



2017 Environmental Sensors & Energy Management Solutions



- Power Monitoring Single-circuit
- Power Monitoring Multi-circuit
- Power Metering CTs
- Network Integration
- Power Accessories
- Air Quality/ Gas Detection
- Flow Monitoring
- Humidity Monitoring
- Leak Detection
- Pressure Monitoring
- Temperature Monitoring
- Occupancy Sensors
- Setpoint Devices
- Environmental Accessories
- Current Monitoring
- Relays
- Power Sources
- Motor Control Accessories

Value of Veris Partnership

The foundation of our products...

Customer Driven
Innovation

Solution Oriented
Service

Unwavering
Quality

Seamless
Integration

Unmatched
Accuracy

5 Key Areas of Cost Savings

How these translate to our customers...

Installation

Maintenance



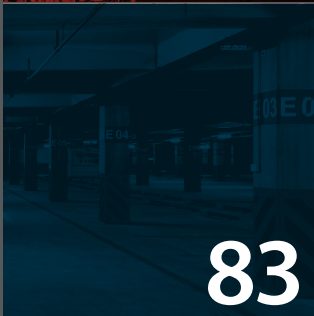
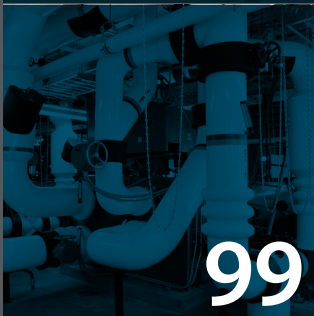

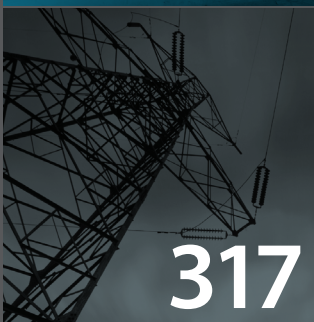
Safety

Flexibility

Adjustability

PRODUCT CATEGORIES

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DATA CENTERS

SERVER ENVIRONMENT

Maintain a consistent environment aisle by aisle



OCCUPANCY SENSORS MSX SERIES

PAGE 205



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

HUMIDITY SENSORS HW SERIES

PAGE 133



Monitor humidity at a zone level with high accuracy to provide an ideal operating environment for critical equipment.

TEMPERATURE SENSORS TW & TD SERIES

PAGES 183, 189



Monitor temperature at a zone level with high accuracy to provide an ideal operating environment for critical equipment.

SERVER PANELS & CRACs

Protect critical equipment and ensure uptime

POWER & ENERGY

Monitor large loads transducers, UPSs, PDUs and RPPs

DCIM

Enhance data center infrastructure management with real-time energy information

LEAK DETECTION LD SERIES

PAGE 149



Be alerted to water leaks early; avoid costly equipment damage and downtime.

SUB-FLOOR MONITORING & PRESSURE CONTROL PX SERIES

PAGE 167



Find optimal sub-floor cooling loads and increase efficiency.

MAIN PANEL & SINGLE-CIRCUIT POWER METERING E5X SERIES

PAGE 25



DIN mounted power meter ideal for sub-metering individual loads where a local display is required.

ENERGY METERS ENERCEPT FLEX E20 SERIES

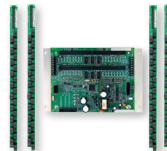
PAGE 19



Maximum retrofit flexibility. Monitor loads from 50 to 5000 A on the same rope style CT.

PANELBOARD MONITORING E30 SERIES

PAGE 45



Provides comprehensive monitoring of panelboards and RPPs with revenue-grade accuracy for new construction projects.

RETROFIT PANELBOARD MONITORING E31 SERIES

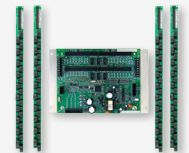
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RETROFIT PANELBOARD MONITORING E31 SERIES

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MULTI-CIRCUIT METERING E34 SERIES

PAGE 43



Monitor all PDU loads with a single device.



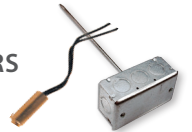
FOOD RETAIL

COOLING & REFRIGERATION

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

TEMPERATURE SENSORS T SERIES

PAGE 183



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

GAUGE PRESSURE SENSORS PG SERIES

PAGE 173



Reliably monitor pressure in parallel refrigeration racks and hydraulic motors.

CURRENT SENSORS H922

PAGE 271



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

ENVIRONMENTS

Regulate environments, efficiency and effectively

MAIN POWER & SUB-METERING

Monitor main power distribution, light panels and sub-metering

RELAYS V100 SERIES

PAGE 289



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

FLOW METERS SDI SERIES

PAGE 101



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

HUMIDITY SENSORS HW & HO SERIES

PAGES 133, 131



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

CO₂ SENSORS CWL SERIES

PAGE 85



Because people are the major source of CO₂ in a building and outside air must often be conditioned, calling for fresh air only when CO₂ levels are high saves energy. Make the CWL Series part of your demand controlled ventilation strategy.

CO & NO₂ SENSORS GWN & GWNP

PAGES 95, 97



Easy parking garage monitoring with the GWN and GWNP modular platforms.

ENERGY METERS ENERCEPT FLEX E20 SERIES

PAGE 19



Maximum retrofit flexibility. Monitor loads from 50 to 5000 A on the same rope style CT.

MULTI-CIRCUIT METERING E34 SERIES

PAGE 43



Monitor up to 28 3-phase loads with a single compact device. Saves cost on both equipment and installation.

MAIN PANEL & SINGLE-CIRCUIT POWER METERING E5X SERIES

PAGE 25



The E5x Series offers ultimate versatility in power monitoring with a wide choice in mounting options, inputs, outputs, and communication protocols including BACnet, LON, and Modbus. The meters are compact in size allowing multiple meters to be mounted in the same panel, saving installation time and costs.



HOSPITALS

ROOM & PATIENT CARE

Provide ideal environmental conditions while optimizing efficiency



OCCUPANCY SENSORS MSX SERIES

PAGE 205



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

CO₂ SENSORS CWL SERIES

PAGE 85



Because people are the major source of CO₂ in a building and outside air must often be conditioned, calling for fresh air only when CO₂ levels are high saves energy. Make the CWL Series part of your demand controlled ventilation strategy.

HUMIDITY SENSORS HED SERIES

PAGE 137



Provide the ideal environment for critical areas such as operating rooms and pharmacies.

HVAC & PHYSICAL PLANT

Increase efficiency, extend safety

POWER & ENERGY

Quantify and qualify usage

PARKING STRUCTURE & VEHICLE BAYS

Monitor and balance risks

LEAK DETECTION LD SERIES

PAGE 149



Detect leaks in boiler and chiller lines, backup power fuel storage and sprinkler systems and be alerted to their exact location, avoiding costly equipment damage.

FLOW MONITORING 380 SERIES

PAGE 109



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

COMMUNICATING THERMOSTATS VT76XX SERIES

PAGE 221



Maximize system adaptability in rooftop unit control with BACnet, Echelon, or wireless communication protocol.

CURRENT MONITORING H904 VFD SWITCH SERIES

PAGE 257



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.

MULTI-CIRCUIT METERING E34 SERIES

PAGE 43



Monitor all PDU loads with a single device.

MAIN PANEL & SINGLE-CIRCUIT POWER METERING E5X SERIES

PAGE 25



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CO & NO₂ SENSORS GWN & GWNP

PAGES 95, 97



Easy parking garage monitoring with the GWN and GWNP modular platforms.



INDUSTRIAL AUTOMATION

WORKSPACE

Maintain a comfortable environment without additional cost

CO₂ SENSORS CWL SERIES

PAGE 85



Because people are the major source of CO₂ in a building and outside air must often be conditioned, calling for fresh air only when CO₂ levels are high saves energy. Make the CWL Series part of your demand controlled ventilation strategy.

HUMIDITY SENSORS HED SERIES

PAGE 137



Control humidity while minimizing energy used with an easy-to-use and accurate humidity sensor.

TEMPERATURE SENSORS TW & TD SERIES

PAGES 183, 189



Monitor temperature levels, minimizing energy used with these thermistor, RTD, and transmitter devices.

BUILDING SAFETY & EFFICIENCY

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

ENERGY & POWER USAGE MONITORING

Monitor power usage, measure caustic fluid discharge, meter heated or chilled liquid

HVAC & PHYSICAL PLANT

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

CURRENT TRANSDUCERS H970

PAGE 279



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

FLOW MONITORING 380 SERIES

PAGE 109



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

PRESSURE SENSORS PX SERIES

PAGE 167



Easily control building pressure and duct static. The PX Series provides highly stable linear output and field-selectable range options.

ULTRASONIC & ENERGY (BTU) MONITORING FSR SERIES

PAGE 119



Monitor waste water discharge volume and caustic fluids, and energy usage. Measure forward flow, reverse flow, and the net total, providing reliable readings at very low flow rates.

SPST RELAYS V100

PAGE 289



Control safety barrier open and close with a pilot duty relay in an easy-to-use nipple mount enclosure.

MAIN PANEL & SINGLE-CIRCUIT POWER METERING E5X SERIES

PAGE 25



The E5x Series offers ultimate versatility in power monitoring with a wide choice in mounting options, inputs, outputs, and communication protocols including BACnet, LON, and Modbus. The meters are compact in size allowing multiple meters to be mounted in the same panel, saving installation time and costs.

COMMUNICATING THERMOSTATS VT76XX SERIES

PAGE 221



Maximize system adaptability in rooftop unit control with BACnet, Echelon, or wireless communication protocol.

LEAK DETECTION LD SERIES

PAGE 149



Detect leaks in boiler and chiller lines, backup power fuel storage and sprinkler systems and be altered to their exact location avoiding costly equipment damage.

REMOTE PRESSURE TRANSDUCERS PWR SERIES

PAGE 179



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

WORKSPACE

Provide ideal environmental conditions, while optimizing efficiency



OCCUPANCY SENSORS MSX SERIES

PAGE 205



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

HUMIDITY SENSORS HED SERIES

PAGE 137



Provide ideal environmental conditions minimizing energy used.

TEMPERATURE SENSORS TW & TD SERIES

PAGES 183, 189



Accurately monitor temperature in all settings and maintain a comfortable environment.



BUILDING SAFETY & EFFICIENCY

Monitor parking structures, maintain optimal building and duct pressure

CO & NO₂ SENSORS GWN & GWNP

PAGES 95, 97



Easy parking garage monitoring with the GWN and GWNP modular platforms.

PRESSURE SENSORS PX SERIES

PAGE 167



Maintain optimal building and duct pressure with the highly stable linear output and field-selectable range options.

CO₂ SENSORS CWL SERIES

PAGE 85



Because people are the major source of CO₂ in a building and outside air must often be conditioned, calling for fresh air only when CO₂ levels are high saves energy. Make the CWL Series part of your demand controlled ventilation strategy.

