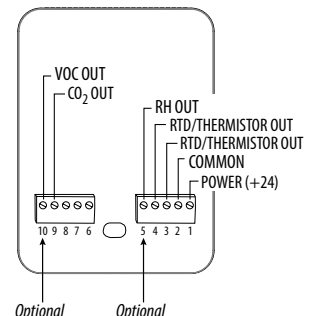
CW2L/CW2T Display Models with RTD/Thermistor

Wiring Diagram



CW2x with RTD/Thermistor

Wiring Diagram



Ordering Information

User Interface	Output	RH Accuracy*	Temperature	VOC Sensor	Example:
CW2					CW2 T A 2 A V
T = Color touchscreen L = 3-button LCD display X = None***	A = Analog output	2 = 2% X = None***	A = Transmitter 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	V = NDIR CO2 / VOC** = None	
* Replaceable 1% with NIST certificate, 2% with NIST certificate and 2% elements available. ** VOC only available with temperature transmitter option *** For analog non-display, non-RH, models with RTD/thermistor order from CWE2 line.					

Replaceable RH Elements

Model	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

CWE2 & CWV2 Series

Economy and Value Wall Mount CO₂ 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 $\pm 3\%$ 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 $\pm 5.5\%$ of measured value, is ideal for bid-spec applications.

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 $\pm 3\%$ of measured value CWV2: ± 40 ppm $\pm 3.5\%$ of measured value
Repeatability	CWE2: ± 20 ppm $\pm 1\%$ of measured value CWV2: ± 30 ppm $\pm 2.5\%$ 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

2-Wire 4-20 mA Output

CWE2 models offer 2-wire current outputs...lower installation costs

Easy to install

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

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

Economy Sensor

Competitively-priced sensors ideal for bid-spec

Self-calibrating

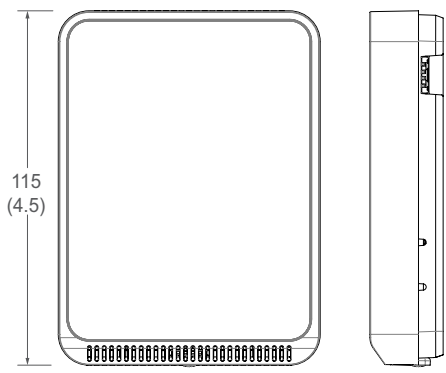
Innovative self-calibration algorithm...easy to maintain

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: EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)

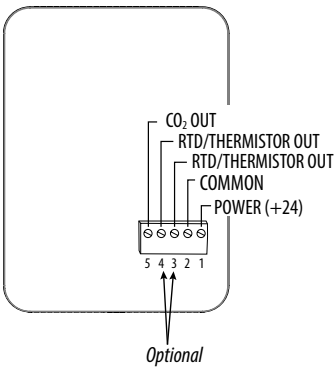


*Applicable for CWE2 4-20 mA current mode only. If load parameters are not met, product will reset.

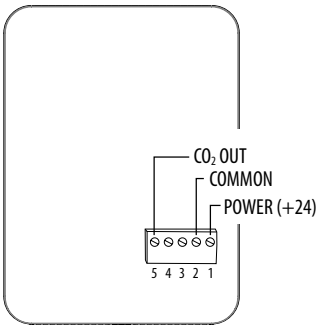
Dimensional Drawing – mm (in.)



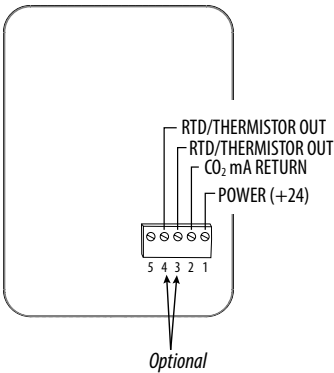
CWE2 Voltage Output
Wiring Diagram



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 

CWV2 (No Options)

SpaceLogic Sensors

Humidity Sensors – BACnet and Modbus

Wall Mount Humidity Sensors



SLPxTX2

SLPxLX2

SLPxXX2

The SpaceLogic SLP Series of humidity sensors for living space is a flexible multisensor platform for use with BAS controllers designed to accept BACnet MSTP or Modbus 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 SLP Series air quality 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	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis	1.5% typical
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)

BACnet & Modbus Field replaceable

Embedded BACnet and Modbus communication protocols...easy systems integration

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

Interchangeable 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.

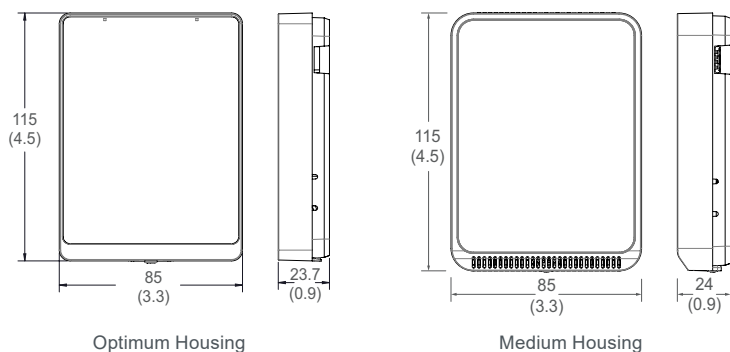
Compliance Information

Agency Approvals

UL 916, European conformance CE:
EN61000-6-2
EN61000-6-3
EN61000 Series - industrial immunity
EN 61326-1
FCC Part 15 Class B, REACH, RoHS,
RCM (Australia), ICES-003 (Canada)



Dimensional Drawings – mm (in.)



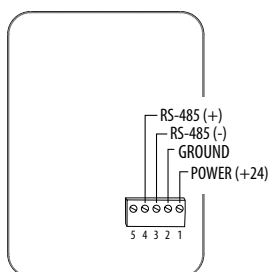
Housing Finishes



User Interface Types



Wiring Diagram



Ordering Information

Model	User Interface	RH*	Temp	Housing
SLPWTX2	Touchscreen	X	X	Optimum White
SLPWLX2	LCD / 3 Buttons	X	X	Optimum White
SLPWXX2	Blank	X	X	Optimum White
SLPBTX2	Touchscreen	X	X	Optimum Black
SLPBLX2	LCD / 3 Buttons	X	X	Optimum Black
SLPBXX2	Blank	X	X	Optimum Black
SLPSTX2	Touchscreen	X	X	Medium White
SLPSLX2	LCD / 3 Buttons	X	X	Medium White
SLPSXX2	Blank	X	X	Medium White

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

Replaceable RH Elements

Model	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

HW2 Protocol Series

Wall Mount Humidity Sensors from Veris



HW2Tx

HW2L

HW2X

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	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis	1.5% typical
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
-------------	--

BACnet & Modbus

Embedded BACnet and Modbus communication protocols...easy systems integration

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Interchangeable element

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

Field replaceable

Replace element in the field...maintain accuracy and minimize downtime

Easy to install

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

Calibration free

Calibration-free interchangeable NIST traceable HS element

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:
EN61000-6-2
EN61000-6-3
EN61000 Series - industrial immunity
EN 61326-1
FCC Part 15 Class B, REACH, RoHS,
RCM (Australia), ICES-003 (Canada)



User Interface Types



Touchscreen

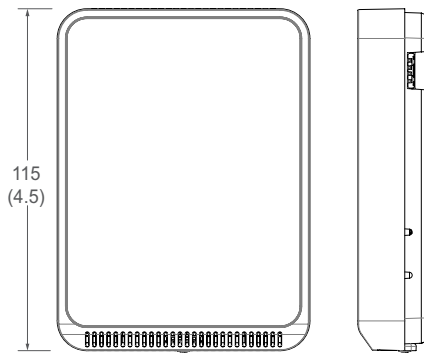


LCD with Buttons

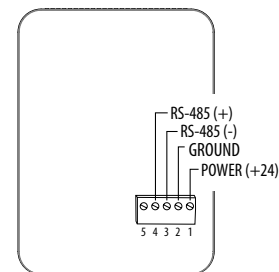


Blank

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	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

SpaceLogic Sensors

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	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis	1.5% typical
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

Interchangeable 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 4 to 20 mA or 3-wire 0-5/0-10 Vdc versions...flexible systems compatibility...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

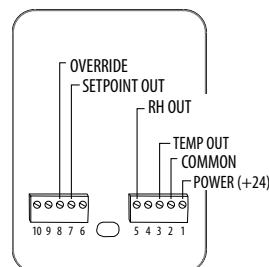
UL 916, European conformance CE:
 EN61000-6-2
 EN61000-6-3
 EN61000 Series - industrial immunity
 EN 61326-1
 FCC Part 15 Class B, REACH, RoHS,
 RCM
 (Australia), ICES-003 (Canada)



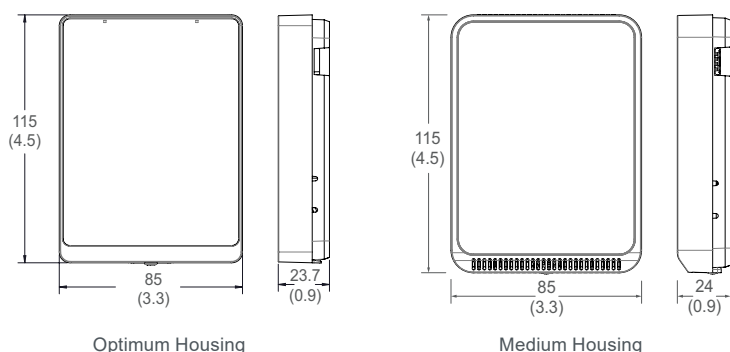
*DIP switch selectable..
 ** One setpoint type is selectable via DIP switch on display models only.

SLAxxx2 Display Models with Temp Transmitter

Wiring Diagram

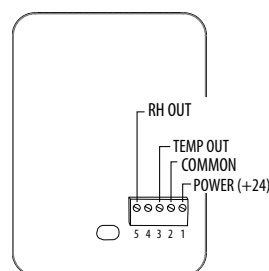


Dimensional Drawings – mm (in.)



SLAxxx2 with Temp Transmitter

Wiring Diagram



Housing Finishes



User Interface Types



Ordering Information

SLA	Housing	User Interface	RH Sensor*	Example:
	☐	☐	☐	SLA ☐ ☐ ☐ ☐
	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.	

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

Replaceable RH Elements

Model	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

HW2 Series

Wall Mount Humidity Sensors from Veris



HW2Txxx

HW2Lxxx

HW2Xxxx

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	Thin-film capacitive, replaceable
Accuracy	±2% from 10 to 80% RH @ 25°C (77 °F)
Hysteresis	1.5% typical
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*
-------------	--

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Interchangeable element

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

Flexible

Polarity insensitive, two-wire 4 to 20 mA or 3-wire 0-5/0-10 Vdc versions...flexible systems compatibility...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

Field replaceable

Replace element in the field...maintain accuracy and minimize downtime

Easy to install

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

Calibration free

Calibration-free interchangeable NIST traceable HS element

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
------------------	---------

Specifications, cont.

Compliance Information

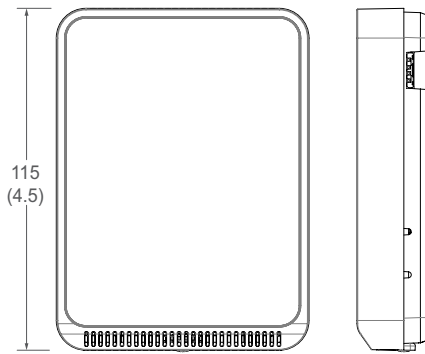
Agency Approvals



UL 916, European conformance CE:
EN61000-6-2
EN61000-6-3
EN61000 Series - industrial immunity
EN 61326-1
FCC Part 15 Class B, REACH, RoHS,
RCM
(Australia), ICES-003 (Canada)

*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

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.

Replaceable RH Elements

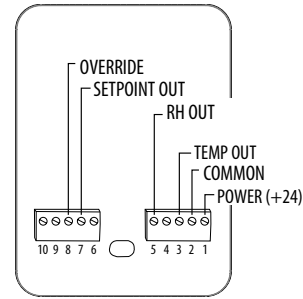
Model	RH Accuracy	Calibration Certificate	Description
SLXRHS1N	±1%	X	Replaceable RH sensor, 1% with NIST certification
SLXRHS2N	±2%	X	Replaceable RH sensor, 2% with NIST certification
SLXRHS2X	±2%		Replaceable RH sensor, 2%



Replaceable RH Element

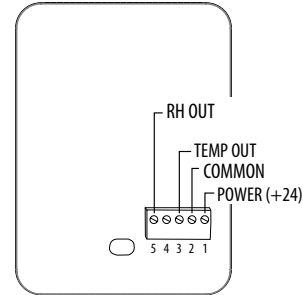
HW2L/HW2T Display Models with Temp Transmitter

Wiring Diagram



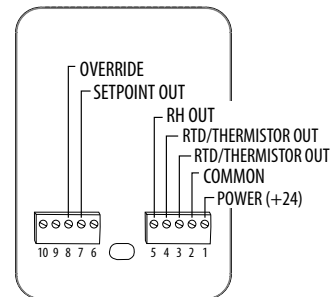
HW2x with Temp Transmitter

Wiring Diagram



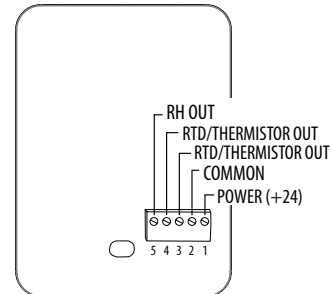
HW2L/HW2T Display Models with RTD/Thermistor

Wiring Diagram



HW2x with RTD/Thermistor

Wiring Diagram



HEW Series

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



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.

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)

RH & temperature Low profile

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

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

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

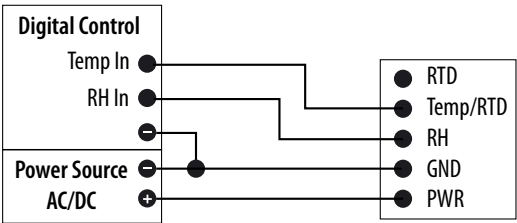
Agency Approvals



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

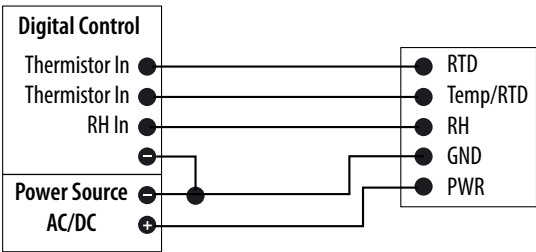
0-5V/0-10V Models, Temperature Transmitter

Wiring Diagram



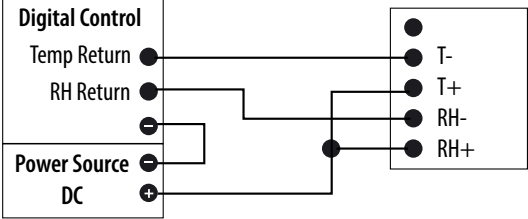
0-5V/0-10V Models, Temperature Transmitter

Wiring Diagram



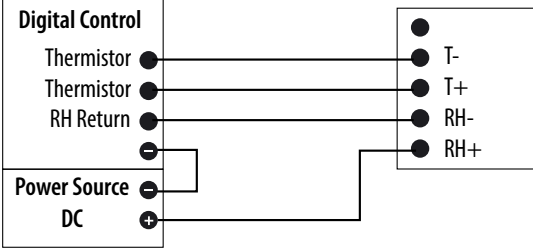
4-20 mA Models, Temperature Transmitter

Wiring Diagram

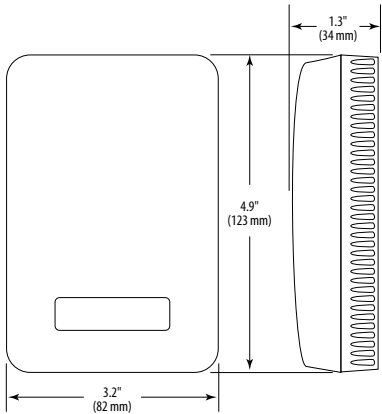


4-20 mA Models, Thermistor

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

Temperature Sensors – BACnet and Modbus

Wall Mount Temperature Sensors



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.

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

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

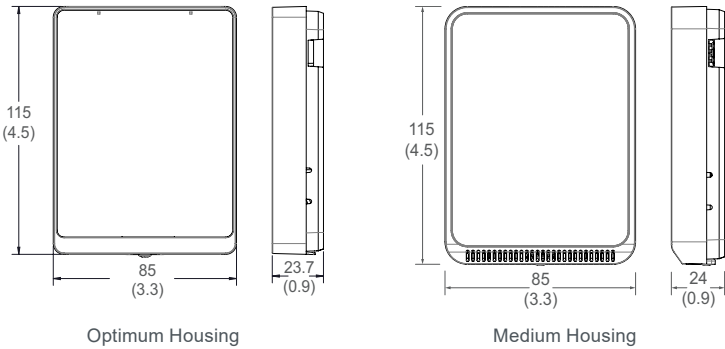
Applications

- 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

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: EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)



Dimensional Drawing – mm (in.)



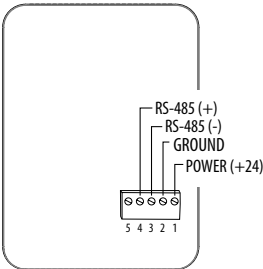
Housing Finishes



User Interface Types



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.

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

BACnet & Modbus

Embedded BACnet and Modbus communication protocols...easy systems integration

Network configuration

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

Multiple baud rates

Configurable baud rates...ensures network compatibility

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

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

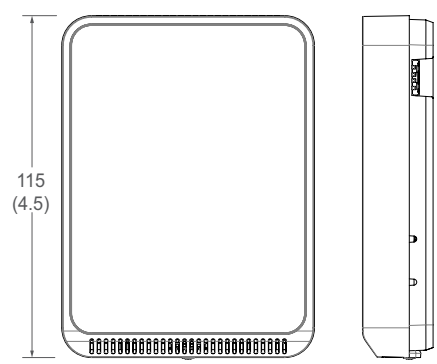
Limited Warranty	5 years
------------------	---------

Compliance Information

Agency Approvals	UL 916, European conformance CE: EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)
------------------	--



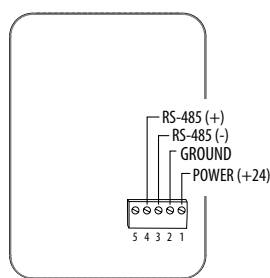
Dimensional Drawing – mm (in.)



User Interface Types



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

Temperature Sensors – Analog

Wall Mount Temperature Sensors



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*
-------------	---

Flexible

Polarity insensitive, two-wire 4 to 20 mA or 3-wire 0-5/0-10 Vdc versions...flexible systems compatibility...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

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: EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)



*DIP switch selectable.

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

Housing Finishes



Optimum White



Optimum Black



Medium White

User Interface Types



Touchscreen

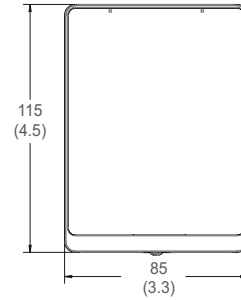


LCD with Buttons

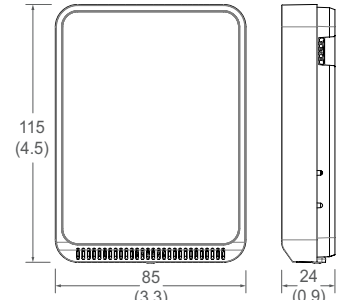


Blank

Dimensional Drawings – mm (in.)



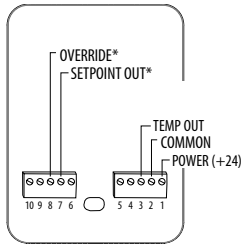
Optimum Housing



Medium Housing

SLAxxXX Display Models with Temp Transmitter

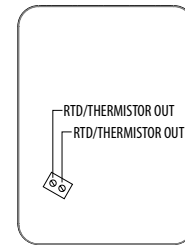
Wiring Diagram



*Touchscreen models only.

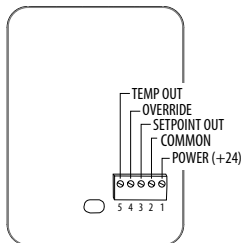
SLAxXXXwith RTD/Thermistor

Wiring Diagram



SLAxxXX with Temp Transmitter

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 Series

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.

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*

Flexible

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

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

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: EN61000-6-2 EN61000-6-3 EN61000 Series - industrial immunity EN 61326-1 FCC Part 15 Class B, REACH, RoHS, RCM (Australia), ICES-003 (Canada)
------------------	---



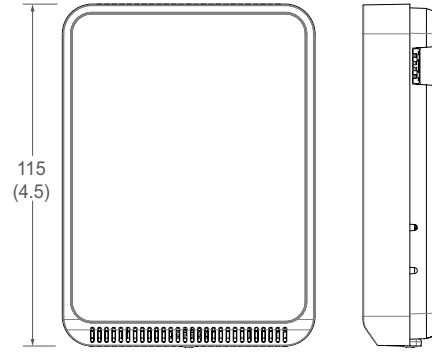
*DIP switch selectable.

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

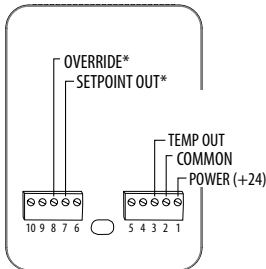
User Interface Types



Dimensional Drawing – mm (in.)

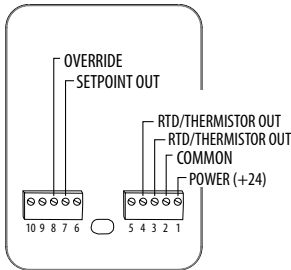


TW2X/TW2T Display Models with Temp Transmitter Wiring Diagram

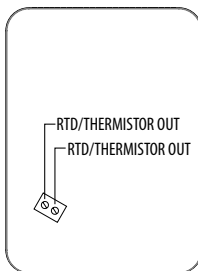


*TW2T models only.

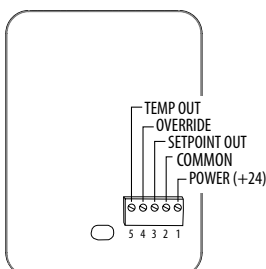
TW2L/TW2T Display Models with RTD/Thermistor Wiring Diagram



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

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 0.00385 curve	±1.0°C -50/150°C	±0.2°C 0/70°C	Consult 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

TE & TP Series

Durable Devices for Temperature Monitoring from Veris



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



*Room temperature offset documented on each unit.

Moisture resistant

Potted sensor element (TP Series)

Durable

Stainless steel construction (TP Series)

Easy installation

Mounts to standard duplex wall mount box

Flexible

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

Simple maintenance

Easy to clean

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
------------------	---------

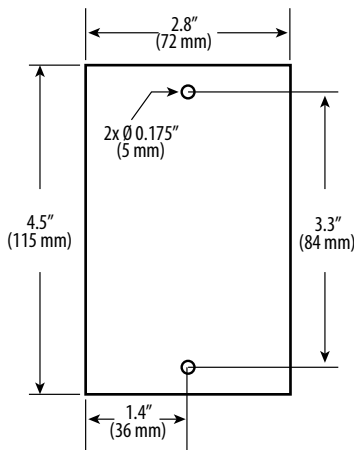
Agency Approvals



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

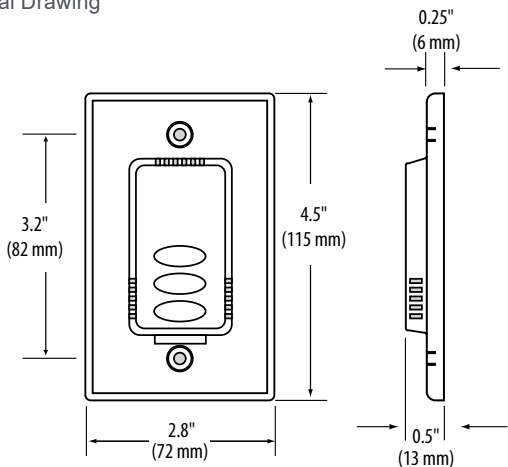
TP

Dimensional Drawing



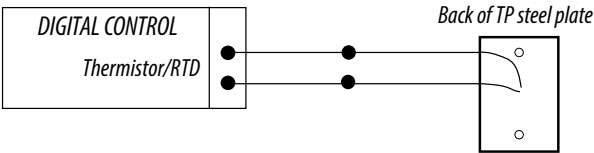
TE/TEA

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  

Output

TEA 

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

US or EU

S 

= Standard
0-5 Vdc

Housing Color



None = Cloud White
B = Black

Example:
TEA  

Sensor Type

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

Setpoint/Override



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

Cal Certificate



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

Housing Color



None = Cloud white
B = Black

Example:
TE   

*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

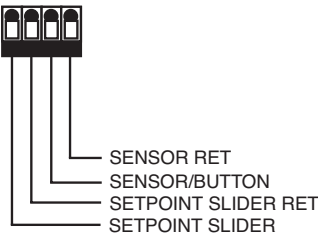
- Accurate, Reliable 10K Type III Thermistor
- LCD Display
- Programmable Keypad
- Built-in Service Port to be Used with the RoamIO-2 Service Tool
- Powered Directly from an i2 or b3 Field Controller

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 mm²) to 24 gauge (0.205 mm²), 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 mm²) wire: 1,200 ft. (366 m) with less than 0.18 °F (-17.67 °C) error 20 gauge (0.518 mm²) wire: 790 ft. (241 m) with less than 0.18 °F (-17.67 °C) error 22 gauge (0.326 mm²) wire: 500 ft. (152 m) with less than 0.18 °F (-17.67 °C) error 24 gauge (0.205 mm²) 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

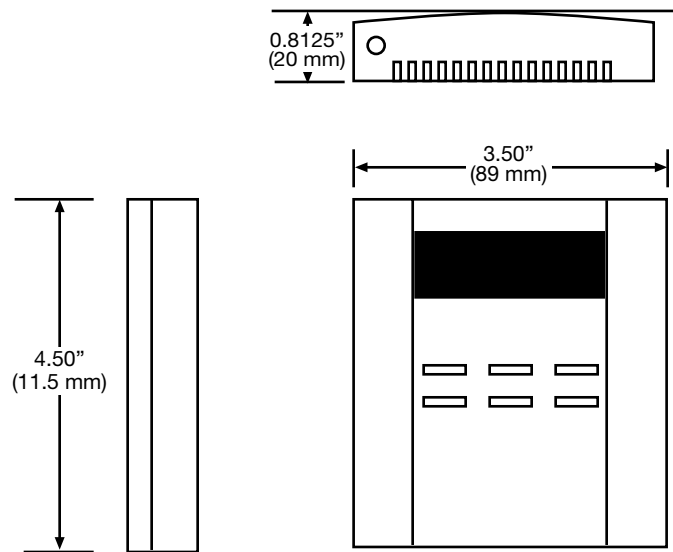


TTS-SD-LCD

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. Sub-base 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

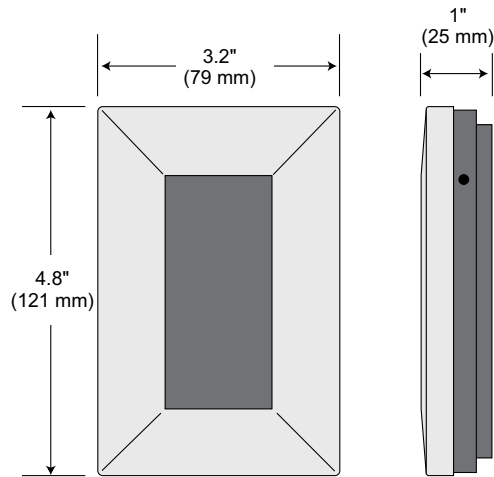
Hardware

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, CO₂, VOC and NO₂ 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
CD	Deluxe Duct & Wall CO ₂ Sensors	57
CDE	Standard Duct and Wall CO ₂ Sensors	59
GWN	Platform, CO/NO ₂ Gas Sensors	61
GWNP	Platform, CO/NO ₂ Gas Sensors, Protocol Communication	63
UG-7-A60 Uniguard	Duct Mount Smoke Detector	65

Plant Room Air Quality Selection Guide

CO₂ Sensors

Feature/Option	Duct Mount
Analog Output	CDL, CDE pages 57 , 59
Field-Selectable Output	CDL, CDE pages 57 , 59
Resistive Temperature Output	CDL page 57
Relay Output	CDL page 57
Touchscreen or LCD Display with Humidity and Temperature Options	CDL page 57

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 61	GWN page 61		GWN page 61
Protocol Output (BACnet and Modbus)	GWNP page 63	GWNP page 63	GWNP page 63	GWNP page 63

Duct Smoke Sensors

Feature/Option	Duct Mount
Relay Output	UG-7-A6O page 65

CD Series

Individual or 3-in-1 CO₂, RH and Temperature from Veris



CDL

Veris CDL carbon dioxide (CO₂) sensors maximize energy savings, while helping optimize ventilation. These sensors allow ventilation systems to be controlled by the amount of CO₂ present in a space. The CDL Series detect fluctuations in CO₂ levels and signal ventilation systems to provide an inlet of fresh air optimal for the space at a given time saving energy and increasing tenant comfort.

Specifications

Input Power	Class 2; 20 to 30 Vdc/24 Vac 50/60 Hz; 100 mA max.
Analog Output	4 to 20 mA (clipped and capped)/0 to 5 Vdc/0 to 10 Vdc (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	0.2 N-m (2.0 in-lbf) max.
Terminal Block Wire Size	28 to 14 AWG (0.5 to 1.5mm ²)

CO₂ Transmitter

Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0 to 2000/5000 ppm (programmable)
Accuracy	±30 ppm ±2% of measured value*
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change

RH Transmitter Option

HS Sensor	Fully replaceable, digitally profiled thin-film capacitive (32-bit mathematics) U.S. Patent 5,844,138
Accuracy	±2% from 10 to 80% RH @ 25 °C; NIST traceable multi-point calibration
Hysteresis	1.5% typical
Stability	±1% @ 20 °C (68 °F) annually for two years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (typical)

Temperature Transmitter Option

Sensor Type	Solid-state, integrated circuit
Accuracy	±0.5 °C (±1 °F) typical
Resolution	0.1 °C (0.2 °F)

Microprocessor based

Microprocessor-based design increases accuracy and reduces installation time

Self-calibrating

Innovative self-calibration algorithm...easy to maintain

NDIR

Non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value...high accuracy measurement

Snap-on faceplate

Snap-on faceplate...no screws required, making installation and service easy

Field-selectable

Field-selectable outputs for operation flexibility

Integrated probe

Integrated transducer and probe...eliminates the need to install a separate pick-up tube

Applications

- Controlling ventilation in response to occupancy
- ASHRAE 62.1 air quality standard compliance

Output Range	10 to 35°C (50 to 95°F)
Relay Contacts	
1 Form C (SPDT)	1 A@30 Vdc, resistive; 30 W max.
Warranty	
Limited Warranty	5 years

Agency Approvals



RTD/Thermistors in wall packages are not compensated for internal heating of product.

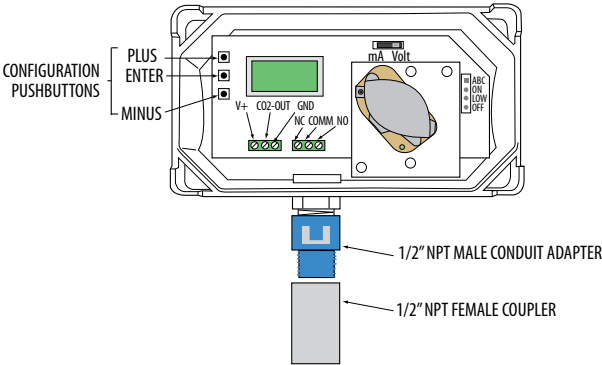
EMC Conformance: Low voltage directive 2014/35/EU and EMC directive 2014/30/EU.

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).

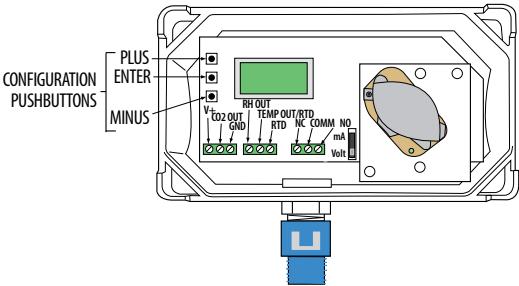
* Measured at NTP.

Note: Rough handling and transportation may cause a temporary reduction of CO₂ sensor accuracy. With time, the ABC function will tune the readings back to the correct accuracy range. The default tuning speed is limited to 30 ppm per week.

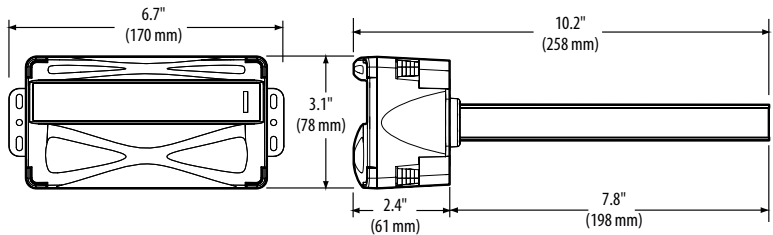
CDL (CO₂ Only)
Wiring Diagram



CDL (Temp and/or RH Options)
Wiring Diagram



Dimensional Drawing



Ordering Information

Ordering Information

CDLS ☐ RH Option ☐ Temp ☐ Sensor Type ☐ Optional Cal Cert ☐

H = RH2%
X = No RH

T = Temp
X = No Temp
(Stop here)

A = 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 w/11k shunt, Thermistor
M = 20k NTC, Thermistor
N = 1800 ohm, Thermistor
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

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

Example:
CDLS ☐ H ☐ T ☐ B ☐ 2

*Not available with W and Y high accuracy thermistors.

SCD to CD Conversion Table

This offer has been simplified to make ordering easier. Below is a conversion from the legacy SCD Series to the CD Series.

Legacy SCD	CD Series Equivalent
SCD110	CDLSXTN
SCD110-H	CDLSHTN
SCD110-D	CDLSXTN
SCD110-D-H	CDLSHTN
SCD210	CDLSXTD
SCD210-H	CDLSHTD
SCD210-D	CDLSXTD
SCD210-D-H	CDLSHTD
SCD510	CDLSXTH
SCD510-H	CDLSHTH
SCD510-D	CDLSXTH
SCD510-D-H	CDLSHTH
SCD810	CDLSXTK
SCD810-H	CDLSHTK
SCD810-D	CDLSXTK
SCD810-D-H	CDLSHTK

CDE

Economy Field-selectable 4 to 20 mA / 0 to 10 Vdc
Output from Veris



CDE

The Veris CDE is a non-dispersive infrared (NDIR) sensor designed for measuring environmental CO₂ concentration in ventilation systems. With a measurement range of 0 to 2000 ppm, the CDE sensor is compliant with ASHRAE and other standards for ventilation control

CDE provides a user-selectable 4 to 20 mA or 0 to 10 Vdc output for versatility. Microprocessor-based digital electronics and a unique self-calibration algorithm improves long-term stability and accuracy.

Specifications

Input Power	Class 2; 20 to 30 Vdc/24 AC 50/60 Hz; 100 mA max.
Analog Output	4 to 20 mA (clipped & capped)/0 to 10 Vdc (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 (4.4 to 5.3 in-lbf) max.
Terminal Block Wire Size:	24 to 12 AWG (0.25 to 2.5mm ²)
Sensor Type	Non-dispersive infrared, 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

Warranty

Limited Warranty	3 years
------------------	---------

Agency Approvals



NDIR

Non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value...high accuracy measurements

Sensitivity

Low ambient sensitivity

Bid-spec

Idea for bid spec applications where low cost is key factor

Applications

- Controlling ventilation in response to occupancy
- Facilitating compliance with ASHRAE 62.1 standard for air quality

4 to 20 mA/
0 to 10 Vdc

4 to 20 mA/0 to 10 Vdc output for flexible control system interface

Self-calibrating

Innovative self-calibration algorithm...easy to maintain. 5-year calibration interval (recommended)

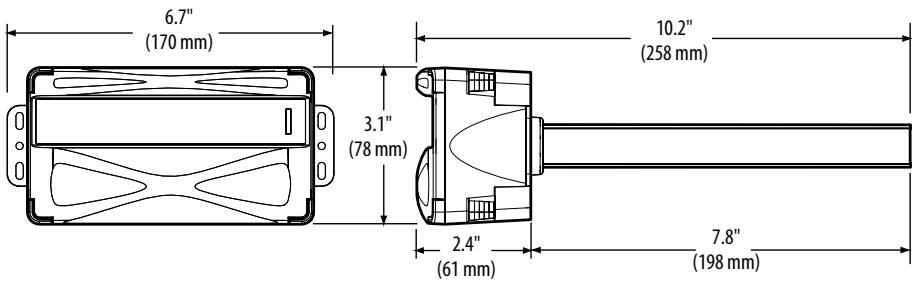
EMC Conformance: Low voltage directive 2014/35/EU and EMC directive 2014/30/EU.

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).

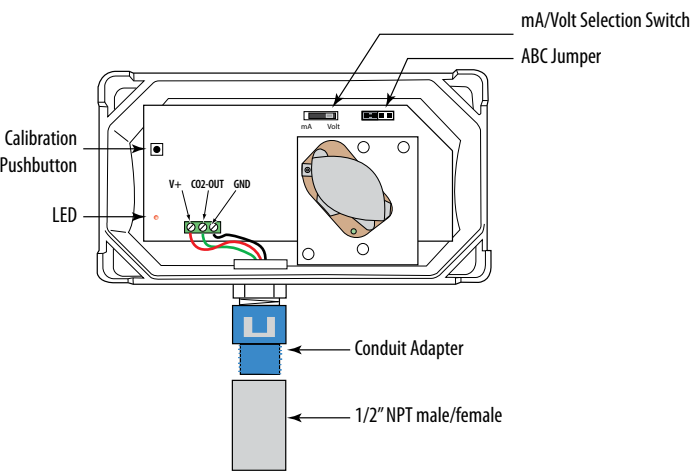
* Measured at NTP

Note: Rough handling and transportation may cause a temporary reduction of CO₂ sensor accuracy. With time, the ABC function will tune the readings back to the correct accuracy range. The default tuning speed is limited to 30 ppm per week.

Dimensional Drawing



Wiring Diagram



Ordering Information

Model	Description
CDE	Economy duct CO ₂ sensor

GWN

Modular Gas Sensor Platform Accepts AG Series Gas Sensors from Veris



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.

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
------------------	-----------------------------------



Modular design

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

LEDs

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

Microprocessor based

Microprocessor controlled...excellent stability operation

Applications

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

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

No calibration

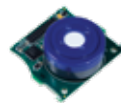
No calibration required...easy maintenance and worry-free

Versatile interface

Interface to DDC systems or direct fan control

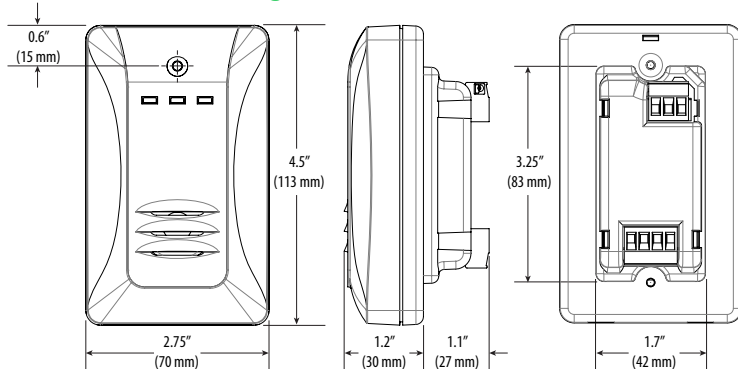
The GWN operates only when an AG Series gas sensor is installed (sold separately). Accuracy, sensitivity, setpoints, and measurement range are dependant on the AG Series sensor connected to the GWN platform. See the AG Series sensor installation guide for details.

* 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.

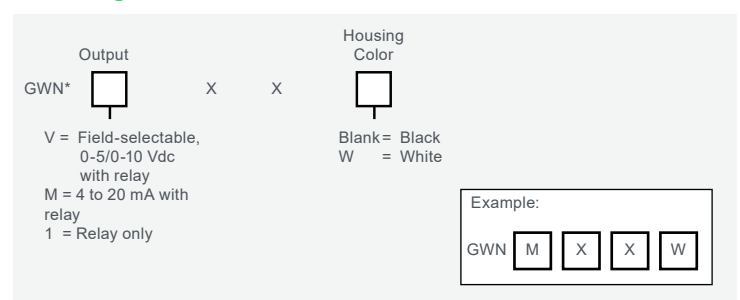
AG01
CO SensorAG01E
CO SensorAG02
NO₂ SensorAG05
R134a Refrigerant SensorAG06
R410a Refrigerant Sensor

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

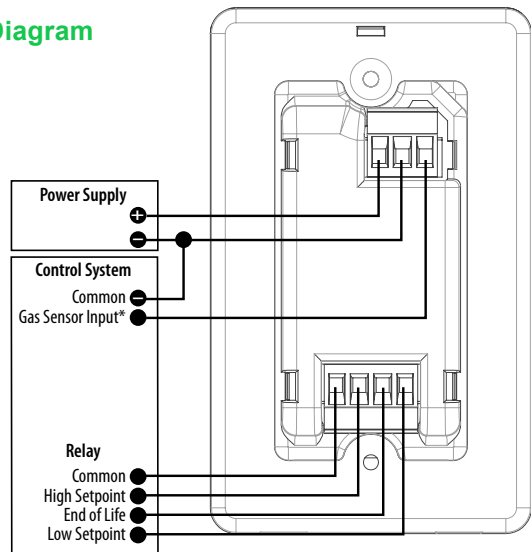


Ordering Information – Platform



*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 $\pm 20\%$, 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
------------------	-----------------------------------



The GWNP operates only when an AG Series gas sensor is installed (sold separately). Accuracy, sensitivity, setpoints, and measurement range are dependent 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.