SUB-TENANT & POWER USAGE MONITORING

Monitor and invoice energy consumption accurately

ADJUSTABLE CURRENT SWITCHES H308

PAGE 245



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

SUB-TENANT METERING ENERCEPT FLEX E20 SERIES

PAGE 19



Maximum retrofit flexibility. Monitor loads from 50 to 5000 A on the same rope style CT.

MAIN PANEL & SINGLE-CIRCUIT POWER METERING E5X SERIES

PAGE 25



The E5x Series offers ultimate versatility in power monitoring with a wide choice in mounting options, inputs, outputs, and communication protocols including BACnet, LON, and Modbus. The meters are compact in size allowing multiple meters to be mounted in the same panel, saving installation time and costs.

HVAC & PHYSICAL PLANT

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

MOTOR CONTROL RELAYS V100 SERIES

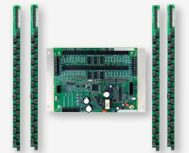
PAGE 289



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

MULTI-CIRCUIT MONITORING E3X SERIES

PAGE 45



Provides comprehensive main breaker and individual branch circuit monitoring with revenue-grade accuracy with options for new construction and retrofit projects.

FLOW MONITORING 380 SERIES

PAGE 109



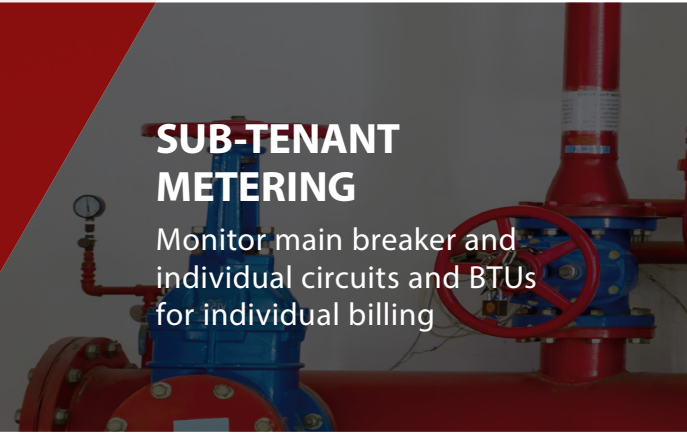
Metering of heated or chilled liquid, with a turbine flow meter and BTU transducer in one compact package.



RESIDENTIAL MULTI-TENANT

SUB-TENANT METERING

Monitor main breaker and individual circuits and BTUs for individual billing



ENERGY METERS ENERCEPT FLEX E20 SERIES

PAGE 19



Maximum retrofit flexibility. Monitor loads from 50 to 5000 A on the same rope style CT.

POWER & ENERGY MONITORS E5X SERIES

PAGE 25



DIN mounted power meter ideal for sub-metering individual loads where a local display is required.

ENERGY METERS H81XX SERIES

PAGE 33



Provide revenue grade energy consumption visibility to tenants and building management.

LIVING & SHARED SPACES

Create comfortable and energy efficient environments

BUILDING INFRASTRUCTURE

Monitor sprinkler systems for leaks and maintain ideal CO levels

OCCUPANCY SENSORS MSX SERIES

PAGE 205



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

COMMUNICATING THERMOSTATS VT76XX SERIES

PAGE 221



Maximize system adaptability in rooftop unit control with BACnet, Echelon, or Wireless communication protocol.

CO₂ SENSORS CWL SERIES

PAGE 85



Because people are the major source of CO₂ in a building and outside air must often be conditioned, calling for fresh air only when CO₂ levels are high saves energy. Make the CWL Series part of your demand controlled ventilation strategy.

LEAK DETECTION LD SERIES

PAGE 149



Detect leaks in sprinkler systems, and be alerted to their exact location avoiding costly equipment damage.

CO & NO₂ SENSORS GWN & GWNP

PAGES 95, 97



Easy parking garage and vehicle bay monitoring with the GWN and GWNP modular platforms.

BTU MONITORING 380 SERIES

PAGE 109



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 environment, while optimizing efficiency

OCCUPANCY SENSORS MSX SERIES

PAGE 205



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

HUMIDITY SENSORS HED SERIES

PAGE 137



Provide ideal environmental conditions minimizing energy used.

TEMPERATURE SENSORS TW & TD SERIES

PAGES 183, 189



Monitor temperature at a zone level with high accuracy to provide an ideal operating environment for critical equipment.

BUILDING SAFETY & EFFICIENCY

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

CO & NO₂ SENSORS GWN & GWNP

PAGES 95, 97



Easy parking garage monitoring with the GWN and GWNP modular platforms.

PRESSURE SENSORS PX SERIES

PAGE 167



Maintain optimal building and duct pressure with the highly stable linear output and field-selectable range options.

CO₂ SENSORS CWL SERIES

PAGE 85



Because people are the major source of CO₂ in a building and outside air must often be conditioned, calling for fresh air only when CO₂ levels are high saves energy. Make the CWL Series part of your demand controlled ventilation strategy.

POWER & ENERGY

Quantify and qualify usage

SUB-METERING ENERCEPT FLEX E20 SERIES

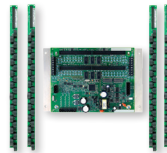
PAGE 19



Maximum retrofit flexibility. Monitor loads from 50 to 5000 A on the same rope style CT.

MULTI-CIRCUIT MONITORING E3X SERIES

PAGE 45



Provides comprehensive main breaker and individual branch circuit monitoring with revenue-grade accuracy and options for new construction and retrofit projects.

MAIN PANEL & SINGLE-CIRCUIT POWER METERING E5X SERIES

PAGE 25



The E5x Series offers ultimate versatility in power monitoring with a wide choice in mounting options, inputs, outputs, and communication protocols including BACnet, LON, and Modbus. The meters are compact in size allowing multiple meters to be mounted in the same panel, saving installation time and costs.

HVAC & PHYSICAL PLANT

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

COMMUNICATING THERMOSTATS VT76XX SERIES

PAGE 221



Maximize system adaptability in rooftop unit control with BACnet, Echelon, or wireless communication protocol.

ADJUSTABLE CURRENT SWITCHES H308

PAGE 245



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

FLOW METERING 380 SERIES

PAGE 109



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





POWER MONITORING SINGLE-CIRCUIT

Veris Industries leads the way with a complete line of innovative power monitoring solutions that save time and money. Veris power monitors are available with popular communication protocols that allow for labor-saving networked wiring, and standard pulse and analog outputs as well. Earn LEED™ points and make Veris power monitors part of your energy conservation plan.

MODEL	DESCRIPTION	PAGE
E2x FLEX	Enercept FLEX Compact Power and Energy Meters	19
H8035/H8036	Enercept Networked Power Transducers (Modbus RTU)	21
H804x/H805x	Enercept kW/kWh Transducers (4 to 20 mA or Pulse Output)	23
E5x	Enhanced Power and Energy Meters	25
E5xxxA	Enhanced Power and Energy Meter, Built-in Rope CT Integrator and Power Supply	27
E53/E54	Energy Meters	29
E61C20	Power Energy Meters	31
H81xx	Energy Meters	33
H81xx-CB	Communications Board for H81xx Series Energy Meters	35
H84xx	Power Meter, for Voltage-Mode CTs	37

See following pages for selection guides.



Maximum Flexibility for Retrofit Applications



Enercept FLEX® Power & Energy Meters E2x Series

Phase Status

Visual indication of meter performance.

Rotary Dial Setup

Configure with or without power.

Essential Protocol Support

Modbus, BACnet, uni-directional and bi-directional measurements.

Interested in learning more about the innovative E20 Series capabilities and applications?

Contact a Power Monitoring Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on 19



SINGLE-CIRCUIT ENERGY/POWER METERS GUIDE

Output / Protocol

SERVICE TYPE	VOLTAGE	40-20 mA	PULSE	MODBUS *3	BACNET MS/TP	BACNET IP	LON	N2
SINGLE-PHASE	120-240V		H81xx-xxxx-x-1	H81xx-xxxx-x-1 and H8163-CB *3	H81xx-xxxx-x-1 and H8186-CB	H81xx-xxxx-x-1 and H8186-CB and U013-0013 *5	H81xx-xxxx-x-1 and H8163-CB and H8920-3	H81xx-xxxx-x-1 and H8126-CB
			H8453V/VB or H8463V/VB	H8436V/VB *3 or H8437V/VB *3	H8436V/VB or H8437V/VB and E8951 *4	H8436V/VB or H8437V/VB and E8951 *4		
			E5xBx/E50B1A	E5xCx/E5xCxA *3	E5xHx/E5xHxA	E5xHx/E5xHx and U013-0013 *5	E50Fx/E50FxA	
SINGLE-PHASE	240V		H81xx-xxxx-x-2	H81xx-xxxx-x-2 and H8163-CB *3	H81xx-xxxx-x-2 and H8186-CB	H81xx-xxxx-x-2 and H8186-CB and U013-0013 *5	H81xx-xxxx-x-2 and H8163-CB and H8920-3	H81xx-xxxx-x-2 and H8126-CB
			H8453V/VB or H8463V/VB	H8436V/VB *3 or H8437V/VB *3	H8436V/VB or H8437V/VB and E8951 *4	H8436V/VB or H8437V/VB and E8951 *4		
			E5xBx/E50B1A	E5xCx/E5xCxA *3	E5xHx/E5xHxA	E5xHx/E5xHx and U013-0013 *5	E50Fx/E50FxA	
3WAY-PHASE	120-240V		H8150-xxxx-x-3	H8150-xxxx-x-3 and H8163-CB *3	H8150-xxxx-x-3 and H8186-CB	H8150-xxxx-x-3 and H8186-CB and U013-0013 *5	H8150-xxxx-x-3 and H8163-CB and H8920-3	H8150-xxxx-x-3 and H8126-CB
	120-480V		H8163-xxxx-x-3	E2x FLEX, H8163-xxxx-x-3 and H8163-CB *3	E2x FLEX, H8186-xxxx-x-3 and H8186-CB	H8186-xxxx-x-3 and H8186-C and U013-0013 *5	H8163-xxxx-x-3 and H8163-CB and H8920-3	H8163-xxx and H8126-CB
				E53B3C	E53C3x *3			
	240-600V		H8453VBS or H8463VBS	H8436VBS *3 or H8437VBS *3	H8436VBS or H8437VBS and E8951 *4	H8436VBS or H8437VBS and E8951 *4		
	208-480V	H8043*2*6 (H8041*2*3*6) H8044*2*7 (H8042*2*3*7)	H8053 *1 H8051*1*2	H8035/8036*1,*3	H8035/8036*1 and E8951*4	H8035/8036*1 and E8951*4	H8035 and H8920-5*1 H8036 and H8920-1*1	H8025/H8026 *1
	90-600V		E50B1/E50B1A	E5xCx/E5xCxA *3	E5xHx/E5xHxA	E5xHx/E5xHx and U013-0013 *5	E50Fx/E50FxA	
3-PHASE DELTA (NO-NEUTRAL)	120-480V		H8453V/VB or H8463V/VB	E2x FLEX, H8436V/VB *3 or H8437V/VB *3	E2x FLEX, H8436V/VB or H8437V/VB and E8951 *4	H8436V/VB or H8437V/VB and E8951 *4		
				E53B3C	E53C3x *3			
	240-600V		H8453VBS H8463VBS	H8436VBS *3 or H8437VBS *3	H8436VBS or H8437VBS and E8951 *4	H8436VBS or H8437VBS and E8951 *4		
	208-480V	H8043/8041*2*6 H8044/8042 *2*7	H8053/8051*2	H8035/8036*3	H8035/8036 and E8951*4	H8035/8036 and E8951*4	H8035 and H8920-5 H8036 and H8920-1	H8025/H8026
90-600V		E50B1/E50B1A	E5xCx/E5xCxA *3	E5xHx/E5xHxA	E5xHx/E5xHx and U013-0013 *5	E50Fx/E50FxA		

Power Quality

H84xx Series

Retrofit

Enercept H80xx Series

Versatility

E20 FLEX Series

Simplicity & Public Accessibility

H81xx Series

*1 - The Enercept H80xx models support Wye configurations without a physical connection to neutral. Line-to-neutral voltages are derived with respect to a calculated, virtual neutral.