Modular platform

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

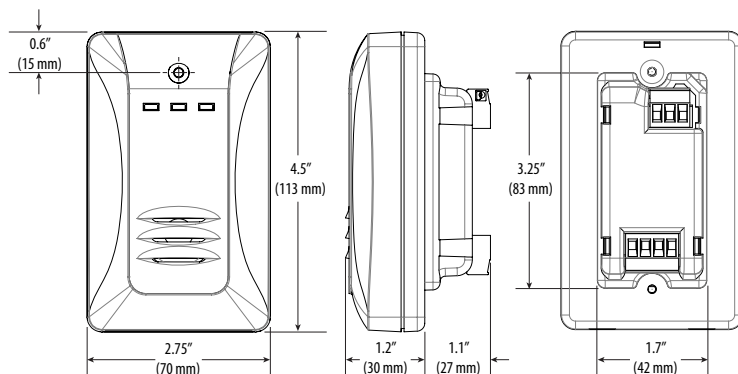
LEDs

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

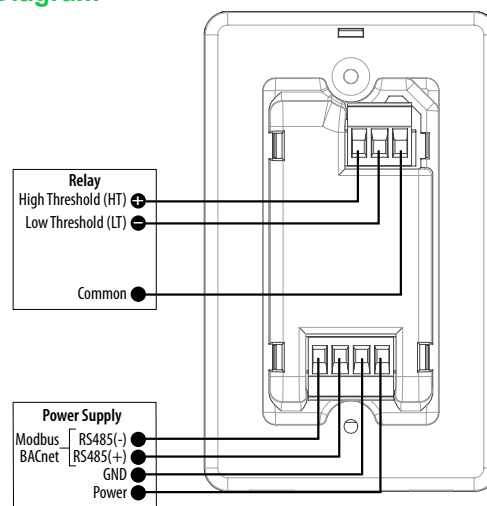
Applications

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

Dimensional Drawing



Wiring Diagram



Microprocessor based

Microprocessor controlled for excellent stability

No calibration

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

Versatile interface

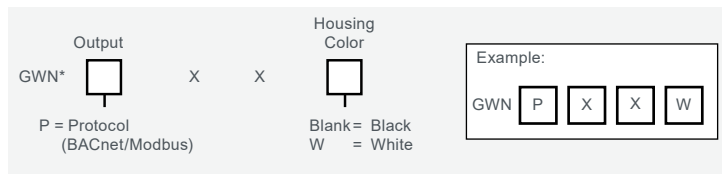
Interface to DDC systems or direct fan control

	 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 where 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 Adjustable

Highly efficient single sampling tube

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

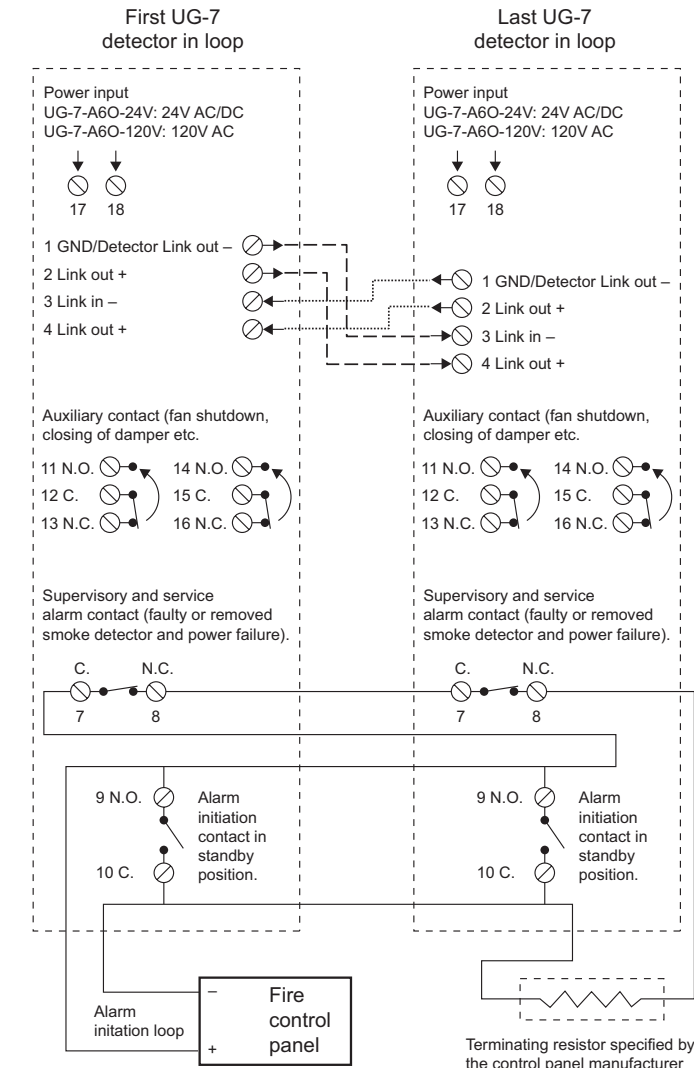
Limited Warranty	2 years
------------------	---------

Agency Approvals

Agency Approvals	UL Signaling Listed: S24724 Fire Alarm Equipment Listed: California State Fire Marshall
------------------	--



Wiring Diagram

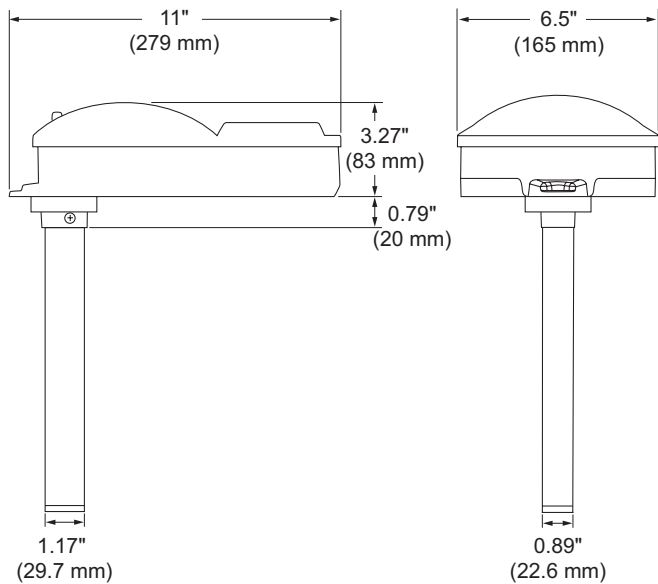


Ordering Information

Model	Description
CAL-UG-7-A60-24V*	SMOKE,DUCT,24V,UL
CAL-UG-7-A60-120V*	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.

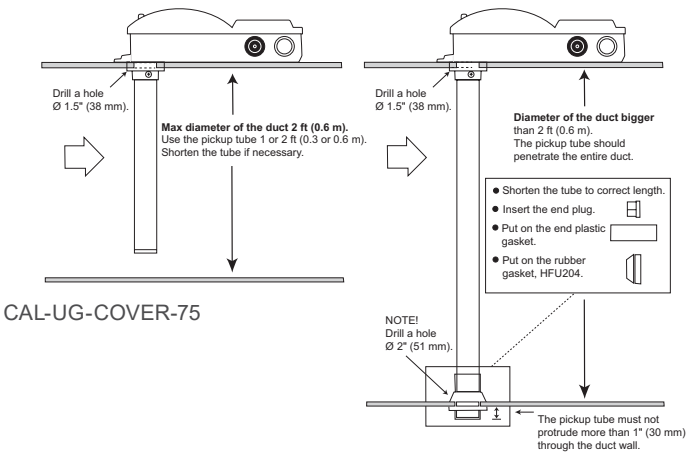
Dimensional Drawing



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-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	•	•		
AA35	Duct Aspiration Box (Allows Wall Mount CO ₂ Sensors to be Mounted into the Duct)				
AA36	CO ₂ Outdoor Aspirator Box (Allows Wall Mount CO ₂ Sensors to Sense Outdoor Air)				
AA50	Remote Sample Pick-up Kit				
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			•	•



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



AA26
17-Liter CO₂ Span Calibration Gas
(2000 ppm) - Disposable
Replacement Bottles



AA27
103-Liter CO₂ 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.

Model	Description	Page
SDI	Insertion Meter, Small Diameter Impeller (SDI)	71
220x, 228x	Insertion Meter, Standard Impeller/Hot Tap	73
250x	Tee Meter, Brass	74
380	Tee Meter, BTU System	75
310, 320, 340	Transmitter: Analog, BTU, Pulse, and Protocol Output	77
Magnetoflow	Electromagnetic (Mag) Meter	79
TFX5000	Ultrasonic Flow and Energy BTU Meter	81
170, RCDL	Nutating Disc Meter	83
450, 1000	Turbine Meter	85
B142/B3000	Gas Turbine Flow Meter and Monitor	87
VN2000	Vortex Shedding Steam Meter	89
FC-5000	Monitor: Local Display, Output and BTU	91
O2	Electronic Flow Meter with Scaled Pulse Output	94
QSE	Electromagnetic Flow Meter	95

Flow Sensor Selection Guide

Flow Sensors

	Insert	Metal Tee
Basic Model	220x, 228x page 73	228x, 250x pages 73 , 74
Hot Tap Capability	SDI page 71	
BTU Measurement		380 page 75
Small Diameter Impeller	SDI page 71	
Built-in Transmitter	SDI page 71	

Transmitters and Monitors

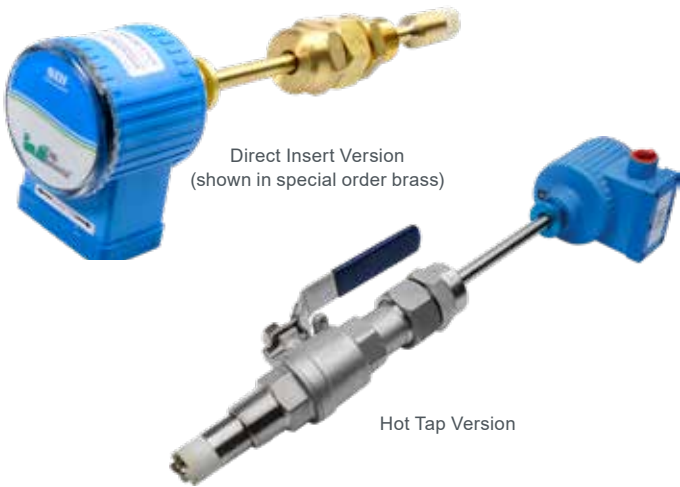
	Analog Output	Scaled Pulse Output	Protocol Output
Transmitter	310 page 77	320 page 77	
Transmitter with BTU Calculation	340 page 77		340 page 77
Flow Monitor with LCD Display	3000 page 91	3000 page 91	3000 page 91
Ultrasonic Flow Monitor with LCD Display and BTU Calculation	3050 page 91	3050 page 91	3050 page 91

Speciality Meters

Non-Impeller Styles	Electromagnetic page 79	Nutating Disc page 83	Turbine page 85	Ultrasonic page 81	Vortex Shedding page 89
---------------------	--	--	------------------------------------	---------------------------------------	--

SDI Series

For Pipe Sizes 1-½” to Over 36”



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).

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.

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

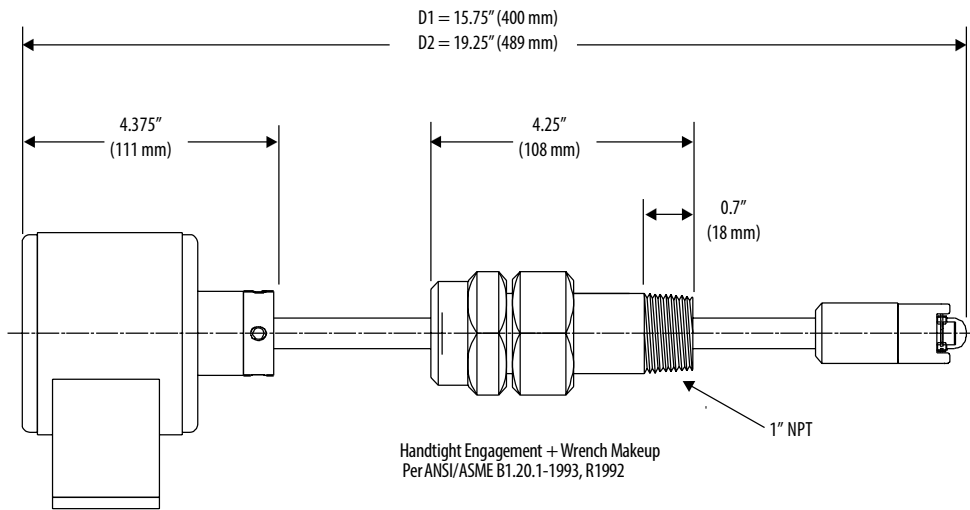
Viton® O-ring seal standard

Applications

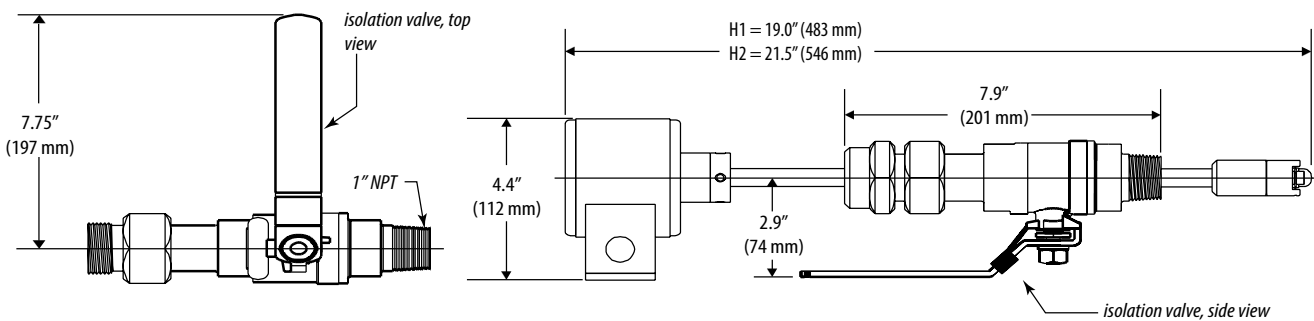
- Flow measuring projects
- True hot tap installations
- BTU applications (requires temperature sensors and transmitter/monitor)

Direct Insert

Dimensional Drawing

**Hot Tap**

Dimensional Drawing

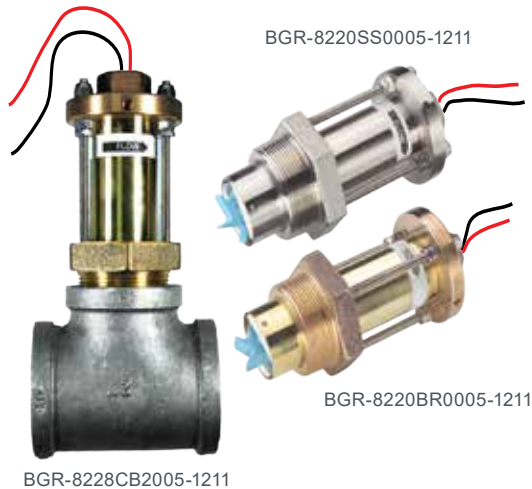
**Ordering Information**

	Material*	Type	Electronic Housing	Output*	Display	O-Ring*	Shaft	Impeller	Bearing
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 = Teflon®
Example: 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

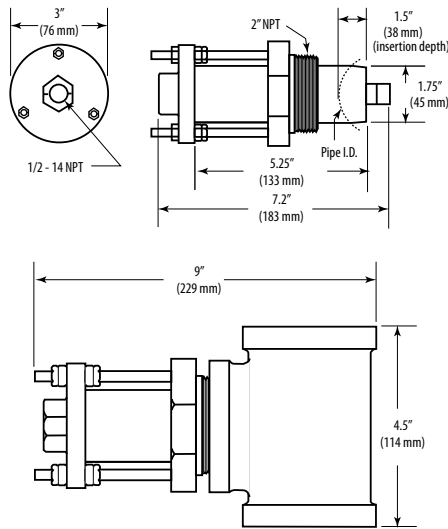
Cable options

Supplied with 20 ft (6 m) of 2-conductor AWG 20 UL type PTLT 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.

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 1/2" to 1 1/2" NPT



BGR-8250BR0505-1211

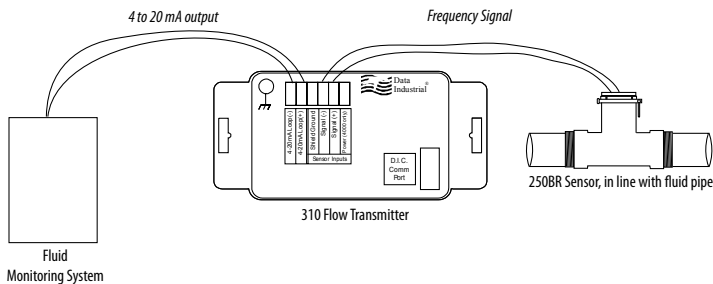
Metal tee-style liquid flow sensor with cast brass housing fits 1/2" to 1 1/2" NPT. These sensors are accurate, even at low flow rates. Use in conjunction with a flow monitor or transmitter for a complete flow monitoring system.

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

Ideal for low flow rates

Operation and repeatability even at low flow rates

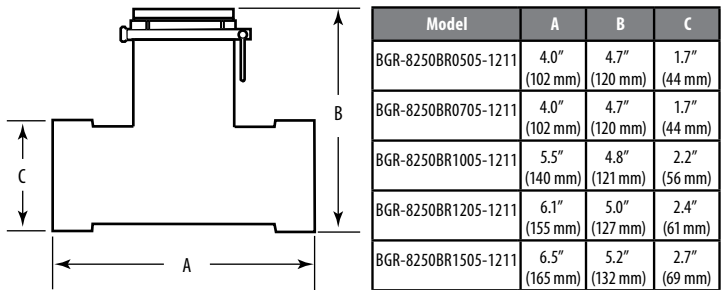
Non-magnetic sensing

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.

Applications

- Measuring liquid flow rates

Dimensional Drawing



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

Applications

- Energy management
- Data systems

Integrated flow & temperature

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

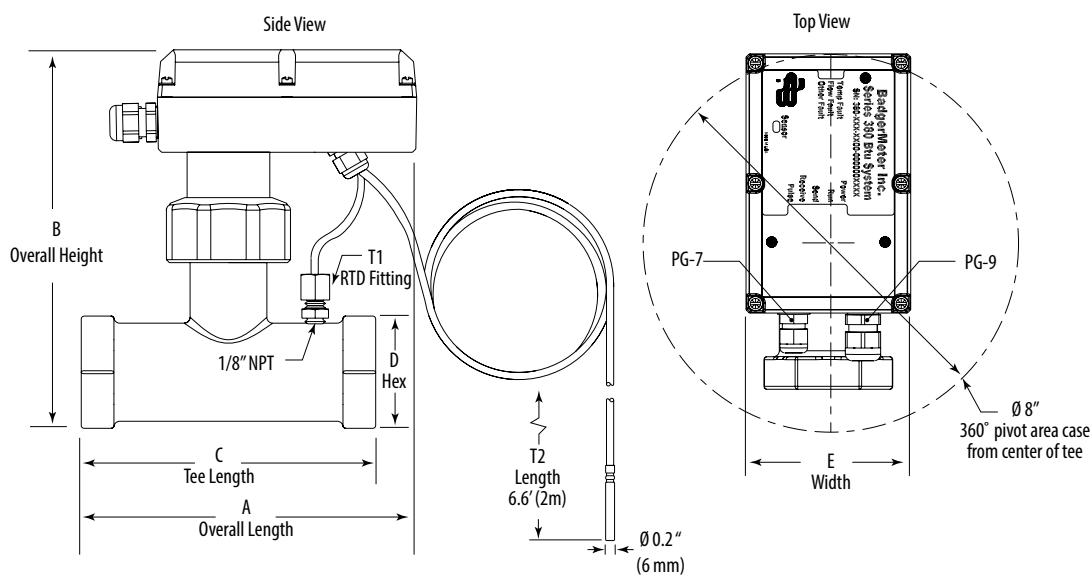
Two temperature probes

Rugged, compact design with two temperature probes

Sensor

PEEK sensor tip

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, 3/4" 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, 1-1/4" tee NPT, with pulse, Modbus and BACNet outputs	70
BGR-8380215000-1202*	8380215000-1202	BTU system, hot and cold service, 1-1/2" 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



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	$\pm 0.04\%$ 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

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

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 500 Ω 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

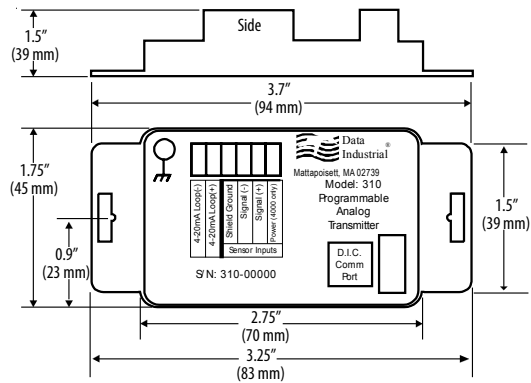
Flow Rate	gpm, gph, l/sec, l/min, l/hr, ft ³ /sec, ft ³ /min, ft ³ /hr, m ³ /sec, m ³ /min, m ³ /hr
Total Flow	gallons, liters, cubic feet, cubic meters
Energy Rate	kBTU/min, kBTU/hr, kW, MW, hp, tons
Total Energy	BTU, kBTU, MBTU, kWh, MWh, kJ, MJ

Warranty

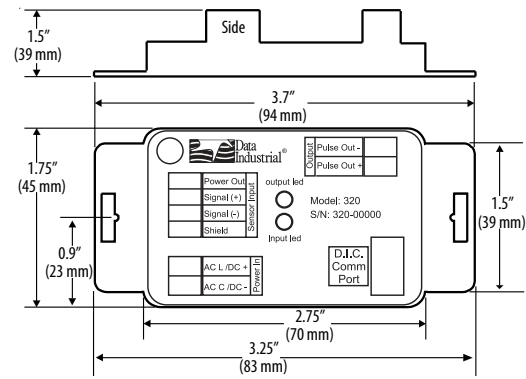
Limited Warranty	1 year
------------------	--------

BGR-8310-00

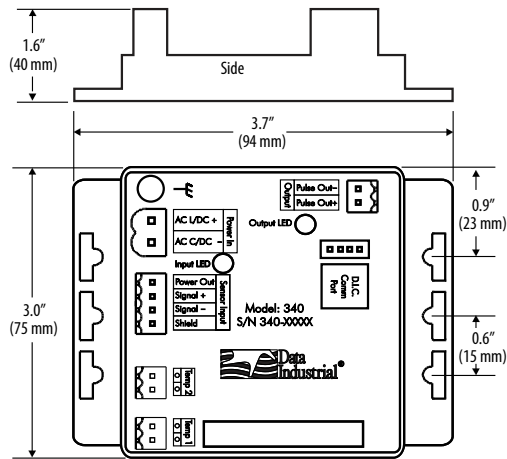
Dimensional Drawing

**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.

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

Reliable, durable design

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

0.2% accuracy

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

Bi-directional

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

Password security

Protect against unwanted program changes

Wide flow range

Exceeds operating characteristics of turbine and propeller meters

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

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	1/2" 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

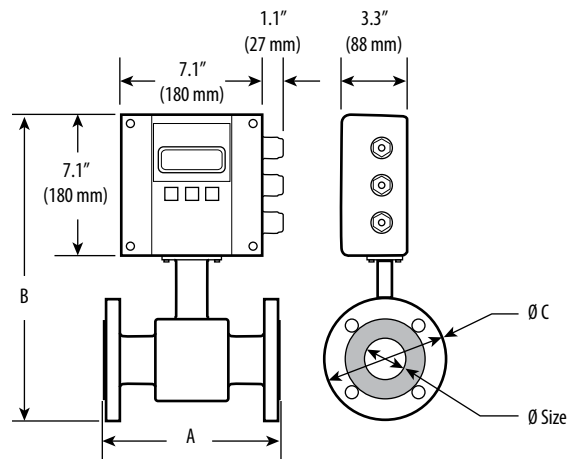
Power Supply

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

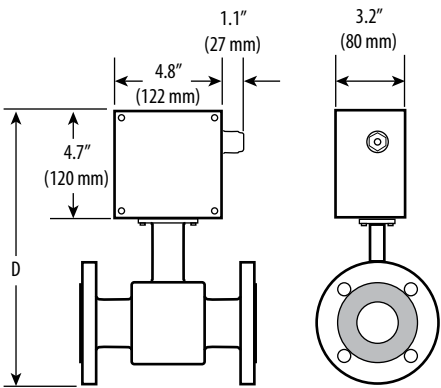
Warranty

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

Meter Size*

BGR-M2-

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

-R1-A-

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

-XX

G = Gallons

F

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



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

Bi-directional

Measure forward flow, reverse flow, and net total

No fluid contact

Safe from fouling and damage from system pressure

Communicating

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

Rugged housing

Compact, rugged aluminum housing...long service in harsh environments

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



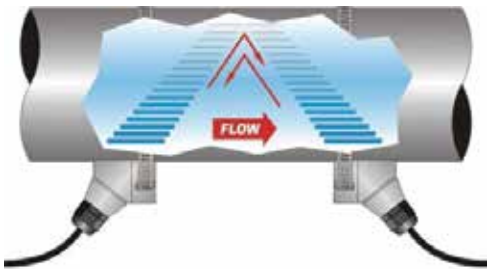
* Additional non-HVAC units available in display menu.

BGR-TXF5000 Meter

Dimensional Drawing

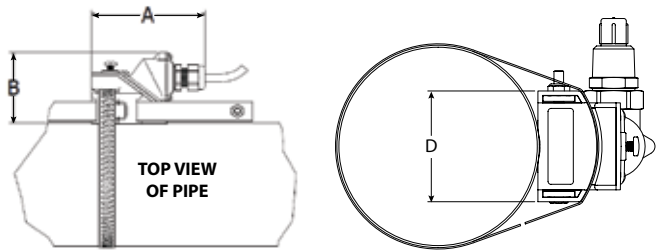


Operating Example



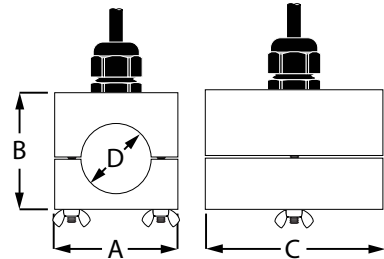
Transducers for Pipes 2-8" (RZ)

Dimensional Drawing



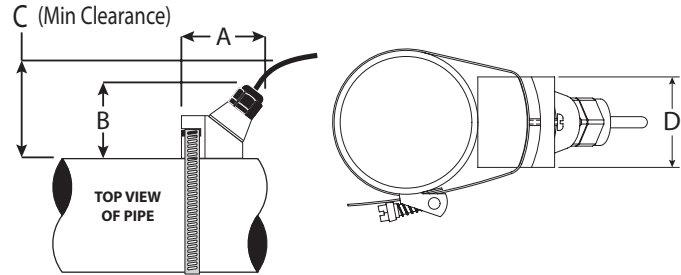
Transducers for Pipes and Tubing, 3/4" and 1"

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*

RZ = Medium pipe (2.5 to 8")

LZ = Large pipe (8" or larger)

-

Power

B = 24V AC/DC

R = 110/220V AC

-AK-WW-N-XX-

Output

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

GF

Example:

BGR-DQ-G-

LZ

-

B

-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*

RZ = Medium pipe (2.5 to 8")

LZ = Large pipe (8" or larger)

-

Power

B = 24V AC/DC

R = 110/220V AC

-AK-WW-C-AK-N-XX-

Output

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

GF

Example:

BGR-DR-G-

LZ

-

B

-AK-WW-C-AK-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.

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	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

Applications

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

Durable components

Minimal maintenance required

Increased versatility

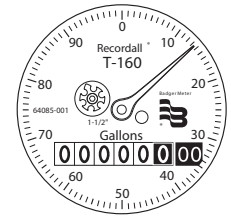
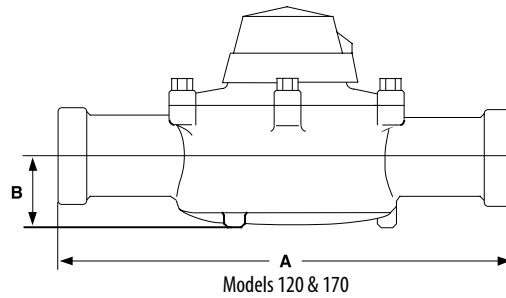
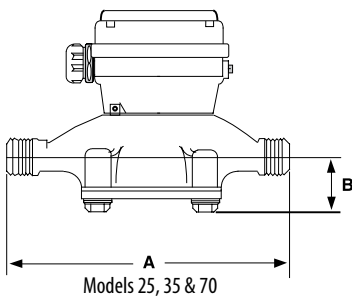
Optional pulse output transmitter

Simple operation

Mechanical dial display

- Fuel consumption

Dimensional Drawings



Dial Display

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-TS-GAXX	M25-625LNSA-TS-GAXX	Flow, Disc, 1/2"Line, Connections, Pulse Output with Dial Display
BGR-M35-750LNSB-TS-GAXX	M35-750LNSB-TS-GAXX	Flow, Disc, 3/4"Line, Connections, Pulse Output with Dial Display
BGR-M70-100LNSC-TS-GAXX	M70-100LNSC-TS-GAXX	Flow, Disc, 1"Line, Connections, Pulse Output with Dial Display
BGR-M120-150LNSF-TS-GAXX	M120-150LNSF-TS-GAXX	Flow, Disc, 1-1/2"Line, Connections, Pulse Output with Dial Display
BGR-M170-200LNSG-TS-GAXX	M170-200LNSG-TS-GAXX	Flow, Disc, 2"Line, Connections, Pulse Output with Dial Display

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	450: 5 to 450 GPM; 1000: 10 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

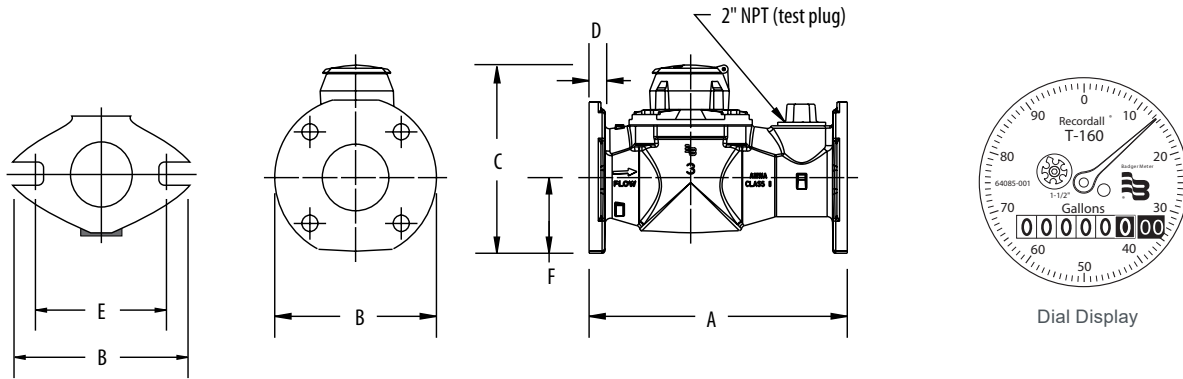
Reliable bearings

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-TS-GA-XXXX	RT-0300BRWPNSC-TS-GA-XXXX	Flow, Turbine, 3", w Conn, RTR Pulser, Gal, Pulse Output with Dial Display
BGR-RT-0400BRWPNSC-TS-GA-XXXX	RT-0400BRWPNSC-TS-GA-XXXX	Flow, Turbine, 4", w Conn, RTR Pulser, Gal, Pulse Output with Dial Display
BGR-RT-0600BRWPNSC-TS-GA-XXXX	RT-0600BRWPNSC-TS-GA-XXXX	Flow, Turbine, 6", w Conn, RTR Pulser, Gal, Pulse Output with Dial Display
BGR-RT-0800BRWPNSC-TS-GA-XXXX	RT-0800BRWPNSC-TS-GA-XXXX	Flow, Turbine, 8", w Conn, RTR Pulser, Gal, Pulse Output with Dial Display

Note: Other meter sizes and configurations are available.

B142 Series/B3000 Monitor

Accurately Measures Gas Flow



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.

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 m³)
B142-20M	14 to 210 ACFM*; 20 to 300 MCFD**; 846 to 12690 MBH† 190 pulses per ACF (6710 pulses per m³)
B142-20H	35 to 350 ACFM*; 50 to 500 MCFD**; 2115 to 21150 MBH† 85 pulses per ACF (3000 pulses per m³)

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 mV-P-P minimum when used with B111113 magnetic pickup

Accuracy

Linearity	±2% of reading over the specified measurement range
-----------	---

Consistent

Consistent, reliable gas flow measurement

No mating flange design

Allows quick and easy installation

Wafer mount

Better fit in limited spaces

Durable

Reliable performance in harsh environmental conditions

Quick response

Lightweight balanced rotor... quick response to changes in flow rate

Applications

- Monitor natural gas flow in boilers and other industrial systems

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

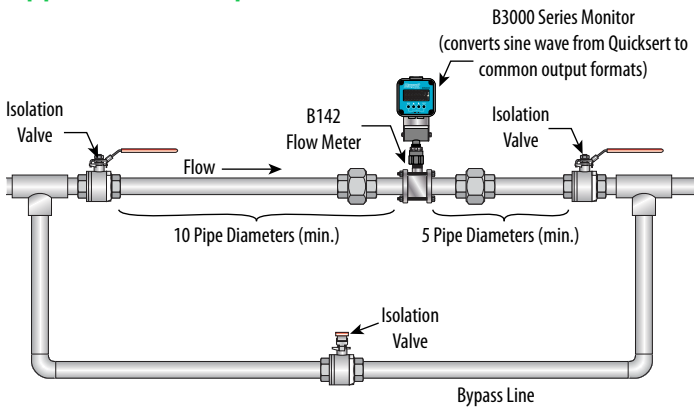
Agency Approvals



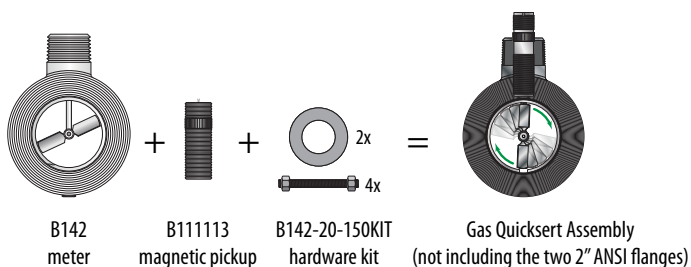
B3000 Monitor Specifications

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

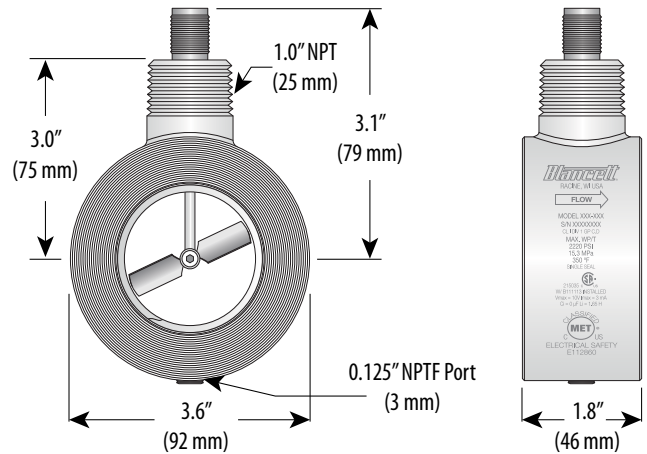


B142 Meter Required Parts



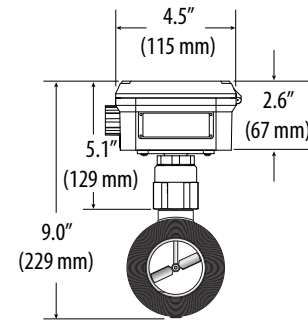
B142 Meter with B11113 Magnetic Pickup Installed

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



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.

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)

Onboard display

Provides several units of measure

Easy installation

Insertion meter and pipe mounting assembly designed for specific pipe sizes

Stainless steel consruction

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

Applications

- Steam flow rate or volumetric measurement

Multiple outputs

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

No moving parts or o-rings

No parts to service means long product life

High temperature

Standard model handles process temperatures up to 400° F (204° 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	Integral meter mount; remote mount available via special order*

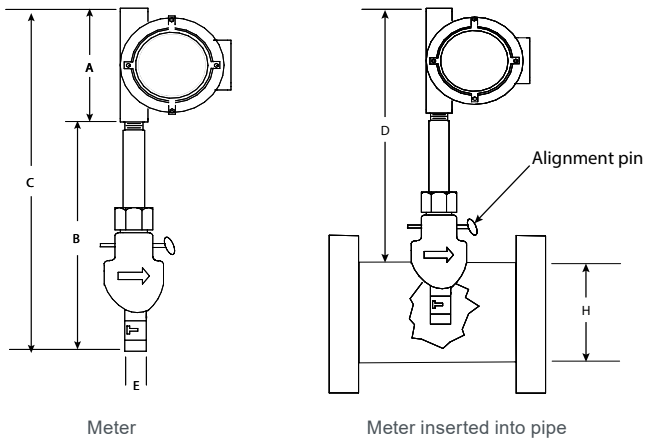
Warranty

Limited warranty	1 year
------------------	--------

*Other meter sizes and configurations are available.

VN2000 Meter with 1-1/2" NPT Connection

Dimensional Drawing



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/ft ³	50 psig 0.1503 lb/ft ³	100 psig 0.2577 lb/ft ³	150 psig 0.3614 lb/ft ³	200 psig 0.4688 lb/ft ³	300 psig 0.6481 lb/ft ³	400 psig 0.8613 lb/ft ³
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



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

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

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 temperatures

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

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 μ A, 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

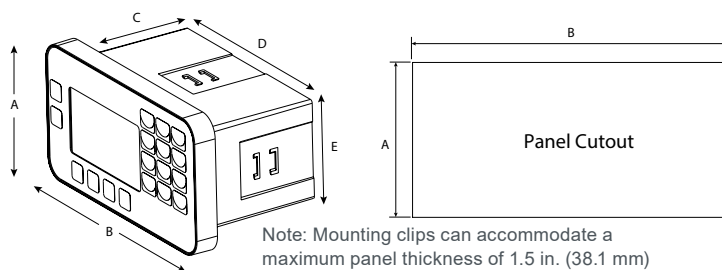
Keypad	Membrane overlay, domed tactile response keys, keypad interface is protected from ESD
Display	128 × 64 pixel LCD graphical display, LED backlit
Additional Parameter	Protected from EMI/RFI

Environmental Ratings

Pollution Degree	2
Altitude	Up to 2000 m (6561 ft)

Panel Mount

Dimensional Drawing



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

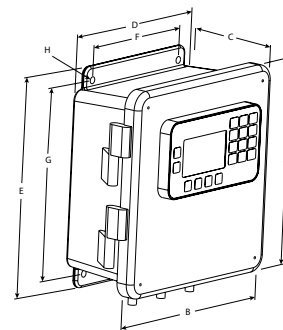
Limited Warranty	1 year
------------------	--------

Agency Approvals

Approvals	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)
-----------	---

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)

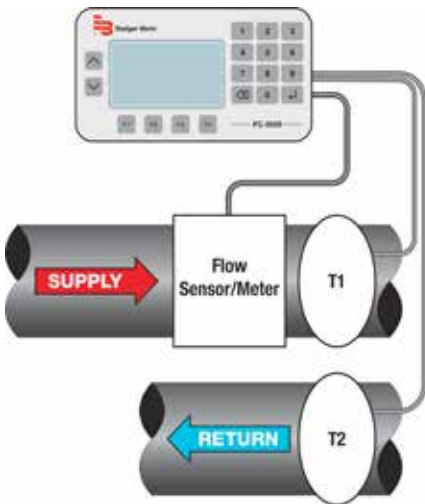
Note: All measurements: in. (mm)

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

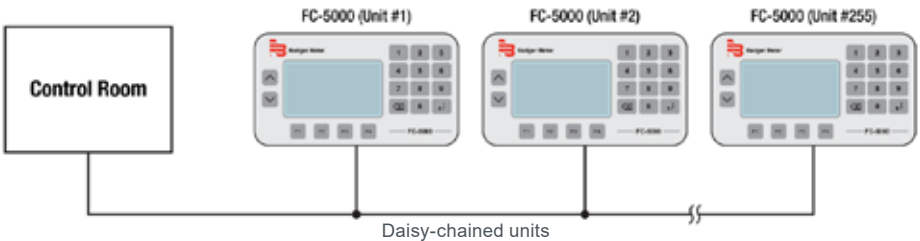
Dual Display



- 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

BGR-FC5	Energy/BTU Option	Sensor Inputs	Scaled Outputs	Relay Outputs	Digital I/O	Comm.	Mount
			F		6	A	
BM = Energy/BTU Monitor FD = Flow Display Only		P0 = 1 Pulse (Flow Display model) P1 = 1 Pulse (Energy/BTU model) P3 = 2 Pulse*	F = 2 Frequency Outputs	A = 1 Form C Relay/ 1 Form A Relay** C = 2 Form C Relays***		A = EIA-485 (RS-485), Modbus, BACnet, USB	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

BGR-FC5	Energy/BTU Option	Sensor Inputs	Scaled Outputs	Relay Outputs	Digital I/O	Comm.	Mount
			A		6	A	
BM = Energy/BTU Monitor FD = Flow Display Only		P1 = 1 Pulse P2 = 2 Pulse*	A = 2 Analog Outputs	A = 1 Form C Relay/ 1 Form A Relay** C = 2 Form C Relays***		A = EIA-485 (RS-485), Modbus, BACnet, USB	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 assembly, 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

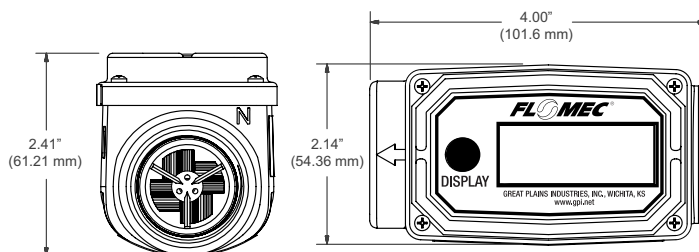
Totalization

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

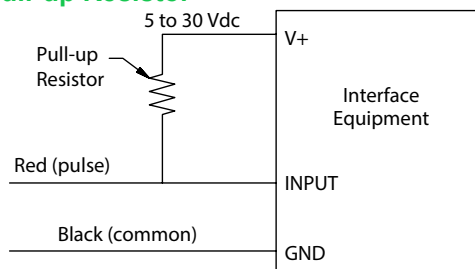
Applications

- 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



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.

Specifications

Fitting Size/Fitting Type	NPT, BSP 1/2" to 2" - NPT (male), BSP (male) (Rc thread) 3" and 4" 150# ANSI flanged, polymer
Recommended Plastic Flange Bolt Torque	25 ft.-lbs. (33.89 N·m)
Pipe Sizes	1/2", 3/4", 1", 1-1/2", 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	1/2" 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

Economical

Low investment and operating costs

Modified bore

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

7 line sizes

1/2", 3/4", 1", 1-1/2", 2", 3" and 4"

Highly accurate

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

Durable

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

Wireless

Configure and monitor meters without display through Android app

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.)

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-QSE05NPT42XXXXA	QSE05NPT42XXXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1/2inch,NPT_outter-thd
FLO-QSE05BSP42XXXXA	QSE05BSP42XXXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1/2inch,BSP_outter-thd
FLO-QSE07NPT42XXXXA	QSE07NPT42XXXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,3/4inch,NPT_outter-thd
FLO-QSE07BSP42XXXXA	QSE07BSP42XXXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,3/4inch,BSP_outter-thd
FLO-QSE10NPT42XXXXA	QSE10NPT42XXXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1inch, NPT_outter-thd
FLO-QSE10BSP42XXXXA	QSE10BSP42XXXXA	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1inch, BSP_outter-thd
FLO-QSE15NPT42XXXD	QSE15NPT42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1-1/2inch,NPT_outter-thd
FLO-QSE15BSP42XXXD	QSE15BSP42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,1-1/2inch,BSP_outter-thd
FLO-QSE20NPT42XXXD	QSE20NPT42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,2inch,NPT_outter-thd
FLO-QSE20BSP42XXXD	QSE20BSP42XXXD	Noryl,MagFlowmeter,Display,pulse+4-20mA-out,2inch,BSP_outter-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_outter-thd
FLO-QSE05BSPQBQ11A	QSE05BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1/2inch,BSP_outter-thd
FLO-QSE07NPTQBQ11A	QSE07NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,3/4inch,NPT_outter-thd
FLO-QSE07BSPQBQ11A	QSE07BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,3/4inch,BSP_outter-thd
FLO-QSE10NPTQBQ11A	QSE10NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1inch,NPT_outter-thd
FLO-QSE10BSPQBQ11A	QSE10BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1inch,BSP_outter-thd
FLO-QSE15NPTQBQ11A	QSE15NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1-1/2inch,NPT_outter-thd
FLO-QSE15BSPQBQ11A	QSE15BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,1-1/2inch,BSP_outter-thd
FLO-QSE20NPTQBQ11A	QSE20NPTQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,2inch,NPT_outter-thd
FLO-QSE20BSPQBQ11A	QSE20BSPQBQ11A	Noryl,MagBTUFlowmeter,Modbus+pulse-out,2inch,BSP_outter-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.

Model	Description	Page
HD/HO	Deluxe Duct and Outdoor Humidity Sensors	99
EHD/EHO	Economy Duct and Outdoor Humidity Sensors	101
HED	Economy Duct Humidity Sensors	103
HN/HP	Specialty Humidity Sensors	105
HS	Replaceable Humidity Elements	107

Plant Room Humidity Sensor Selection Guide

Feature/Option	Duct Mount	Outdoor Mount	Probe
Analog Output	HD, EHD, HED pages 99 , 101 , 103	HO, EHO pages 99 , 101	HN/HP page 105
NIST Traceable Accuracy Down to 1%	HD page 99	HO page 99	HN/HP page 105
Resistive Temperature Sensing	HD, EHD pages 99 , 101	HO, EHO pages 99 , 101	HN/HP page 105

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: $\pm 1\%$ 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	$\pm 0.1\%$ RH/°C above or below 25 °C (typical)
Temperature Effect, Outdoor Model	4 to 20 mA version: $(0.0013\% \text{ RH} \times (\text{T}^\circ\text{C} - 25))$; 0-5V/0-10V versions: $(0.0015\% \text{ RH} \times (\text{T}^\circ\text{C} - 25)) - (\% \text{ RH} \times 0.0008 \text{ xabs}(\text{T}^\circ\text{C} - 25))$
Scaling	0 to 100% RH
Hysteresis	1.5% typical
Linearity	Included in accuracy spec.
Reset Rate***	24 hours
Stability	$\pm 1\%$ @ 20 °C (68 °F) annually, for two years

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Accuracy

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

Field replaceable

Replace element in the field... maintain accuracy and minimize downtime

Easy servicing

Duct sensor element can be serviced without disturbing conduit

Potted circuitry

Prevents costly condensate shorts

Flexibility

Polarity insensitive, two-wire 4 to 20 mA or 3-wire 0-5/0-10 Vdc versions...flexible systems compatibility...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	Digital, 4 to 20 mA (clipped & capped) or 0-5/0-10 V output
HO Transmitter Accuracy	± 1.3 °C (± 2.3 °F) typical;
HD Transmitter Accuracy	± 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



* 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.

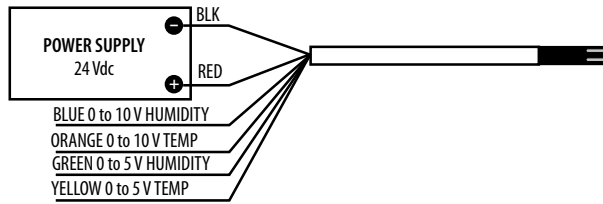
Shielded cabling is required for conformance to EMC standards. Technical information is available from the factory upon request or from the Veris website at www.veris.com.

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).

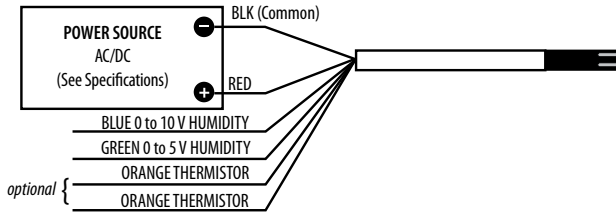
HD/HO (0-5V/0-10V Temperature Transmitter Versions)

Wiring Diagram



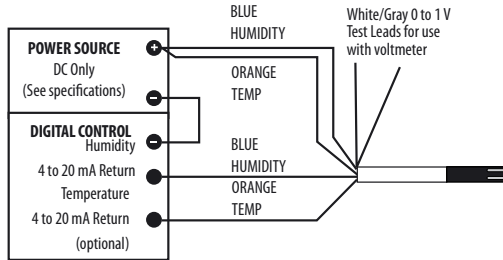
HO (0-5V/0-10V Resistance Versions)

Wiring Diagram



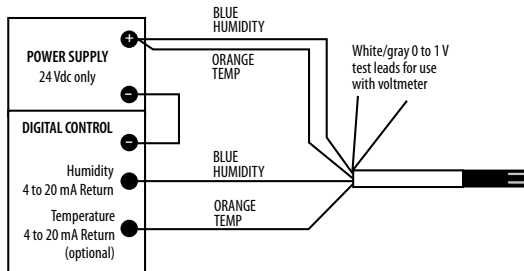
HD/HO (4-20 mA Temperature Transmitter Versions)

Wiring Diagram



HO (4-20 mA Resistance Versions)

Wiring Diagram



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:

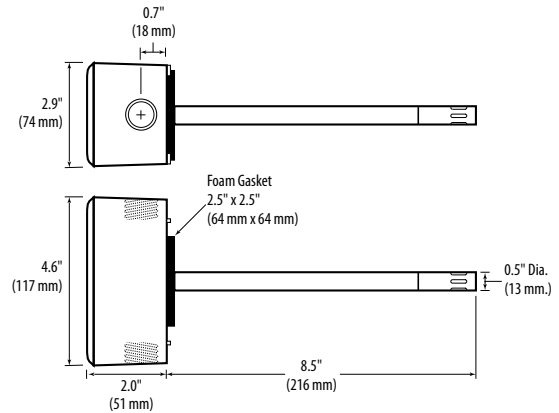
H ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

No Temp:

H ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

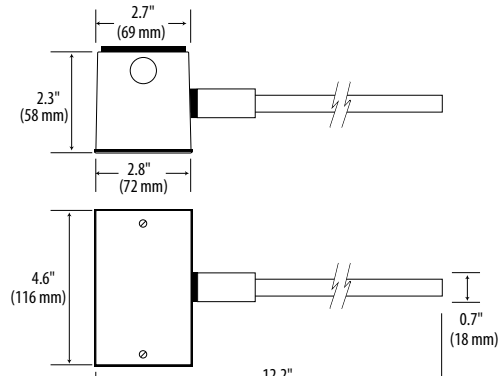
HD

Dimensional Drawing



HO

Dimensional Drawing



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



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)

Single-point
Field Calibration

Field-selectable
Output Signals

±2% Accuracy

Low Drift

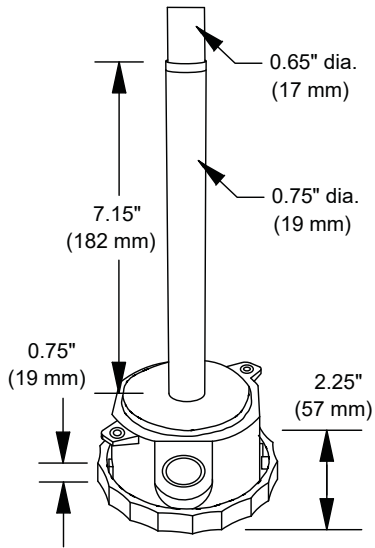
Highly
Repeatable

Integral Temp
Sensor

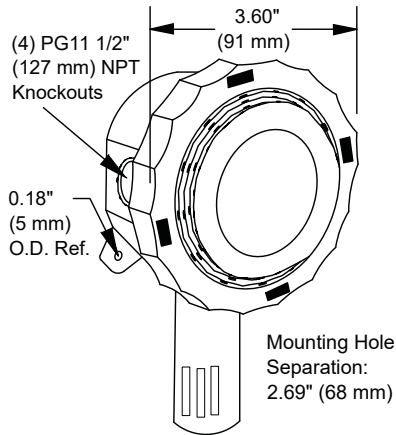
Applications

- 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 ☐ 110- ☐

HED Series

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



HED

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.

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

RH & temperature Easy hook-up

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

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

Applications

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

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
------------------	--------

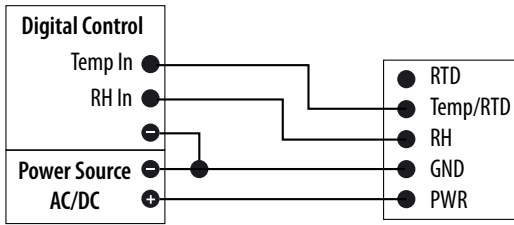
Agency Approvals



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

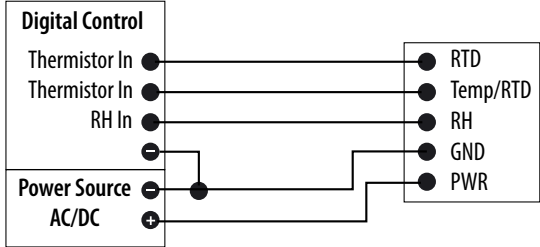
0-5V/0-10V Models, Temperature Transmitter

Wiring Diagram



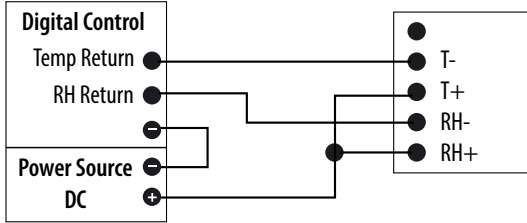
0-5V/0-10V Models, Thermistor

Wiring Diagram

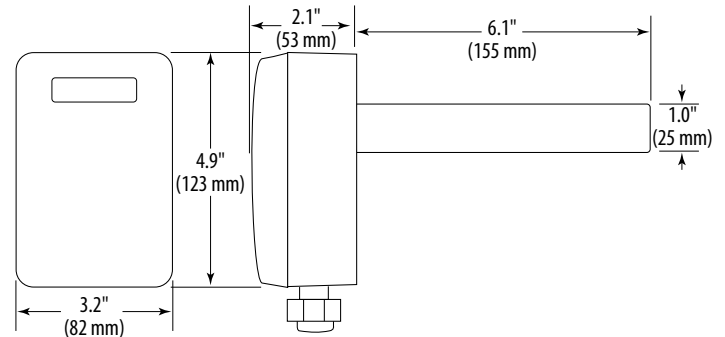


4-20 mA Models, Temperature Transmitter

Wiring Diagram

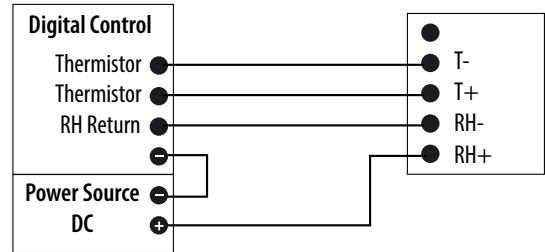


Dimensional Drawing



4-20 mA Models, Thermistor

Wiring Diagram



Ordering Information

Accuracy	Output	US or EU	Temp.	Sensor Type	Temp Range	Temp Cert
HED				A		
2 = 2%	M = 4 to 20 mA	S = Standard	T = Temp	= Temp. transmitter	1 = -40 to 50 °C (-40 to 122 °F)	Blank = None
3 = 3%	V = 0-5/0-10 Vdc		X = No Temp (Stop here)		2 = 0 to 50 °C (32 to 122 °F)	1 = 1 pt cal
5 = 5%						2 = 2 pt cal

Accuracy	Output	US or EU	Temp.	Sensor Type	Temp Cert
HED					
2 = 2%	M = 4 to 20 mA	S = Standard	T = Temp	B = 100R Platinum, RTD	Blank = None
3 = 3%	V = 0-5/0-10 Vdc		X = No Temp (Stop here)	C = 1k Platinum, RTD	1 = 1 pt cal*
5 = 5%				D = 10k T2, Thermistor	2 = 2 pt cal*
				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	

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



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.

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

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Corrosion resistant

Electronics are encapsulated in stainless steel probe to resist corrosion

Interchangeable

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

Flexible

Pendant and insertion versions for application flexibility

Compatibility

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

Calibration free

Calibration-free interchangeable NIST traceable HS element

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

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



* 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.

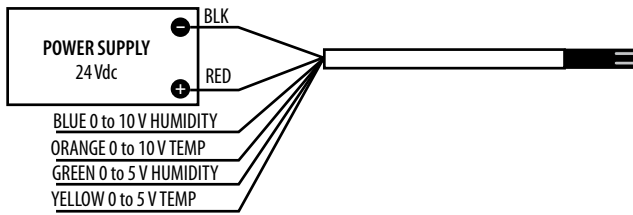
Shielded cabling is required for conformance to EMC standards. Technical information is available from factory upon request or is available on our website: www.veris.com.

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).

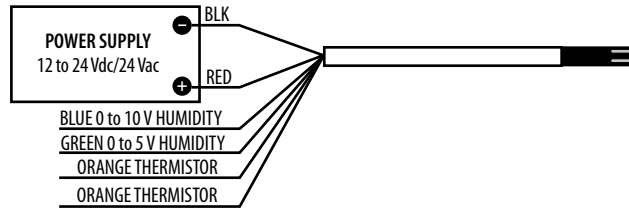
HN/HP (0-5V/0-10V Versions)

Wiring Diagram



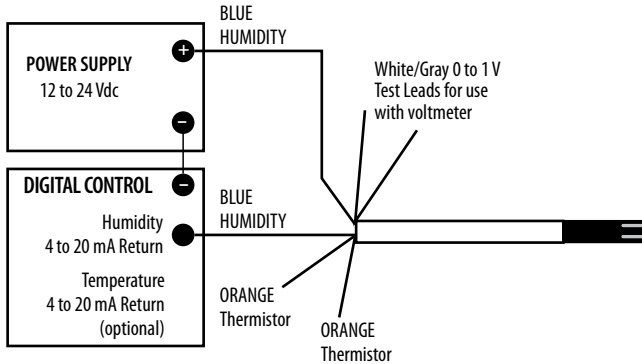
HN/HP with RTD/Thermistor (0-5V/0-10V Versions)

Wiring Diagram



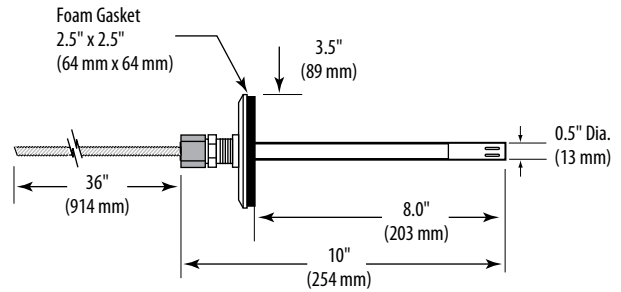
HN/HP with RTD/Thermistor (4-20 mA Versions)

Wiring Diagram



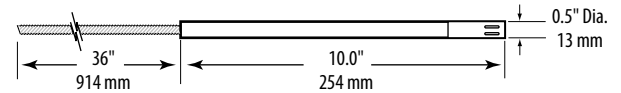
HN Series

Dimensional Drawing



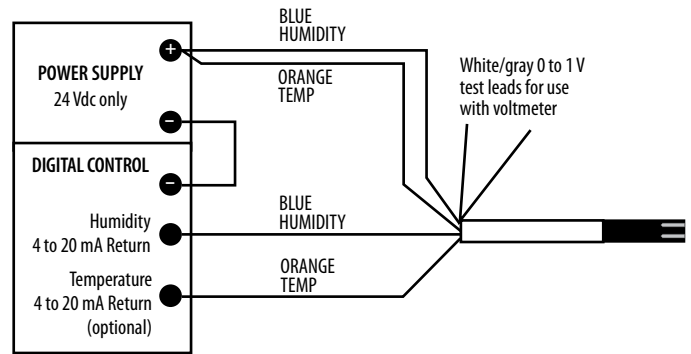
HP Series

Dimensional Drawing



HN/HP (4-20 mA Versions)

Dimensional Drawing



Ordering Information

Humidity Transmitter Combination

Sensor Type	Range	OPTION Temp Cert
☐ A = 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

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

Enclosure	Accuracy	NIST	Output	US or EU	Temp.
☐ 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)

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.

HS Series

Easy Field Replacement for Veris Deluxe Humidity Sensors



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

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.

Ordering Information

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

Accuracy

HS

1 = 1%*

2 = 2%

3 = 3%

5 = 5%

NIST

X

N = NIST
(1% & 2% models only)

X = None (2%, 3%, & 5% models only)

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.

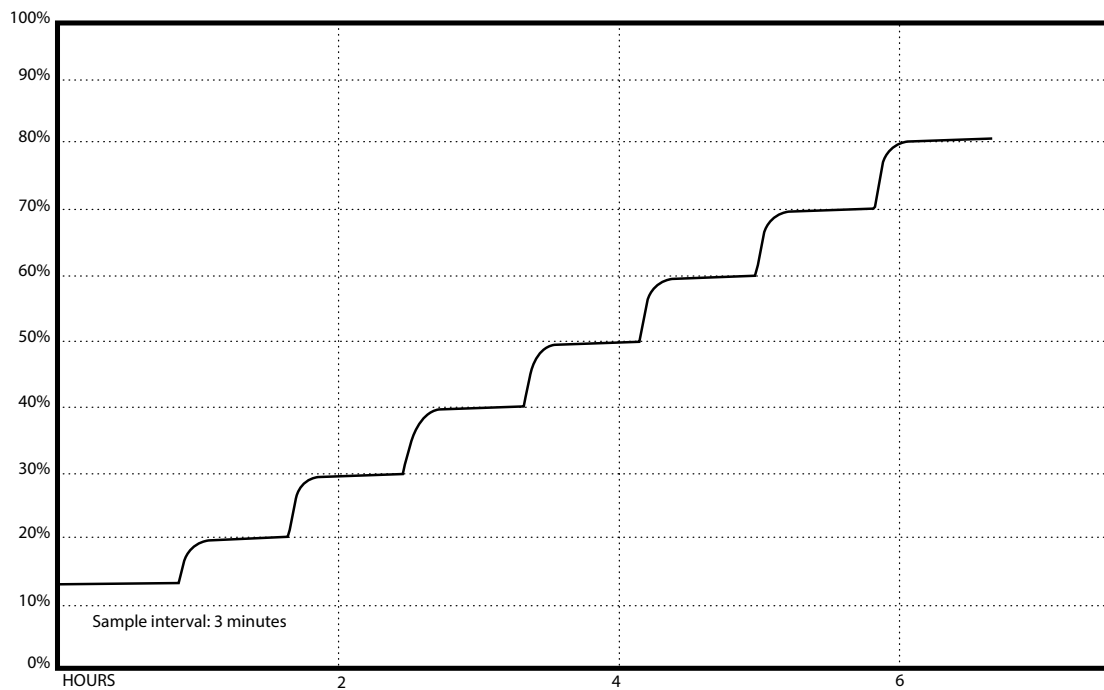
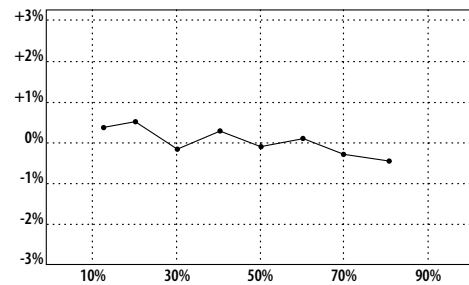
HS Digital Humidity Sensor Certificate of Performance

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%





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	111
LD1500 & LD2100	Distance Read Panels	113
LD5200	Distance Read Panel, Touch Screen	115
SD, SD-R01 & MX1B	Spot Leak Detectors	117
SC & NSC	Cables	119
LC-KIT	Leak Detection Kit	121

Leak Detection Sensor Selection Guide

Sensors and Control Panels

	Spot Detection	Single Zone	Multi Zone	Distance Read
Basic Model	SD/MX1B page 117			
Leak Detection with Relay Output	SD-R01 page 117	LD310/LD1000 page 111	LDRA6 page 111	LD1500/LD2100 page 113 LD5200 page 115
Modbus Output			LDRA6 page 111	LD1500/LD2100 page 113 LD5200 page 115

Cables

	Cable Kits	Conductive Fluids	Non-Sensing Leader Cable
Basic Model	LC-KIT page 121	SC page 119	NSC page 119

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 $\pm 10\%$ 24 Vac/dc ($\pm 10\%$)@300 mA max. (AC: 50/60 Hz) 24 Vac/dc ($\pm 10\%$)@600 mA max. (AC: 50/60 Hz)
Relay Output: LD310	2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac
LD1000	2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac
LDRA6	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, $\pm 10\%$ 20 to 3600 sec, software adjustable in 10 sec increments, $\pm 2\%$

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

Applications

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

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

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
------------------	---------

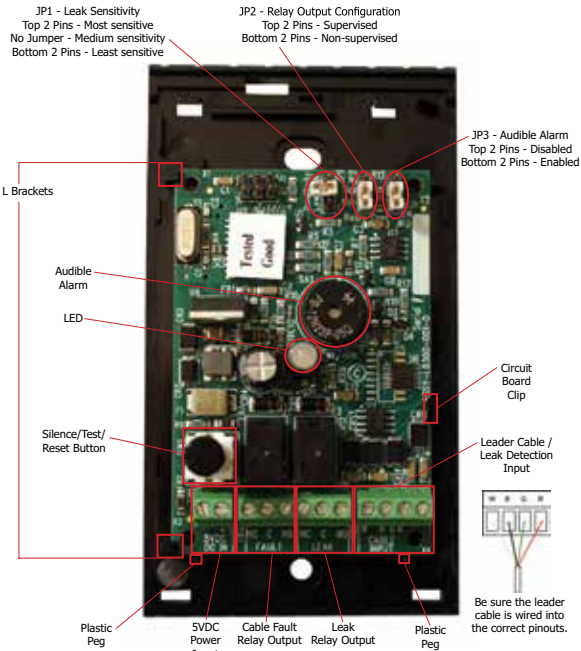
Agency Approvals

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
---	---



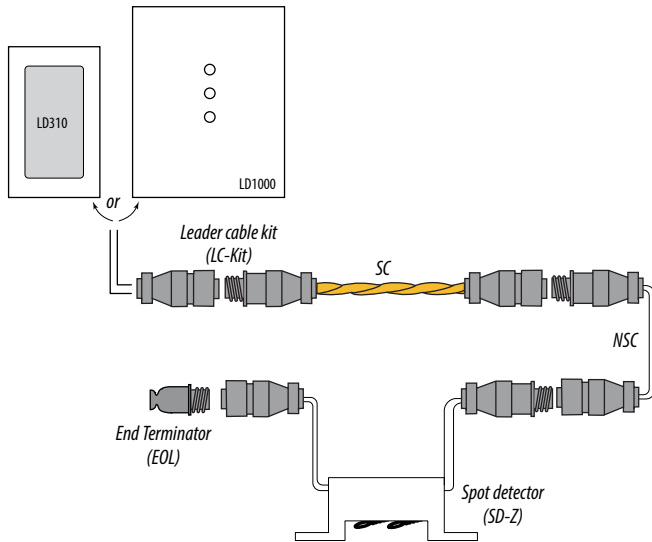
LD310

Wiring Diagram



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

Wiring Diagram

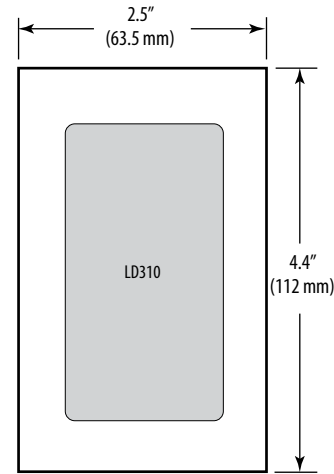


Blink Code Key

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

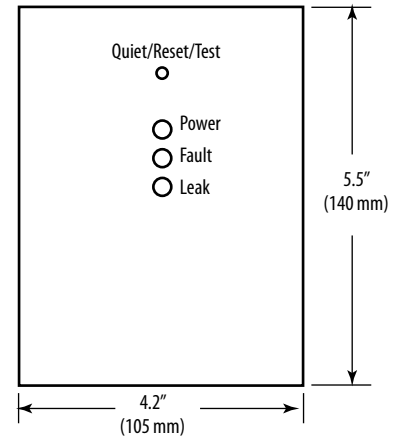
LD310

Dimensional Drawing



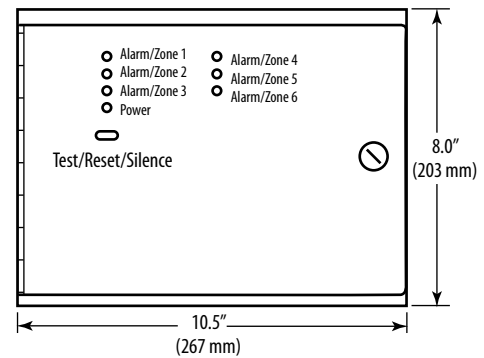
LD1000

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

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 (selectable); 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 Manageable 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

High detection accuracy

Adjustable leak and contamination alarm thresholds reduce false alarms due to high humidity...high detection accuracy

PC configuration

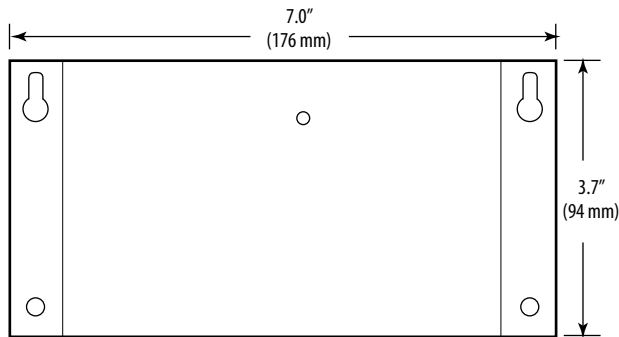
Summary alarm relay output... fast response

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

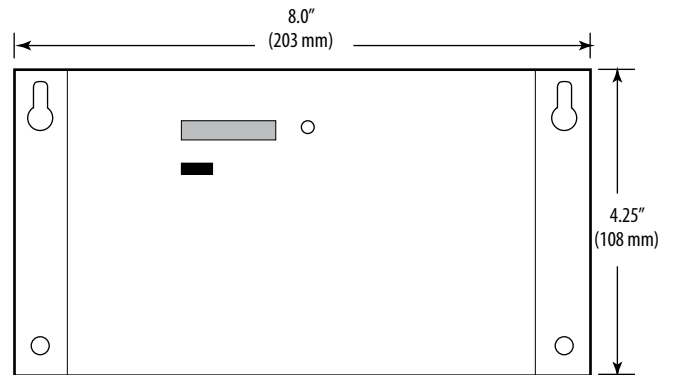


LD1500

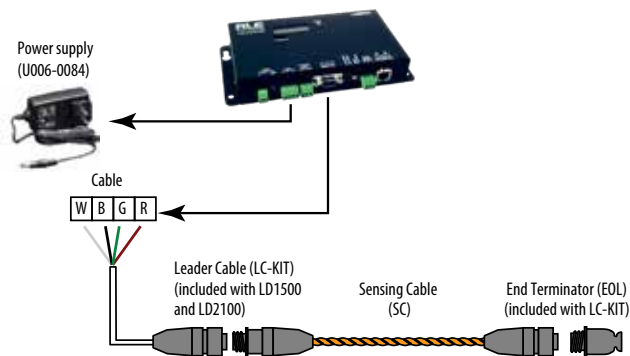
Dimensional Drawing

**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 Base T Ethernet port (TCP/IP)
Protocols	
Terminal Emulation EIA-232	VT100 compatible

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

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
------------------	---------

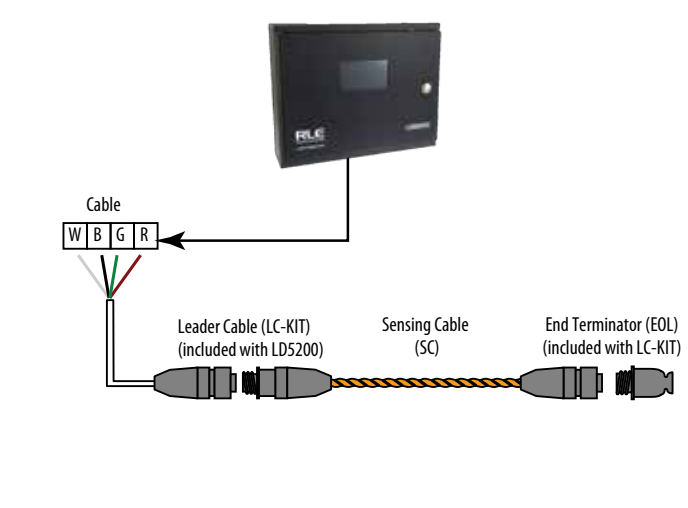
Agency Approvals

Agency Approvals	CE; ETL listed: conforms to UL 61010-1, EN 61010-1; CAN/CSA C22.2 No. 61010-1; RoHS compliant
------------------	---

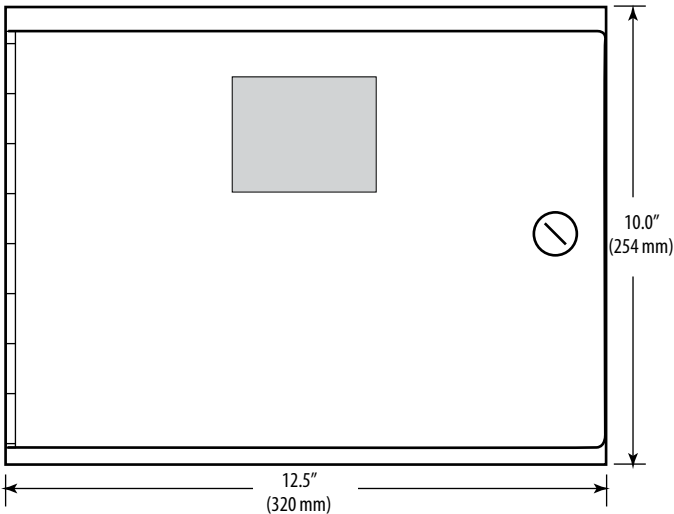


LD5200 Basic SC Installation

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



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 $\pm 10\%$ - 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 $\pm 10\%$; 0.1 A max. (AC: 50/60 Hz)
Storage Environment	-20 to 70 °C (-4 to 158 °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	14 ft. (4.2 m)
SD-R01	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
------------------	---------

Simple installation Polymer coated

Simple installation – screw, or ram-set to floor (SD & SD-R01)

SD & SD-R01 models have polymer-coated sensing probes...no exposed metal that will rust

Simple operation Durability

Simple operation...no maintenance

All models are fully potted for water resistance...maximum durability

Solid-state design

No moving parts to fail

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

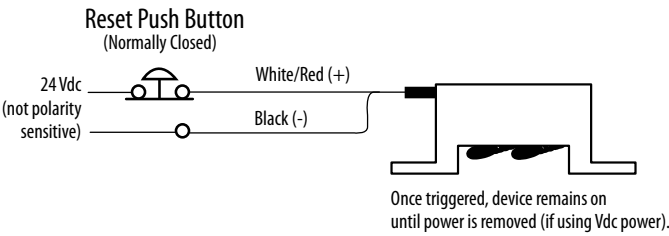
Limited Warranty	5 years
------------------	---------

Agency Approvals



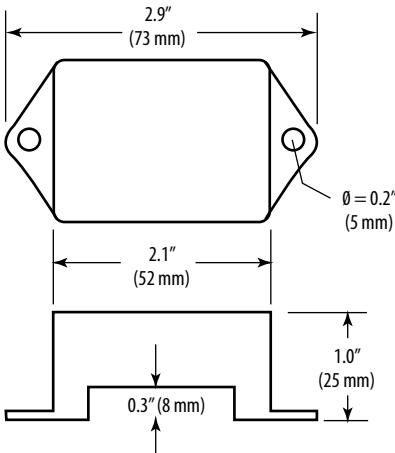
SD

Wiring Diagram



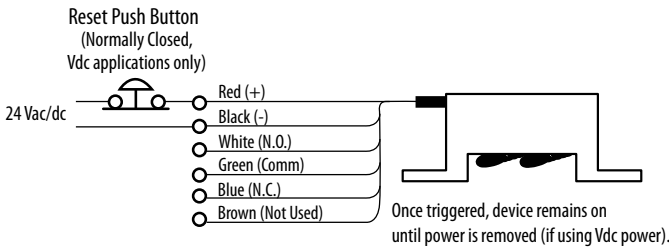
SD Series

Dimensional Drawing



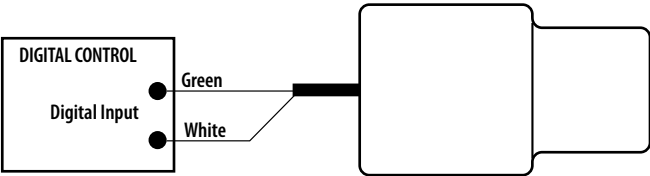
SD-R01

Wiring Diagram



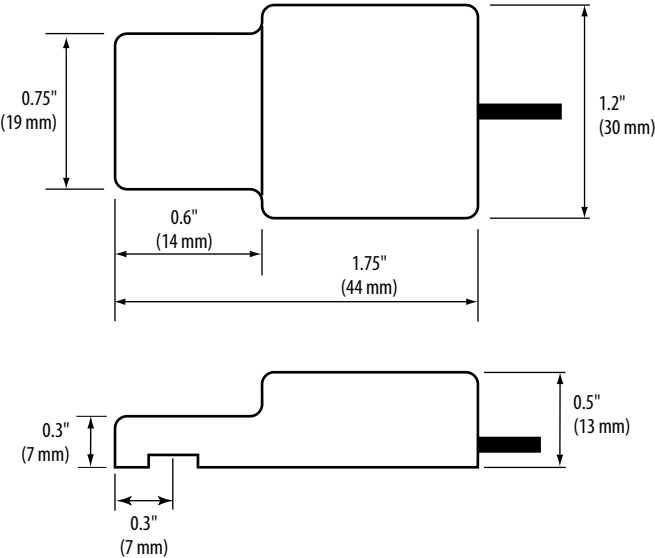
MX1B

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.

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)

Strong

Strong, durable, and abrasion resistant

Easy installation

Expansion with mating end connectors...easy installation

Installation flexibility

Available in pre-measured and custom lengths with pre-installed end connectors

Plenum rated

Plenum rated and UL Listed

Accurate

Highly accurate alarm notification...fewer false alarms

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

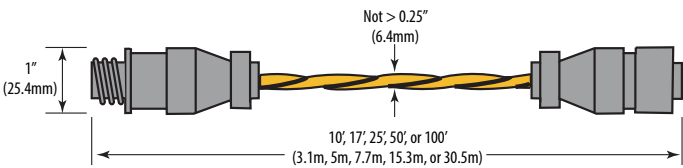
Warranty

Limited Warranty	2 years
------------------	---------

Agency Approvals



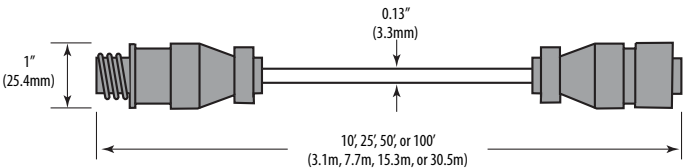
SC
Dimensional Drawing



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

NSC
Dimensional Drawing



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



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.

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

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

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

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

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

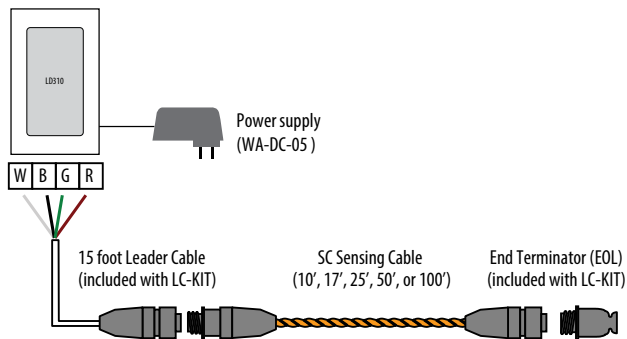
Limited Warranty	2 years
------------------	---------

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.

Model	Description	Page
EP	Bluetooth® Differential Pressure/Air Velocity Transducers	127
PX3	Bluetooth® Differential Pressure/Air Velocity Transducers with Available NIST Certificates	129
PW	Wet Media Differential Pressure Transducers (Selectable Pressure Units)	131
PW2	Wet Media Differential Pressure Transducers (Dual Pressure Units)	133
PWR	Wet Media Differential Pressure Remote Transducers	135
PASxx	Differential Air Pressure Switches	137
AFS-460	Air Pressure Sensing Switches	139
EP3	Electropneumatic Transducers, Analog Output (V or mS, Selectable)	141
EP2	Electropneumatic Transducers, psi Output	143
PH	Digitally Controlled Gauge Pressure Transducers	145
PG	Gauge Pressure Sensors	147

Note: The Bluetooth word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Any use of such marks is under license.

Pressure Sensor Selection Guide

Feature/Option	Wet Media	Dry Media
Analog Output	PW, PW2, PH, PG pages 131 , 133 , 145 , 147	EP, PX3 pages 127 , 129
Differential Pressure Sensing (Uni- and Bidirectional Operation)	PW, PW2, PWR pages 131 , 133 , 135	EP page 127
LCD Display Option Available	PW, PW2, PWR pages 131 , 133 , 135	EP page 127
Duct Mount		EPD/EPU, PX3D/PX3U pages 127 , 129
Panel Mount	PW, PW2, PWR, PASxx pages 131 , 133 , 135 , 137	EPD/EPU page 127
Remote Mount	PWR page 135	
Transmitter Only (No local display)	PH, PG pages 145 , 147	EP, PG pages 127 , 147
Switch		PASxx page 137
Pneumatic Systems		EP3, EP2 pages 141 , 143

Electropneumatic Transducers

Feature/Option	Wet Media	Dry Media
Pneumatic Systems	PW, PW2, PH, PG pages 131 , 133 , 145 , 147	EP3, EP2 pages 141 , 143

SpaceLogic Sensors EP Series

Bluetooth® Differential Pressure/Air Velocity Transducers



The SpaceLogic EP Series transducer can measure either air pressure or velocity with the flip of a switch. The device 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 Series 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 critical 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 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	
301 Pressure Range	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

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

Applications

- Duct static pressure (Pressure mode)
- Building or room pressure (Pressure mode)
- Filter status (Pressure mode)
- Air flow measurement (Velocity mode)

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

302 Pressure Range	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
305 Pressure Range	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	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.
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 ABS, plenum rated

Warranty

Limited Warranty	5 years
------------------	---------

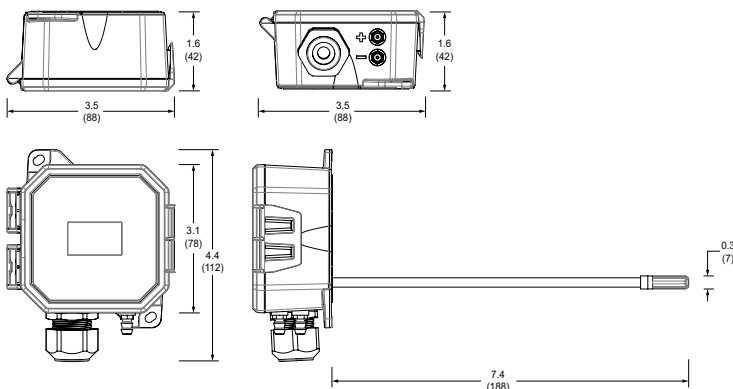
Agency Approvals



EMC Conformance: EN 61000-6-3 and A1, Class B, EN 61000-6-1, EN61326-1 and EN61326-2-3.
* Class 2/III 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).

Dimensional Drawing

in. (mm)



Smart Phone App

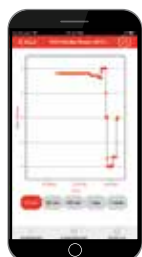
The Veris Sensors App allows for remote viewing and adjustment of settings. A great tool for reducing commissioning time.



Device Info Screen



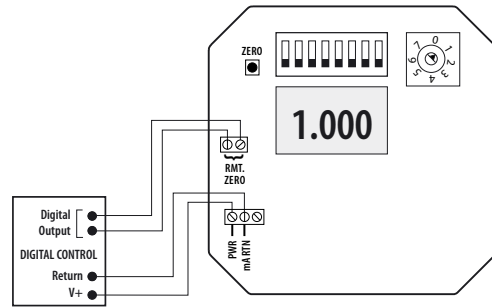
Custom Config Screen



Trend Log Tab

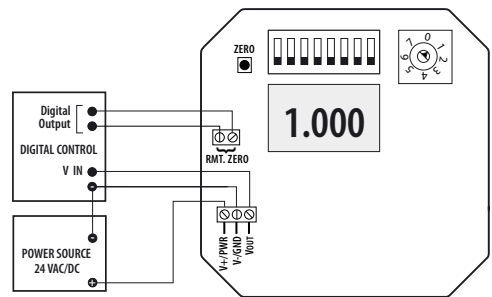
Wiring Diagram

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
EP D = Duct P = Panel	301 = Pressure: 0 to 1 in. WC / 0 to 250 Pa Velocity: 0 to 3,000 ft/min / 0 to 15 m/s 302 = Pressure: 0 to 10 in. WC/0 to 2500 Pa Velocity: 0 to 6,000 ft/min / 0 to 30 m/s	Blank = No Display L = LCD Display
Example: EP D 301 L		
Enclosure	Range	Local Display
EP U = Universal	305 = 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
Example: EP U 305 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.