*2 - These are lower-cost models that use a single CT to monitor a 3-phase service with a balanced load (with reduced accuracy).

*3 - All Veris Modbus products support Modbus RTU (serial) natively. For Modbus TCP (Ethernet), add the U013-0012 Modbus Gateway.

*4 - The E8951 is a Modbus RTU to BACnet (both MS/TP and IP) gateway for use with Veris power/energy meters.

*5 - The U013-0013 is a BACnet router, which adds BACnet IP support to any product with BACnet MS/TP.

*6 - For 208-240V applications.

*7 - For 480V applications.



OPTIMIZE ENERGY COSTS & CONSUMPTION WITH VISIBILITY OF POWER USE



Ultimate Retrofit – Enercept FLEX E20 Series Meters

From form factor to function, the Enercept FLEX was designed with the user in mind. This meter is the ideal solution for retrofit applications, offering maximum flexibility with in-panel mount design, wide CT form factor and range compatibility. Setup and configuration are simple via the rotary dial.

Ultimate Power Quality – H84xx Series Meters

Maximize system efficiency and gain more power quality information, including THD and neutral current. This industrial-grade meter has a large, multi-line display and can be panel-mounted for custom installations or wall-mounted when purchased pre-installed in an optional enclosure.



Ultimate Simplicity – H81xx Series Meters

Meet requirements & get quick access to the information needed for sub-tenant metering or monitoring energy consumption with this enclosed wall-mount meter that includes a customer accessible LCD display. They are simple to buy with calibrated CTs included, simple to install and use where customers and managers can safely read the information they need, simple to integrate with a range of communication protocol options.

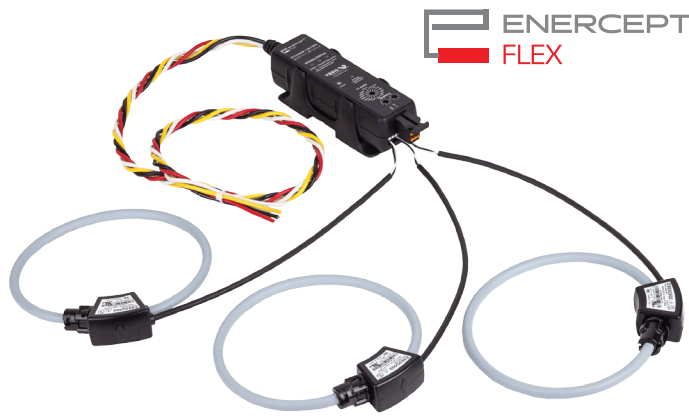
Ultimate Versatility – E5x Series Meters

Save costs while addressing a broad range of applications from sub-metering to full bi-directional monitoring of renewable energy installations with a meter that has comprehensive measurement capabilities. It can be panel, DIN rail, or wall mounted, and offers a wide choice of inputs, outputs, & communication protocols. Bi-directional models monitor alternative energy sources or loads with regenerative braking.



E2X FLEX SERIES

Uni-directional, Bi-directional, Modbus, & BACnet



ANSI model shown with E683x Rogowski CTs (sold separately)

Enercept FLEX E2x Series power and energy meters provide a unique solution for measuring energy data. Designed with the user in mind, the E2x Series offers maximum application flexibility for retrofit applications.

The Enercept FLEX E2x Series is compatible with split-core, solid-core and Veris E683x Series rope-style Rogowski current transducers (CTs) from 5 to 5000 A, often allowing installers to utilize existing CTs with the meter. Adding to its versatility, the Enercept FLEX E2x Series has a wide input range of 90 to 480 Vac, alleviating the need to keep multiple models in stock. The meter's small form factor enables installation in existing panels with limited space, and does not require external mounting or the expense of extra enclosures or conduit runs. Communicating models support auto detection of baud rate, parity, and protocol for Modbus® RTU and BACnet® MS/TP.

SPECIFICATIONS

MEASUREMENT ACCURACY	
Real Power & Energy, 1/3 Volt Current Input Mode	IEC 62053-22 Class 0.2S, ANSI C12.20 0.2%
Real Power & Energy, Rogowski Current Input Mode	IEC 62053-22 Class 0.5S, ANSI C12.20 0.5%
Reactive Power & Energy	IEC 62053-23 Class 2, 2%
INPUT VOLTAGE CHARACTERISTICS	
Measured AC Voltage	Min. 90 VL-N (156 VL-L) for stated accuracy; UL max.: 480 VL-L (277 VL-N); CE max.: 300 VL-N
Impedance	2.5 MΩ-L / 5 MΩ-L-L
Frequency Range	45 to 65 Hz
INPUT CURRENT CHARACTERISTICS	
Measurement Input Range	0 to 0.333 Vac (+20% over-range)
Impedance	50 ms at 120 Vac
CONTROL POWER	
AC	4 VA max.; 90 V min. UL max.: 480 VL-L (277 VL-N) CE max.: 300 VL-N
Ride-through Time	50 ms at 120 Vac

High reliability

ANSI C12.20 0.2% accuracy, IEC 62053-22 Class 0.2S

Wide range of service types

Compatible with CTs from 5 to 5000 A

Easy ordering & stocking

Modbus and BACnet protocols along with uni-directional and bi-directional feature sets in one unit

90 to 480 Vac

Application versatility with fewer models to stock

Easy installation

DIN rail or screw mount options (with included mounting bracket)

Protocol support

Native Modbus and BACnet MS/TP support (no gateway) with serial rates up to 115.2 kbaud

APPLICATIONS

- Energy monitoring (BAS)
- Renewable energy
- Energy management
- Commercial sub-metering
- Industrial monitoring
- Cost allocation

MECHANICAL CHARACTERISTICS

Ingress Protection (IEC 60529)	IP20
Plug Wire Size (I/O, Communications, CT)	24 to 16 AWG (0.2 to 1.5 mm ²)
Optional Bracket: Rail Mounted	T35 (35 mm) DIN rail per EN50022
Optional Bracket: Wall Mounted	Two #10 or M5 screws, 2.953" (75 mm) center-to-center

ENVIRONMENTAL CONDITIONS

Operating Temp.*	-30 to 70 °C (-22 to 158 °F)
Storage Temp.	-40 to 85 °C (-40 to 185 °F)
Humidity Range	<95% RH (non-condensing)
Altitude of Operation	3 km max.
Pollution Degree	2

METERING CATEGORY

UL	CAT III; for distribution systems up to 277 VL-N / 480 VaL-L
CE**	CAT III; for distribution systems up to 300 VL-N



SPECIFICATIONS (CONT.)

Dielectric Withstand	Per UL 61010-1, EN 61010-1
Conducted and Radiated Emissions	FCC part 15 Class A, EN 61000-6-4, EN 61326-1 Class A (industrial)
Conducted and Radiated Immunity	EN 61000-6-2, EN 61326-1 (industrial)

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

US and Canada	UL 61010-1
Europe (CE)	EN 61010-1

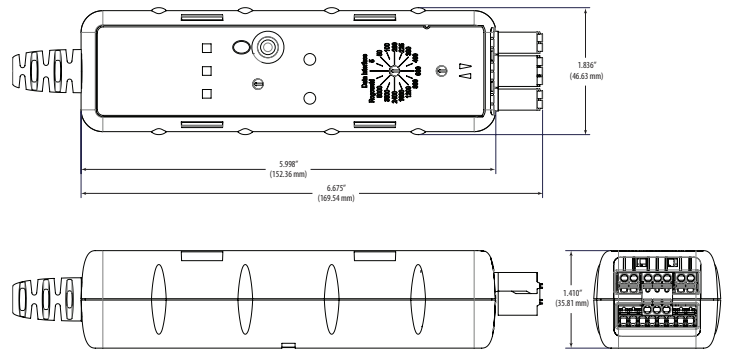


*The Enercept FLEX E2x is limited to an operating temperature of 55 °C (131 °F) when used with a E683x Series Rogowski rope-style CT.
 **The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

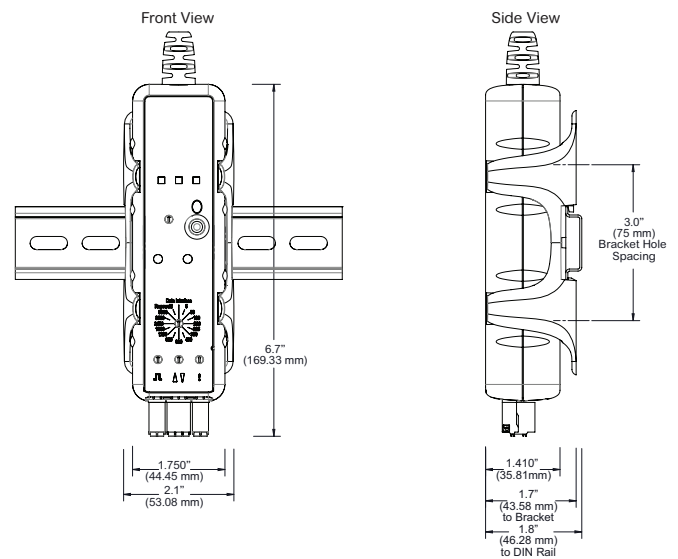
ORDERING INFORMATION

	E23Cx
MEASUREMENT CAPABILITY - FULL DATA SET	
Bi-directional Energy Measurements	•
Power (3-phase Total and Per Phase): Real (kW) Reactive (kVAR), and Apparent (kVA)	•
Power Factor: 3-phase Average and Per Phase	•
Present Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)	•
Import and Export Totals of Present Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)	•
Peak Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)	•
Current (3-Phase Average and Per Phase)	•
Voltage: Line-Line and Line-Neutral (3-phase Average and Per Phase)	•
Frequency	•
ANSI C12.20 0.2% Accuracy, IEC 62053-22 Class 0.2S	•
Accumulated Net Energy: Real (kWh), Reactive (kVARh), and Apparent (kVAh)	•
Accumulated Real Energy by Phase (kWh)	•
Import and Export Accumulators of Real and Apparent Energy	•
Reactive Energy Accumulators by Quadrant (3-phase Total and Per Phase)	•
Demand Interval Configuration: Fixed or Rolling Block	•
Demand Interval Configuration: External Sync to Comms	•
OUTPUTS	
RS-485 Serial (Modbus RTU Protocol)	•
RS-485 Serial (BACnet MS/TP Protocol)	•

DIMENSIONAL DRAWING



DIMENSIONS, MOUNTED



ORDERING INFORMATION

<p>Data Set</p> <p>E</p> <p>23 = Uni/Bi Dir (FDS)</p>	<p>I/O</p> <p>C = RS-485 MB/BAC</p>	<p>System Types & Wires</p> <p>5 = 1, 2, or 3ph (A-B-C-N) IEC International 6 = 1, 2, or 3ph (A-B-C-N) ANSI North & South America</p>
<p>Example:</p> <p>E 23 C 6</p>		



H8035 & H8036 SERIES

Integral Monitoring Solution Eliminates the Need for Separate Enclosures



The Enercept H8035 and H8036 Series are innovative three-phase networked (Modbus RTU) power transducers that combine measurement electronics and high accuracy industrial grade CTs in a single package. The need for external electrical enclosures is eliminated, greatly reducing installation time and cost.

There are two application-specific platforms to choose from. The Basic Enercept energy transducers (H8035) are ideal for applications where only kW and kWh are required. The Enercept Enhanced power transducers (H8036) output 26 variables including kW, kWh, volts, amps, and power factor, making them ideal for monitoring and diagnostics.

Color-coordination between voltage leads and CTs makes phase matching easy. Additionally, the Enercept automatically detects and compensates for phase reversal, virtually eliminating the concern of CT load orientation. Up to 63 Enercepts can be daisy-chained on a single RS-485 network.

SPECIFICATIONS

INPUTS	
Voltage Input	208 to 480 Vac, 50/60 Hz RMS ^{1,2,3}
Current Input	Up to 2400 A continuous per phase ^{2,3}
ACCURACY	
System Accuracy	±1% of reading from 10% to 100% of the rated current of the CTs, accomplished by matching the CTs with electronics and calibrating them as a system
OUTPUTS	
Type	Modbus RTU ^{4,5}
Baud Rate	9600, 8N1 format
Connection	RS-485, 2-wire + shield
ENVIRONMENTAL	
Operating Temp Range	0 to 60 °C (32 to 140 °F), 50 °C (122 °F) for 2400 A

Revenue grade measurements

Meets ANSI C12.20 Class 0.2 standards

Labor savings

Precision electronics and current transformers in a single package... reduces the number of installed components

Reduce wiring time & cost

Monitor energy parameters (kW, kWh, kVAR, PF, Amps, Volts) at up to 63 locations on a single RS-485 network

Save time & labor

Fast split-core installation virtually eliminates the need to remove conductors

Fast, trouble-free installation

Smart electronics alleviate CT orientation concerns

CSI approved

Eases submission process for California Solar Initiative

APPLICATIONS

- Energy management and performance contracting
- Monitoring for commercial tenants
- Activity-based costing in commercial and industrial facilities
- Real-time power monitoring
- Load shedding

Humidity Range	0 to 95% non-condensing; indoor use only
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL508



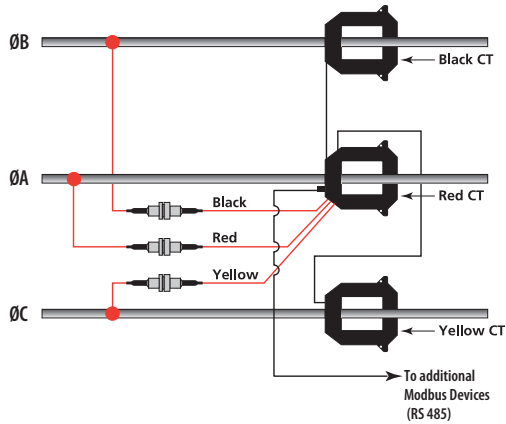
Approved for California CSI Solar applications (check the CSI website for model numbers).

1. Do not install on the line or load side of a VFD unit, or on any other equipment generating harmonics. For line side applications, use the E5x Series meters.
2. Contact factory to interface for voltages above 480 Vac or current above 2400 A.
3. Do not apply 600 V Class current transformers to circuits having a phase-to-phase voltage greater than 600 V, unless adequate additional insulation is applied between the primary conductor and the current transformers. Veris assumes no responsibility for damage of equipment or personal injury caused by products operated on circuits above their published ratings.
4. Detailed protocol specifications are available at www.veris.com/modbus.
5. Modbus TCP, BACnet MS/TP, BACnet IP and LON TP/FT-10 protocols available via accessories

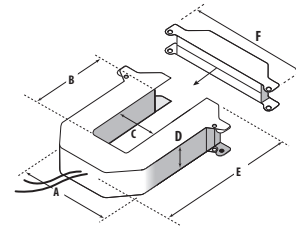


208 OR 480VAC 3Ø, INSTALLATION

Wiring Diagram

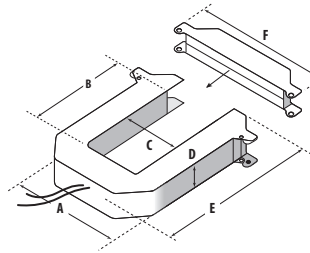


DIMENSIONAL DRAWINGS



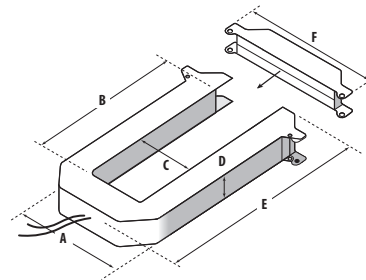
SMALL
100/300 Amp

A =	3.8" (96 mm)
B =	1.2" (30 mm)
C =	1.3" (31 mm)
D =	1.2" (30 mm)
E =	4.0" (100 mm)
F =	4.8" (121 mm)



MEDIUM
400/800 Amp

A =	4.9" (125 mm)
B =	2.9" (73 mm)
C =	2.5" (62 mm)
D =	1.2" (30 mm)
E =	5.2" (132 mm)
F =	6.0" (151 mm)

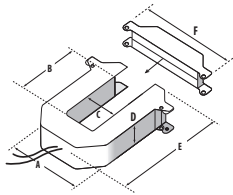


LARGE
800/1600/2400 Amp

A =	4.9" (125 mm)
B =	5.5" (139 mm)
C =	2.5" (62 mm)
D =	1.2" (30 mm)
E =	7.9" (201 mm)
F =	6.0" (151 mm)

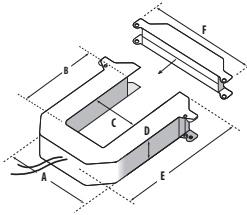
240VAC 1Ø, 3-WIRE INSTALLATION

Wiring Diagrams



SMALL
100/300 Amp

A =	3.8" (96 mm)
B =	1.2" (30 mm)
C =	1.3" (31 mm)
D =	1.2" (30 mm)
E =	4.0" (100 mm)
F =	4.8" (121 mm)



MEDIUM
400/800 Amp

A =	4.9" (125 mm)
B =	2.9" (73 mm)
C =	2.5" (62 mm)
D =	1.2" (30 mm)
E =	5.2" (132 mm)
F =	6.0" (151 mm)

DATA OUTPUTS

H8035	H8036	
kWh	kWh, Consumption	Minimum Real Power
kW	kW, Real Power	Maximum Real Power
	kVAR, Reactive Power	Voltage, L-L
	kVA, Apparent Power	Voltage, L-N*
	Power Factor	Amps, Average Current
	Average Real Power	*Based on derived neutral voltage.

ORDERING INFORMATION

Modbus Basic Power Transducers*

MODEL	MAX. AMPS	CT SIZE
H8035-0100-2	100	SMALL
H8035-0300-2	300	SMALL
H8035-0400-3	400	MEDIUM
H8035-0800-3	800	MEDIUM
H8035-0800-4	800	LARGE
H8035-1600-4	1600	LARGE
H8035-2400-4	2400	LARGE

*H8035 models work with H8920-5 LON nodes

Modbus Enhanced Data Stream Power Transducers*

MODEL	MAX. AMPS	CT SIZE
H8036-0100-2	100	SMALL
H8036-0300-2	300	SMALL
H8036-0400-3	400	MEDIUM
H8036-0800-3	800	MEDIUM
H8036-0800-4	800	LARGE
H8036-1600-4	1600	LARGE
H8036-2400-4	2400	LARGE

*H8036 models work with H8920-1 LON nodes



H804X & H805X SERIES

Integral Monitoring Solution Eliminates the Need for Separate Enclosures



The Enercept H804x and H805x Series kW (real power)/kWh (consumption) transducers combine processing electronics & industrial grade CTs in an easy-to-install split-core package. These devices continuously measure voltage and current values for the monitored conductors and update calculations to provide highly accurate true RMS power readings. Models designed for balanced loads include one CT only, while models for unbalanced loads have three CTs for improved accuracy.

The unique design of the H804x/H805x Series transducers reduces the number of installed components, making them ideal for monitoring electrical power in commercial and industrial facilities. The H804x provides industry-standard 4 to 20 mA output, and the H805x provides a pulse output.

Installation is simple. The H804x/H805x eliminates the need to mount and wire a transducer and enclosure. CTs and voltage leads are color-matched, and the meters are designed to detect and automatically compensate for phase reversal. No more worries about CT load orientation.

SPECIFICATIONS

INPUTS

Voltage Input	208/240 or 480 Vac, 50/60 Hz RMS ^{1,2,3}
Current Input	Up to 2400 A continuous per phase ^{2,3}

ACCURACY

System Accuracy	±1% of reading from 10% to 100% of the rated current of the CTs, accomplished by matching the CTs with electronics and calibrating them as a system
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OUTPUTS (H804X)

Output	4 to 20 mA
Supply Power (current loop)	9 to 30 Vdc, 30 mA max.