Note: The Bluetooth word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Any use of such marks is under license.

PX3 Series

Bluetooth® 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 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 critical 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 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

01 Pressure Range	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
-------------------	---

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

Applications

- Duct static pressure (Pressure mode)
- Building or room pressure (Pressure mode)
- Filter status (Pressure mode)
- Air flow measurement (Velocity mode)

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

02 Pressure Range	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
05 Pressure Range	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	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.
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 ABS, plenum rated

Warranty

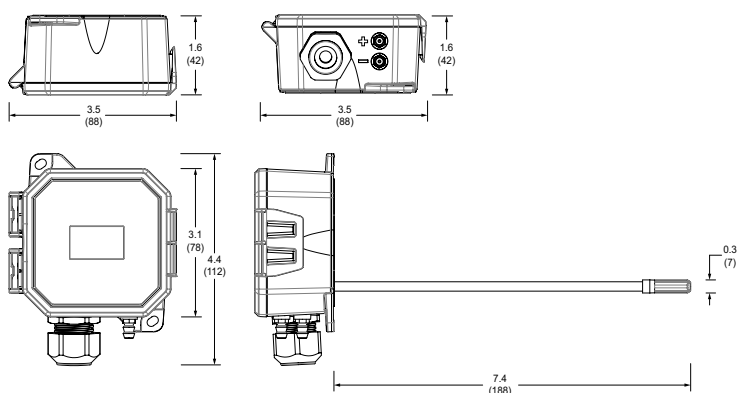
Limited Warranty	5 years
------------------	---------

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/III 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).

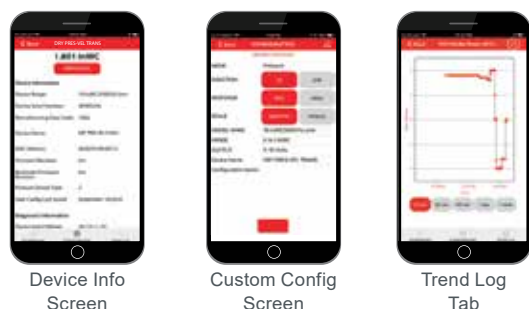
Dimensional Drawing

in. (mm)



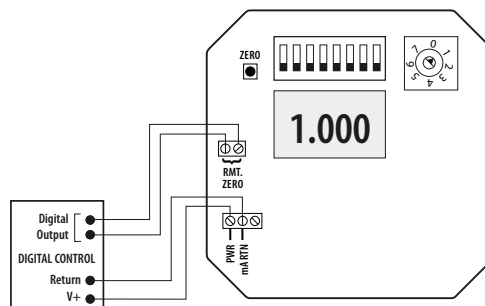
Smart Phone App

The Veris Sensors App allows for remote viewing and adjustment of settings. A great tool for reducing commissioning time.



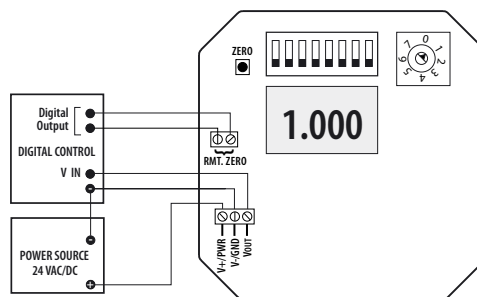
Wiring Diagram

2-wire, 4-20 mA Current Loop Output



Wiring Diagram

3-wire, 0-5 V/0-10 V Voltage Output



Ordering Information

Enclosure	Local Display	NIST Cert.*	Range
PX3			
D = Duct P = Panel	L = LCD Display X = No Display	N = NIST X = None	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: 0 to 10 in. WC/0 to 2500 Pa Velocity: 0 to 6,000 ft/min / 0 to 30 m/s
Example: PX3 D L X 01			
*8-point calibration			
Local Display	NIST Cert.*	Range	
PX3U			
L = LCD Display X = No Display	N = NIST X = None	05 = Pressure: 0 to 10 in. WC / 0 to 2,500 Pa Velocity: 0 to 7,000 ft/min / 0 to 35 m/s	
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.



Note: The Bluetooth word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Any use of such marks is under license.

PW Series

DIP Switch Selectable Port Swap Feature from Veris



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.

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)

Flexible

The DIP switch selectable output switch for normal (4 to 20 mA) or reverse (20 to 4 mA) operation provides application flexibility

Rugged

Rugged, die-cast enclosure provides NEMA 4 sealing

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

Switch-selectable

Switch-selectable pressure ranges...fewer models to order and stock

High stability

DIP switch controlled electronic surge dampening

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



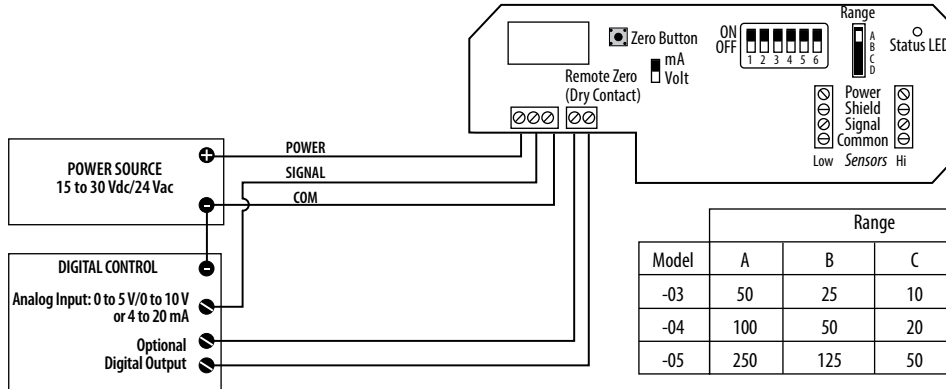
*VFD systems and system wiring generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor or sensor wiring.

**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



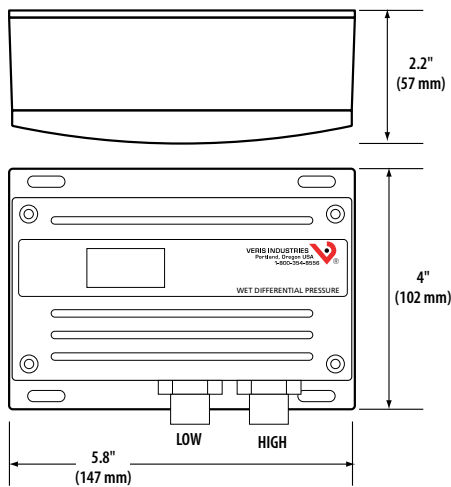
	Range			
Model	A	B	C	D
-03	50	25	10	5
-04	100	50	20	10
-05	250	125	50	25

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.

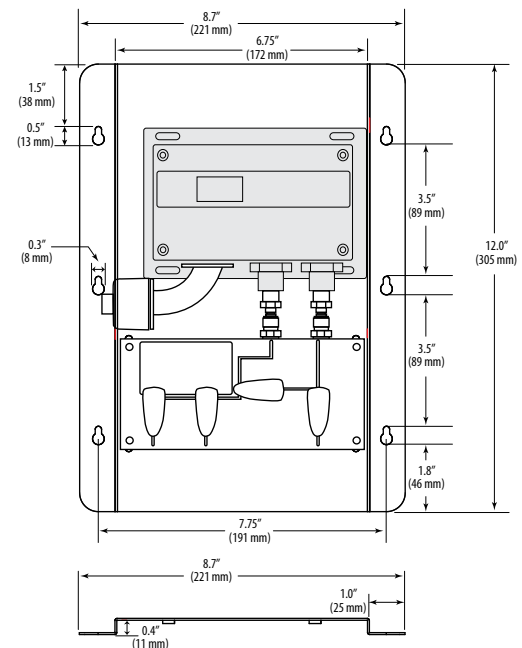
Dimensional Drawing

PW Series (PWxxxS)



Dimensional Drawing

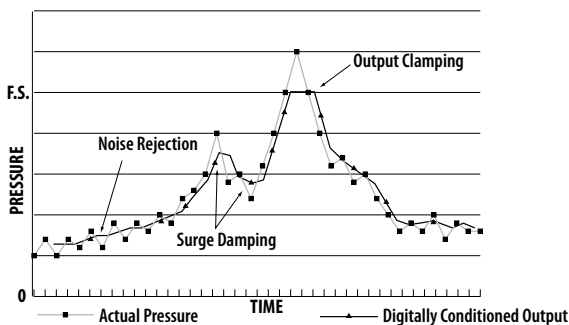
PW Series with Optional Mounted Bypass Assembly (PWxxxBP)*



* 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 ☐	NIST ☐	☐	☐
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)



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: $\pm 1\%$ F.S.; Range D: $\pm 2\%$ F.S.***
Media Compatibility	Media compatible with 17-4 PH stainless steel
Long Term Stability	$\pm 0.25\%$ 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 $< \pm 1.5\%$ of product F.S. per sensor; TC Span $< \pm 1.5\%$ 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



* Minimum input voltage: 250 Ω loop = 12 Vdc; 500 Ω loop = 17 Vdc

**Accuracy combines linearity, hysteresis, and repeatability.

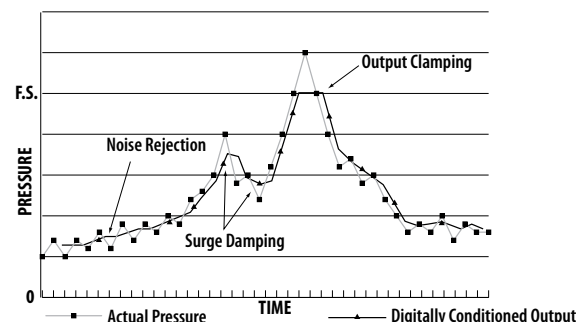
***FS is defined as full span of selected range in bi-directional mode.

EMC Conformance - Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.

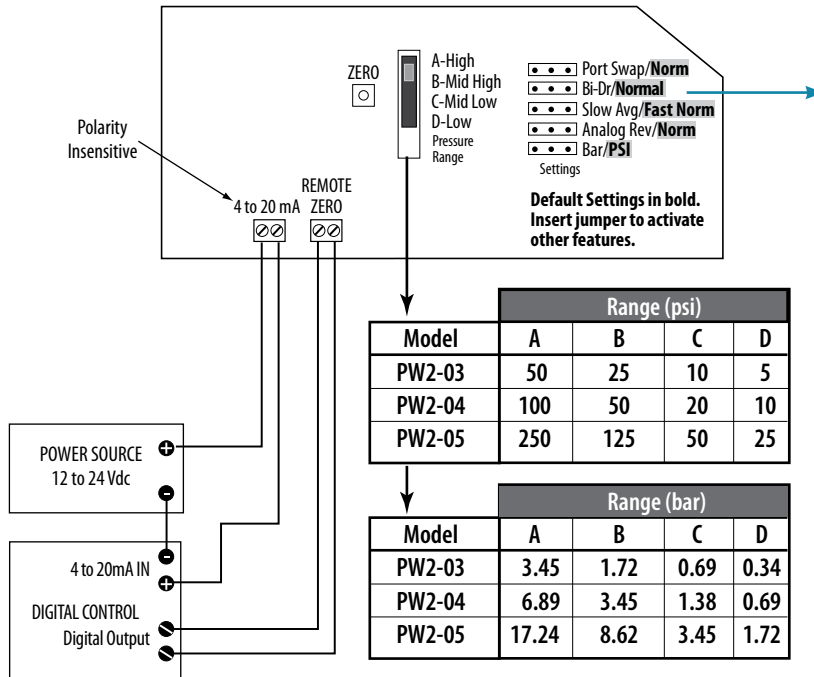
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

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

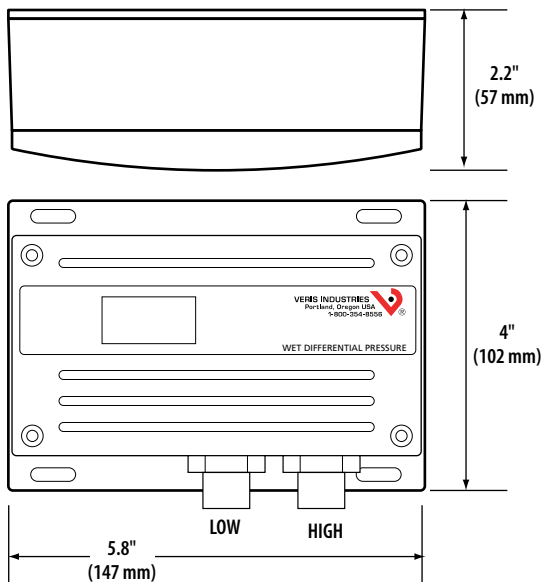


Bidirectional Operation

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

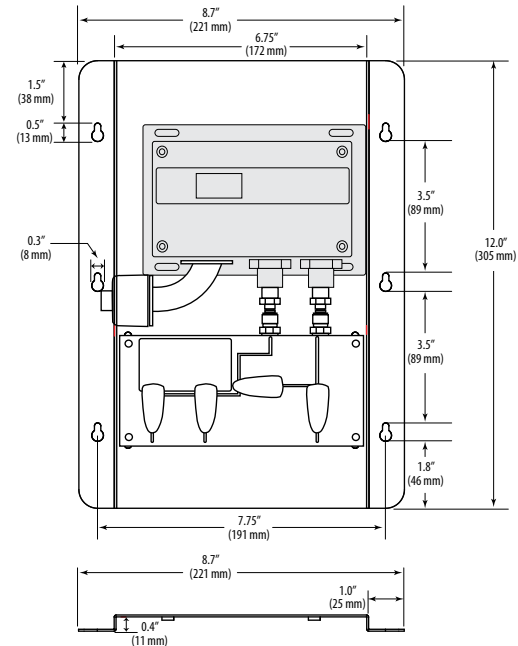
Dimensional Drawing

PW2xxxS



Dimensional Drawing

PW2xxxBP*



Ordering Information

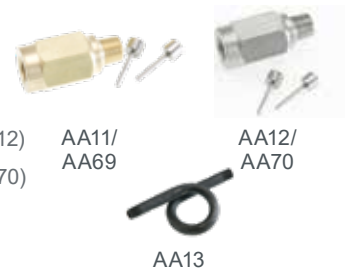
Local Display	NIST	Operational Range*	Options
PW2 ☐	☐	☐	☐
L = LCD Display X = No Display	N = NIST X = None	03 = 0 to 50 psig/3.45 barg 04 = 0 to 100 psig/6.89 barg 05 = 0 to 250 psig/17.24 barg	S = Standard BP = With mounted bypass assembly**
Example: PW2 ☐ L ☐ X ☐ 04 ☐ S			

*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.

* 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)



PWR Series

3-Wire Device, User-Selectable Output



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.

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

Armor cable

Armor cable or conduit connector minimizes the need for field customization

Lower costs

Remote probes reduce need for plumbing or bypass assemblies...lower costs and reduced labor for installation

Zero calibration

Pushbutton zero calibration – no trim pots to adjust...maintain accuracy and prevent callbacks with automatic zero calibration

Switch-selectable

Switch-selectable pressure ranges...fewer models to order and stock

Applications

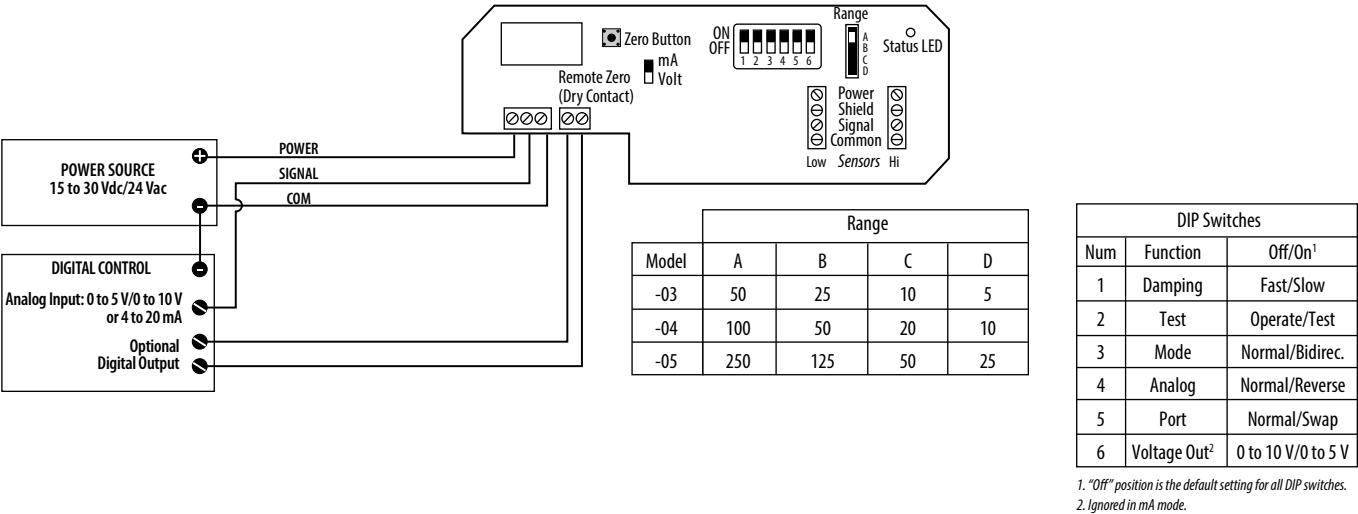
- Monitoring and controlling pump differential pressure
- Chiller/boiler differential pressure drop
- CW/HW system differential pressure

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

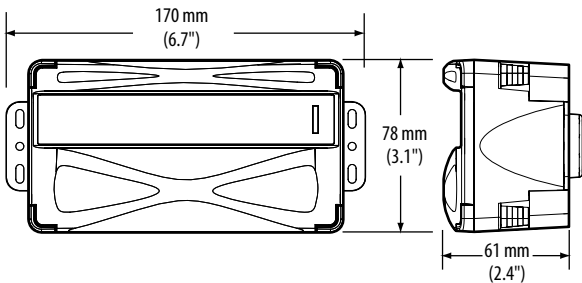


*VFD systems and system wiring generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor or sensor wiring.
**F.S. is defined as full span of selected range.
***Accuracy combines linearity, hysteresis, and repeatability.

Wiring Diagram



Dimensional Drawing



Ordering Information

Display: PWR [L] = LCD Display

NIST: [X] = None

Operational Range*: []
03 = 0-50 psig
04 = 0-100 psig
05 = 0-250 psig

Media: [S] = Water

Cable Length: []
006 = 6 ft. (1.8 m)
010 = 10 ft. (3.1 m)
020 = 20 ft. (6.1 m)

Cable: []
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)



PASxx SERIES

Monitor Air Ducts, Filters and Fans from Veris



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
- Filter monitoring
- Vacuum pressure 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	



AFS-460

Manual Reset DPDT Air Pressure Sensing Switch for 120 Vac or 24 Vac Applications



AFS-460-136

The AFS-460 is a general purpose airflow proving switch designed for 120 Vac (AFS-460-136) or 24 Vac (AFS-460-137) HVAC and Energy Management applications where a manual reset switch with DPDT contacts is desirable. It may be used to sense positive, negative, or differential air pressure.

The plated housing contains a diaphragm, a calibration spring, a snap-acting switch with manual reset button, and a DPDT relay. The sample connections located on each side of the diaphragm accept 0.25" OD tubing via the integral compression ferrule and nut.

An enclosure cover guards against accidental contact with the live switch terminal screws and the set point adjusting screw. The enclosure cover will accept a 0.5" conduit connection. The manual reset button is located on the top surface of the enclosure cover.

Multi-purpose

Sense positive, negative or differential air pressure

Durable

Housed in a plated enclosure with removable metal guard protecting set point screw and snap action switch terminals

Field adjustable

Field adjustable set point range of 0.40 ± 0.06" WC to 12.0" WC

Enclosure cover

Avoid accidental contact with the live switch

Applications

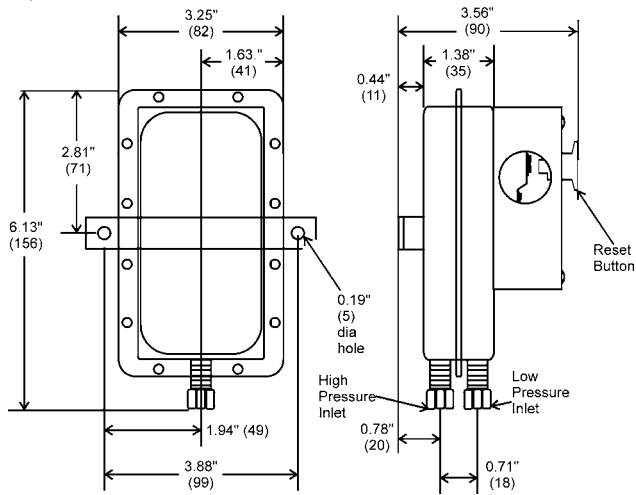
- Proving fan status
- Monitoring filter for excess pressure drop
- Monitoring duct static pressure
- Proving air flow
- Monitoring damper status

Specifications

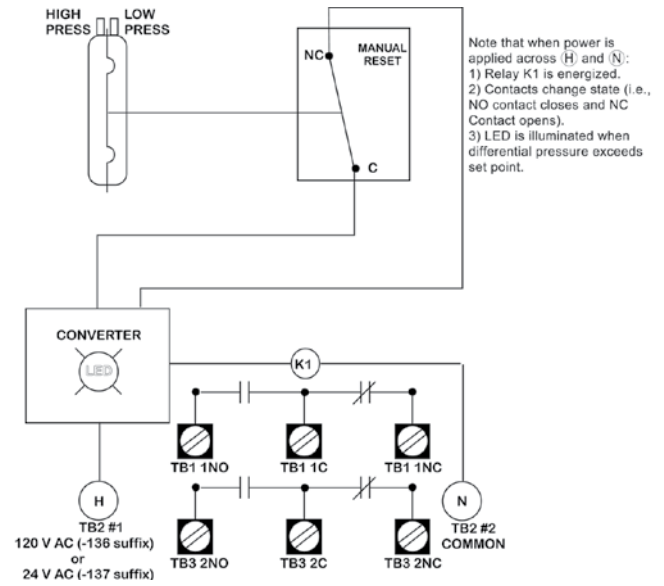
Sample Media	Air or combustion by-products that will not degrade silicone
Mounting Position (to meet lowest operating specifications)	Diaphragm in any vertical plane
Field Adjustable Range	0.40 ± 0.06" WC to 12.0" WC
Maximum Pressure	0.5 psi (0.03 bar)
Operating Temperature Range	-40 to 180 °F (-40 to 82 °C)
Electrical Rating	AFS-460-136: 4.5 VA @ 120 Vac, 50/60 Hz AFS-460-137: 0.5 VA @ 24 Vac, 50/60 Hz
Contacts	DPDT, 2 form-C rated 8 A @ 250 Vac
Electrical Connections	Screw terminals
Sample Line Connections	Ferrule and nut compression type connectors will accept 0.25" OD rigid tubing
Shipping Weight	1.2 pounds
Agency Approvals	Pending
Limited Warranty	2 years

Dimensional Drawing

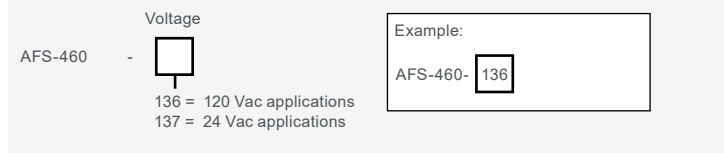
in. (mm)



Wiring Diagram



Ordering Information



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.

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.

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

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

Applications

- Hospitals
- Schools
- Pneumatic dampers/actuators

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

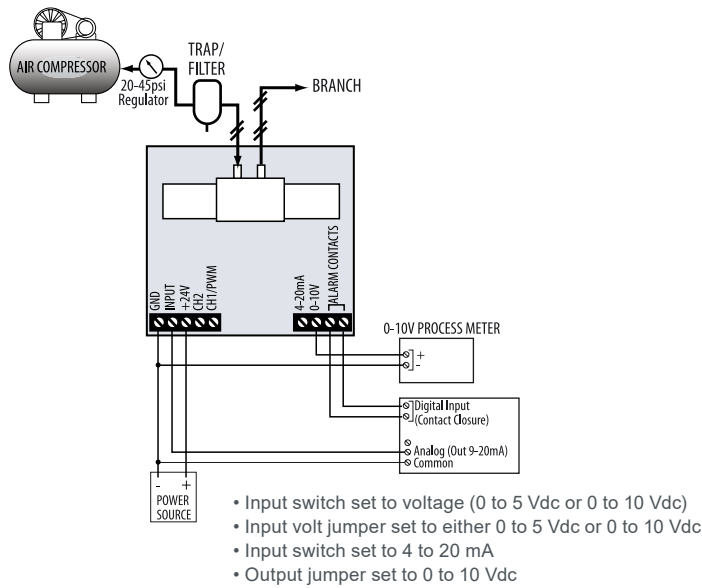


*For shorter tubing runs use the Veris AA45 Pneumatic Capacitor
EMC Conformance: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note - CE option: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

**The CE mark applies to models with cover only.

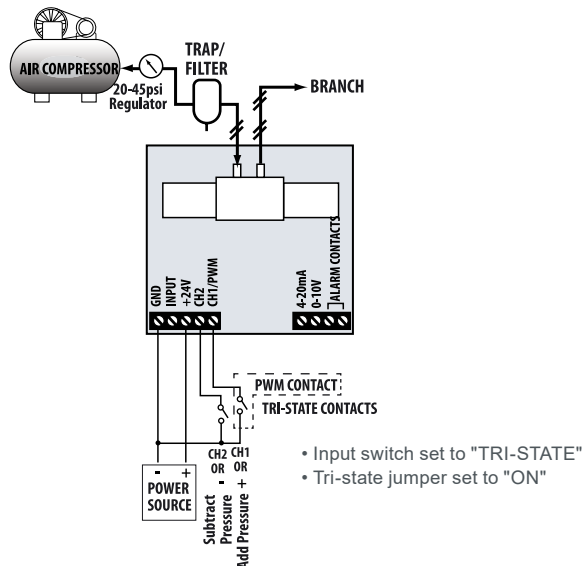
Current/Voltage Control

Wiring Diagrams



Tri-state Control

Wiring Diagrams



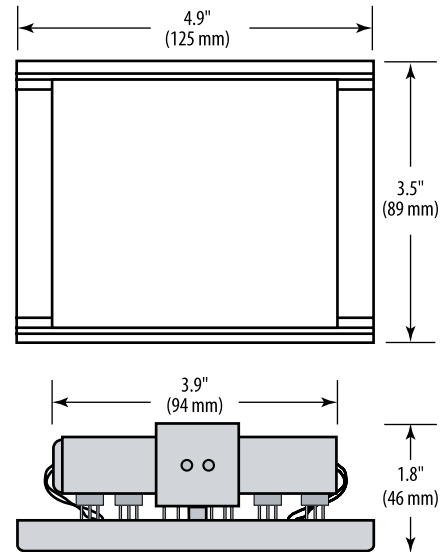
Ordering Information

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.

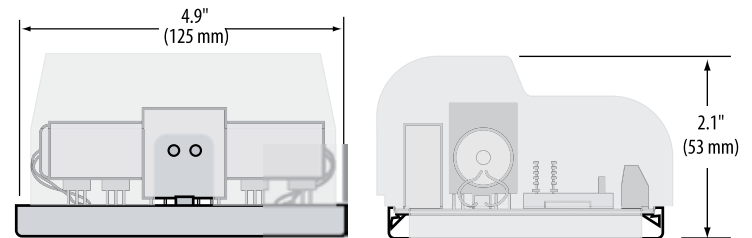
Example:
EP3 0 3 0 S 2 Option = Cover Plate

Dimensional Drawing

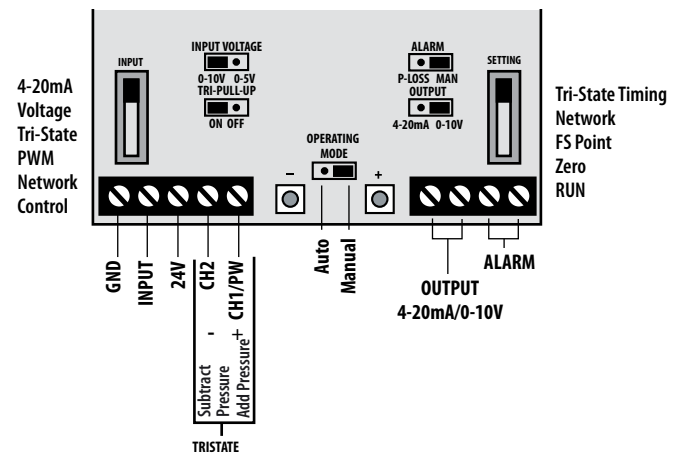


Dust Cover

Dimensional Drawings (Front View) Side View



Configuration



Accessories

Dust Cover (AA43)
Pneumatic Capacitor(AA45)
Triac adapter (AA49)



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.

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)

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

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

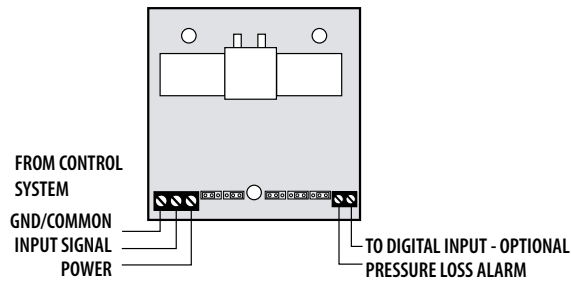
Agency Approvals



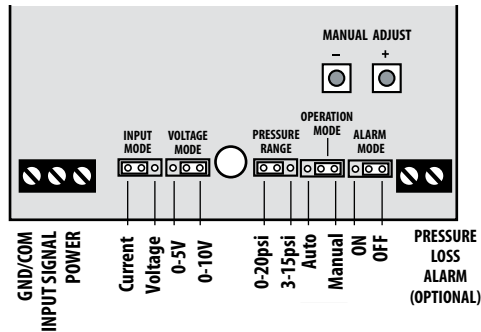
*For shorter tubing runs use AA45 Pneumatic Capacitor
EMC Conformance - CE option: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

**The CE mark applies to models with cover only.

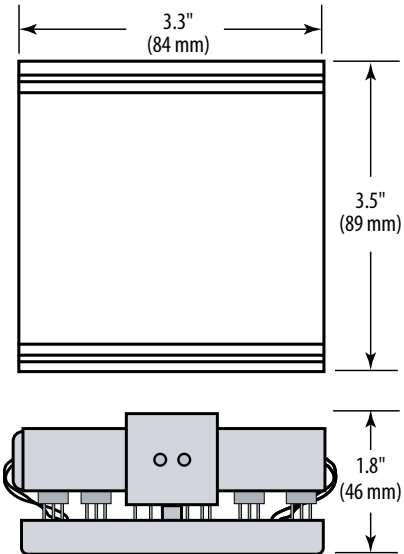
Wiring Diagram



Configuration

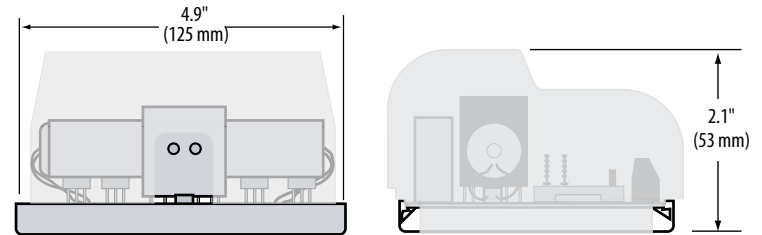


Dimensional Drawings



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	0	0	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 Option = EP cover plate

Accessories

Dust Cover (AA43)

Pneumatic Capacitor(AA45)



PH Series

Three Switch-Selectable Ranges with Test Mode from Veris



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.

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

Reduces failures

Micromachined silicon sensor design...improves overpressure capacity and reduces failures

High stability

Electronic surge damping for high stability

Zero calibration

Pushbutton zero calibration...no trim pots to adjust, saves installation time

Switch-selectable

Switch-selectable pressure ranges...fewer models to order and stock

Pushbutton

Pushbutton and remote zero adjustment...maintain accuracy and prevent callbacks with automatic zero calibration

Microprocessor

Microprocessor controlled signal conditioning (see graph)

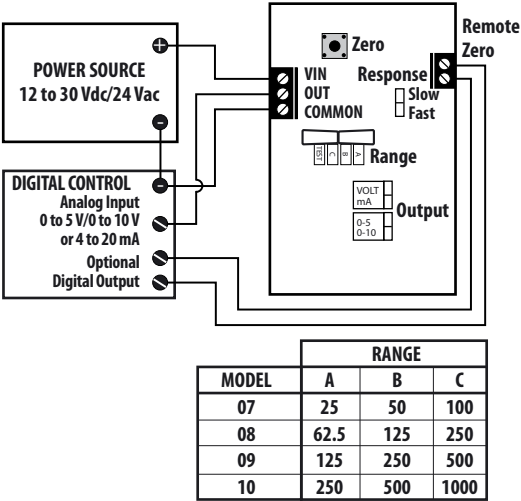
Applications

- Chilled and hot water pump monitoring
- Instrument air pressure
- Hydraulic oil pressure
- HVAC and industrial gas monitoring

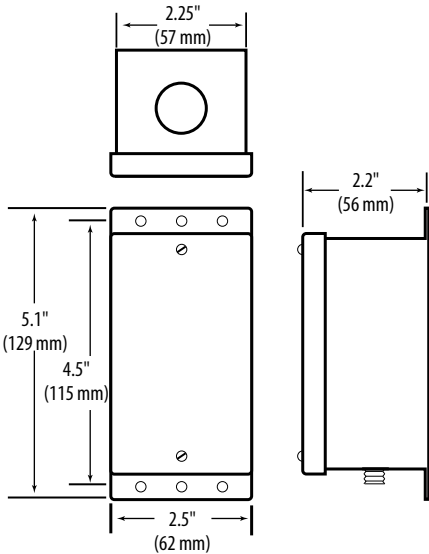
Sensor	
Accuracy	±1% F.S. Combined linearity, hysteresis, and repeatability
Long Term Stability	±0.25% per year
Media Compatibility	Media compatible with 17-4 PH stainless steel
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range
Temp Compensated Range	0 to 50 °C (32 to 122 °F)
Media 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

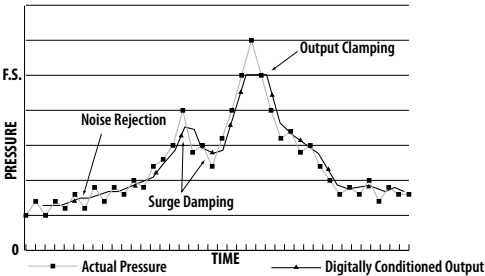
Wiring Diagram



Dimensional Drawing



Signal Conditioning Diagram



Ordering Information

NIST Range

PH ☐ ☐ ☐ S

N = NIST 07 = 0-100 psig = Standard
X = None 08 = 0-250 psig
 09 = 0-500 psig
 10 = 0-1000 psig

Example:
PH ☐ X ☐ 07 ☐ S

Accessories

- Brass Snubber, 1/4" NPT (AA69)
- Stainless Steel Snubber, 1/4" NPT (AA70)
- Pigtail Steam Siphon (AA13)



PG Series

Rugged Stainless Steel Construction



PG

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.

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)

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 Rugged

No silicon oil, no internal O-rings, no welds

Stainless steel wetted construction

Applications

- Pump inlet/outlet and compressors
- Refrigeration equipment, fluids
- Hydraulic/pneumatic systems
- Gas pressure measurement
- Energy and water management

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

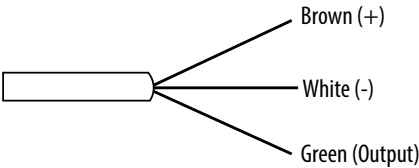
Agency Approvals



* Accuracy includes nonlinearity and hysteresis.

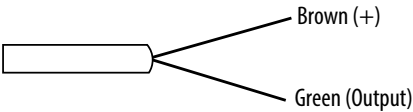
3-wire, 0-5 Vdc/0-10 Vdc

Wire Color Coding

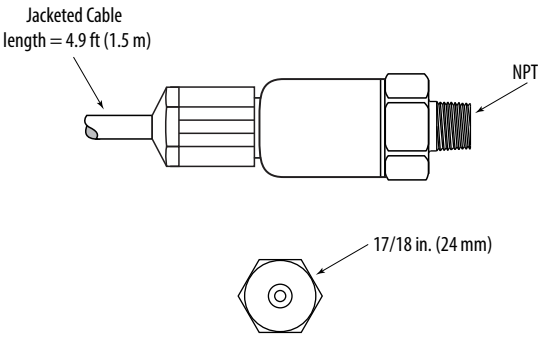


2-wire, 4 to 20 mA

Wire Color Coding



Dimensional Drawing



Ordering Information

	Range	Wetted Material	Output
PG	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	A = 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)



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)



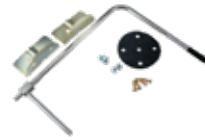
AA12/AA70
Stainless Steel Snubber, 1/8" NPT (AA12)
Stainless Steel Snubber, 1/4" NPT (AA70)



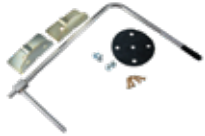
AA13
Pigtail Steam Siphon



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.

Model	Description	Page
ETD	Duct Mount Temperature Sensors	153
TJ	VAV Discharge Temperature Sensors	155
ETI	Immersion Temperature Sensors	157
ETS/ETB/TRA	Specialty Temperature Sensors	159
ETA	Averaging Temperature Sensors	161
ETO	Outdoor Temperature Sensors	162
TC/TS	Ceiling and Recessed Mount Temperature Sensors	163

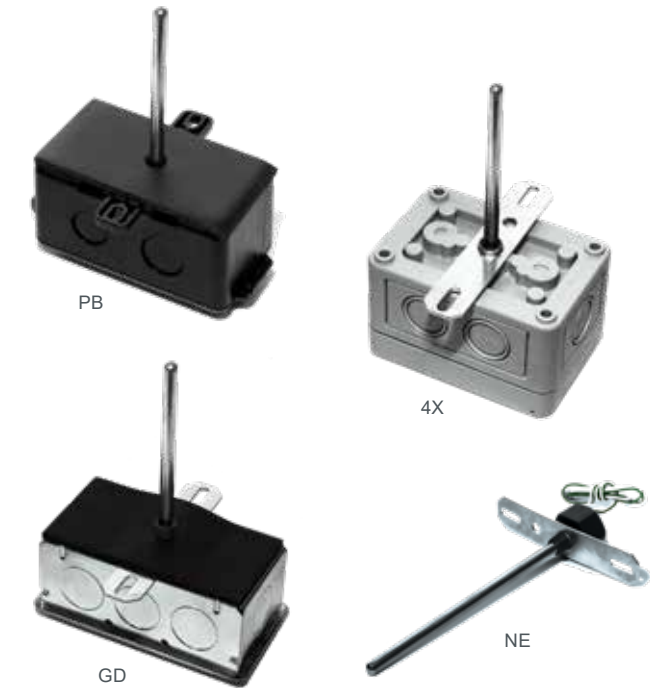
Plant Room Temperature Sensor Selection Guide

	Duct Mount	Ceiling Mount	Outdoor Mount	Remote	Strap-On	Immersion	VAV
Analog Transmitter Output	ETD* page 153	TC/TS* page 163	ETO* page 162	ETB/TRA* page 159	ETS* page 159	ETI* page 157	TJ* page 155
Resistive Output	ETD page 153	TC/TS page 163	ETO page 162	ETB/TRA page 159	ETS page 159	ETI page 157	TJ page 155
Averaging Sensor	ETA page 161						

*Requires AA10 Series Temperature-to-Current Transmitter, see [page 165](#).