OUTPUTS (H805X)

Pulsed Output	Field selectable; 1, 0.5, 0.25, 0.1 kWh/pulse ⁴
Pulsed Output Type	Normally Open, Opto-FET, 100 mA@24 Vdc

Revenue grade measurements

Meets ANSI C12.20 Class 0.2 standards

Ideal for retrofit

Fast split-core installation virtually eliminates the need to remove conductors

Labor savings

Precision meter electronics and current transformers in a single package...reduces the number of installed components

Trouble-free installation

Smart electronics virtually eliminate the need to be concerned with CT orientation

APPLICATIONS

- Optimize chillers, pumps and cooling towers
- Energy management and performance contracting
- Control processes
- Activity-based costing in commercial and industrial facilities
- Monitor real-time power
- Load shedding

ENVIRONMENTAL

Operating Temp Range	0 to 60 °C (32 to 140 °F), 50 °C (122 °F) for 2400 A
Humidity Range	0 to 95% non-condensing; indoor use only

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL508
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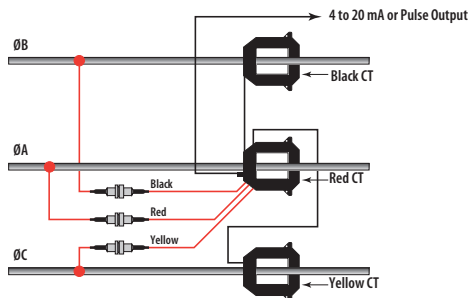


1. Do not install on the line or load side of a VFD unit, or on any other equipment generating harmonics. For line side applications, use the E5x Series meters.
2. Contact factory to interface with voltages above 480 Vac or current above 2400 A.
3. Do not apply 600 V Class current transformers to circuits having a phase-to-phase voltage greater than 600 V, unless adequate additional insulation is applied between the primary conductor and the current transformers. Veris assumes no responsibility for damage of equipment or personal injury caused by products operated on circuits above their published ratings.
4. Count must be multiplied by the number of phases when using single CT models to monitor balanced multiphase systems.



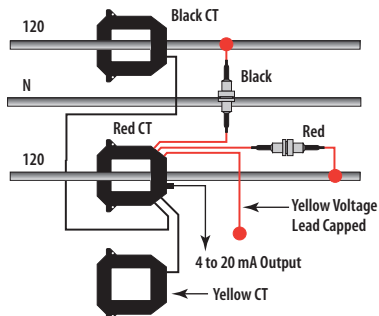
H804X/H805X 208 OR 480 VAC 3Ø, 3/4-WIRE

Wiring Diagram



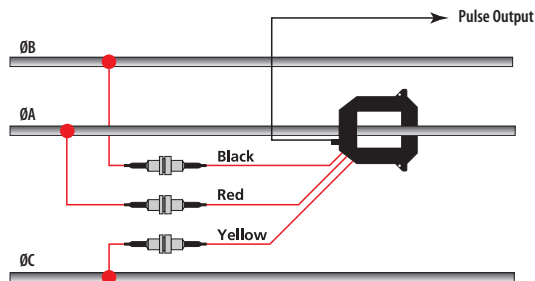
H804X 240 VAC 1Ø, 3-WIRE

Wiring Diagram



H805X 208 OR 480 VAC 3Ø, 3/4-WIRE

Wiring Diagram



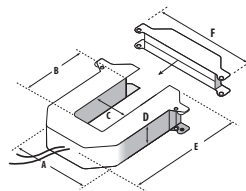
ORDERING INFORMATION

Pulse Output Power Transducers

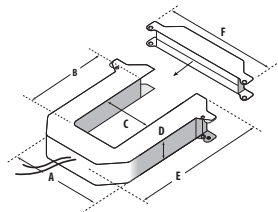
MODEL	VOLTAGE	MAX. AMPS	OUTPUT	CT SIZE	CT TYPE
H8051-0100-2	208/480	100	Pulse	SMALL	Single CT Model
H8051-0300-2		300		SMALL	
H8051-0400-3		400		MEDIUM	
H8051-0800-3		800		MEDIUM	
H8051-0800-4		800		LARGE	
H8051-1600-4		1600		LARGE	
H8051-2400-4		2400		LARGE	Three CT Model
H8053-0100-2		100		SMALL	
H8053-0300-2		300		SMALL	
H8053-0400-3		400		MEDIUM	
H8053-0800-3		800		MEDIUM	
H8053-0800-4		800		LARGE	
H8053-1600-4	1600	LARGE			
H8053-2400-4	2400	LARGE			

Single CT models for use with balanced 3Ø loads
 Three CT models for use with unbalanced 3Ø loads

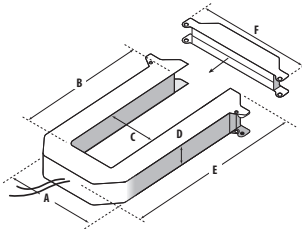
DIMENSIONAL DRAWINGS



- SMALL**
100/300 Amp
- A = 3.8" (96 mm)
 - B = 1.2" (30 mm)
 - C = 1.3" (31 mm)
 - D = 1.2" (30 mm)
 - E = 4.0" (100 mm)
 - F = 4.8" (121 mm)



- MEDIUM**
400/800 Amp
- A = 4.9" (125 mm)
 - B = 2.9" (73 mm)
 - C = 2.5" (62 mm)
 - D = 1.2" (30 mm)
 - E = 5.2" (132 mm)
 - F = 6.0" (151 mm)



- LARGE**
800/1600/2400 Amp
- A = 4.9" (125 mm)
 - B = 5.5" (139 mm)
 - C = 2.5" (62 mm)
 - D = 1.2" (30 mm)
 - E = 7.9" (201 mm)
 - F = 6.0" (151 mm)

ORDERING INFORMATION

4 to 20 mA Output Power Transducers

MODEL	VOLTAGE	MAX. AMPS	OUTPUT	CT SIZE	CT TYPE
H8041-0100-2	208/240	100	4 to 20 mA	SMALL	Single CT Model
H8041-0300-2		300		SMALL	
H8041-0400-3		400		MEDIUM	
H8041-0800-3		800		MEDIUM	
H8041-0800-4		800		LARGE	
H8041-1600-4		1600		LARGE	
H8041-2400-4		2400		LARGE	Single CT Model
H8042-0100-2		100		SMALL	
H8042-0300-2		300		SMALL	
H8042-0400-3		400		MEDIUM	
H8042-0800-3		800		MEDIUM	
H8042-0800-4		800		LARGE	
H8042-1600-4	1600	LARGE			
H8042-2400-4	2400	LARGE	Three CT Model		
H8043-0100-2	100	SMALL			
H8043-0300-2	300	SMALL			
H8043-0400-3	400	MEDIUM			
H8043-0800-3	800	MEDIUM			
H8043-0800-4	800	LARGE			
H8043-1600-4	1600	LARGE			
H8043-2400-4	2400	LARGE	Three CT Model		
H8044-0100-2	100	SMALL			
H8044-0300-2	300	SMALL			
H8044-0400-3	400	MEDIUM			
H8044-0800-3	800	MEDIUM			
H8044-0800-4	800	LARGE			
H8044-1600-4	1600	LARGE			
H8044-2400-4	2400	LARGE			

Single CT models for use with balanced 3Ø loads
 Three CT models for use with unbalanced 3Ø loads



E5X SERIES

Versatile Energy Monitoring Solution



The E5x Series DIN Rail Meter combines exceptional performance and easy installation to deliver a cost-effective solution for power monitoring applications. The E5x can be installed on standard DIN rail or surface mounted as needed. The Modbus, LON, and BACnet output models offer added flexibility for system integration. The data logging capability (E5xC3 and E5xx5) protects data in the event of a communications or power failure elsewhere in the system. Combinations of serial communication, pulse output, and phase alarms are provided to suit a wide variety of applications. Additional pulse inputs on E5xHx and E50Fx provide an easy way to incorporate simple flow sensors to track gas, water, steam, or other energy forms using a BACnet or LON system.

The E51 models add a bi-directional monitoring feature designed expressly for renewable energy applications, allowing measurement of power imported from the utility grid as well as power exported from the renewable energy source (e.g. solar panels). In this way, a facility administrator can track all energy data, ensuring accuracy in billing and crediting. They are also useful for monitoring loads that use regenerative braking.

SPECIFICATIONS

INPUTS	
Control Power, AC	50/60 Hz; 5 VA max.; 90 V min.; UL Maximums: 600 VL-L (347 VL-N); CE Maximum: 300 VL-N
Control Power, DC	3W max.; UL and CE: 125 to 300 Vdc (external DC current limiting required)
Voltage Input	UL: 90 VL-N to 600 VL-L; CE: 90 VL-N to 300 VL-N
CURRENT INPUT	
Scaling	5 A to 32,000 A
Input Range	0 to 0.333 V or 0 to 1 V (selectable) CTs must be rated for use with Class 1 voltage inputs
Pulse Inputs E5xHx & E50Fx only	Contact inputs to pulse accumulators (one set with E5xH2 and E50F2; two sets with E5xH5 and E51F5)*
ACCURACY	
Real Power & Energy	0.2% (ANSI C12.20, IEC 62053-22 Class 0.2S)
OUTPUTS	
E50B1 & E5xCx	Real Energy Pulse: N.O. static**; Alarm contacts: N.C. static**

Revenue grade measurements

Meets ANSI C12.20 Class 0.2 standards

High reliability

ANSI C12.20 0.2% accuracy, IEC 62053-22 Class 0.2S on E5xxx

Easy installation

DIN rail or screw mounting options

Multiple applications

Real energy output and phase loss alarm output on E50Bx and E5xCx models...one device serves multiple applications

Data logging

Ensures long term data retrieval and safeguards during power failures (E5xC3 and E5xx5)

Wide CT compatibility

Compatible with CTs from 5 A to 32000 A

APPLICATIONS

- Energy monitoring in building automation systems
- Renewable energy
- Energy management
- Commercial sub-metering
- Industrial monitoring
- Cost allocation

E50Bx	Reactive energy pulse 30 Vac**
E5xCx	RS-485 2-wire Modbus RTU (1200 baud to 38.4 kbaud)
E5xHx	RS-485 2-wire BACnet MS/TP (9600 baud to 115.2 kbaud)
E50Fx	2-wire LON FT

MECHANICAL

Mounting	DIN Rail or 3-point screw mount
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ENVIRONMENTAL

Altitude of Operation	3000 m
Operating Temp Range	-30 to 70 °C (-22 to 158 °F)
Storage Temp Range	-40 to 85 °C (-40 to 185 °F)
Humidity Range	<95% RH noncondensing; indoor use only

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL508 (Open Type Device), EN61010-1, California CSI Solar, ANSI C12.20, Cat III, Pollution Degree 2
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*10 kΩ Vac/dc to 4 to 10 Vdc. **30 Vac/dc, 100 mA max. (AC: 50/60Hz).