ETD Series

Corrosion Resistant Stainless Steel Probe



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 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

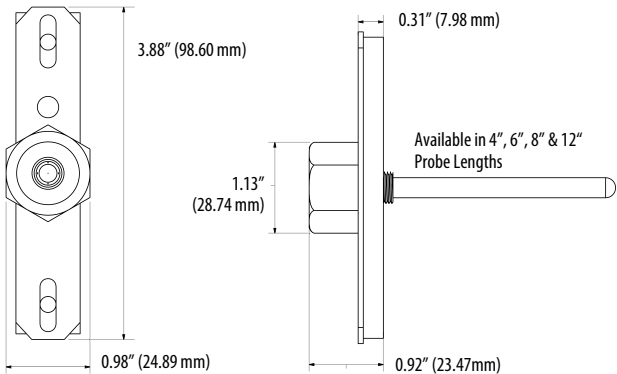
Duct mount, service entry body, threaded, and water resistant to fit your application

Applications

- Tanks
- Pipes
- Chillers

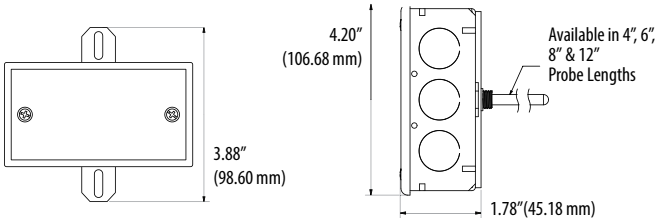
No Enclosure (NE)

Dimensional Drawing



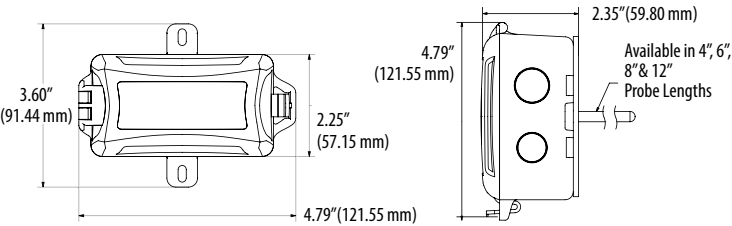
Galvanized Enclosure (GD)

Dimensional Drawing



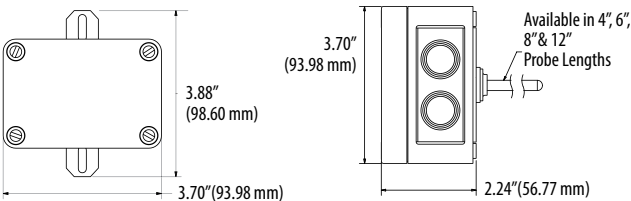
Plastic Box Enclosure (PB)

Dimensional Drawing



NEMA 4X Enclosure (4X)

Dimensional Drawing

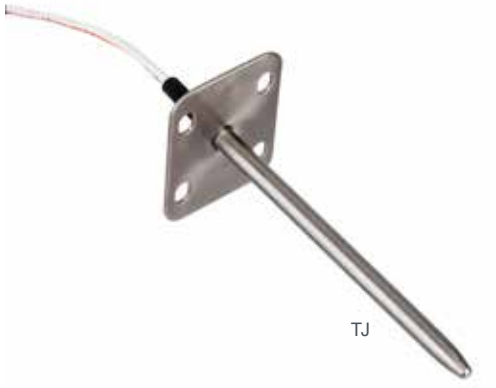


Ordering Information

ETD	Thermistor/ RTD Type	Probe Length	Housing Type	Example:
				ETD  -  - 
	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	4 = 4" 6 = 6" 8 = 8" 12 = 12"	None = Galvanized Steel Enclosure -NE = No Enclosure, Plate Only -PB = ABS Plastic Box Enclosure -4X = NEMA 4X (IP65) Polystyrene Plastic Enclosure	

TJ Series

VAV Discharge Air Sensor for Reheat Applications from Veris



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

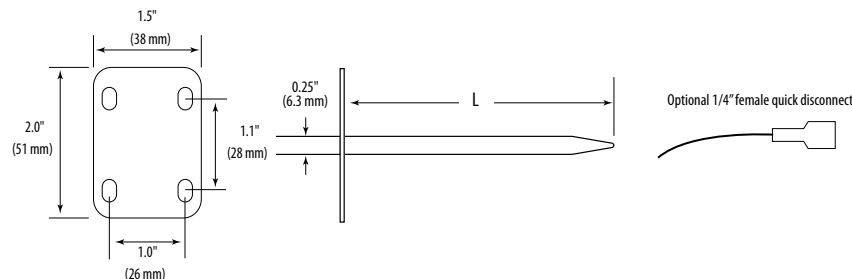
Application flexibility

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

Probe Length "L"	Sensor Type	Output	Cal Certificate	Option
TJ	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	R = Resistive	0 = None 2 = 3-point NIST calibration	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						10k Type 2	10k Type 3
Type	100 Ohm	1000 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	20k		
Accuracy	±0.3°C 0.00385 curve	±0.3°C 0.00385 curve	±1% @70°C	±0.2°C 0/70°C	±0.2°C 0/70°C	±1.0°C -50/150°C	±0.2°C 0/70°C	±0.2°C -20/70°C	Consult Factory	±0.1°C 20/70°C ±0.2°C 0/20°C	±0.1°C 0/70°C
Temp. Response*	PTC	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC

*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



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 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

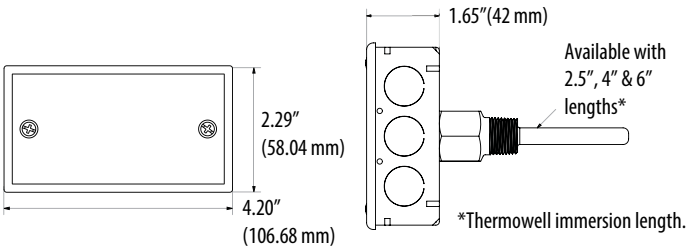
Duct mount, service entry body, threaded, and water resistant to fit your application

Applications

- Tanks
- Pipes
- Chillers

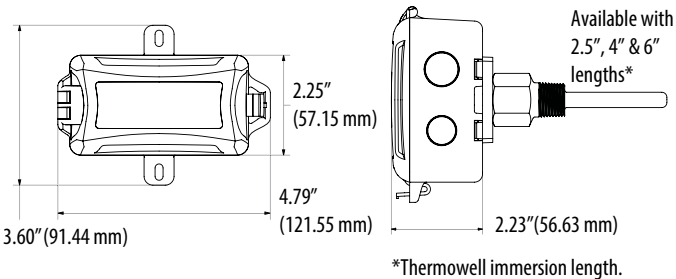
Galvanized Enclosure (GD)

Dimensional Drawing



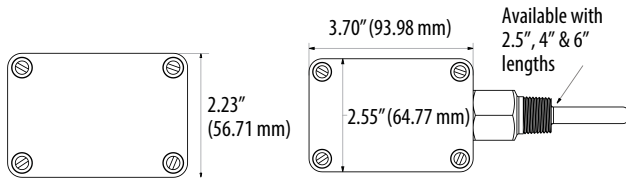
Plastic Box Enclosure (PB)

Dimensional Drawing

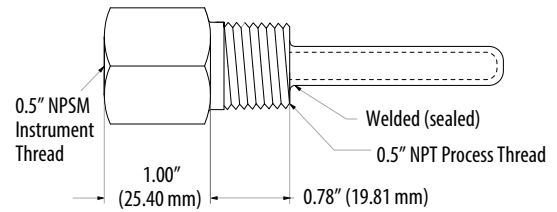


NEMA 4X Enclosure (4X)

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

Thermistor/ RTD Type	Probe Length	Housing Type
ETI		
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	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)	None = Galvanized Steel Enclosure PB = ABS Plastic Box Enclosure 4X = NEMA 4X (IP65) Polystyrene Plastic Enclosure
Example: ETI 100 - 6 - PB		

Thermowells

Immersion Depth	Construction
ETI-WELL-	
2S = 2.5" 4S = 4" 6S = 6.25"	None = Two-piece welded M = One-piece machined
Example: ETI-WELL- 4S M	

ETS, ETB & TRA Series

High-Accuracy Specialty Sensors



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	-25 to 105 °C (-13 to 221 °F)*
ETS	Probe: -25 to 105 °C (-13 to 221 °F),
ETB	Wiring: -20 to 80 °C (-4 to 176 °F)
TRA	

Warranty

Limited Warranty	5 years
------------------	---------

*Room temperature offset documented on each unit.

Secondary measurement

Secondary measurement of water temperature...ideal for retrofit applications (ETS)

Long sensor life

Durable copper sensing probe (ETB)

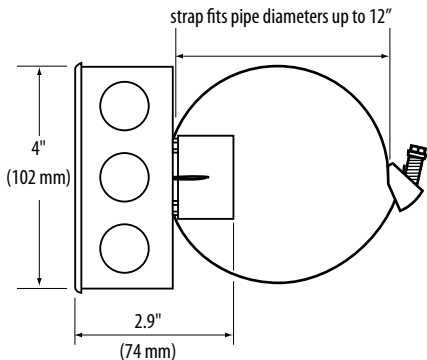
Easy installation

Pipe clamps allow for easy installation on pipes up to 12" in diameter (ETS)

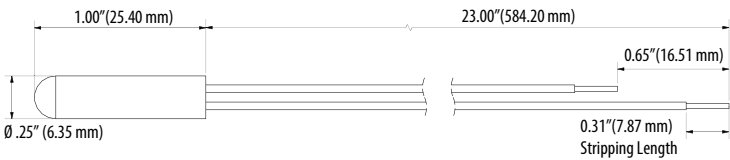
Multiple cable lengths

Multiple cable lengths for application flexibility (ETB)

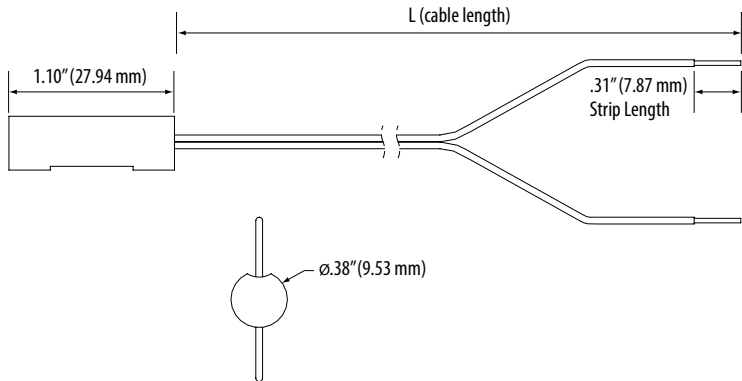
ETS Dimensional Drawing



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

Example:

ETS

500

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)

Remote Probe (Stainless Steel)

Thermistor/
RTD Type

ETB

Example:

ETB

200

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)

Remote Probe (Copper)

Sensor Type

Calibration Certificate

Cable Length

TRA

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

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

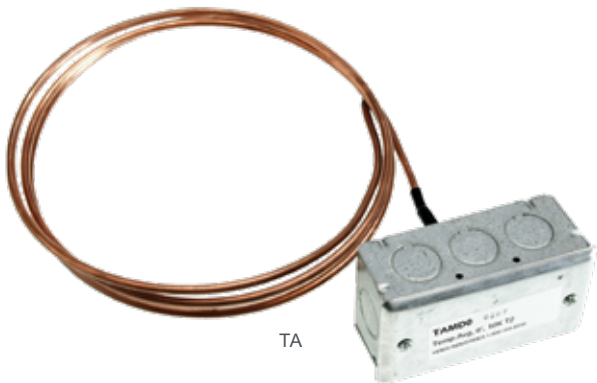
*Not available for sensor types B, C & P.
**Not available for sensor types B, C, E, F, N & P.
***Not available for sensor types B & P.

1 888-444-1311 | www.se.com | Schneider Electric, 800 Federal Street, Andover, MA 01810 USA

160

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

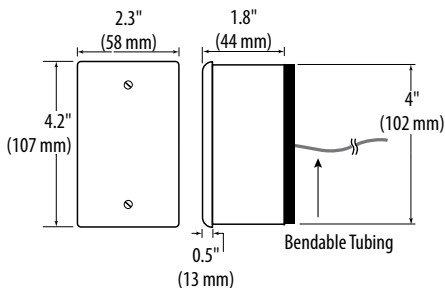
Wiring	22 AWG; 2-wire: RTD/Thermistor
Operating Temp	-25 to 105 °C (-13 to 221 °F)*
Lintemp Option	
Input Power	Class 2; 5 to 30 Vdc
Output	10mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Calibration Error	1.5 °C (2.7 °F) typical; 2.5 °C (4.5 °F) max. at 25 °C (77 °F)*
Error Over Temp	1.8 °C (3.24 °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 exchangers
- 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



Sleek design

Reduces solar heating...reliable and accurate

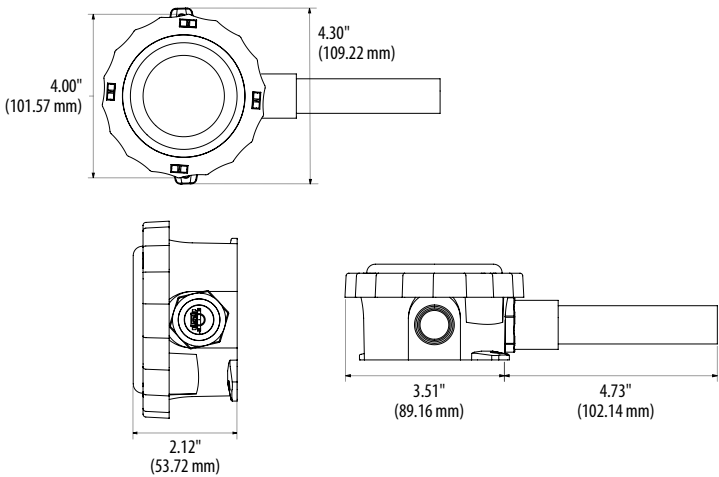
Flexible

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 Thermistor 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 164.

**Room temperature offset documented on each unit.

Ceiling mount

Ceiling mount probe for more accurate readings...ideal for open office environments

Recessed sensor

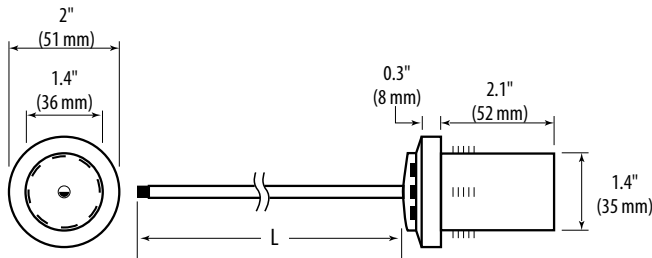
Recessed press-fit sensor virtually “disappears”...great for museums and galleries

Applications

- Hospitals and operating rooms, pharmaceutical labs
- Clean rooms
- Food processing plants
- Environmental testing facilities and other institutional applications

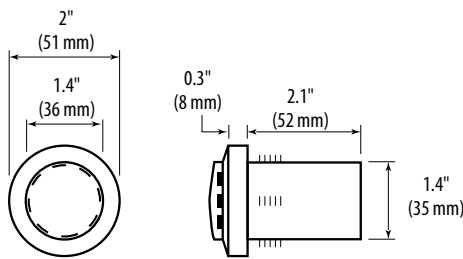
TC

Dimensional Drawing



TS

Dimensional Drawing



Ordering Information

Probe Length	Sensor Type	Calibration Certificate	Sensor Type	Calibration Certificate	Housing Color
TC B = 4" (102mm) C = 6" (152mm) D = 8" (203mm) E = 12" (305mm) F = 18" (457mm) G = 24" (610mm)	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	0 = None 1 = 1-point cal validation* 2 = 2-point cal validation*	TS 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	0 = None 1 = 1-point cal validation* 2 = 2-point cal validation*	None = Cloud White B = Black

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

Example:

TC

D

D

2

* 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										10k Type 2	10k Type 3
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		
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

*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

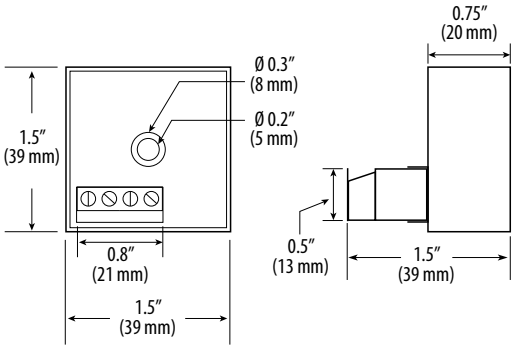


AA64
Klipet Mounting Clip



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	169
MSB	Wall Switch Occupancy Sensors	171

Lighting Control Selection Guide

Ceiling Mount	Wall Mount
MSC page 169	MSB page 171

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



* 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

Daylight sensing

Daylight level sensing (from 0.5 to 250 foot-candles)... avoids unnecessary lighting

Adjustable time delay

Adjustable time delay (preset time delays from 15 seconds [test] to 30 minutes)...provides ultimate flexibility

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

Adjustable coverage

Adjustable coverage sensitivity (from 60 to 100%)

Auxiliary relay

Easily communicates with building control system

Tamper resistant cover

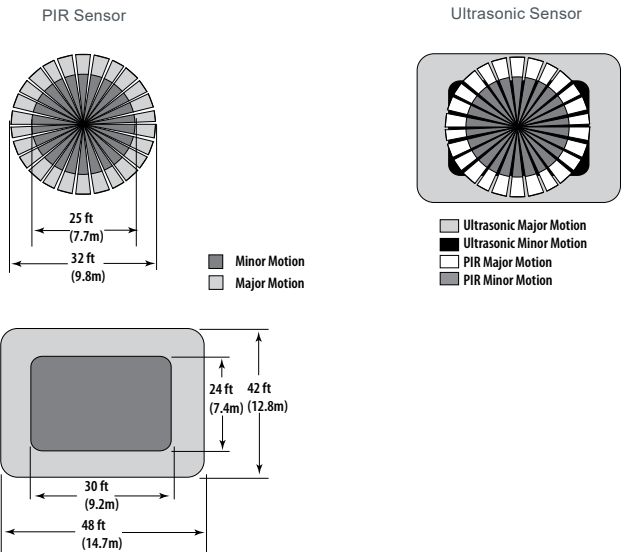
Adjustment compartment cover...tamper resistant

- 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

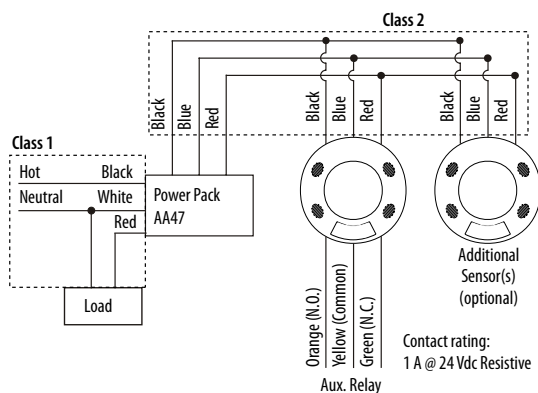
MSC Series

Coverage Patterns for 9 ft (2.8 m) Ceiling Height



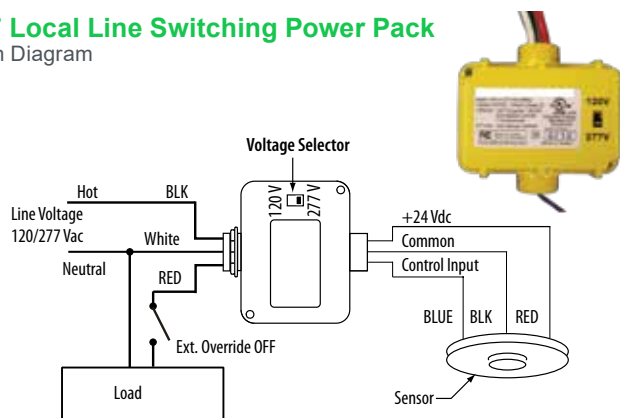
Local Line-Power Control MSC

Wiring Diagram



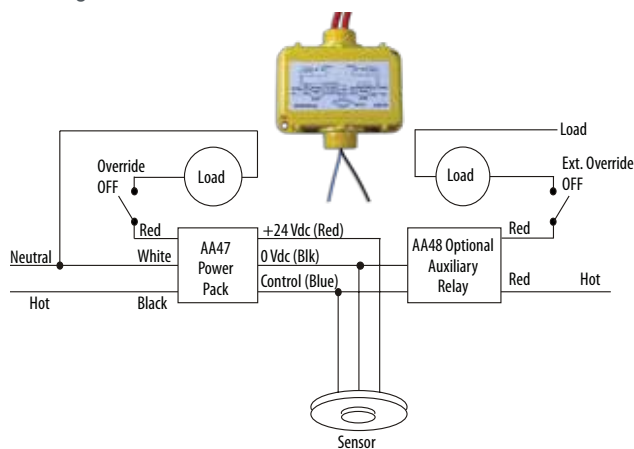
AA47 Local Line Switching Power Pack

System Diagram



AA48 Auxiliary Relay (Optional)

System Diagram

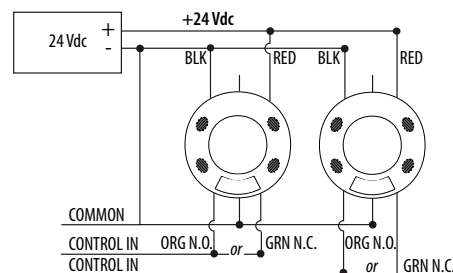


Ordering Information

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	SLSP1277	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 $\pm$ 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 Temperature	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

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 magnetic ballast loads.

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



Adjustable

Adjustable time delay

Bypass button

Bypass button for “always on” operability...simplifies commissioning 180-degree motion detection

180 degrees

180-degree motion detection

Line powered

No separate supply needed

Ballast compatibility

Compatible with magnetic and electronic ballasts...provides ultimate flexibility

Loading

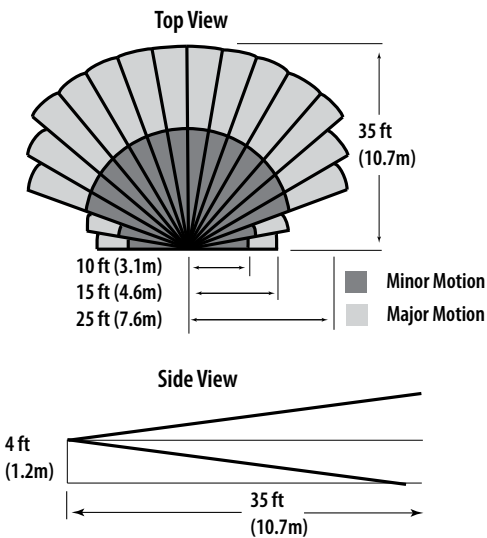
No minimum loading requirement

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

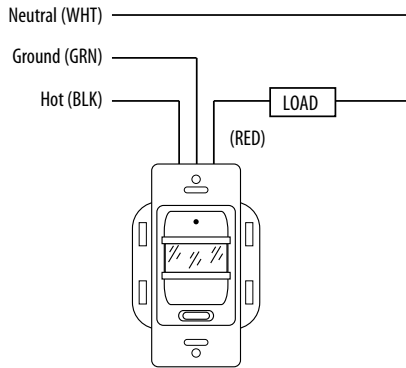
*Leadership in Energy and Environmental Design (LEED) is a registered mark of the US Green Building Council

MSB Series Coverage Patterns

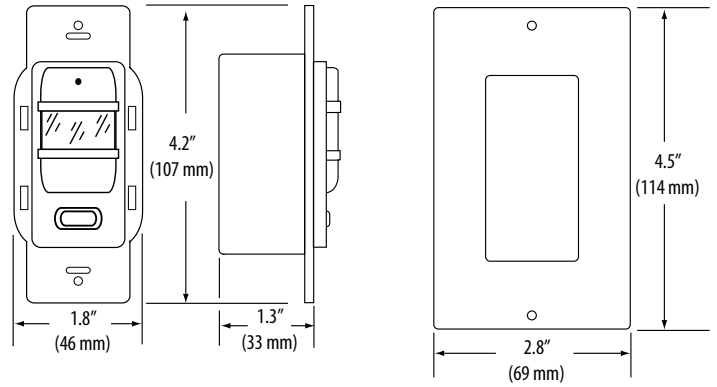


Single-Level Lighting

Wiring Diagram

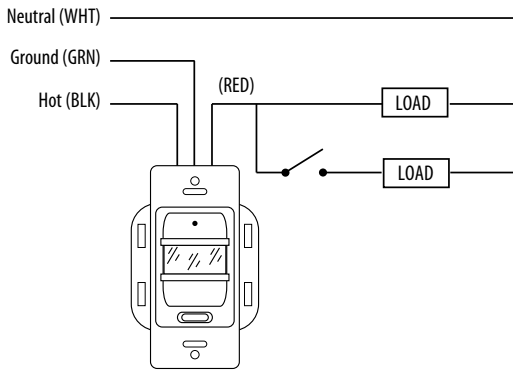


Dimensional Drawings



Bi-Level Lighting

Wiring Diagram

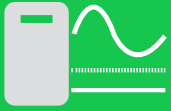


Ordering Information

Sensing Technology	Turn On	# of Circuits	Color
MSB P = Passive Infrared (PIR)	 A = Automatic M = Manual	1	 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)	175
H308/608/701/708/808/908	Current Switches: Adjustable Trip Point, Standard Output	177
H609/709/709HV/809/909/909HV	Current Switches: Adjustable Trip Point, High Voltage Output	179
H606/706/806/906	Current Switches: Adjustable Trip Point, N.C. Output	181
H11D	Current Switches: Auto Calibration, Automation Systems, LCD Display	183
H614	VFD Current Switch: Auto Calibration	185
H720/904/934	VFD Switches and Current Sensors	187
H6ECM	ECM-Optimized Current Switch	189
H730/740/750/930/940/950	Current Switches with Relay: Fixed Trip Point (Status)	191
H735/738/748/758/938/948/958	Current Switches with Relay: Adjustable Trip Point, Standard Output	193
H739/749/939/949/959	Current Switches with Relay: Adjustable Trip Point, High Voltage Output	195
H721HC/721LC/921	Current Transducers: 4 to 20 mA Analog Output	197
H221/221SP/321/321SP/421/421SP	Current Transducers: 4 to 20 mA Analog Output, High Current Monitoring	199
H722LC/722HC/822/822-20/922	Current Transducers: 0 to 5 Vdc Analog Output	201
H723LC/723HC/923	Current Transducers: 0 to 10 Vdc Analog Output	203
H931	Current Transducers with Relay: 4 to 20 mA Analog Output	205
H932/952	Current Transducers with Relay: 0 to 5 Vdc Analog Output	207
H971/971SP/EA20 Series	Direct Current Transducers: 4 to 20 mA and 0 to 5 Vdc Analog Output	209
H5xx Series	Field Mount Motor Control Device	211
H120/120NC	Field Mount Status Relay	213

Current Sensor Selection Guide

Current Status Switches (Digital Output)

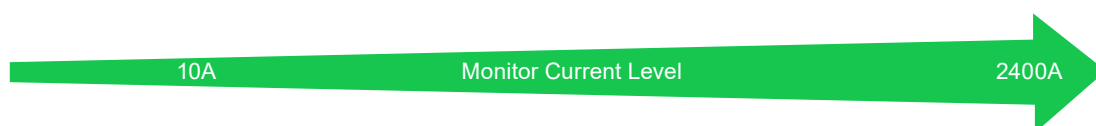
Application	Micro Split-Core (Best on Retrofits)	Mini Solid-Core (Cost Effective for New Installations)	Mini Split-Core (Best on Retrofits)	Standard Solid-Core (Cost Effective for New Installations)	Standard Split-Core (Best on Retrofits)
Detect Status (Digital On/Off)	H300 — 60A page 175	H800* — 200A page 175	H600 — 200A page 175		H900 — 200A page 175
Detect Belt Loss and Mechanical Failure (Adjustable Threshold)	H308 — 50A page 177	H808 — 50A page 177 H806 — 50A page 181 H809 — 50A page 179	H608 — 175A page 177 H606 — 50A page 181 H609 — 50A page 179	H708 — 135A page 177 H706 — 135A page 181 H709* — 135A page 179	H908 - 135A page 177 H906 - 135A page 181 H909* - 135A page 179
Self-Calibrating Switch					H11D — 200A page 183
VFD Model - Patented Technology			H614 — 150A page 185		H904 — 135A/20-75Hz page 187 H6ECM — 0.5 - 175A page 189
VFD Model - Patented Technology (Onboard Relay)					H934 — 135A/20-75Hz page 187
Exclusive Patented Technology Status & Control (Onboard Pilot Duty Relay)				H730* — 200A page 191 H738* — 135A page 193 H739* — 135A page 195	H930* — 200A page 191 H938* — 135A page 193 H939* — 135A page 195

Flying Leads and Junction Box Mounting

Power Duty Status and Control	H120* — to 20A/2HP page 213	H5xx* — to 15A/1.5HP page 211
-------------------------------	--	--

* Indicates a series of products.

Current Transducers (Analog Output)



Load Trending 4-20mA Output		H721LC: 10-40A page 197	H921: 30-120A page 197	H721HC: 50-200A page 197	H221/321/421: 300/800/2400A page 199
Load Trending 0-5V Output	H822*: 10/20A page 201	H722LC: 10-40A page 201	H922*: 30-120A page 201	H722HC: 50-200A page 201	
Load Trending 0-10V Output		H723LC: 10-40A page 203	H923: 20-150A page 203	H723HC: 50-200A page 203	
Load Trending with Relay 4-20mA Output			H931: 30-120A page 205		
Load Trending with Relay 0-5V Output			H932/H952: 30-120A page 207		
DC Current 4-20mA Output				H971/EA20: 10-200A page 209	
VFD 4-20mA Output				H720: 0-200A page 187	

* Indicates a series of products.

Hx00 Series

On/Off Status Current Switches from Veris



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!

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	-15 to 60 °C (5 to 140 °F)
H600	-15 to 40 °C (5 to 104 °F) (to 200 A);
H800, H800HV	-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 mm ²); 22 to 16 AWG (0.3 to 1.3 mm ²)

Reliable

More reliable for status than relays across auxiliary contacts

Ideal for direct-drive units

Ideal for direct-drive units, unit vents, fan coil units, exhaust fans, and other fixed loads

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

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

Installation flexibility

Removable mounting bracket provides installation flexibility

Flexibility

Bracket on H900 can be installed in three different configurations

Quick installation

Split-core H300, H600 and H900 for fast retrofit installation

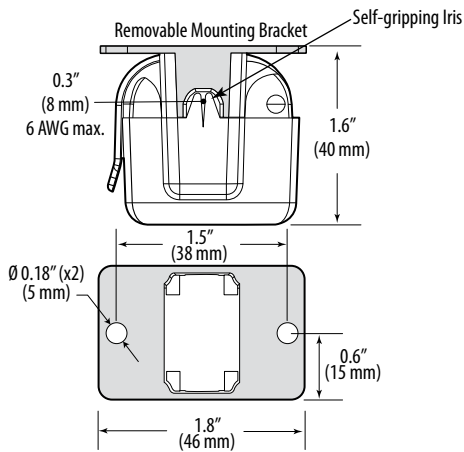
Terminal Block Torque H600, H800, H900 H300	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m); 7 in-lbs (0.8 N-m)
Warranty	
Limited Warranty	5 years
Agency approvals	
Agency approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation



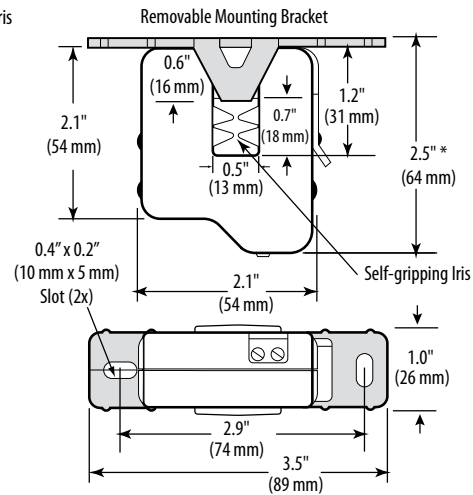
Note: Do not use the LED status indicators as evidence of applied voltage.
(a) VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.

H300

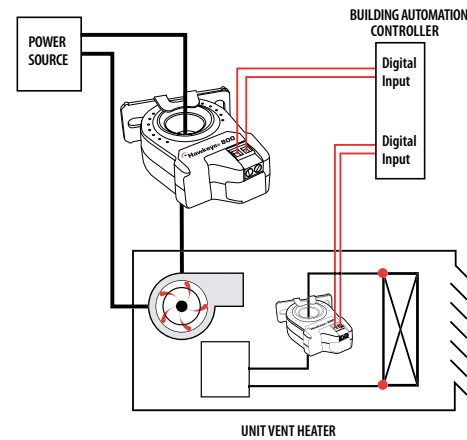
Dimensional Drawing

**H600**

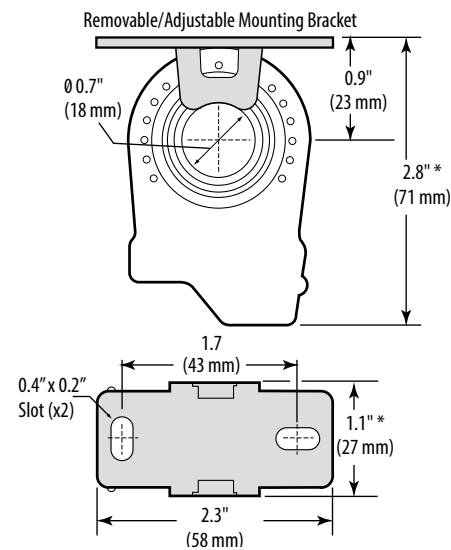
Dimensional Drawing

**Unit Vent Heater Control**

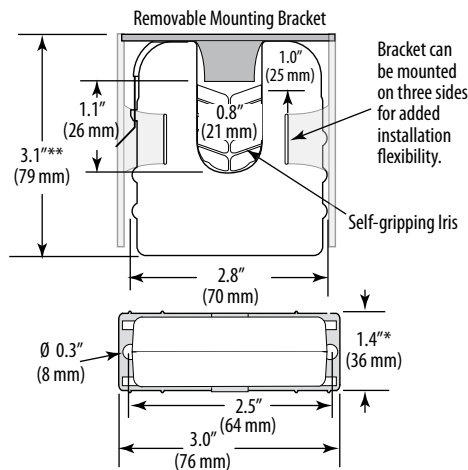
Wiring Diagram

**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



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 mm ²) Others: 24-14 AWG (0.2 to 2.1 mm ²)
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
------------------	--



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

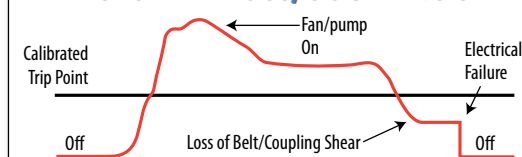
Status LEDs

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

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.

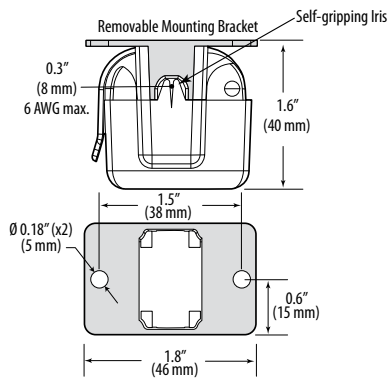
Notes: Do not use the LED status indicators as evidence of applied voltage.

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>.

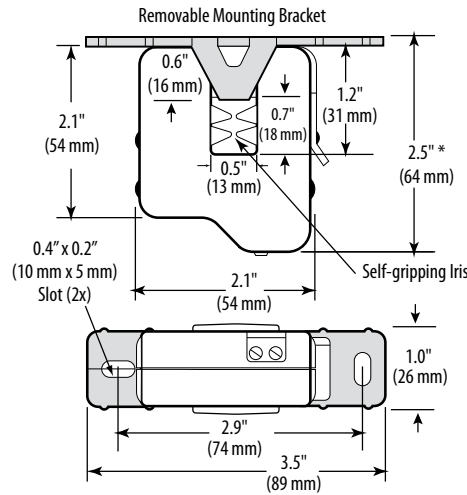
VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.

H308

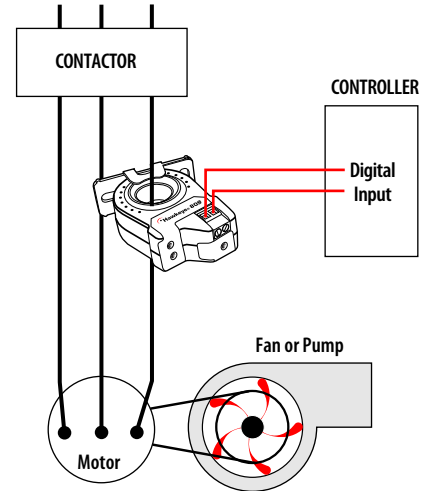
Dimensional Drawing

**H608**

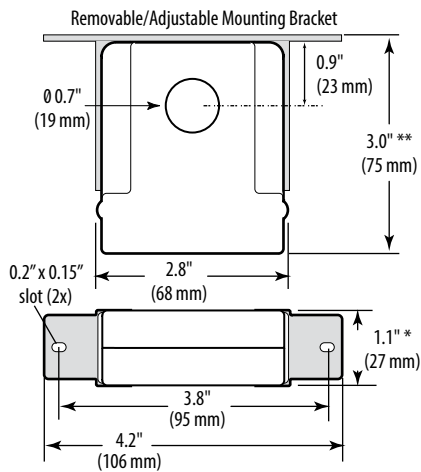
Dimensional Drawing

**Monitoring Fan / Pump Motors for Positive Proof of Flow**

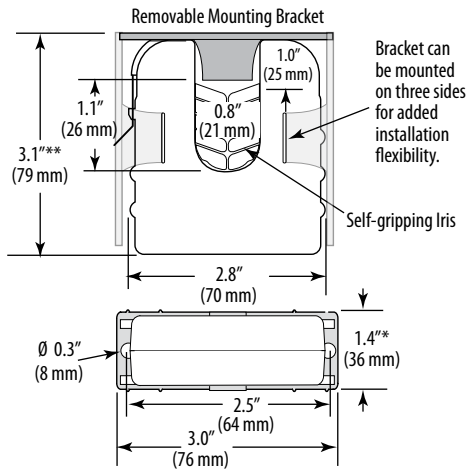
Wiring Diagram

**H708/701**

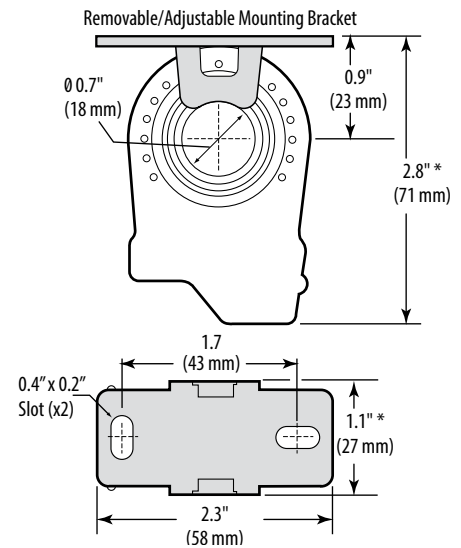
Dimensional Drawing

**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



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 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
------------------	--



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

Small in size

H609 and H809 are small in size to fit easily inside small starter enclosures

Versatility

Removable mounting bracket optimizes field versatility

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

Adjustable trip point

Precise current trip point setting

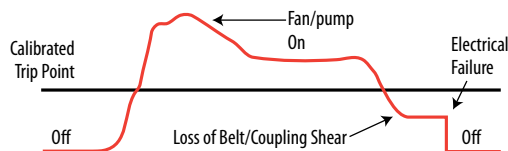
Status LEDs

For easy setup and local indication

Flexibility

Bracket on H909 can be installed in three different configurations

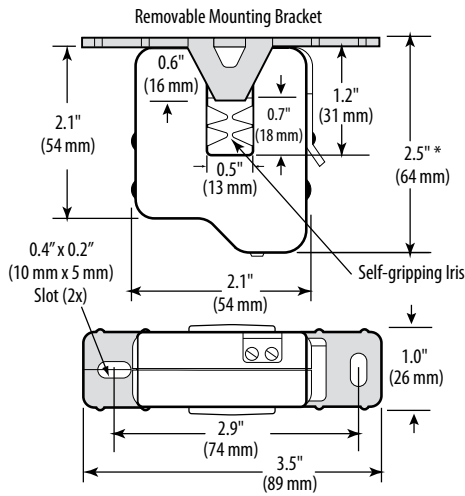
DETECTS BELT LOSS/COUPLING SHEAR!



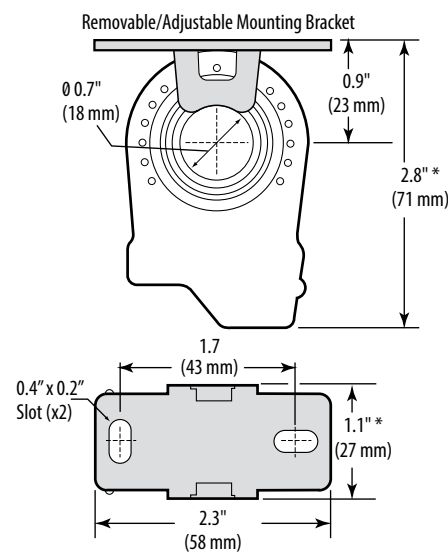
Now you can easily detect when drive belts slip, break, or pump couplings shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

H609

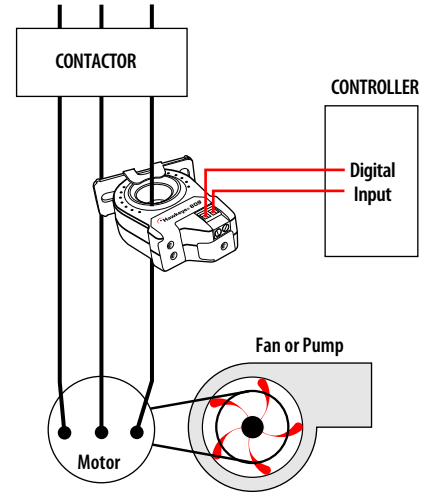
Dimensional Drawing

**H809**

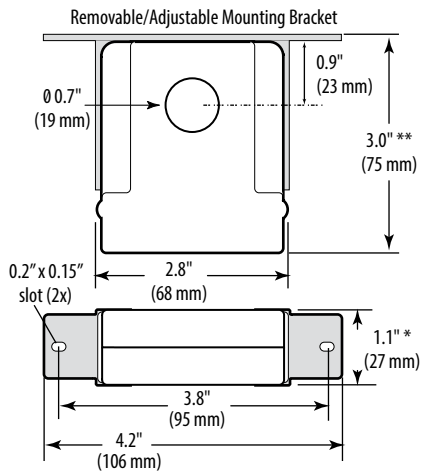
Dimensional Drawing

**Monitoring Fan /Pump Motors for Positive Proof of Flow**

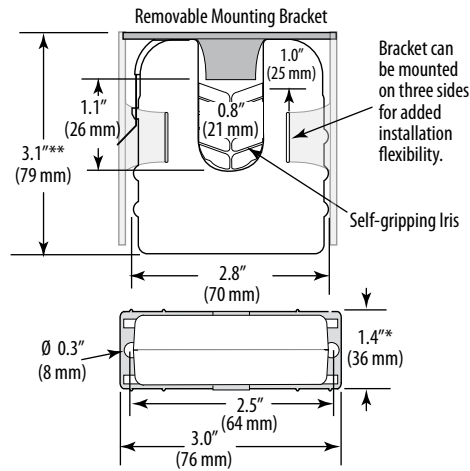
Wiring Diagram

**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. 0.2 A @ 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. 1.0 A @ 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



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.

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 mm²) Others: 24 to 14 AWG (0.2 to 2.1 mm²)
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
------------------	--



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.