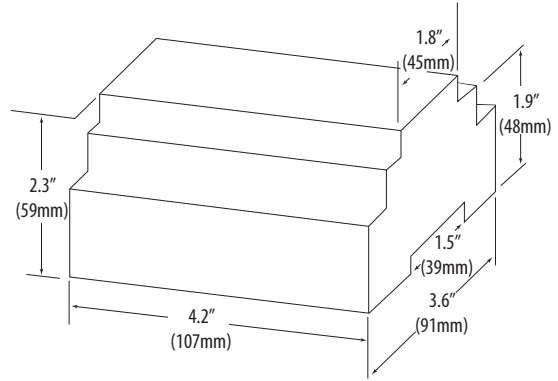
*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



ORDERING INFORMATION

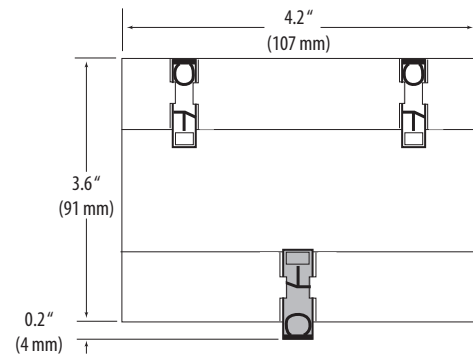
	E50B1	E50C2	E50C3	E50F2	E50F5	E50H2	E50H5	E51C2	E51C3	E51H2	E51H5	
MEASUREMENT CAPABILITY - FULL DATA SET												
Bi-directional Energy Measurements										•	•	•
Power (3-phase total and per phase): Real (kW) Reactive (kVAR), and Apparent (kVA)	•	•	•	•	•	•	•	•	•	•	•	•
Power Factor: 3-phase average & per phase	•	•	•	•	•	•	•	•	•	•	•	•
Present Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)	•	•	•	•	•	•	•	•	•	•	•	•
Import and Export totals of Present Power Demand: Real (kW), Reactive (kVAR), & Apparent (kVA)								•	•	•	•	•
Peak Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)	•	•	•	•	•	•	•	•	•	•	•	•
Current (3-phase average and per phase)	•	•	•	•	•	•	•	•	•	•	•	•
Voltage: Line-Line and Line-Neutral (3-phase average and per phase)	•	•	•	•	•	•	•	•	•	•	•	•
Frequency	•	•	•	•	•	•	•	•	•	•	•	•
ANSI C12.20 0.2% accuracy, IEC 62053-22 Class 0.2S	•	•	•	•	•	•	•	•	•	•	•	•
Accumulated Net Energy: Real (kWh), Reactive (kVARh), and Apparent (kVAh)	•	•	•	•	•	•	•	•	•	•	•	•
Accumulated Real Energy by phase (kWh)	•	•	•	•	•	•	•	•	•	•	•	•
Import and Export Accumulators of Real and Apparent Energy								•	•	•	•	•
Reactive Energy Accumulators by Quadrant (3-phase total & per phase)								•	•	•	•	•
Demand Interval Configuration: Fixed or Rolling Block	•	•	•	•	•	•	•	•	•	•	•	•
Demand Interval Configuration: External Sync to Comms		•	•	•	•	•	•	•	•	•	•	•
DATA LOGGING												
Data Logging: 10 16-Bit Configurable (can include Date/Time) Data Buffers			•							•		
Data Logging: 3 Timestamped 32-Bit Configurable Data Buffers					•		•					•
Store up to 60 days of readings at 15-minute intervals			•		•		•			•		•
OUTPUTS												
Alarm Output (N.C.)	•	•	•	•		•		•	•	•		•
1 Pulse Output (N.O.)		•	•					•	•			
2 Pulse Outputs (N.O.)	•											
RS-485 Serial (Modbus RTU Protocol)		•	•					•	•			
RS-485 Serial (BACnet MS/TP Protocol)						•	•			•	•	
LON FT Serial (LonTalk Protocol)				•	•							
INPUTS												
2 Pulse Contact Accumulator Inputs				•	•		•					•
1 Pulse Contact Accumulator Input			•		•					•		

DIMENSIONAL DRAWING



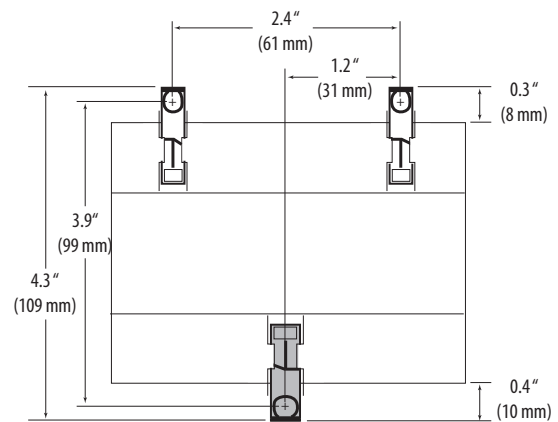
DIN MOUNT CONFIGURATION

Mounting Diagram



SCREW MOUNT CONFIGURATION

Mounting Diagram



E5XXXA SERIES

Cost-Saving, Versatile Monitoring Solution with Associated E683x Rope Style CTs (Sold Separately)



E50xxxA/E51xxxA



E683x Series Rope CT (sold separately)

The E5xxxA Series DIN Rail Meter combines exceptional metering performance with a built-in integrator and power supply to deliver a cost-effective, easily installed solution for power monitoring applications. Multiple communication protocol options offer added flexibility for easy system integration.

E5xxxA devices work exclusively with Veris E683x Series rope CTs for fast connection. The rope style CTs allow convenient installation in tight spaces.

The data logging capability (E5xC3A and E5x5A) protects data in the event of a power or communications failure elsewhere in the system. Different devices in the series offer serial communication, pulse output, and phase alarms to suit a wide variety of applications.

SPECIFICATIONS

ACCURACY	
Real Power & Energy E5xxxA	0.5% (ANSI C12.20, IEC 62053-22 Class 0.5S)
INPUTS	
Control Power, AC	50/60 Hz; 5 VA max.; 90 V min.; UL Maximums: 600 VL-L (347 VL-N); CE Maximum: 300 VL-N
Control Power, DC	3 W max.; UL and CE: 125 to 300 Vdc (external DC current limiting required)
Voltage Input	UL: 90 VL-N to 600 VL-L; CE: 90 VL-N to 300 VL-N
Current Input Scaling Input Range	50 to 5000 A E683x Series rope style CTs only (CTs must be rated for connection to Class 1 voltage inputs)
Pulse Inputs (E5xHxA & E50FxA only)	Contact inputs to pulse accumulators (one set with E5xH2A & E50F2A; two sets with E5xH5A & E51F5A)*
OUTPUTS	
All Models (except E5xHxA & E50FxA)	Real Energy Pulse: N.O. static**; Alarm contacts: N.C. static**
E50BxA	Reactive energy pulse**
E5xCxA	RS-485 2-wire Modbus RTU (1200 baud to 38.4 kbaud)

Faster installation 0.5% accuracy

Integrator and power supply for the CTs are built into the meter... fewer devices to purchase and faster installation

ANSI C12.20 0.5% accuracy, IEC 62053-22 Class 0.5S on all E5xxxA...great for cost allocation

Rope CTs

Versatile rope CTs allow convenient installation in tight spaces

Easy installation

DIN rail or screw mounting options

400 to 5000A

Designed to work exclusively with E683x Series rope CTs which offer 1% accuracy from 50 to 5000 A... monitor a wide range of loads with breakers from 400 to 5000 A

Multiple applications

Real energy output and phase loss alarm output on E50BxA and E5xCxA models...one device serves multiple applications

APPLICATIONS

- Energy monitoring in building automation systems
- Renewable energy
- Energy management
- Commercial sub-metering
- Industrial monitoring
- Cost allocation

E5xHxA	RS-485 2-wire BACnet MS/TP (9600 baud to 115.2 kbaud)
E50FxA	2-wire LON FT
MECHANICAL	
Mounting	DIN rail or 3-point screw mount
ENVIRONMENTAL	
Operating Temp Range	-30 to 70 °C (-22 to 158 °F)
Storage Temp Range	-40 to 85 °C (-40 to 185 °F)
Humidity Range	<95% RH non-condensing; indoor use only
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL508, EN61010, California CSI Solar, ANSI C12.20



*10 kΩ Vac/dc to 4 to 10 Vdc.

**30 Vac/dc, 100 mA max.

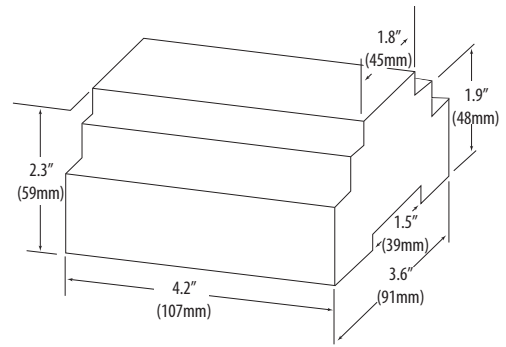
***The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



ORDERING INFORMATION

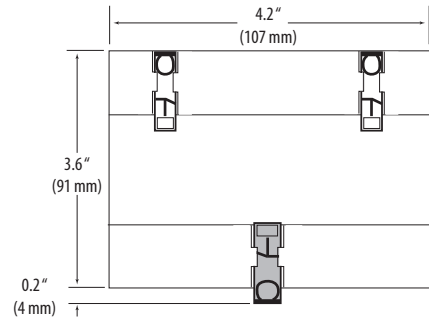
	E50B1A	E50C2A	E50C3A	E50F2A	E50F5A	E50H2A	E50H5A	E51C2A	E51C3A	E51H2A	E51H5A
MEASUREMENT CAPABILITY - FULL DATA SET											
Bi-directional Energy Measurements											
Power (3-phase total and per phase): Real (kW) Reactive (kVAR), & Apparent (kVA)	•	•	•	•	•	•	•	•	•	•	•
Power Factor: 3-phase average & per phase	•	•	•	•	•	•	•	•	•	•	•
Present Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)	•	•	•	•	•	•	•	•	•	•	•
Import & Export totals of Present Power Demand: Real (kW), Reactive (kVAR), & Apparent (kVA)								•	•	•	•
Peak Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)	•	•	•	•	•	•	•	•	•	•	•
Current (3-phase average and per phase)	•	•	•	•	•	•	•	•	•	•	•
Voltage: Line-Line and Line-Neutral (3-phase average and per phase)	•	•	•	•	•	•	•	•	•	•	•
Frequency	•	•	•	•	•	•	•	•	•	•	•
ANSI C12.20 0.5% accuracy, IEC 62053-22 Class 0.5S	•	•	•	•	•	•	•	•	•	•	•
Accumulated Net Energy: Real (kWh), Reactive (kVARh), and Apparent (kVAh)	•	•	•	•	•	•	•	•	•	•	•
Accumulated Real Energy by phase (kWh)	•	•	•	•	•	•	•	•	•	•	•
Import and Export Accumulators of Real and Apparent Energy								•	•	•	•
Reactive Energy Accumulators by Quadrant (3-phase total and per phase)								•	•	•	•
Demand Interval Configuration: Fixed or Rolling Block	•	•	•	•	•	•	•	•	•	•	•
Demand Interval Configuration: External Sync to Comms	•	•	•	•	•	•	•	•	•	•	•
DATA LOGGING											
Data Logging: 10 16-Bit Configurable (can include Date/Time) Data Buffers			•							•	
Data Logging: 3 Timestamped 32-Bit Configurable Data Buffers						•		•			•
Store up to 60 days of readings at 15-minute intervals			•			•		•			•
OUTPUTS											
Alarm Output (N.C.)	•	•	•	•		•		•	•	•	
1 Pulse Output (N.O.)		•	•					•	•		
2 Pulse Outputs (N.O.)	•										
RS-485 Serial (Modbus RTU Protocol)		•	•					•	•		
RS-485 Serial (BACnet MS/TP Protocol)						•	•			•	•
LONFT Serial (LonTalk Protocol)				•	•						
INPUTS											
2 Pulse Contact Accumulator Inputs				•		•					•
1 Pulse Contact Accumulator Input				•		•					•