Adjustable trip point

Versatility with four available amperage ranges

Status LEDs

Output status LEDs for fast set up

No tubing needed Easy placement

Easier to install than differential pressure switches

Adjustable mounting bracket on the solid-core housing

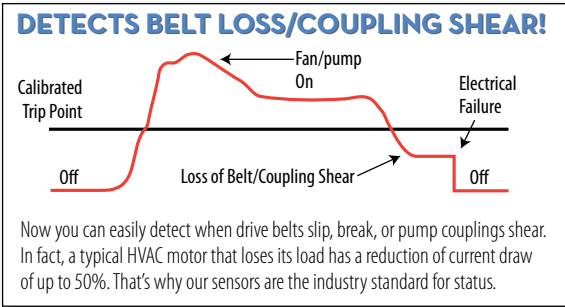
100% solid-state Self-gripping iris

No moving parts to fail

Self-gripping iris on split-core housings for easy installation

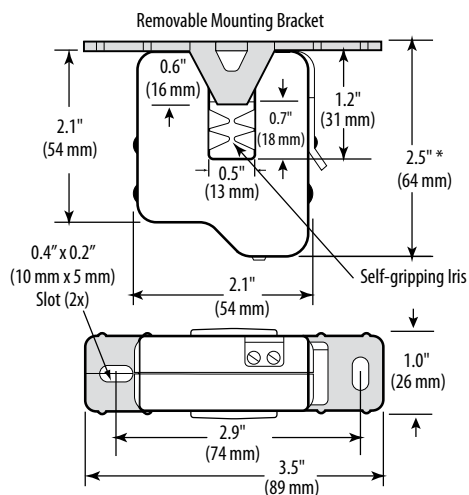
Applications

- 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)

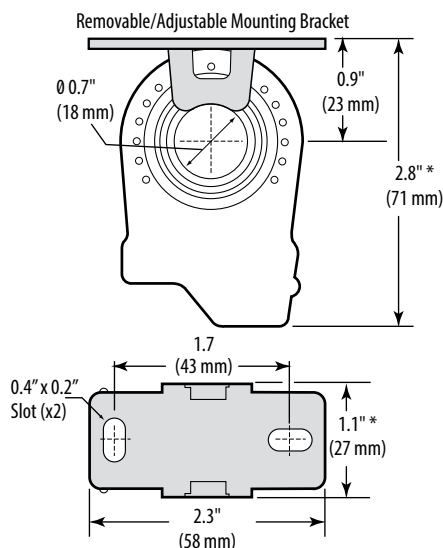


H606

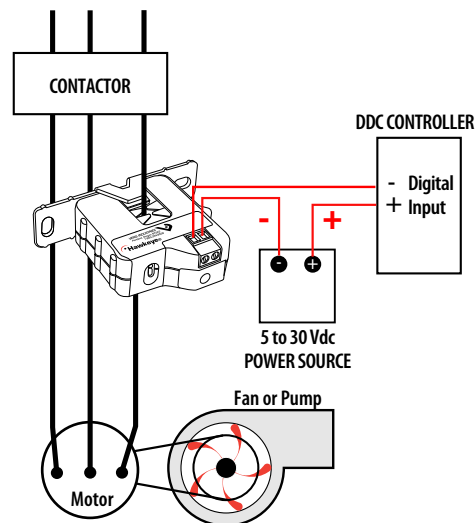
Dimensional Drawing

**H806**

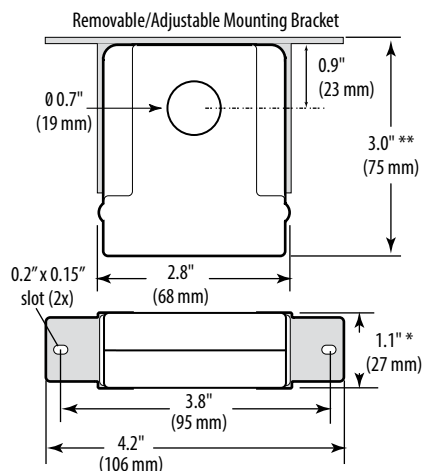
Dimensional Drawing

**Monitoring Fan/Pump Motors for Positive Proof of Flow (H606 & H806)**

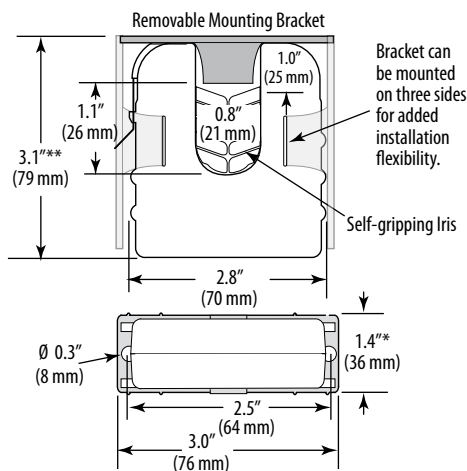
Wiring Diagram

**H706**

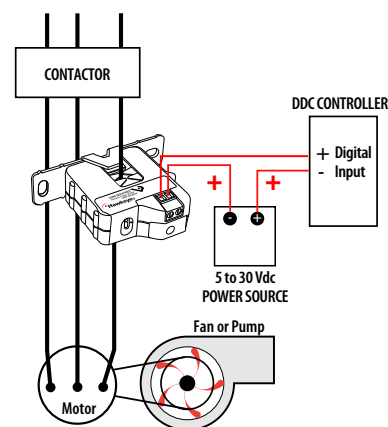
Dimensional Drawing

**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



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.

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

Backlit LCD

View the monitored current (up to 200 A)...no need for expensive handheld meters and offers easy visibility in dark enclosures

Simplified troubleshooting

Records and displays the amperage level that trips the alarm

Microcontroller-based learning technology

Automatically learns load upon initial power-up...minimizes calibration labor

Applications

- HVAC fans, pumps, and blowers
- Monitoring status of industrial process equipment

Versatility

Slide-switch selectable trip point limits

Automatic calibration

Reduced errors and installation costs

Reset function

Reset function can be used when unpowered...reduces the possibility of an arc flash incident

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
------------------	--

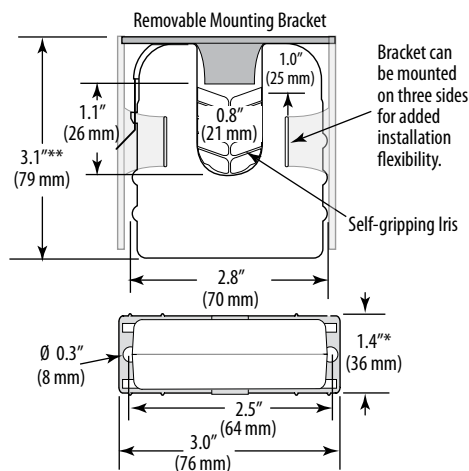


1. Trip point switch positions A and B are not for use in applications where the current will fluctuate by more than 40% (A) or 60% (B) of the nominal current. If the current will fluctuate by more than 60%, use the H11D for on/off status (position C) only.
2. The upper trip limit alarm resets when the 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.

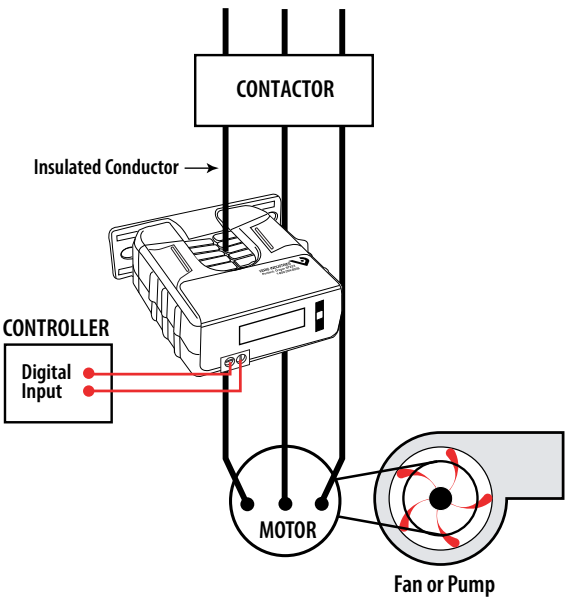
Specification Note: For CE compliance, conductor shall be insulated according to IEC 61010-1.

Do not use the LCD as evidence of applied voltage.

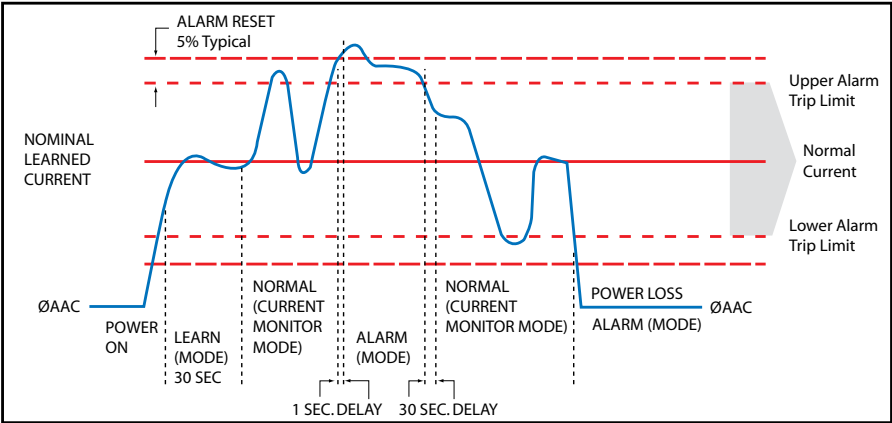
Dimensional Drawing



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



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 $\pm 20\%$ 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).

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	$\pm 20\%$ 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 mm ²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)

Microcontroller based learning technology

Automatically learns load upon initial power-up...minimizes calibration labor

Automatic trip point

Automatic trip point (1.5 to 150 Amps, 12 to 115 Hz)...detect abnormal events

Under- and over-load

Microcontroller based learning technology...automatically learns load

Applications

- Monitoring fans, pumps, motors, and other electrical loads for proper operation
- Monitoring critical motors (compressor, fuel, etc.)
- Detecting belt loss and motor failure...ideal for fan and pump status
- Verifying lighting circuit loads
- Monitoring industrial process equipment status (OEM)

Saves space

Small size fits easily inside small starter enclosures

100% solid state

100% solid state...no moving parts to fail

Flexibility

Removable mounting bracket for installation flexibility

Warranty

Limited Warranty	5 years
------------------	---------

Agency Approvals

Agency Approvals	UL508 open device, CE: EN61010-1, CAT III, Pollution Degree 2
------------------	---

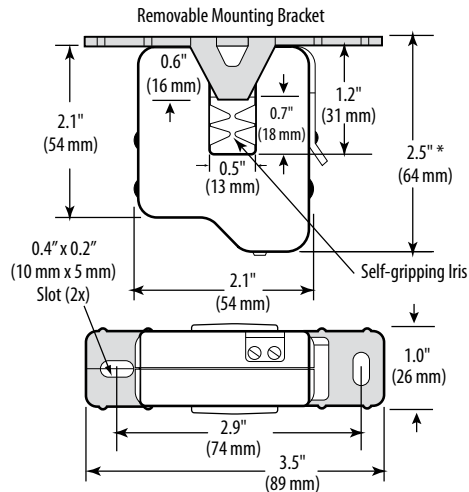


- VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.
- The H614 is not intended for use in applications where the current is expected to fluctuate by more than 20% due to acceptable causes other than VFD driven changes.
- 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

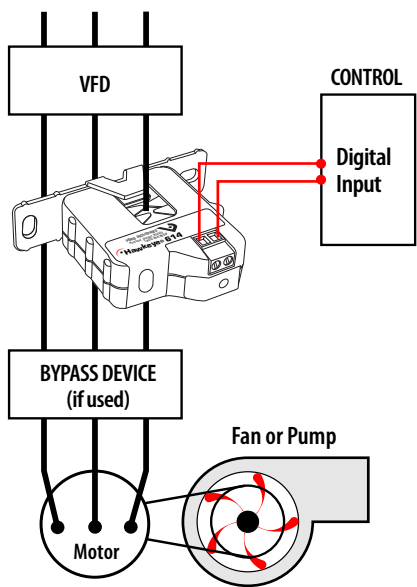
The product design provides for basic insulation only. Use wire with minimum 75°C rated insulation. Do not use the LED status indicators as evidence of applied voltage. This sensor detects abnormal operation by looking for sudden changes in current across the entire frequency range. In Learn mode, the 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



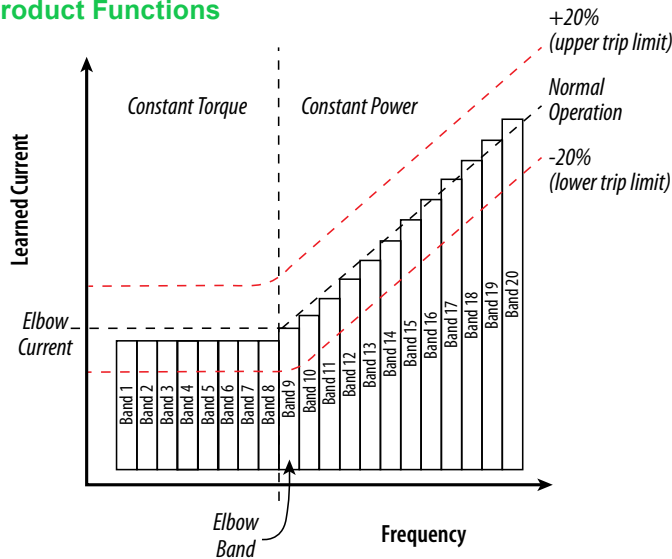
* Terminal block may extend up to 1/8" over the height dimensions shown.

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 $\pm 20\%$ 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	$\pm 20\%$ 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.



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.

Specifications

Sensor Power	H904/H934: Induced from monitored conductor; H720: 12 to 30 Vdc
Insulation Class	600 Vac RMS
Frequency Range: H720	10 to 80 Hz;
H904/H934	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)

Load side monitoring

Suitable for load side monitoring of VFDs (H720)

Precise scaling

Adjustable zero and span for precise scaling (H720)

0.5% accuracy

Accurate to 0.5% of full scale (H720)

Applications

- Monitoring positive status on motors controlled by variable frequency drives
- Replacing pressure switches
- Measuring current and load trending

Automatically compensates

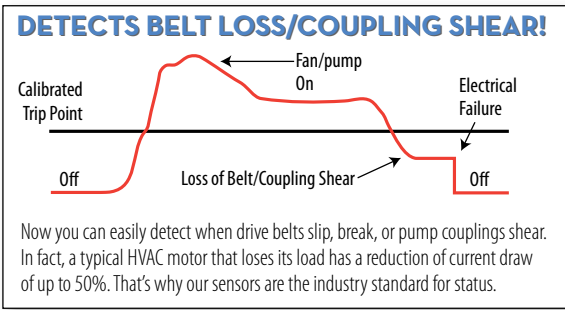
Automatically compensates for the effects of frequency and amperage changes in monitored conductor associated with VFDs (H901/934)

Nuisance reduction

Provides a secondary setpoint option of 50% of the originally measured current (H901/934)

Rapid troubleshooting

LED indicates normal and alarm conditions (H901/934)



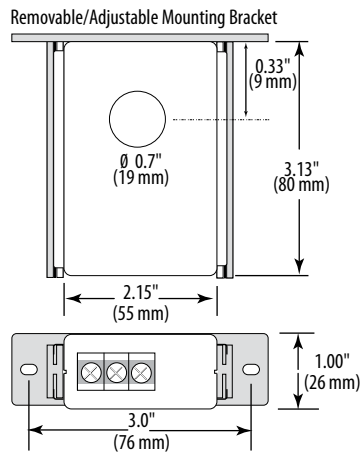
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm ²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Warranty	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing CAT III, Pollution Degree 2, basic insulation



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.

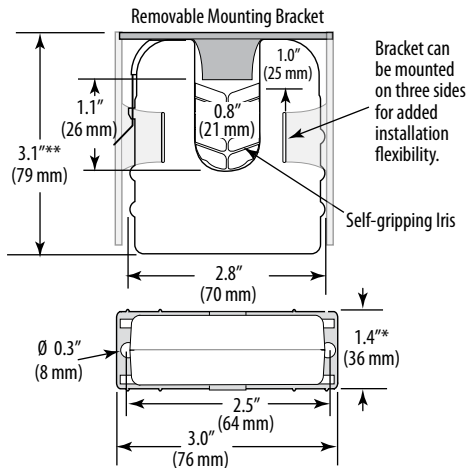
H720

Dimensional Drawing



H904/934

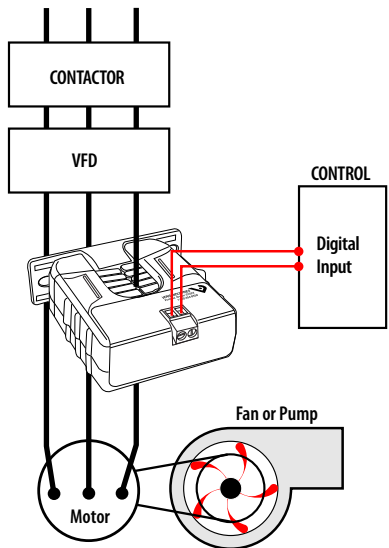
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.

Monitoring Fan /Pump Motors for Positive Proof of Flow

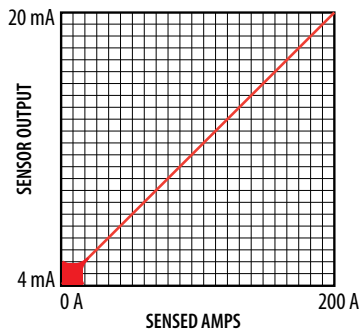
Wiring Diagram



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



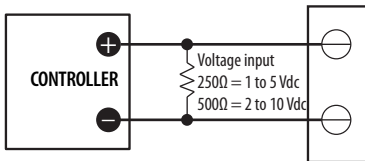
H934 Relay Contact Ratings

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



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.

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

High performance Self-gripping iris

High performance device, split-core housing

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

Applications

- Systems with Electrically Commutated Motors such as cooling fans or compressor motors with off-state (keep alive) current less than 0.5 A

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
------------------	---------

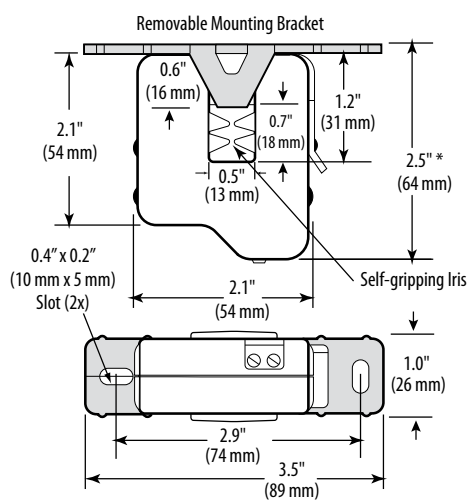
Agency Approvals

Agency Approvals	UL508 open device listing
Installation Category	CAT III, Pollution Degree 2



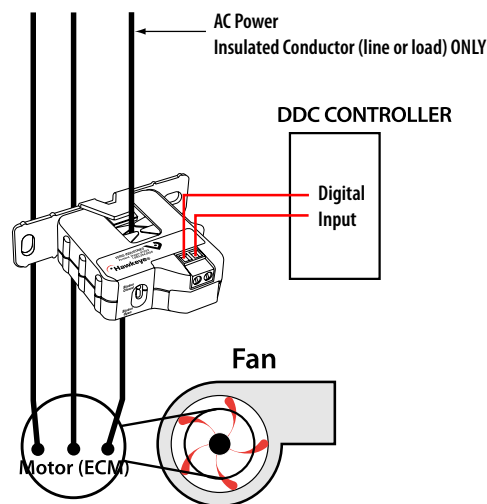
Notes:
The product design provides basic insulation only.
Do not use the LED indicators as evidence of applied voltage.

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



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.

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 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
------------------	---



Note: Do not use the LED status indicators as evidence of applied voltage.

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

Applications

- Monitoring direct drive units, exhaust fans, and other fixed loads
- Monitoring on/off status of electrical loads
- Starting/stopping motors

Relay Contact Ratings

Hx30, Hx50 (SPST, N.O.)

Resistive	10 A @ 250 Vac, 30 Vdc
Inductive	5 A @ 250 Vac, 30 Vdc

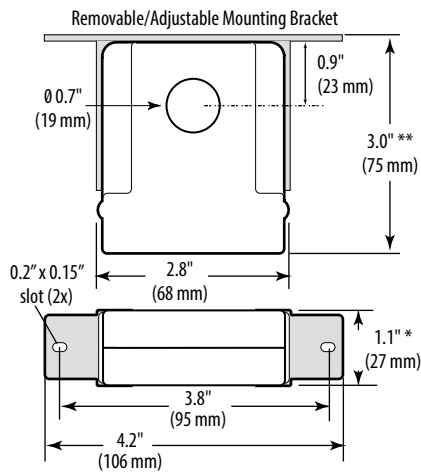
Hx40 (SPDT)

Resistive	8 A @ 250 Vac, 30 Vdc
Inductive	3.5 A @ 250 Vac, 30 Vdc

Typical Coil Performance

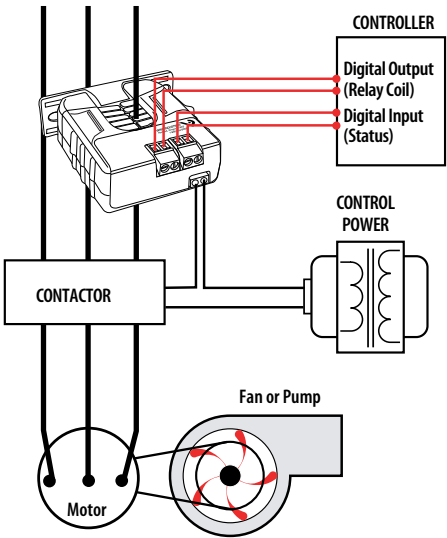
Voltage	AC	DC
24V	10 mA	10 mA
Pull In Voltage		
Hx30		20.1 Vdc
Hx40		20.1 Vdc
Hx50		8.4 Vdc
Drop Out Voltage		
Hx30		5.2 Vdc
Hx40		5.2 Vdc
Hx50		3.0 Vdc

H730/740/750
Dimensional Drawing

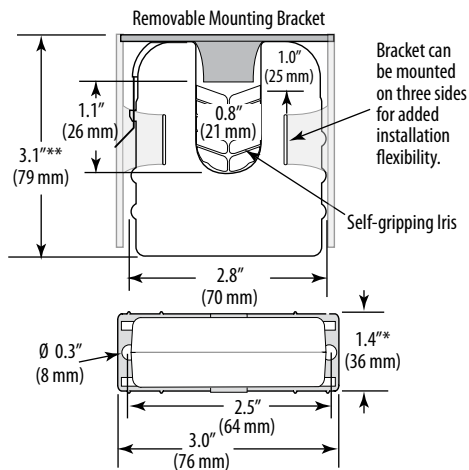


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Start/Stop Monitoring of
Fan/Pump Motors
Wiring Diagram

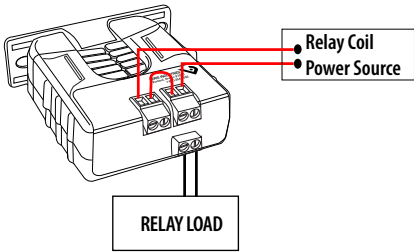


H930/940/950
Dimensional Drawing



* Terminal block may extend up to 1/8" over the height dimensions shown.

Relay Controlled Directly by
Status Contacts
Wiring Diagram

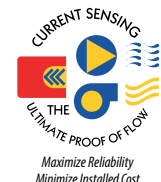


Ordering Information

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



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.

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	
Limited Warranty	5 years
Agency Approvals	
Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation



Note: 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

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

Applications

- Starting/stopping and monitoring positive status of motors
- Detecting belt loss and coupling shear

Two outputs

H748 and H948 feature a SPDT command relay...control two outputs with a single relay

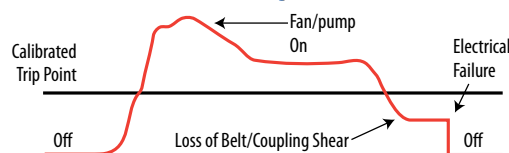
Added flexibility

Bracket on H938, H948, and H958 can be installed in three different configurations

Easy setup

Relay and status LEDs

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.

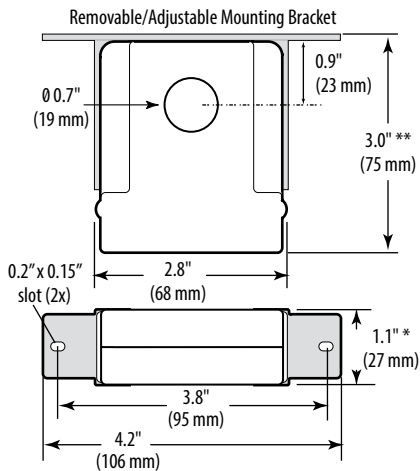
Relay Contact Ratings

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

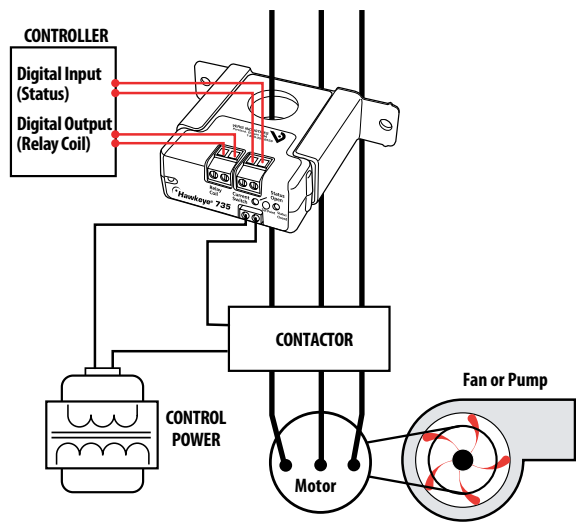
Voltage	AC	DC
24V	10 mA	10 mA
12V (Hx58)		20 mA
Pull-in Voltage		
Hx3x		20.1 Vdc
Hx48		20.1 Vdc
Hx58		8.4 Vdc
Drop-out Voltage		
Hx3x		5.2 Vdc
Hx48		5.2 Vdc
Hx58		3.0 Vdc

H735/738/748/758
Dimensional Drawing

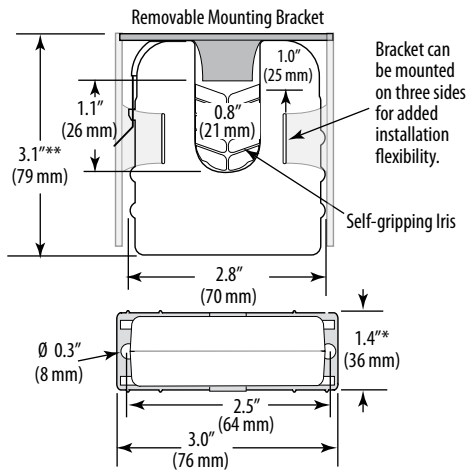


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

Start/Stop Monitoring of Fan /Pump Motors
Wiring Diagram

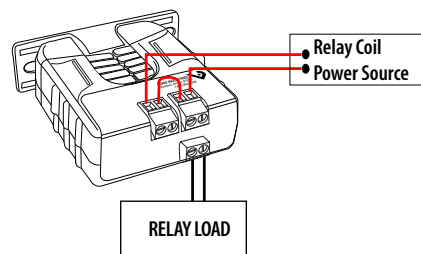


H938/948/958
Dimensional Drawing



* 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	1.0 A @ 30 Vac/dc	1 A or less	SPST, N.O.	24 Vac/dc	Solid-core	•	•	•
H738	1 to 135 A		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



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
------------------	---------



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

Polarity insensitive

Polarity insensitive status outputs...fast and easy installation

Easy setup

Relay and status LEDs

No tubing

Easier to install than differential pressure switches...no tubing needed

Detect belt loss

Detect belt loss & motor failure...ideal for fan and pump status

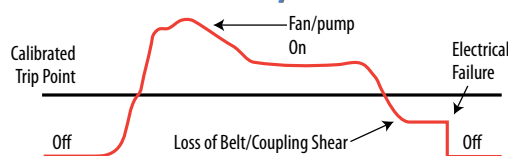
Added flexibility

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

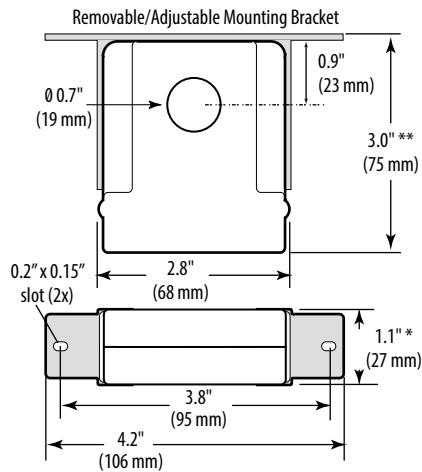
Inductive 3.5 A @ 250 Vac, 30 Vdc

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

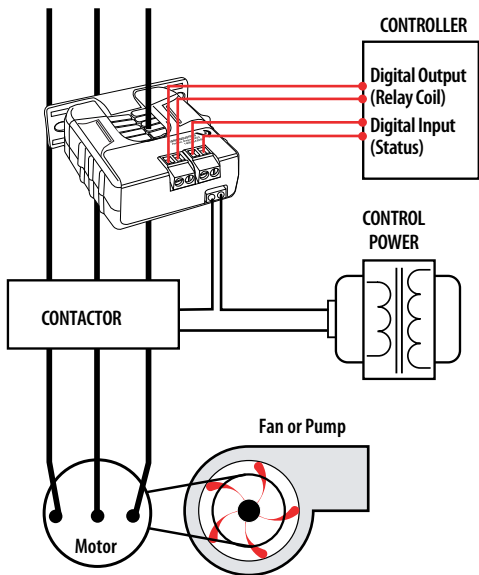
Dimensional Drawing



* 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.

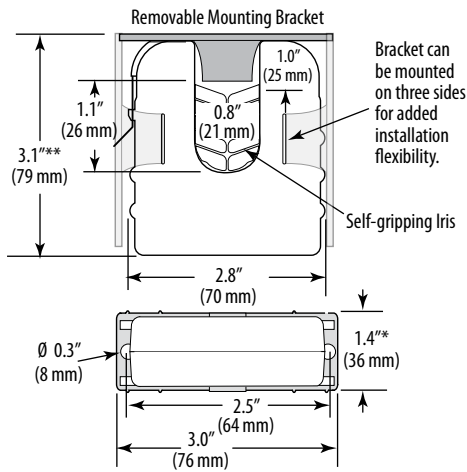
Start/Stop Monitoring of Fan /Pump Motors

Wiring Diagram



H939/H949/H959

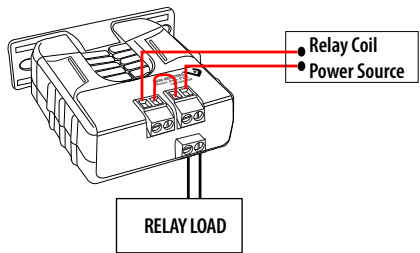
Dimensional Drawing



* 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 Output (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



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	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 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
------------------	--



Lower costs

Power the sensor, and receive the signal with only two wires...lower cabling and commissioning costs than with traditional 3-wire sensors

Retrofit

Self-gripping, split-core design for fast retrofit installation... no need to remove conductor (H921)

New construction

Economical solid-core features adjustable bracket for easy alignment (H721 Series)

Factory calibrated

Factory calibrated switch-selectable ranges for high resolution and installation ease

3 field-selectable

Three field-selectable ranges per unit...fewer versions to choose from, stock, and install

Installation flexibility

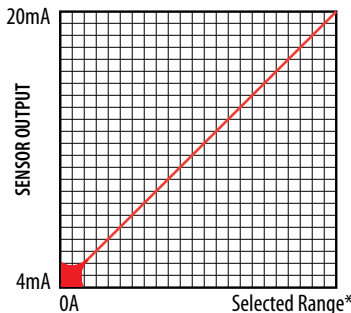
Removable mounting bracket for installation flexibility

Applications

- Load trending
- Motor control
- Fan/pump status

Example Linear Output

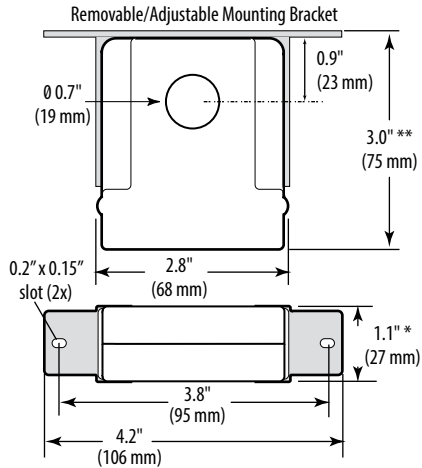
Scale software as shown



SENSED AMPS
*Factory calibrated ranges selected with the amperage range switch

H721LC/H721HC

Dimensional Drawing

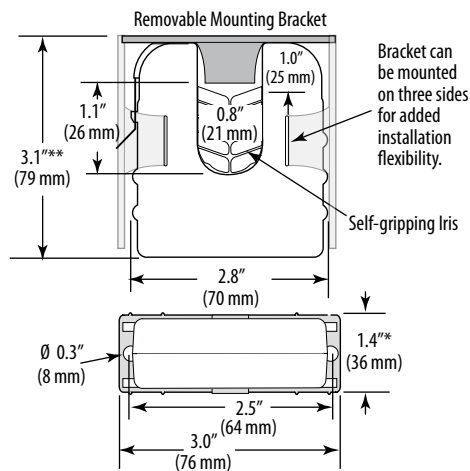


* Terminal block may extend up to 1/8" over the height dimensions shown.

** Slide switch may extend up to 1/4" over the height dimensions shown.

H921

Dimensional Drawing

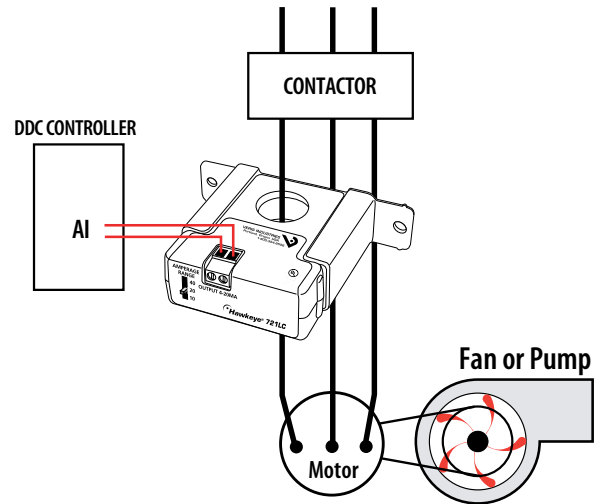


* Terminal block may extend up to 1/8" over the height dimensions shown.

** Slide switch may extend up to 1/4" over the height dimensions shown.

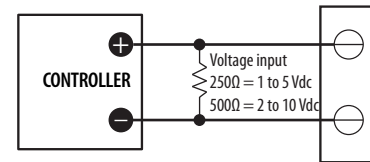
Monitoring Fan /Pump Motors for Positive Proof of Flow

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

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 mm ²) - 22 AWG (0.33 mm ²)
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
------------------	--

Split-core design

Split-core design for easy installation and fast retrofits

No need for external CTs

No need for external CTs on large conductors

Large openings

Large openings for heavy conductors

Loop powered

Loop powered 4 to 20 mA output

Two-wire design

Two-wire design reduces wiring cost

Field flexibility

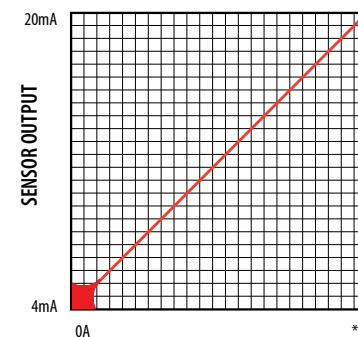
Hx21 models offer zero and span adjustments for field flexibility

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

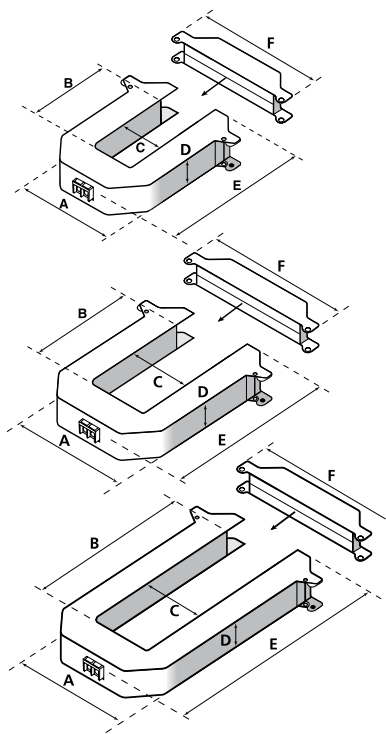


*Adjusted with Span Potentiometer for Hx21 models;
Factory-set per customer specification for Hx21SP models

100 to 300A (H221/H221SP)
300 to 800A (H321/H321SP)
1000 to 2400A (H421/H421SP)

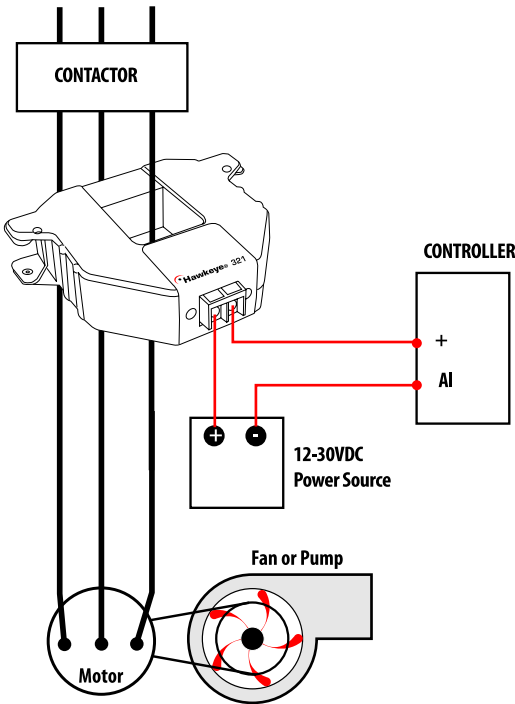


Dimensional Drawing

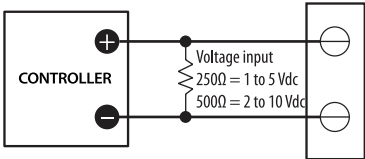


H221	H321	H421
A = 3.7" (94 mm)	A = 4.9" (124 mm)	A = 4.9" (124 mm)
B = 1.6" (40 mm)	B = 2.9" (75 mm)	B = 5.5" (141 mm)
C = 1.4" (35 mm)	C = 2.5" (63 mm)	C = 2.5" (63 mm)
D = 1.1" (29 mm)	D = 1.2" (29 mm)	D = 1.1" (29 mm)
E = 4.2" (106 mm)	E = 5.5" (140 mm)	E = 8.1" (206 mm)
F = 4.7" (120 mm)	F = 6.0" (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



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
------------------	--



Self-powered analog

Self-powered analog current sensor simplifies installation

No external power required

No external power required for sensor

Retrofit

Self-gripping, split-core design for fast retrofit installation... no need to remove conductor (H622-xx, H922)

Applications

- Load trending
- Motor control
- Positive proof of flow

New construction

Economical solid-core models feature adjustable bracket for easy alignment (H722xC)

Factory calibrated

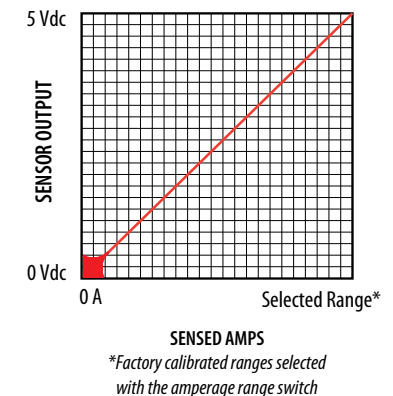
Factory calibrated ranges for increased flexibility and resolution

No jumpers

No jumpers on unit...reduces installation error

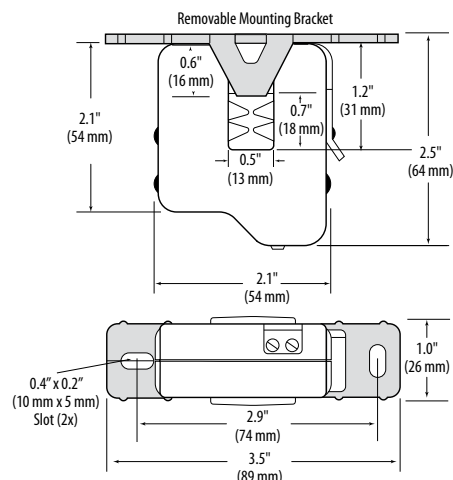
Example Linear Output

Scale software as shown

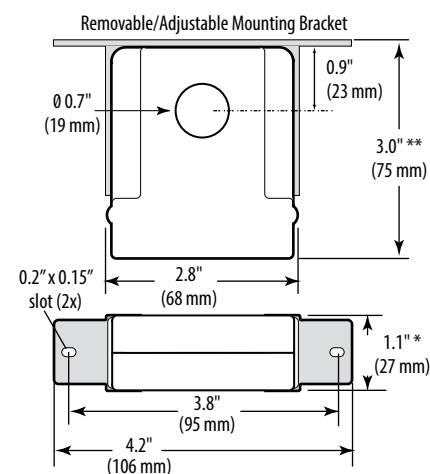


H622-xx

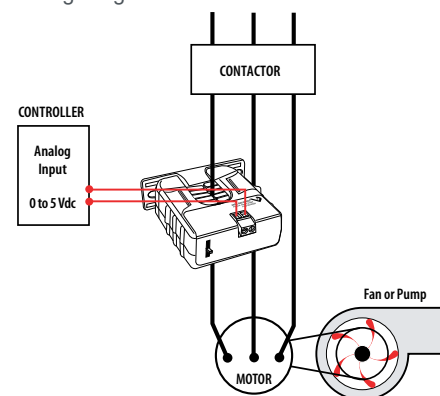
Dimensional Drawing

**H722LC/H722HC**

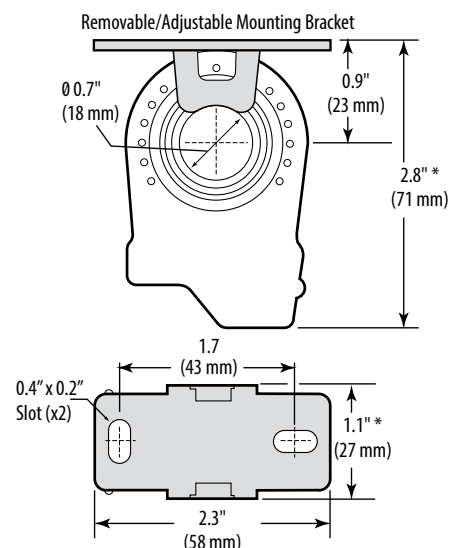
Dimensional Drawing

**Monitoring Fan /Pump Motors for Positive Proof of Flow**

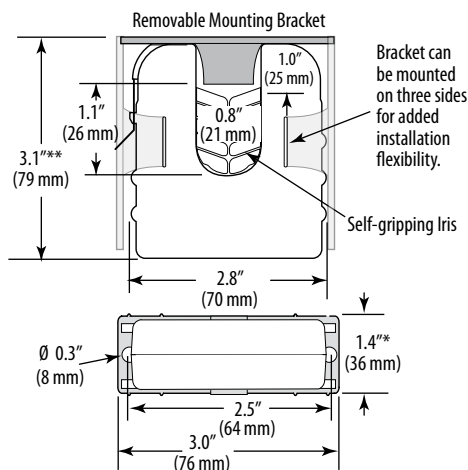
Wiring Diagram

**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



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
------------------	---



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

Applications

- Load trending
- Motor control
- Fan/pump status

No external power required

No external power required for sensor

Factory calibrated

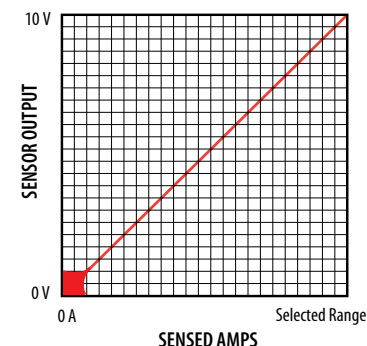
Factory calibrated ranges for high resolution and installation ease

Field-selectable ranges

Some models available with field-selectable ranges

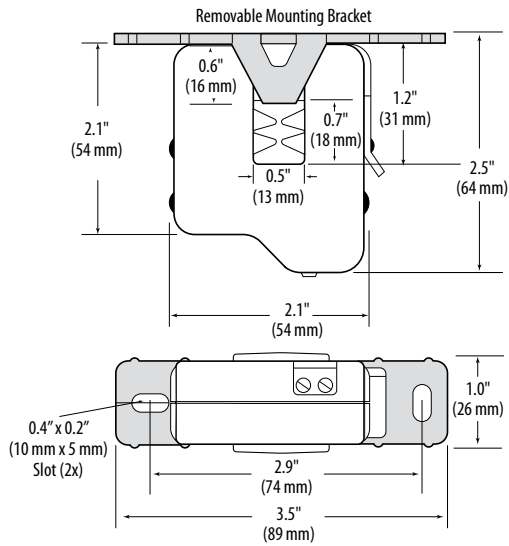
Example Linear Output

Scale software as shown

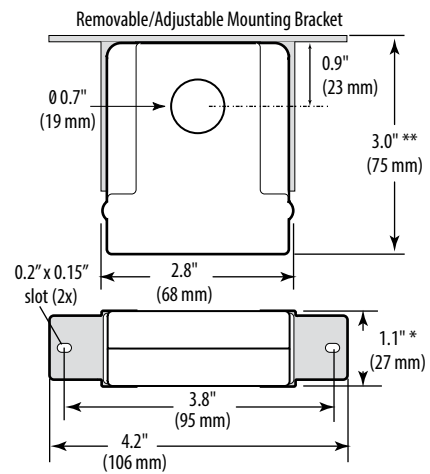


H623-xx

Dimensional Drawing

**H723LC/H723HC**

Dimensional Drawing

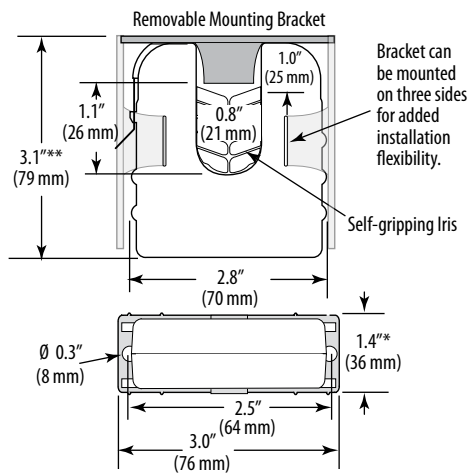


* Terminal block may extend up to 1/8" over the height dimensions shown.

** Slide switch may extend up to 1/4" over the height dimensions shown.

H923

Dimensional Drawing

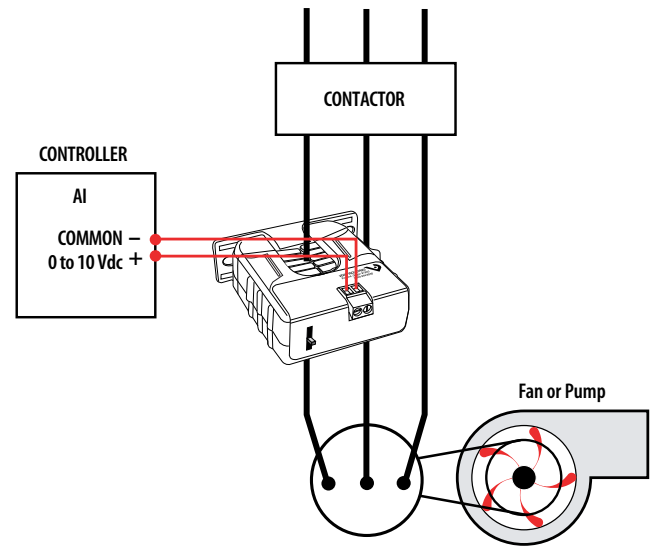


* Terminal block may extend up to 1/8" over the height dimensions shown.

** 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



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.

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 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
------------------	---



Note: Do not use LED status indicators as evidence of applied voltage

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

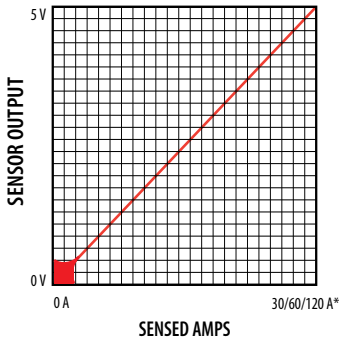
Selectable factory calibrated ranges up to 120 A for increased flexibility and resolution

Applications

- Load trending
- Motor control
- Positive proof of flow

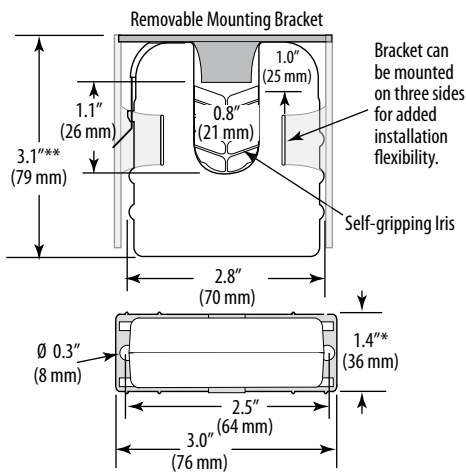
Example Linear Output

Scale software as shown



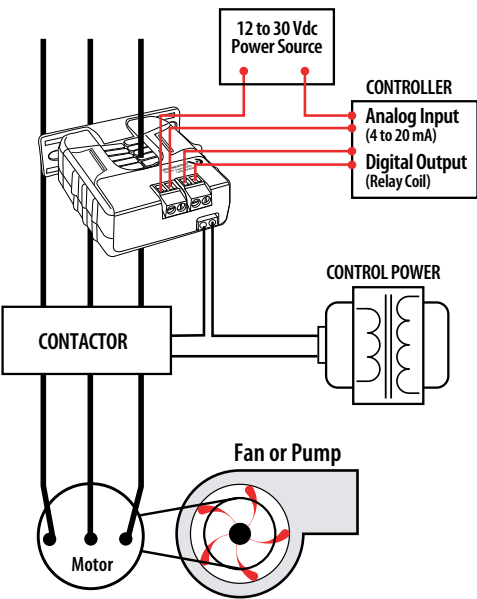
*Factory calibrated ranges selected with the amperage range switch

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



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
------------------	---



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

Applications

- Load trending
- Motor control
- Fan/pump status

Reduces installation

One device to install for start/stop and status

No external power

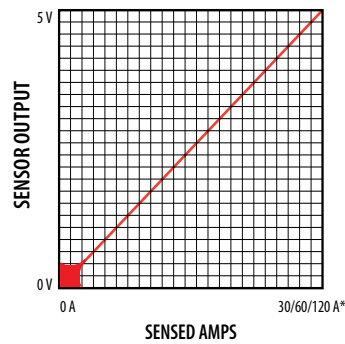
No external power required for current sensor

Increased flexibility

Selectable factory calibrated ranges up to 120 A for increased flexibility and resolution

Example Linear Output

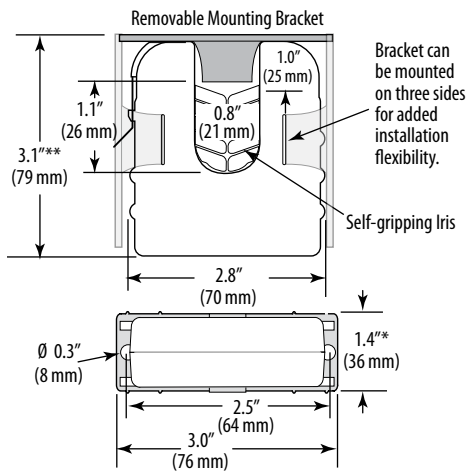
Scale software as shown



*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.

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

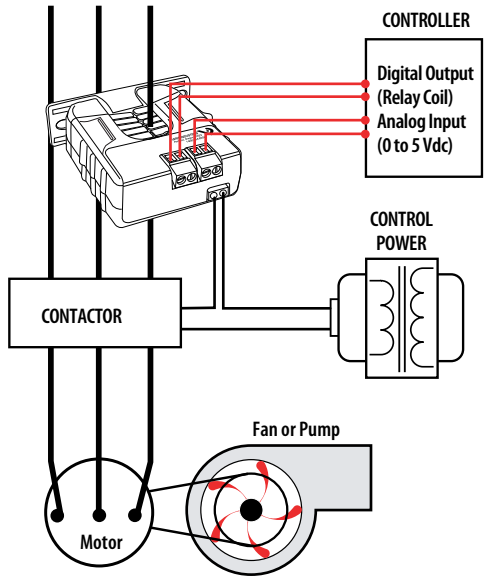
Voltage	AC	DC
24 (H932)	15	15
12 (H952)		20
Pull In Voltage (H952 only)		
12 Vdc		8.4 Vdc
Drop Out Voltage (H952 only)		
12 Vdc		3.0 Vdc

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		•

Trending & Controlling Motor Loads with the Hawkeye 932

Wiring Diagram



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.

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	$\pm 0.5\%$ full scale (combined linearity, hysteresis, and repeatability) ³
Withstand Current	25,000 ADC

Warranty

Limited Warranty	5 years
------------------	---------

Retrofit

Self-gripping iris for easy installation

Flexibility

Bracket can be installed in three different configurations

Pulse Reset Technology™

Patented Pulse Reset Technology significantly increases accuracy...sensor is not affected by stray magnetic fields, minimize magnetization from over-current faults

Applications

- Battery chargers
- Motor armature current
- Motor field current
- Automotive loads
- Marine equipment
- Solar energy applications
- Telecom
- Electroplating

HOA

Bi-directional model...user-adjustable span from ± 20 to ± 200 A (H971)

Status LED

Status LED ensures proper wiring

100, 150 and 200 Amp span

100, 150, and 200 A versions available...application flexibility (EA20 uni-directional model)

Agency Approvals

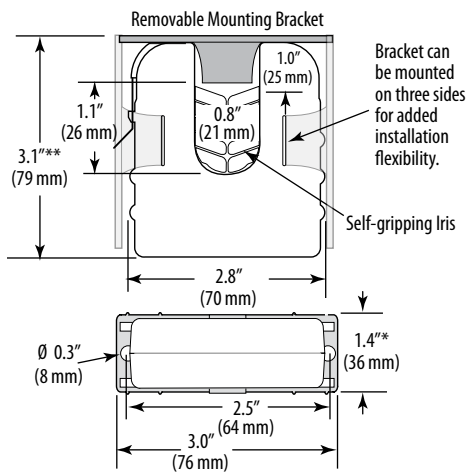
Agency Approvals	CE 4: EN61010-1, CAT III, Pollution Degree 2, basic insulation
------------------	--



Note: Do not use the LED status indicators as evidence of applied voltage.

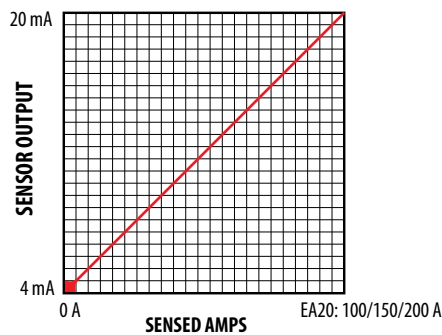
- For currents over 120A, supply voltage must be at least 15V.
- For H971, at zero monitored current: 35mA max.; at 200A monitored current: 55mA to 100mA depending on supply voltage and current polarity.
- For single conductor through product (no wraps).

H932/H952
Dimensional Drawing

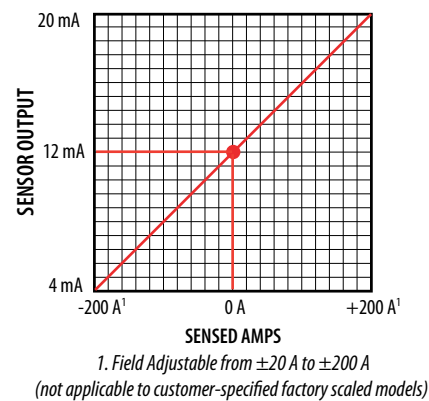


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

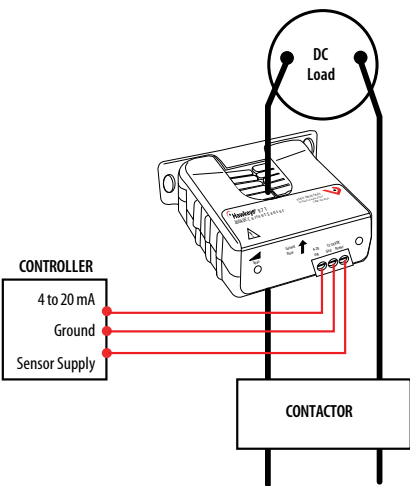
EA20 Linear Output
Scale software as shown



H971 Bidirectional Output
Scale software as shown



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



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, nipped to a field enclosure, or stand alone.

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 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 closed type device listing, CAT III, Pollution Degree 2, basic insulation



*Some models

Remote mounted HOA

Remote mounted current status sensor* and command relay with or without HOA switch

HOA provides true relay control...ideal for troubleshooting control wiring

Status sensor SPST

Combines status sensor*, command relay, and HOA switch in a single series circuit...one line connection for three devices

SPST relay is field-selectable for N.O. or N.C. operation

Gang box mounting Up to 1 HP

Mounts directly onto gang box, flush to existing enclosures and standalone

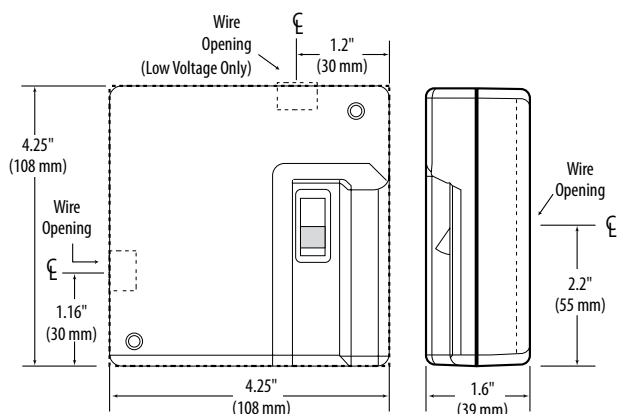
All models rated up to 1 HP @ 120 Vac, NS Versions 1 HP @ 120 Vac and 1.5 HP @ 277 Vac...one product for all fractional HP motor control and status applications

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

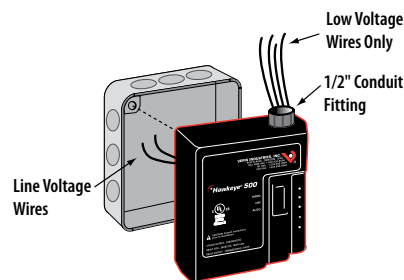
Relay Contact Ratings		
SPDT (NS) Models		
Resistive	15 A @ 277 Vac	
Motor	1 HP @ 120 Vac	
	1.5 HP @ 277 Vac	
SPST (HOA) Models		
Resistive	15 A @ 250 Vac	
Motor	1 HP @ 120 Vac	
Typical Coil Performance		
Voltage	AC	DC
24 V	36 mA	36 mA

Dimensional Drawing



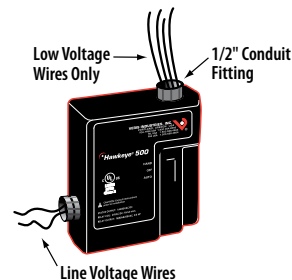
Mounts Directly on 4-Gang Junction Box

Mounting Options

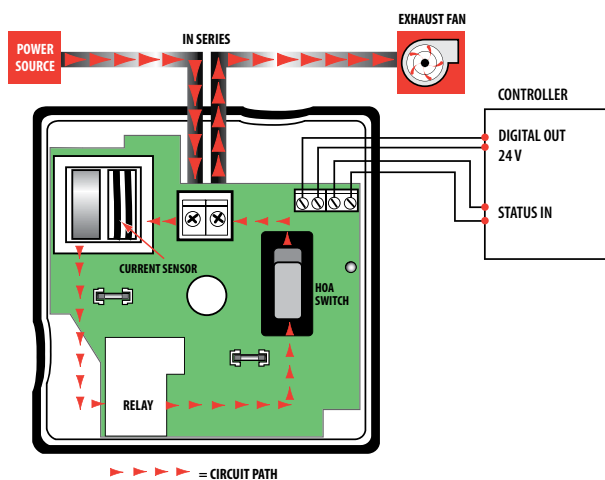


Mounts Directly on Wall or Panel

Mounting Options

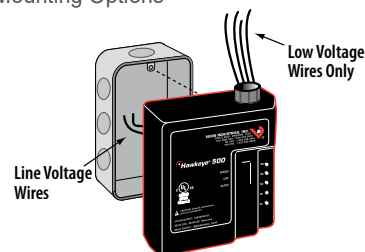


Wiring Diagram

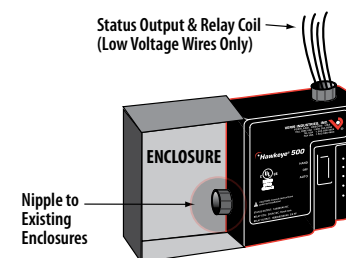


Mounts Directly on 2-Gang Junction Box

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



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.

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
------------------	--



Note: Do not use the LED status indicators as evidence of applied voltage.

2-in-1

Current switch and relay are in series...connect the contacts to the load and your current switch is automatically installed

Nipple mount

The nipple mount housing can be connected to any 1/2" conduit knockout for installation versatility

Relay coil LED

Relay coil LED streamlines job commissioning and check out

HP ratings

HP ratings make the H120 ideal for control and status of fractional HP motors

0.1A turn-on

Easily monitors the smallest loads

NEMA 1 rated

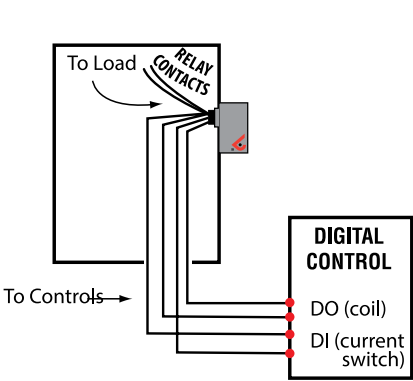
NEMA 1 rated housing may be used in plenum spaces

Applications

- Unit ventilators
- Fan coil units
- Exhaust fans
- Fan terminal units
- Fractional HP motors
- Light resistive loads

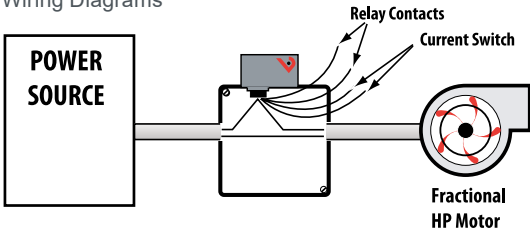
Nipple Mount Directly to a Panel

Wiring Diagrams

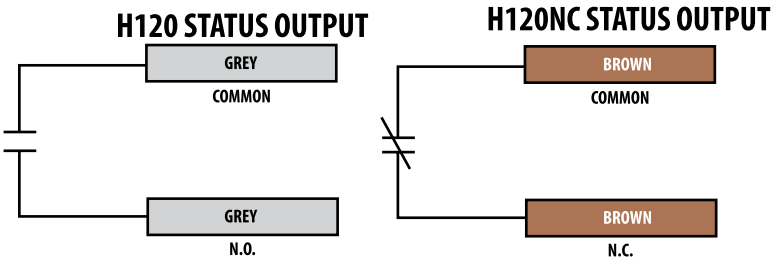
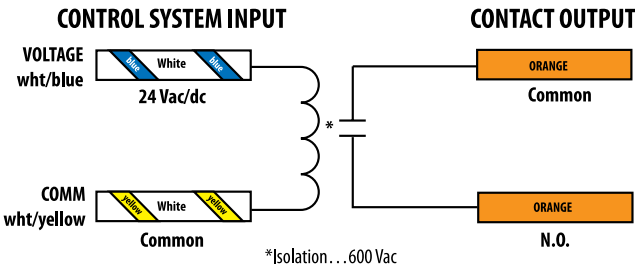


Nipple Mount to 4x Electrical Box

Wiring Diagrams



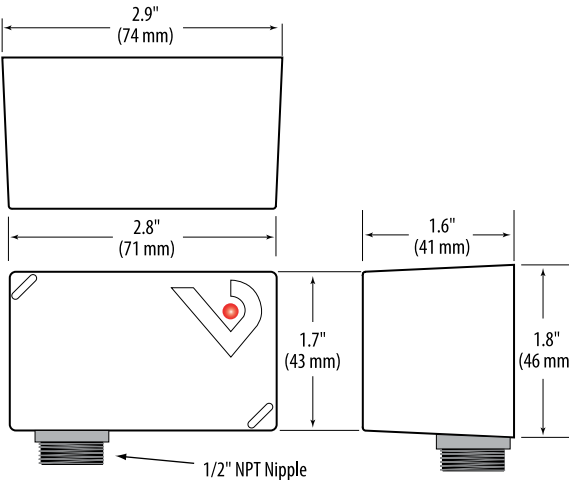
Wire Code Colors



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			•	•

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

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 Relay 10 A@277 Vac, 28 Vdc	219
V101/102/103 and V201	10 A SPST Enclosed Relay with HOA Switch 10 A@250 Vac or 277 Vac	221
V300/400	10 A DPDT Enclosed Relay 10 A@277 Vac, 30 Vdc	223
V120/V220	20 A SPDT Enclosed Relay 20 A@277 Vac, 28 Vdc	225
V121/122/123 and V221/222/223	20 A SPST Enclosed Relay with HOA Switch 20 A@240 Vac, 8 A@28 Vdc	227
V320/V420	20 A DPDT Enclosed Relay 20 A@277 Vac, 28 Vdc	229
V321/V421	20 A DPST Enclosed Relay with HOA Switch 20 A@240 Vac or 8 A@240 Vdc	231
V645	10 A SPDT Enclosed Mini Command Relay 10 A@250 Vac N.O., 7 A@250 Vac N.C.	233
VMD1B	Socket SPDT Relays	235
VMD2B	Socket DPDT Relays	237
VMD3B	Socket 3PDT Relays	239
VMD4B	Socket 4PDT Relays	241
VS861	Solid State Relays	243
VTD	Time Delay Relays	245

Relay Selection Guide

Relays and Sockets

	Nipple Mount	Socket Mount	DIN Mount
SPDT, 10A	V100*/V200* page 219	VMB1B-S* (3A) page 235	V645, VMB1B-S* (3A) page 233 , page 235
SPDT, 20A	V120/V220 page 225	VMD1B-C*/VMD1B-F* page 235	VMD1B-C*/VMD1B-F* page 235
DPDT, 10A	V300/V400 page 223	VMD2B-S* page 237	VMD2B-S* page 237
DPDT, 20A	V320/V420 page 229	VMD2B-C*/VMD2B-F* page 237	VMD2B-C*/VMD2B-F* page 237
3PDT, 15A		VMD3B-C*/VMD3B-F* page 239	VMD3B-C*/VMD3B-F* page 239
4PDT, 15A		VMD4B-C*/VMD4BF* page 241	VMD4B-C*/VMD4BF* page 241
Time Delay, 12A		VTD2P-F50 page 245	VTD1P-UNI/VTD2P-UNI page 245
Solid State, 8A			VS861* page 243

* Indicates a series of products.

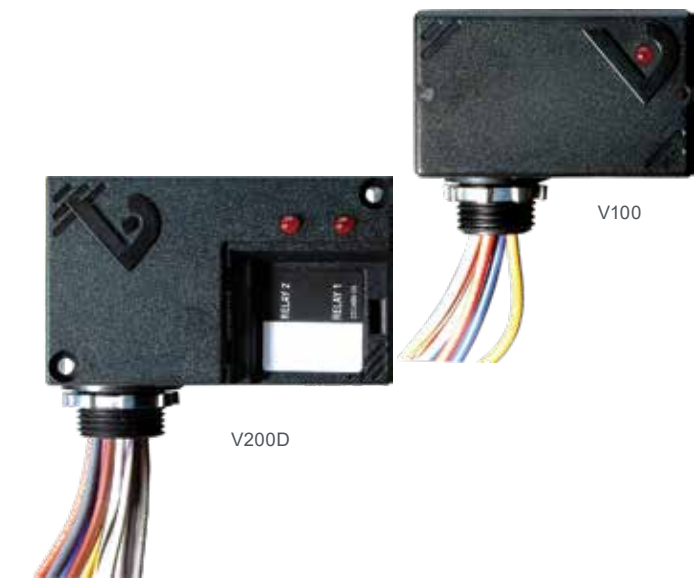
Relays with HOA Switch

	No HOA Monitoring	Resistive HOA Monitoring	Digital HOA Monitoring
SPST, 10A	V101*/V201* page 221	V102 page 221	V103 page 221
SPST, 20A	V121/V221 page 227	V122/V222 page 227	V123/V223 page 227
DPST, 20A	V321/V421 page 229		

* 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
------------------	--------



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

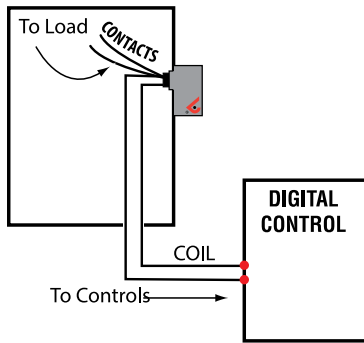
Applications

- 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	

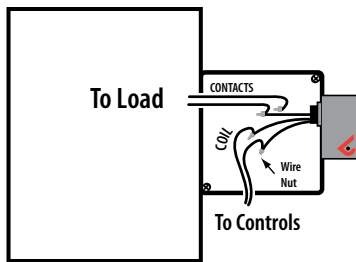
Nipple Mount Directly to a Panel

Wiring Diagram



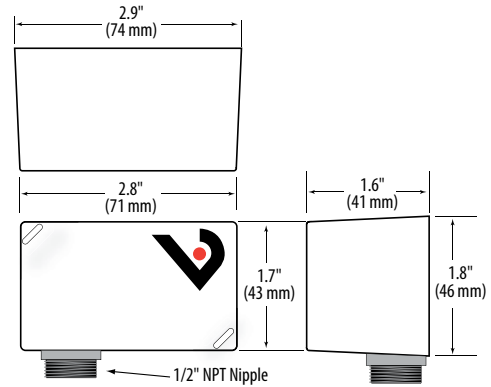
Nipple Mount to Any 2x or 4x Electrical Box

Wiring Diagram



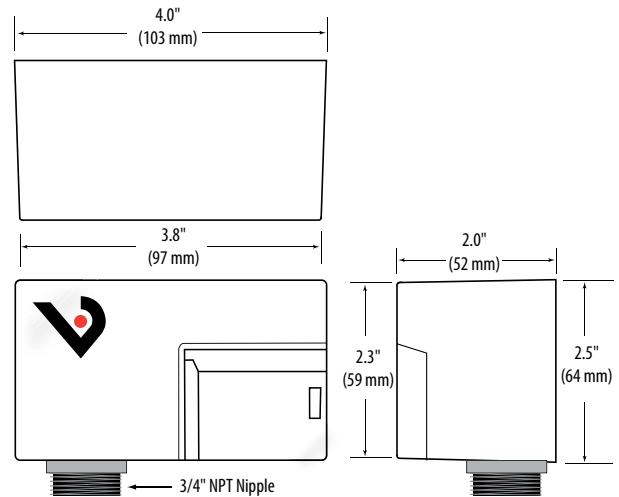
V100/V100DC/V200

Dimensional Drawing



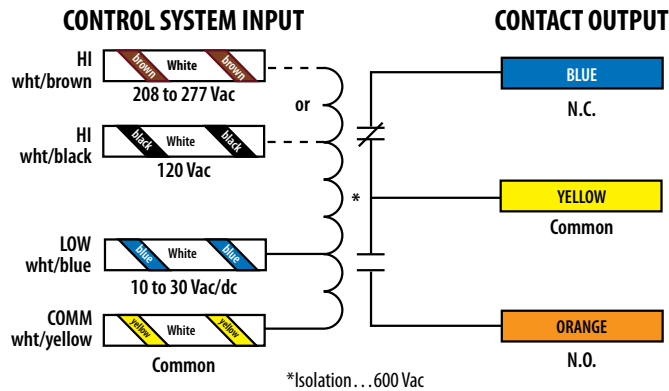
V100D/V200D

Dimensional Drawing



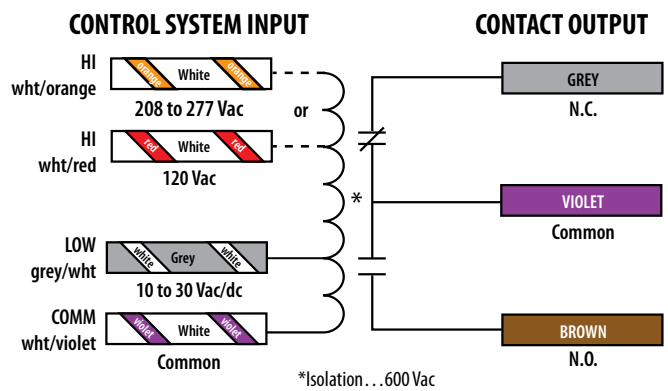
Primary

Wire Color Codes



Relay 2 on V100D and V200D Only

Wire Color Codes

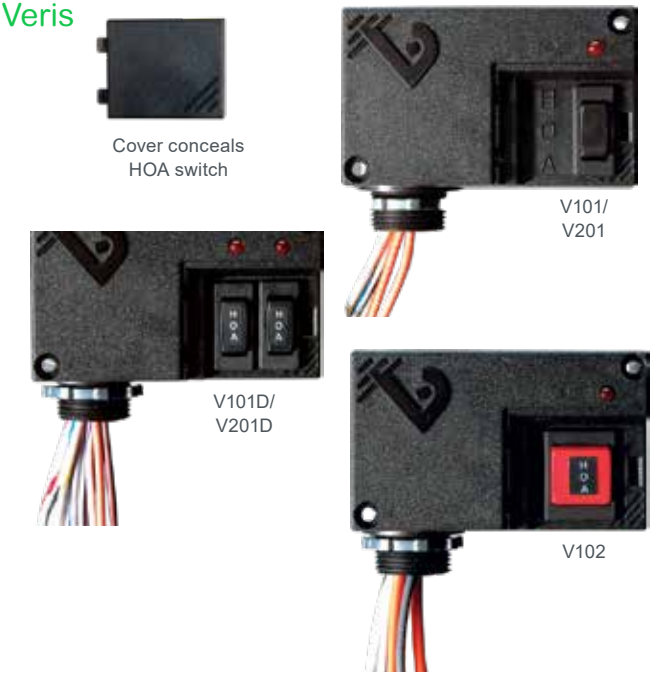


Ordering Information

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

Protective cover

Conceals and protects the HOA switch, reducing the likelihood of tampering

Sleek enclosure

Reduces the need for panel space

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

Flexible wire

Flexible tinned stranded wire... fits easily in tight spaces, provides secure connections to wire nuts

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 (V102 and V103 models)

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

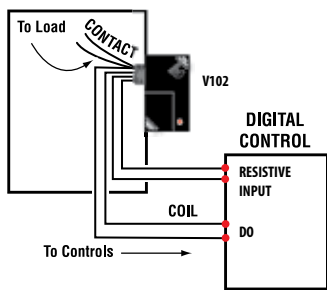
Agency Approvals

Agency Approvals	UL 508
------------------	--------



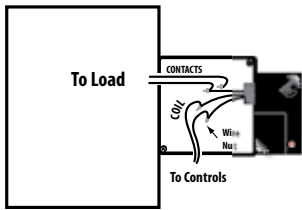
Nipple Mount Directly to a Panel

Wiring Diagram

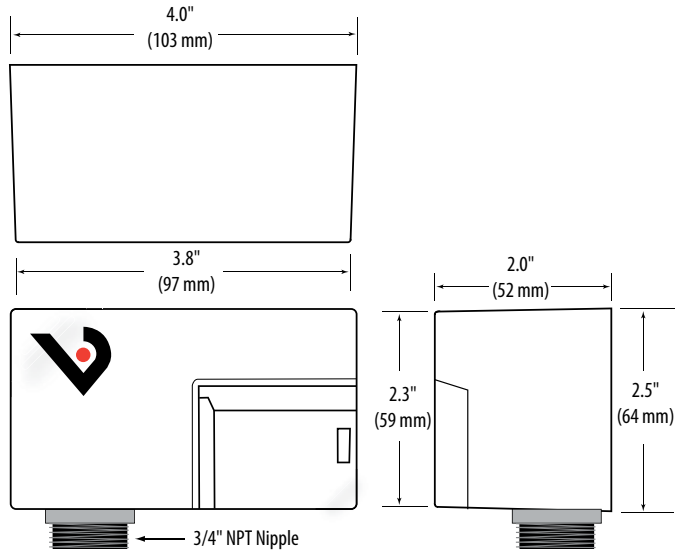


Nipple Mount to Any 2x or 4x Electrical Box

Wiring Diagram

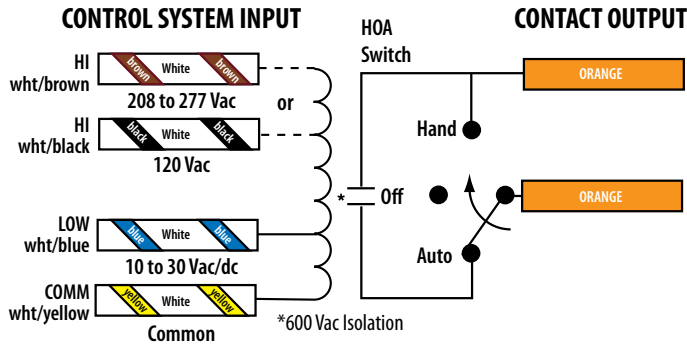


Dimensional Drawing



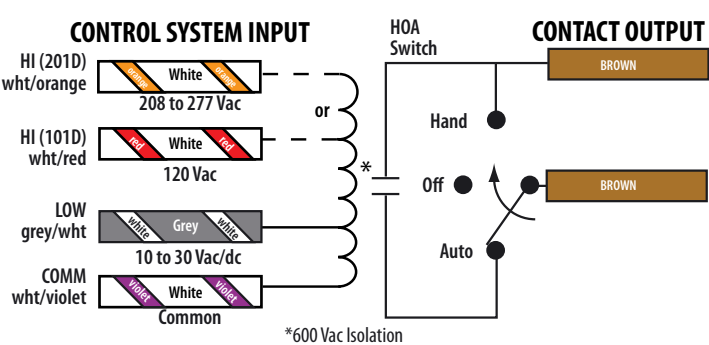
Primary

Wire Color Codes



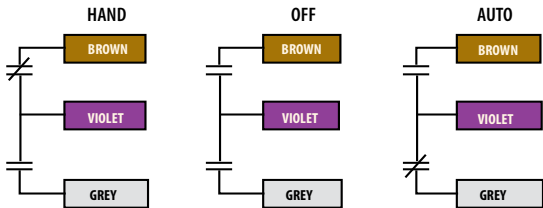
Relay #2 for V101D/V201D Only

Wire Color Codes



V103 Digital HOA Position Monitor

Wire Color Codes

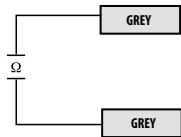


Switch Positions:
HAND = Brown wire closed to Common
OFF = Both wires open to Common
AUTO = Grey wire closed to Common
VIOLET = Common

V102 Resistive HOA Position Monitor

Switch Positions:
HAND ~ 1.4 k Ω
OFF ~ 6.2 k Ω
AUTO ~ 3.4 k Ω

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.

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
------------------	--------



Nipple mount

Can be mounted to any electrical enclosure, easing installation

Sleek enclosure

Reduces the need for panel space

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

Flexible wire

Flexible tinned stranded wire... fits easily in tight spaces and provides secure connections to wire nuts

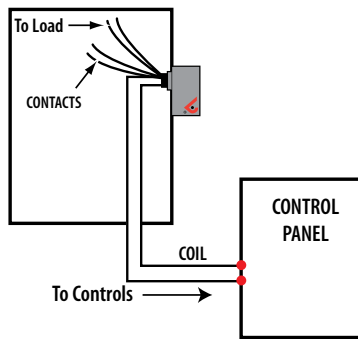
UL508 Listed

Designed and listed for field installation...makes electrical inspection a snap

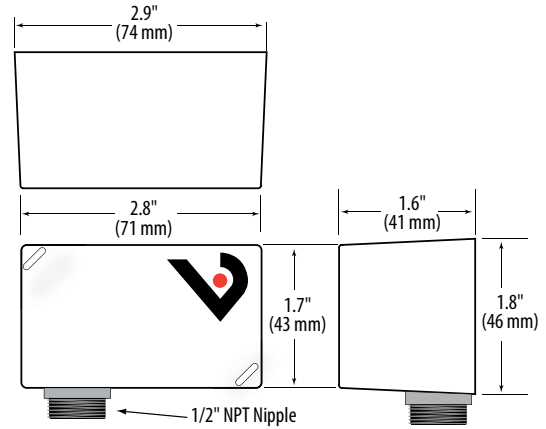
Contact Ratings	
Resistive	10 A total of both poles, 250 Vac & 28 Vdc
Motor	1/8 HP @ 120 Vac

Nipple Mount Directly to a Panel

Wiring Diagram

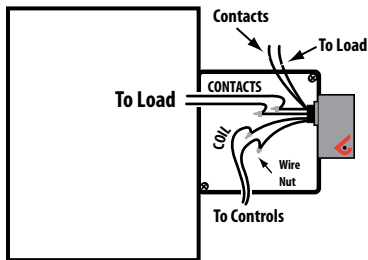


Dimensional Drawing

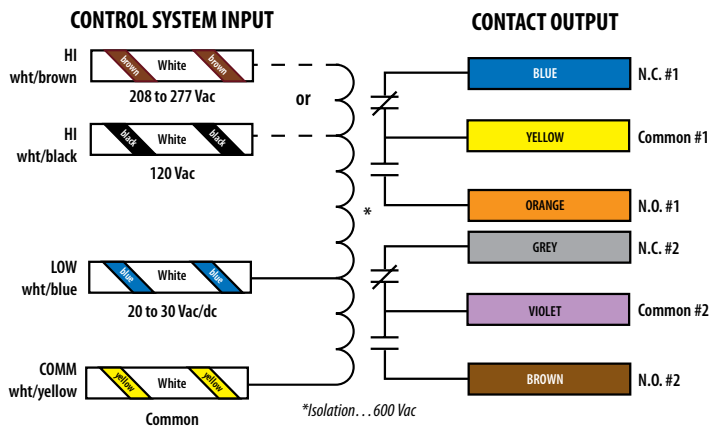


Nipple Mount to Any 2x or 4x Electrical Box

Wiring Diagram



Wire Color Codes



Ordering Information

Model	Relay	Coil	Amperage Rating	Relay Power LED	UL
V300	DPDT	20 to 30 Vac/dc, 120 Vac	10 A	•	•
V400		20 to 30 Vac/dc, 208 to 277 Vac		•	•

Victory 120 & 220

Great for External Mount Applications from Veris



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.

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
------------------	--------



Nipple mount

Can be mounted to any electrical enclosure, easing installation

HP ratings

Ideal for control of fractional HP motors

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

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

Typical Coil Performance

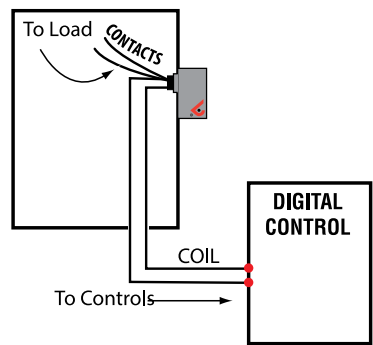
Voltage	Coil Current	
	AC	DC
24 V	75 mA	32 mA
120 V	42 mA	
208 V	36 mA	
277 V	49 mA	

Contact Ratings

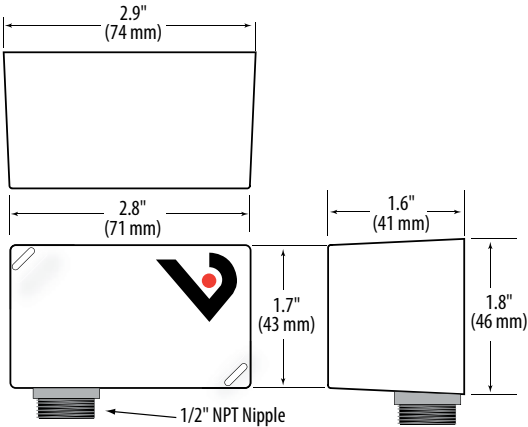
Resistive	20 A @ 277 Vac, 28 Vdc
Motor	120 Vac, 1 HP 277, 2 HP
Pilot Duty	A300
Ballast	277 Vac, 20 A N.O. 277 Vac, 10 A N.O.
Tungsten	120 Vac, 10 A N.O. 120 Vac, 2 A N.O.