DIMENSIONAL DRAWING



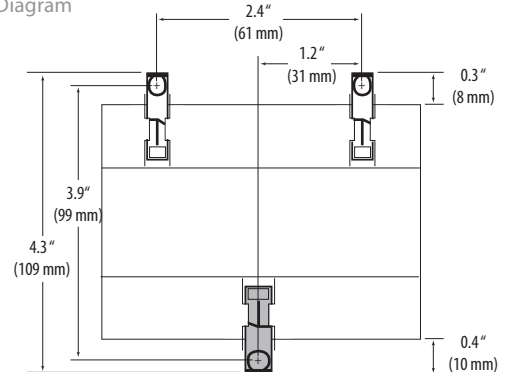
DIN MOUNT CONFIGURATION

Mounting Diagram



SCREW MOUNT CONFIGURATION

Mounting Diagram



REQUIRED CTS

MODEL	DESCRIPTION
E683C502	Rogowski CT, 250 mm (9"), 600 V, 5 kA, U018 equivalent
E683D502	Rogowski CT, 300 mm (12"), 600 V, 5 kA, U018 equivalent
E683G502	Rogowski CT, 460 mm (18"), 600 V, 5 kA, U018 equivalent
E683J502	Rogowski CT, 600 mm (24"), 600 V, 5 kA, U018 equivalent
E683L502	Rogowski CT, 900 mm (35"), 600 V, 5 kA, U018 equivalent



E53/E54 SERIES

Versatile Energy Monitoring Solution



The E53 and E54 Energy Meters provide a solution for measuring all essential values (current, voltage, energy, etc.) on a 1-phase or 3-phase electrical installation. They also report diagnostic information such as power factor and reactive power. The E54C3B allows direct measurement, while the E53B3C and E54C3C models work with standard 1A or 5A CTs. E54 models have Modbus communication capability.

These devices are MID compliant when installed in an IP51 enclosure.

SPECIFICATIONS

POWER SUPPLY

Measured Voltage	100 to 277 VLN; 173 to 480 VLL \pm 20%
Frequency	50/60 Hz \pm 10%

CURRENT INPUTS (E53B3C AND E54C3C)

Nominal Current	Nominal: 1 or 5 A; Measured: 20 mA to 6 A
Frequency	50/60 Hz \pm 10%

CURRENT MEASUREMENT (E54C3B)

Maximum Current	63A (CTs are internal to meter)
Measured Current	0.5 to 63 A

PULSE OUTPUT (E53B3C)

Type	Optical coupler (S0 Form)
Number of Pulses per kWh	Configurable
Pulse Width	Configurable, 50 msec minimum
Voltage	5 to 30 Vdc
Current	1 to 15 mA

DIGITAL INPUT (E54C3B AND E54C3C)

Type	Type 1 (IEC 61131-2)
Maximum Input	40 Vdc, 4 mA
Voltage	On: 11 to 40 Vdc; Off: 0 to 5 Vdc; Nominal: 24 Vdc

DIGITAL OUTPUT (E54C3B AND E54C3C)

Type	SPST N.O. (Form A)
Maximum Input	5 to 40 Vdc, 50 mA

MODBUS COMMUNICATION (E54C3B AND E54C3C)

Parity	Even, Odd, None
Baud Rate	9600, 19200, 38400

Faster installation Modbus

Multi-tariff feature...compare power use at peak and off-peak times of day (E54 models only)

Allows efficient data collection and communication (E54 models only)

Direct

E54C3B measures current directly...no external CTs required

Bi-directional

4-quadrant energy measurement...allows bi-directional metering (E54 models only)

Easy integration

Easily connect industry standard 1 or 5 A CTs to E53B3C & E54C3C... easy integration with standard systems

Large display

Easy to read...scrolls through all measurements showing values, date and time stamp, units and tariff (if applicable)

APPLICATIONS

- Tenant sub-metering
- Backup generators
- Real-time power monitoring
- Solar installations (E54 models)

OPERATING CONDITIONS

Operating Temperature Range	-25 to 55 °C (-13 to 131 °F) (5% to 95% RH non-condensing)
Storage Temperature Range	-40 to 85 °C (-40 to 185 °F)
Altitude of Operation	< 2000 m

MEASUREMENT ACCURACY (E53B3C)

Real Energy for x/1 A Current Input	1%; Class 1 conforming to IEC 62053-21 and IEC 61557-12 (PMD SD): $I_{max}=1.2$ A, $I_n=1$ A, and $I_{st}=0.002$ A Class B conforming to EN 50470-3: $I_{max}=1.2$ A, $I_n=1$ A, $I_{min}=0.01$ A, and $I_{st}=0.002$ A
Real Energy for x/5 A Current Input	0.5%; Class 0.5S conforming to IEC 62053-22 and IEC 61557-12 (PMD SD): $I_{max}=6$ A, $I_n=5$ A, and $I_{st}=0.005$ A Class C conforming to EN 50470-3: $I_{max}=6$ A, $I_n=5$ A, $I_{min}=0.05$ A, and $I_{st}=0.005$ A

MEASUREMENT ACCURACY (E54C3B)

Real Energy	1%; Class 1 conforming to IEC 62053-21 and IEC 61557-12 (PMD DD): $I_{max}=63$ A, $I_b=10$ A, and $I_{st}=0.04$ A Class B conforming to EN 50470-3: $I_{max}=63$ A, $I_{ref}=10$ A, $I_{min}=0.5$ A, and $I_{st}=0.04$ A
Reactive Energy	Class 2 conforming to IEC 62053-23 and IEC 61557-12 (PMD DD): $I_{max}=63$ A, $I_b=10$ A, and $I_{st}=0.05$ A

MEASUREMENT ACCURACY (E54C3C)

Real Energy for x/1A Current Input	1%; Class 1 conforming to IEC 62053-21 and IEC 61557-12 (PMD Sx): $I_{max}=1.2$ A, $I_n=1$ A, and $I_{st}=0.002$ A Class B conforming to EN 50470-3: $I_{max}=1.2$ A, $I_n=1$ A, $I_{min}=0.01$ A, and $I_{st}=0.002$ A
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SPECIFICATIONS (CONT.)

Reactive Energy for x/1A Current Input	Class 2 conforming to IEC 62053-23 and IEC 61557-12 (PMD Sx): $I_{max}=1.2$ A, $I_n=1$ A, and $I_{st}=0.003$ A
Real Energy for x/5 A Current Input	0.5%; Class 0.5S conforming to IEC 62053-22 and IEC 61557-12 (PMD SD): $I_{max}=6$ A, $I_n=5$ A, and $I_{st}=0.005$ A Class C conforming to EN 50470-3: $I_{max}=6$ A, $I_n=5$ A, $I_{min}=0.05$ A, and $I_{st}=0.005$ A
Reactive Energy for x/5 A Current Input	Class 2 conforming to IEC 62053-23 and IEC 61557-12 (PMD Sx): $I_{max}=6$ A, $I_n=5$ A, and $I_{st}=0.015$ A

WARRANTY

Limited Warranty	2 years
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COMPLIANCE INFORMATION

Approvals	CE; UL61010-1; IEC 61010-1; IEC62053-31
Housing	IP40 front panel, IP20 casing, Pollution Degree 2, IK08 impact rating
MID	2004/22/EC compliance



Not suitable for wet locations. For indoor use only.

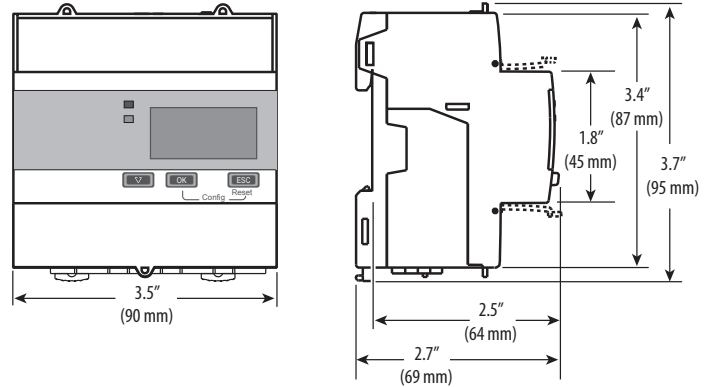
*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

ORDERING INFORMATION

	E53B3C	E54C3B	E54C3C
MEASUREMENT CAPABILITY			
Bi-directional Energy Measurements		•	•
Total Real Energy Import	•	•	•
Total Real Energy Export		•	•
Total Reactive Energy Import		•	•
Total Reactive Energy Export		•	•
Partial Real Energy Import	•	•	•
Partial Reactive Energy Import		•	•
Real Energy Import Per Tariff (T1 - T4)		•	•
Average Voltage		•	•
Current Per Phase		•	•
Real Power (kW)		•	•
Reactive Power (kVAR)		•	•
Apparent Power (kVA)		•	•
Power Factor		•	•
Frequency		•	•
Operation Time		•	•
Diagnostics Code	•	•	•
OUTPUTS			
Pulse	•		
Digital		•	•
Modbus Communication		•	•
INPUTS			
Direct In-line Measurement (current and voltage)		•	
1 or 5 A CTs	•		•

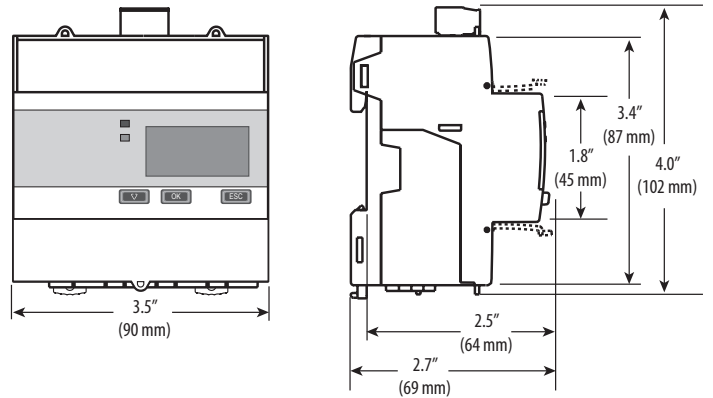
E53B3C

Dimensional Drawing



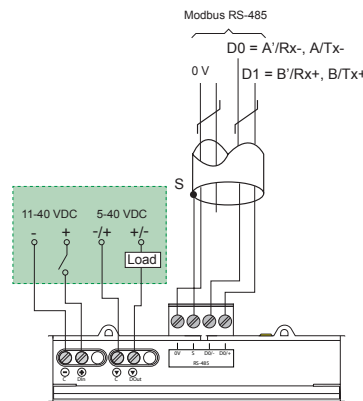
E54C3B/E54C3C

Dimensional Drawing



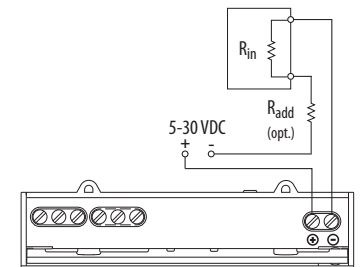
E54C3B/E54C3C DIGITAL OUTPUT

Wiring Diagram



E53B3C PULSE OUTPUT

Wiring Diagram



E61C20

Basic Power Monitoring with Ethernet Connection



E61C20

The E61C20 Panel Mount Power and Energy Meter provides basic four quadrant metering capability with Modbus communication via Ethernet cable. It includes voltage and current inputs with digital and optical outputs with a multi-tariff feature for storing accumulated energy data.