Nipple Mount Directly to a Panel

Wiring Diagram

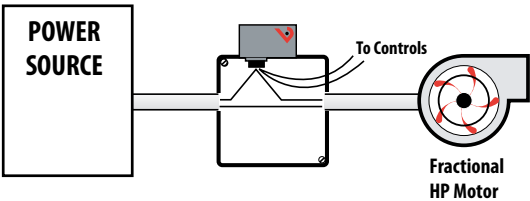


Dimensional Drawing

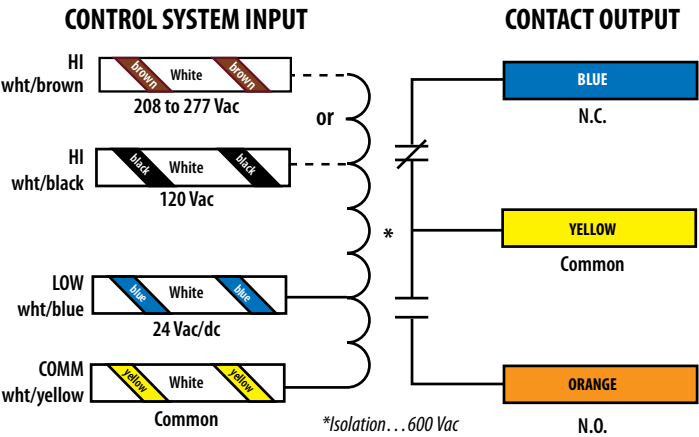


Nipple Mount to a 4x Electrical Box

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



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.

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
------------------	---------

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

Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

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

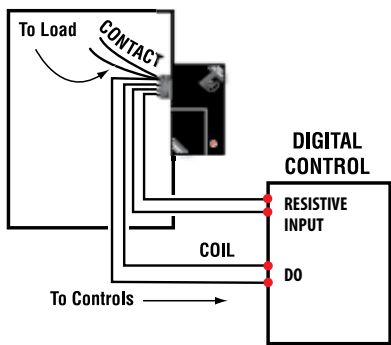
Agency Approvals

Agency Approvals	UL 508
------------------	--------



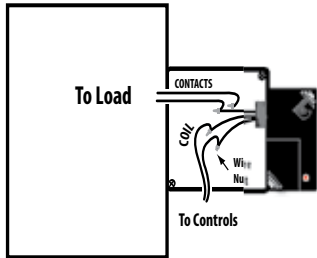
Nipple Mount Directly to a Panel

Wiring Diagram

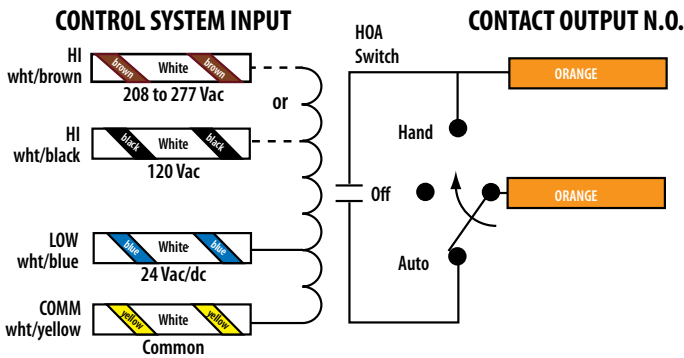


Nipple Mount to Any 2x or 4x Electrical Box

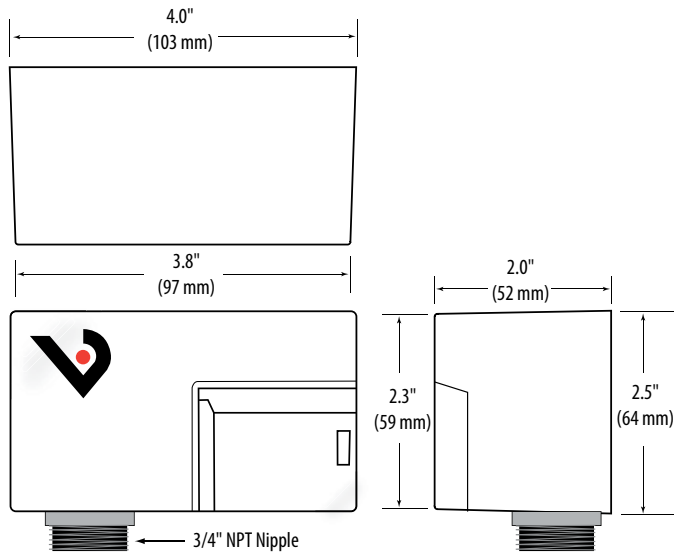
Wiring Diagram



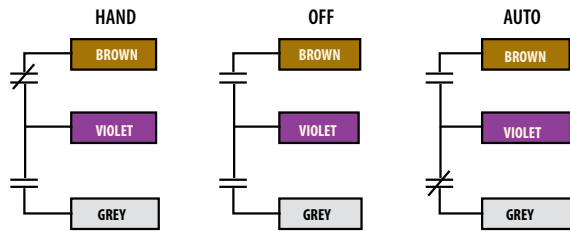
Wire Color Codes



Dimensional Drawing

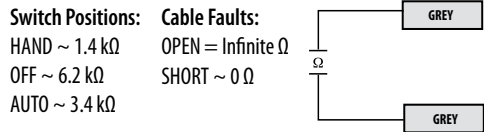


V123 Digital HOA Position Monitor



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



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



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
------------------	--------

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

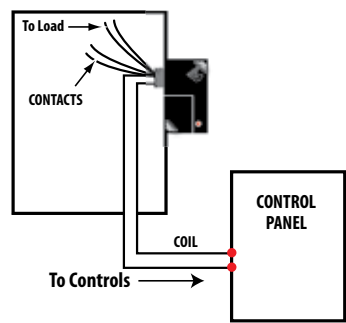
Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24 V	150 mA	64 mA
120 V	84 mA	
277 V	102 mA	

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.



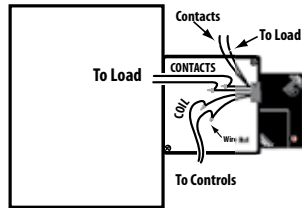
Nipple Mount Directly to a Panel

Wiring Diagram

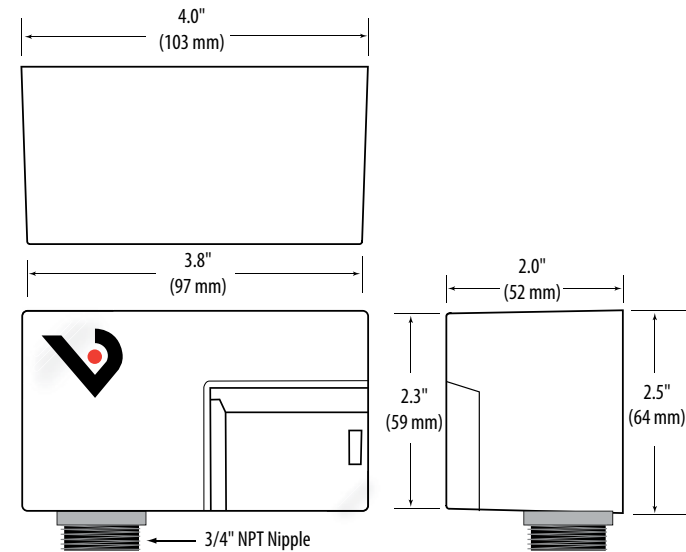


Nipple Mount to Any 2x or 4x Electrical Box

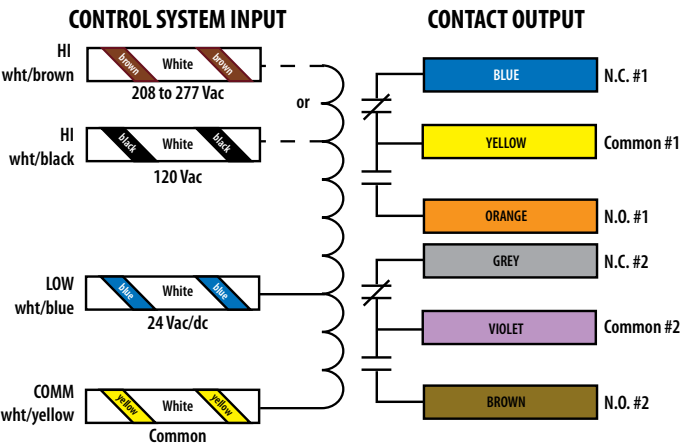
Wiring Diagram



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



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.

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
------------------	--------



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

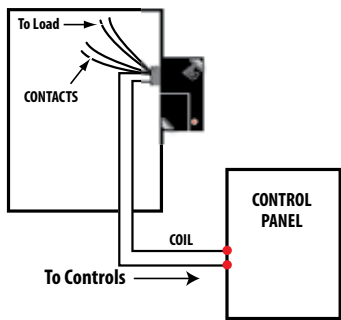
Applications

- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

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	

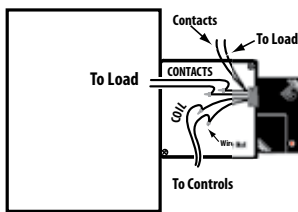
Nipple Mount Directly to a Panel

Wiring Diagram

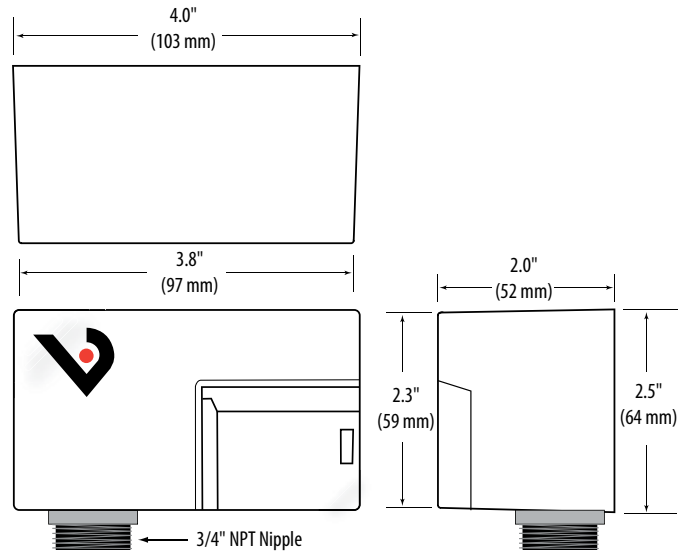


Nipple Mount to Any 2x or 4x Electrical Box

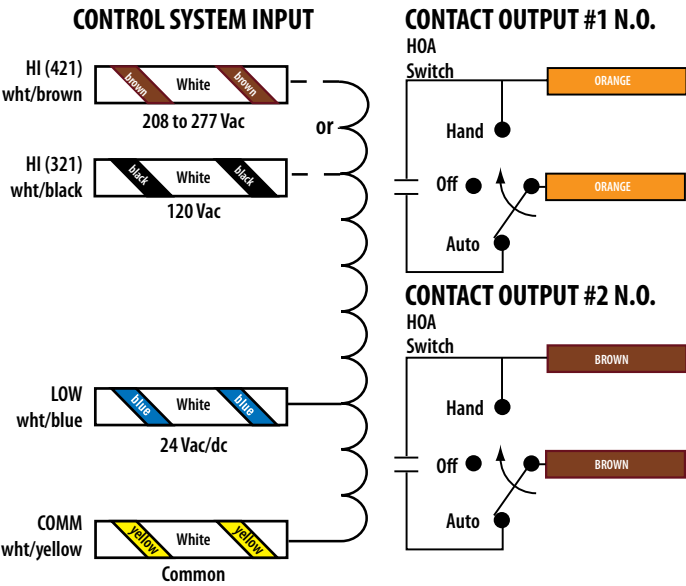
Wiring Diagram



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



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.

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
------------------	--------



Economical

Economical multi-voltage relay

Flexible

24 to 30 Vac/dc or 120 Vac coil input provides application flexibility

Easy diagnostics

Status LED for visual indication

Switching

Switch up to 10 A@250 Vac

Mounting options

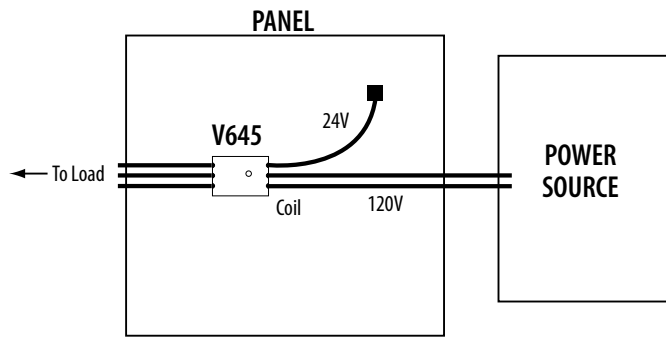
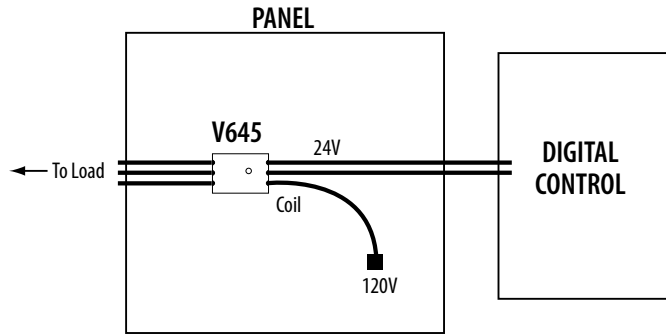
Ships with foam tape, mounting screw, and DIN rail clip

Applications

- Sense voltages for alarm conditions
- Relay logic
- Isolation
- For start/stop of small motors & contactors
- Device interlocking

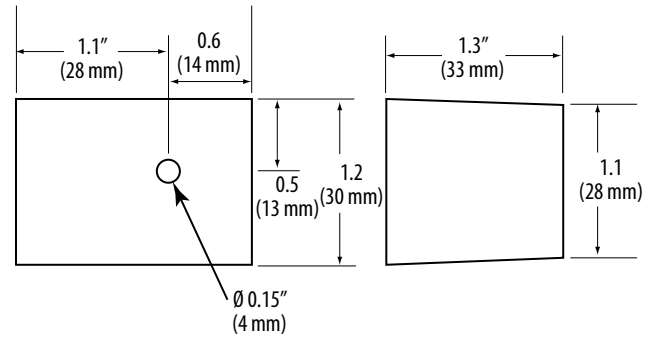
Typical Coil Performance		
Voltage	Coil Current	
	AC	DC
24 to 30 V	32 mA	13 mA
120 V	17 mA	
Contact Ratings		
Resistive	10 A @ 250 Vac, N.O.	
	7 A @ 250 Vac, N.C.	
	6 A @ 277 Vac	
	7 A @ 30 Vdc	
Motor	125 Vac, 1/4 HP, H.P.	

Wiring Diagrams

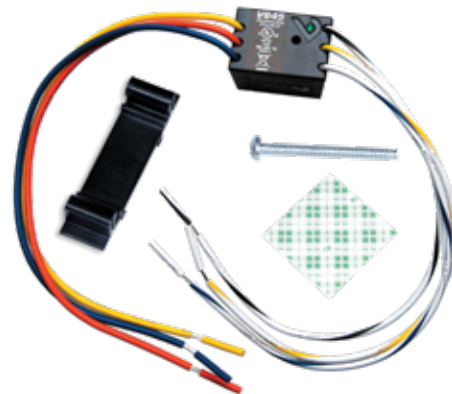


* Wire is capped on unused option.

Dimensional Drawing

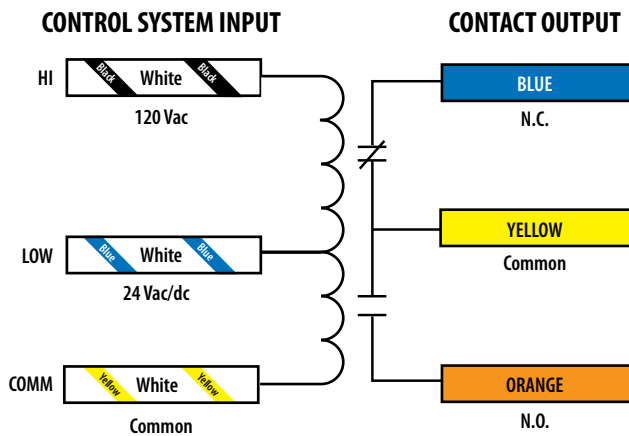


Mounting Method



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.

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



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

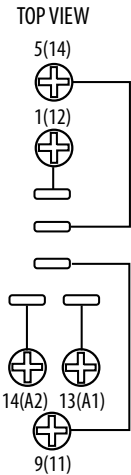
Relays and sockets sold individually or in kits

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

VBD1B Socket Wiring Diagram

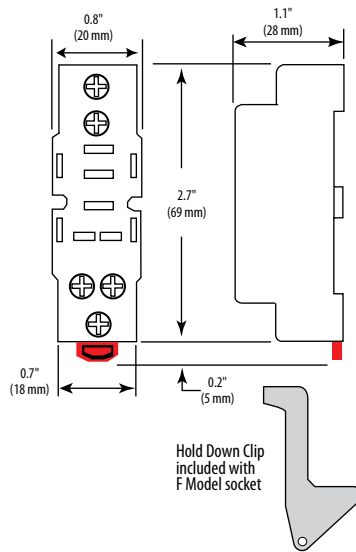
Function	NEMA (IEC) Terminal
Coil (+)*	14 (A2)
Coil (-)*	13 (A1)
COMM	9 (11)
N.O.	5 (14)
N.C.	1 (12)

* NOTE: Observe polarity for relays with DC coil voltages only.

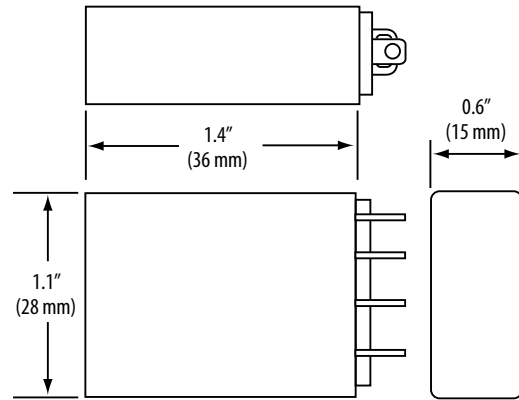


VMD1B Socket

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



Color-coded push button

Allows manual operation of relay, AC coils red or DC coils blue

(-F Series only)

LED status lamp

Shows coil “ON” or “OFF” status

(-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)

Flag indicator

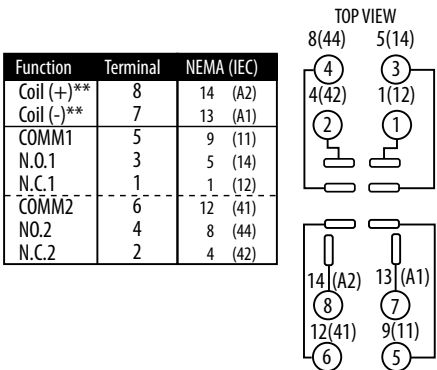
Shows relay status in manual or powered condition (F Series only)

Flexible ordering

Relays and sockets sold individually or in kits

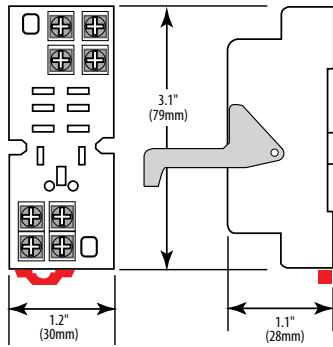
Typical Coil Performance	
	Power Consumption
AC Coils	1.2 VA
DC Coils	0.9 W
Contact Ratings	
Standard (F & C Series)	
Resistive	15 A @ 120 Vac
	12 A @ 277 Vac
	12 A @ 28 Vdc
Motor	1/2 HP @ 120 Vac
	1 HP @ 250 Vac
Pilot Duty	B300

VBD2B Socket Wiring Diagram

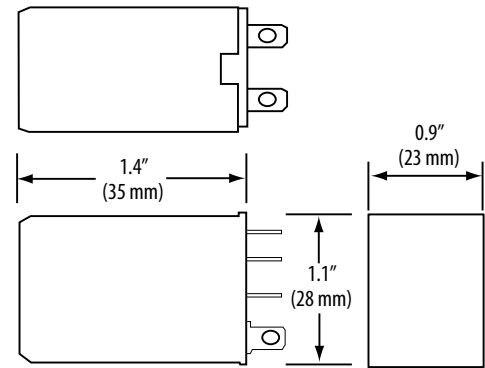


VBD2B-F Socket

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	Socket 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.

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
------------------	---------

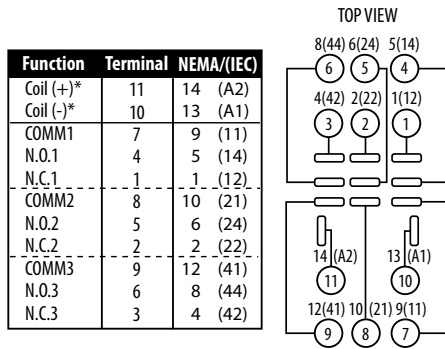
Agency Approvals



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

VBD3B Socket

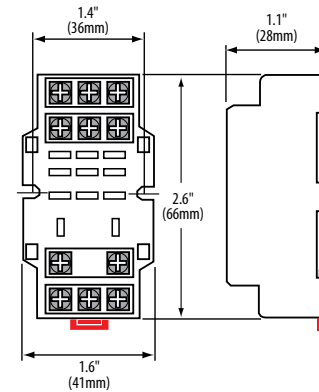
Wiring Diagram



*Observe polarity for relays with DC coil voltages only

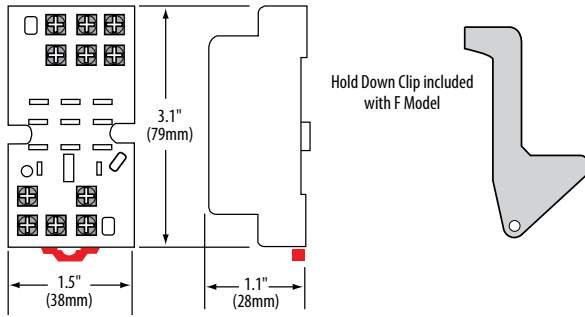
VBD3B-C Socket

Wiring Diagram



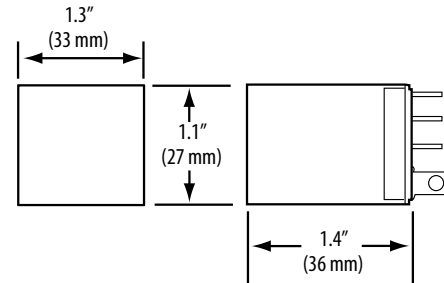
VBD3B-F Socket

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	•	•	•	•

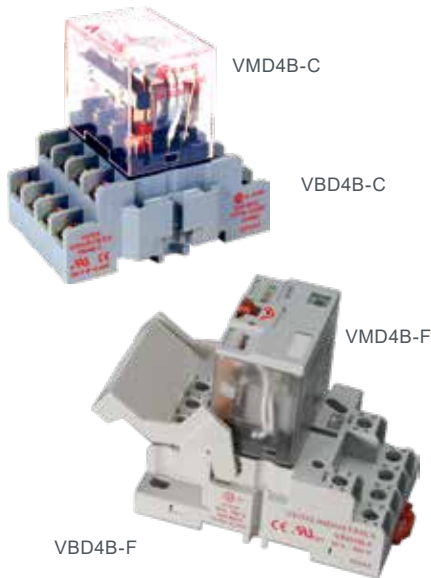
Note: When relays and sockets are used together, the amperage rating is the lesser of the two ratings.

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



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.

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



Color-coded pushbuttons

Allows manual operation of relay. AC coils red, DC coils blue.
(-F Series only)

Override lever

When activated, locks pushbutton and contacts in the powered position (-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

ID tag

ID tag/write-on plastic label... used for identification of relays in multi-relay circuits (-F Series only)

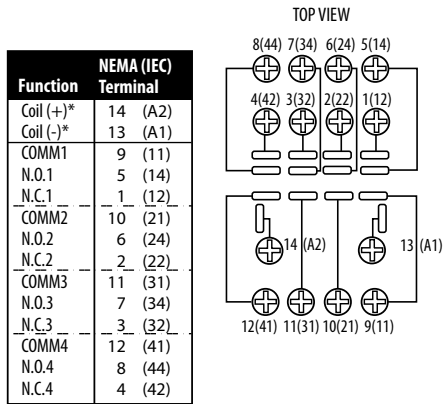
LED status lamp

Shows coil “ON” or “OFF” status
(-F Series only)

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

VBD4B Socket

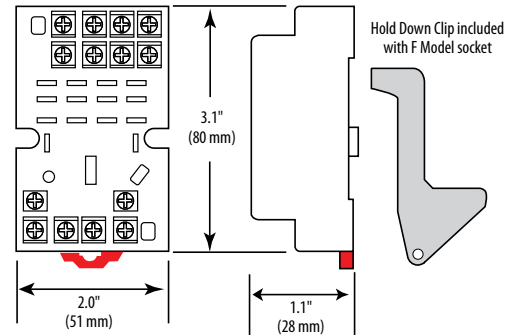
Wiring Diagram



*Observe polarity for relays with DC coil voltages only

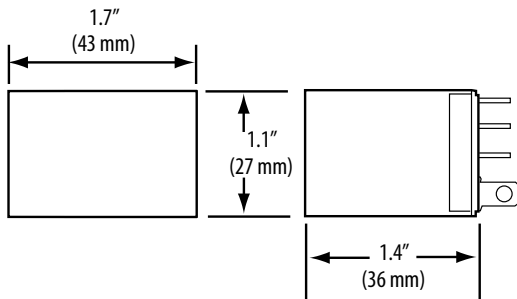
VBD4B-F Socket

Dimensional Drawing



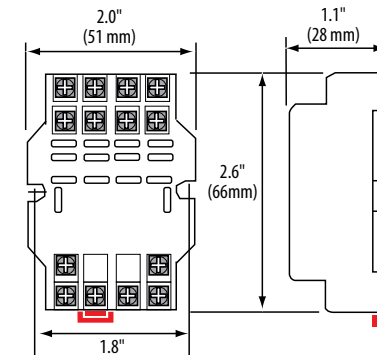
VMD4B Relay

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.

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

No moving parts

No moving parts to wear or fail

Contacts

No contact bounce or arcing contacts

Superior performance

Fast response time and high frequency of on/off cycling

EMI

Reduced EMI

Long life

Longer life than electromechanical relays

Applications

- Lighting
- Instrumentation systems and alarm systems
- Traffic control
- Industrial automation

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

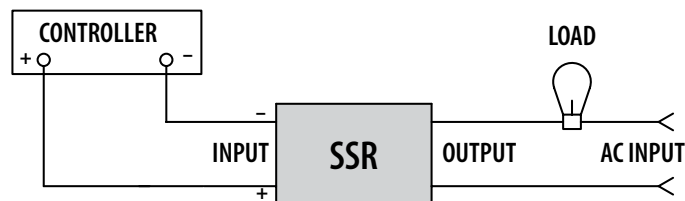
Warranty

Limited Warranty	5 years
------------------	---------

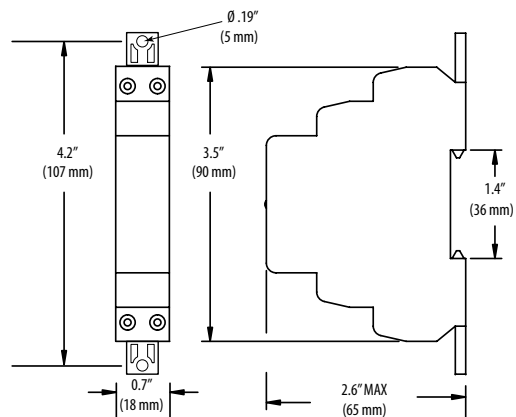
Agency Approvals



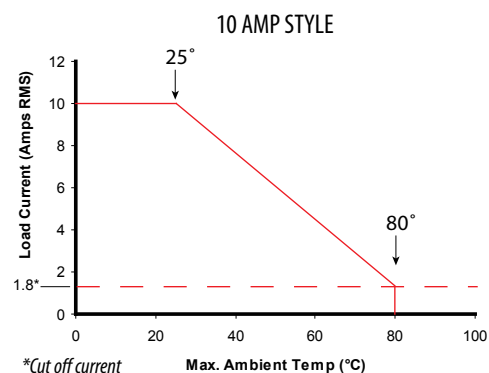
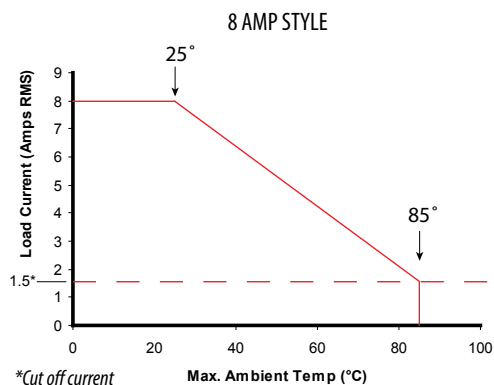
Wiring Diagram



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



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

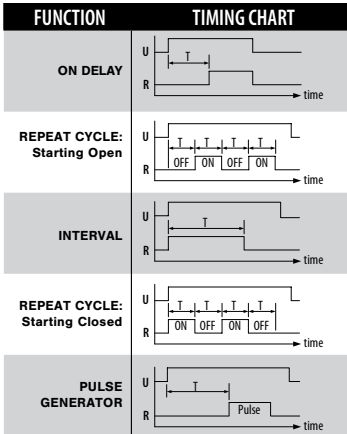
Limited Warranty	5 years
------------------	---------

Agency*Approvals

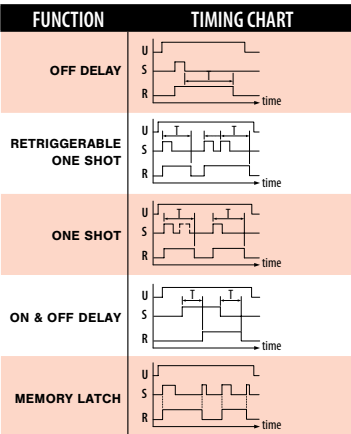


*The CE mark indicates RoHS2 compliance.

Power Trigger



Switch Trigger



U: Input voltage (power supply) S: Control switch (open or closed)
R: Relay contacts (on or off) T: Setting time

Thumb wheel adjustment

VTD2P-F50 has thumb wheel adjustment for function and timing accuracy

Housing options

Two different housings provide multiple mounting options

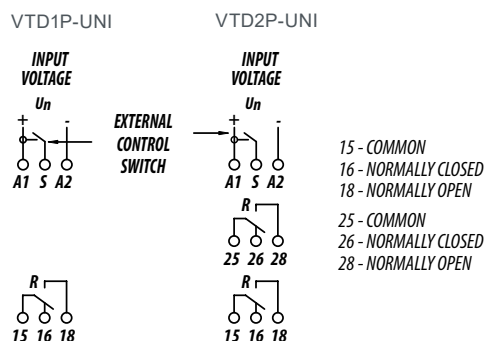
Solid state relays

VTD1P/2P-UNI models are made with solid state relays for greater reliability

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	0 to 999	1 to 10
sec	0 to 999	1 to 10
0.1 min	0 to 999	1 to 10
min	0 to 999	1 to 10
0.1 hr	0 to 999	1 to 10
hr	0 to 999	1 to 10
10 hr	0 to 999	---
0.1 day	---	1 to 10
day	---	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

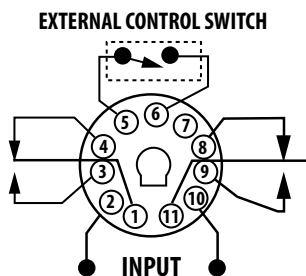
VTD1P-UNI/VTD2P-UNI

Dimensional Drawing



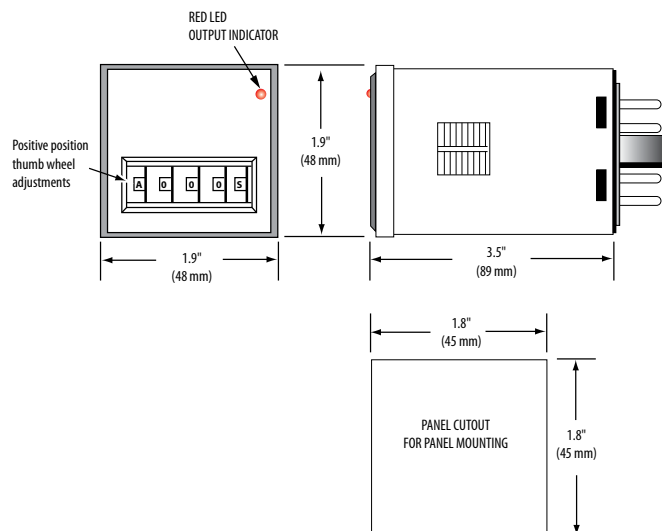
VTD2P-F50

Wiring Diagram



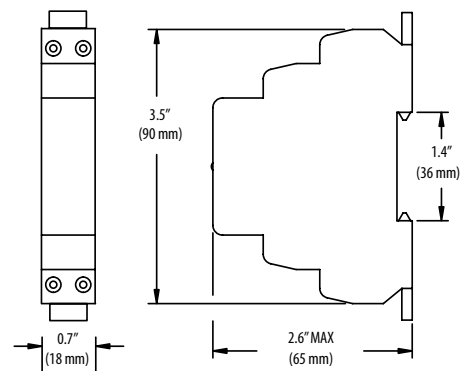
VTD2P-F50

Dimensional Drawing



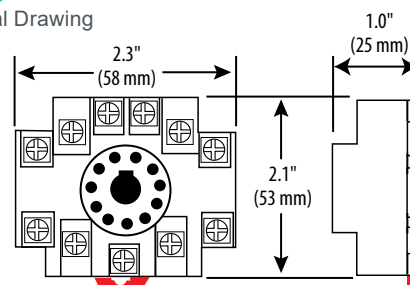
VTD1P-UNI/VTD2P-UNI

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.

Model	Description	Page
PS	Power Supplies	251
X	Control Transformers	253

Power Sources Selection Guide

DC Power Supply	PS* page 251
Control Transformers	X* page 253

* 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)

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 Selectable 50/60 Hz (47 to 63 Hz); 240 to 370 Vdc
Input Current (Typical @100 Vac)	
7.5 W (12 and 24 Vdc)	0.18 A
15 W (12 and 24 Vdc)	0.35 A
30 W (12 and 24 Vdc)	0.7 A
60 W	1.3 A
90 W	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	0.6 A
15 W	1.3 A
30 W	2.5 A
Output Current (24 V Models)	
7.5 W	0.3 A
15 W	0.65 A
30 W	1.3 A
60 W	2.5 A
90 W	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)

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

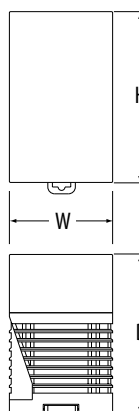
Universal voltage input

Universal voltage input from 100 to 240 Vac/110 to 340 Vdc

High efficiency

Won't generate excessive heat in control panel

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

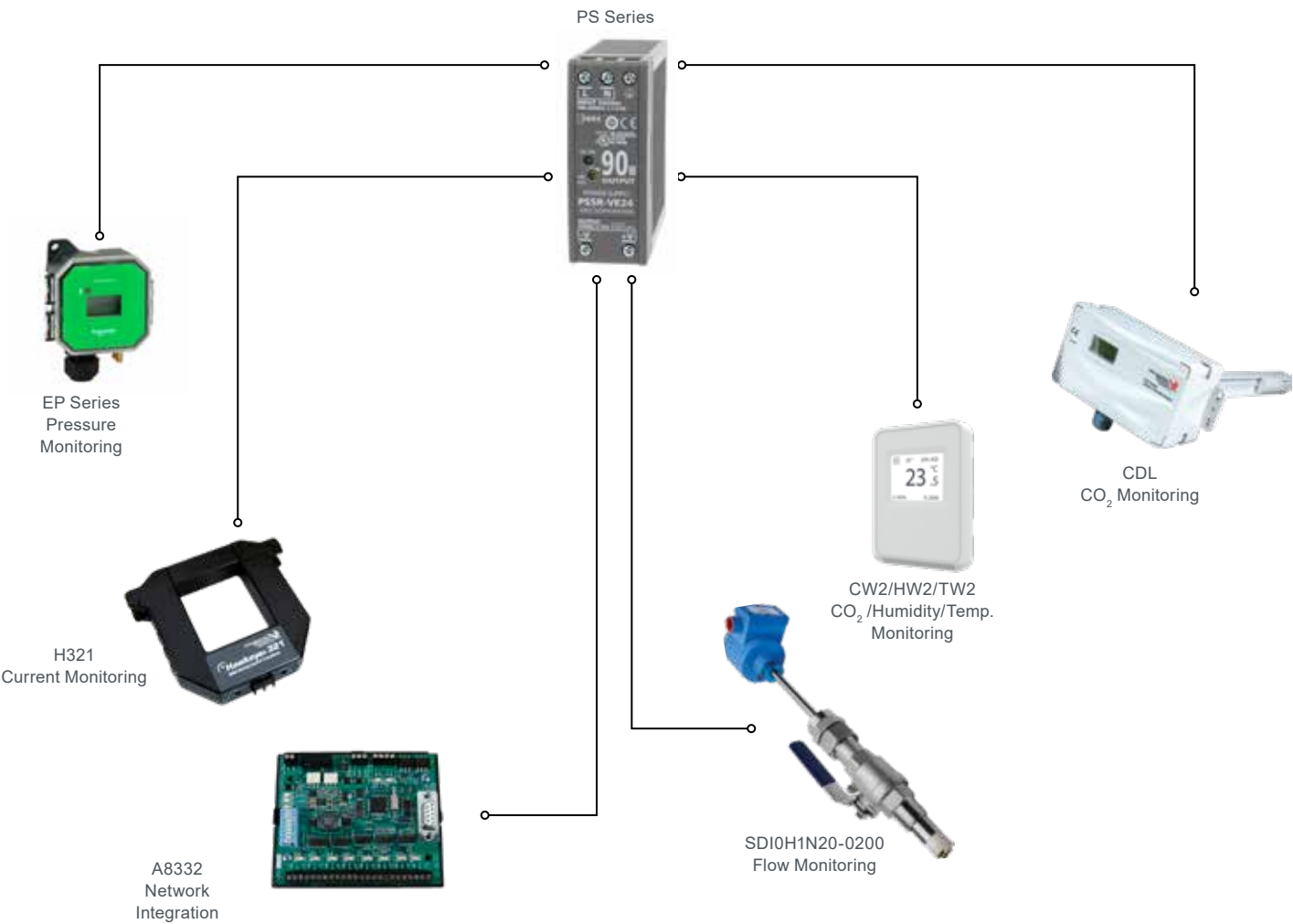
Terminals

Spring-up, finger-safe (when tightened); captive M3.5 screws Phillips/flat heads

Agency Approvals



Supplying Power for All Your DC Needs



Ordering Information

Output		Watts
PS	□	S □ W
12 = 12 Vdc		7.5 = 7.5 Watts
24 = 24 Vdc		15 = 15 Watts
		30 = 30 Watts
		60* = 60 Watts
		90* = 90 Watts

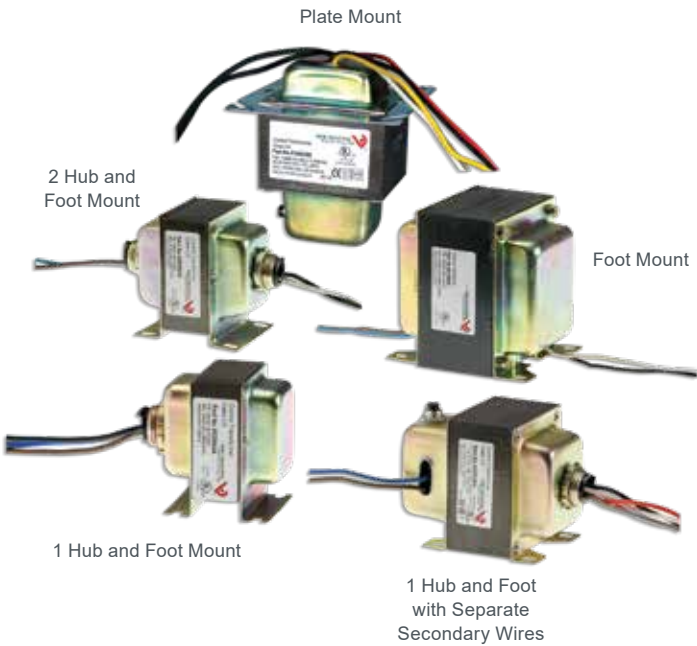
Example:

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

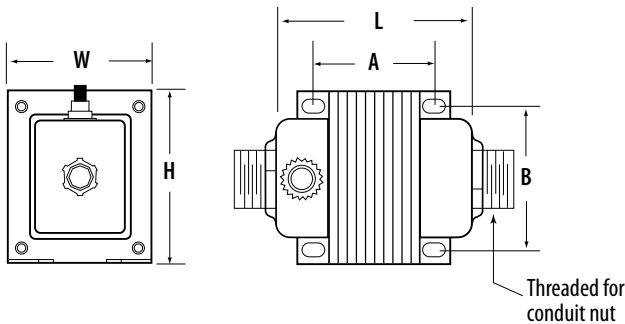
Threaded hub options

Threaded hub options maximize installation flexibility

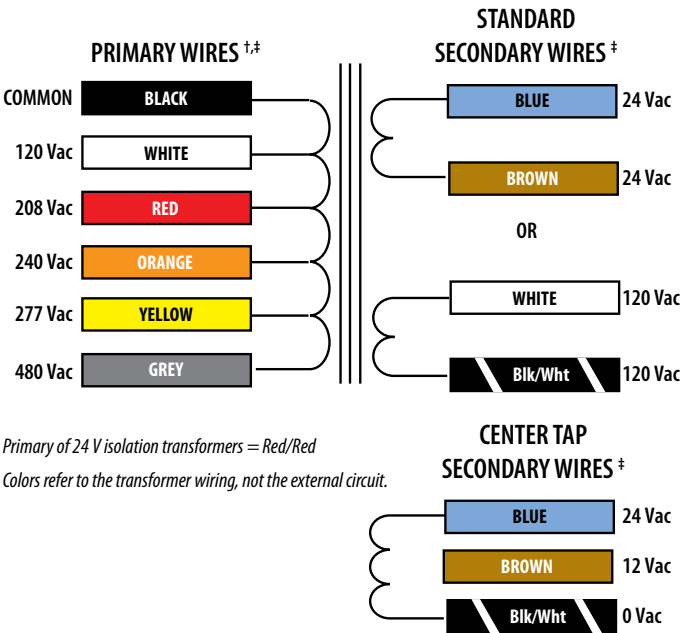
Applications

- 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		Circuit Breaker	General	2HUB+FT	•	•	•	3.5	2.5	3.1	1.91	2.03
T-249	X050CEG		208/240/277/480	120	Circuit Breaker	General	Plate, 90° Sec Elbow	•	•	•	3.5	4.0	4.0	3.38	3.38
	X050CHA	75	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
	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	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	24	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
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
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-28296-1
January 2023

© 2023 Schneider Electric. All rights reserved. All trademarks are owned by Schneider Electric Industries SAS or its affiliated companies.