The E61C20 requires external power to operate.

SPECIFICATIONS

CONTROL POWER

AC	100 to 277 Vac _{L-N} ± 10%; 100 to 415 Vac _{L-L} ± 10%
DC	125 to 250 Vdc ± 20%
AC Burden	5 W/11 VA max. at 415 Vac
DC Burden	4 W max. at 125 Vdc
Frequency	50/60 Hz ± 5 Hz
Fuses	500 mA
Wire Size	0.82 to 3.31 mm ² (18 to 12 AWG)
Terminal Block Torque	0.5 to 0.6 N·m (4.4 to 5.3 in-lb)

VOLTAGE INPUTS

Measured Voltage	UL CAT III, 20-347V _{L-N} /35-600V _{L-L} (Delta) IEC CAT III, 20-400V _{L-N} /35-690V _{L-L}
Frequency	50/60 Hz

CURRENT INPUTS

Nominal Current	1 A or 5 A
Measured Current	5 mA to 8.5 A
Withstand	20 A continuous; 50 A@10 sec/hr; 500 A@1 sec/hr
Frequency	50/60 Hz

DIGITAL OUTPUT

Maximum Load Voltage	40 Vdc
Maximum Load Current	50 mA
On Resistance	50 Ω max.
Pulse Width	50% duty cycle
Pulse Frequency	25 Hz max.
Leakage Current	0.03 μA
Isolation	5 kV RMS

Ethernet

Easier Internet connection

Multi-tariff

Track power use at peak and off-peak times

APPLICATIONS

- Basic THD monitoring
- Industrial monitoring
- Energy and cost allocation
- Billing verification and energy procurement

Easy installation

Standard 96x96 mm size...easy installation with standard size and no-tool clips

Digital I/O

Synchronize with external pulses

LED OPTICAL OUTPUT

Pulse Width (orange LED)	200 μsec
Pulse Frequency	50 Hz max.

COMMUNICATION

Ethernet Port	10/100 Mbps; Modbus TCP/IP; 1 port
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MEASUREMENT ACCURACY

Accuracy	0.5%; IEC 61557-12 PMD/[SD][SS]/K70/0.5
Real Power and Energy	0.5%; Class 0.5 as per IEC 61557-12; Class 0.5S as per IEC 62053-22
Reactive Power and Energy	Class 2 as per IEC 61557-12; Class 2S as per IEC 62053-23
Current, Phase	0.5%; Class 0.5 as per IEC 61557-12
Voltage, L-N	0.5%; Class 0.5 as per IEC 61557-12

OPERATING CONDITIONS

Operating Temp. Range	-25 to 70 °C (-13 to 158 °F) 5 to 95% RH noncondensing Display functions to -25 °C with reduced performance
Storage Temp. Range	-40 to 85 °C (-40 to 185 °F)
Altitude of Operation	< 2000 m

WARRANTY

Limited Warranty	2 years
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COMPLIANCE INFORMATION

Approvals	CE; UL61010-1; IEC 61010-1; IEC62052-11; IEC61557-12
Housing	Pollution Degree 2, Installation Category III



* The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

Symbols per IEC 417 that may appear in this document

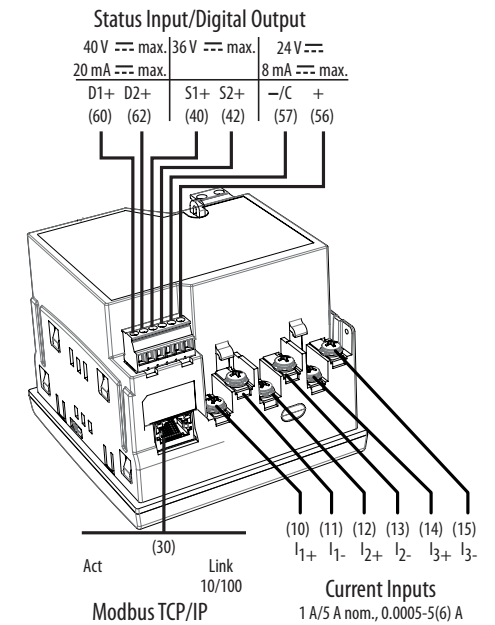
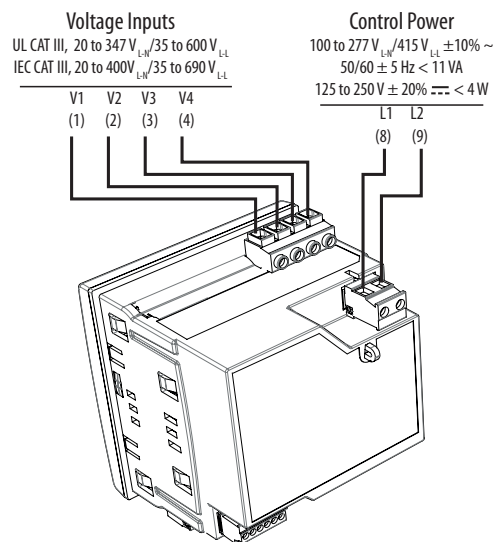
- ⎓ Direct Current (DC)
- ~ Alternating Current (AC)
- ⎓ AC/DC
- ⎓ 3phase AC



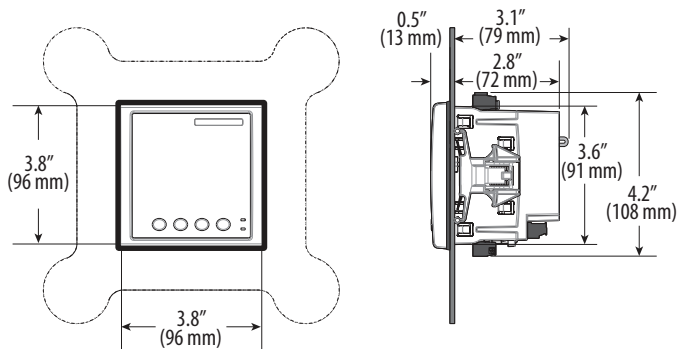
ORDERING INFORMATION

		E61C20
INSTANTANEOUS RMS VALUES		
Bi-directional energy measurements current (per phase and neutral)		•
Voltage (total, per phase L-L and L-N)		•
Frequency		•
Real, reactive, and apparent power (total and per phase)		•
True power factor (total and per phase)		•
ENERGY VALUES**		
Accumulated active, reactive and apparent energy		•
POWER QUALITY MEASUREMENTS		
THD, thd (Total Harmonic Distortion) I, VAC _{L-N} , VAC _{L-L} per phase		•
OTHER MEASUREMENTS		
Alarm counters and alarm logs		•
DATA RECORDING		
Min/max of instantaneous values, plus phase identification		•
Alarms with 1s timestamping		•
Data logging		•
DEMAND VALUES		
Current average		•
Active power		•
Reactive power		•
Apparent power		•
Demand calculation (sliding, fixed and rolling block, thermal methods)		•
Synchronization of the measurement window to input, communication command or internal clock		•
Settable demand intervals		•
INPUTS & OUTPUTS		
Two digital outputs (form A relay)		•
Two digital inputs with timestamp		•
Whetting voltage		•

WIRING DIAGRAMS



DIMENSIONAL DRAWING



H81XX SERIES

Sub-tenant Meter with Calibrated CTs for Superior System Accuracy



The H81xx Series Energy Meters are easy to install and provide exceptional system accuracy, making them ideal for all sub-metering applications.

Each meter is factory-matched with one to three split-core CTs. The meter/CT pairs are system-calibrated to provide excellent total system accuracies of 1% from 2% to 100% of the amperage rating of the CTs (e.g., 2 to 100 A with 100 A CTs). Matching serial numbers assure that the meter and CT were calibrated together (matching does not apply if using 100 A CTs).

The H81xx is easy to install. The split-core CTs virtually eliminate the need to remove electrical conductors, reducing installation time. The meter is also capable of detecting and correcting phase reversal, eliminating the need for concern about CT load orientation. The convenient color coding of the CTs and voltage leads make correct connection simple.

SPECIFICATIONS

INPUTS (VOLTAGE)	
H8150	90 to 132 Vac line-to-neutral
H8163	90 to 300 Vac line-to-neutral
ACCURACY	
System Accuracy	±1% of reading from 2% to 100% of the rated current of the CTs, accomplished by matching the CTs with electronics and calibrating them as a system
Sample Rate	1280 Hz
OUTPUTS	
LCD Display All Models	1.2" x 3.8" (31 mm x 97 mm) viewing area, 160 segments, backlit with LCD
H8163 ONLY	
Pulse Output	Normally open, Opto-FET, 100 mA@24 Vac/dc
Pulse Rate	0.10 ¹ , 0.25 ² , 0.50, or 1.00 kWh per pulse
Pulse Width	200 msec closed
Phase Loss Alarm	N.O. (opens on alarm), Opto-FET, 100 mA @ 24 Vac/dc; fixed threshold 25% below

Revenue grade measurements

Meets ANSI C12.20 Class 0.2 standards

Equipment protection

Phase-loss alarm (H8163)

LCD display

High resolution backlit LCD display provides clear readings at a distance...reduces the risk of data misinterpretation. Back-lighting can be disabled if desired.

Easy connection

H8163 provides a pulse output from 1/10 to 1 pulse per kWh for easy connection to existing control or data acquisition systems

Reduce installation costs

With the optional communications board (H81xx-CB), the H81xx can easily be added to a Modbus, BACnet or N2 control system network to report multiple variables including kW, kWh, kVAR, PF, amps and volts, providing crucial power information at a reduced installation cost

APPLICATIONS

- Commercial tenant sub-metering
- Performance contracting
- Allocating costs
- Real-time power monitoring via local display or through control/data acquisition systems

ENVIRONMENTAL	
Protection Class	NEMA 1
Altitude of Operation	2000 m
Operating Temp Range	0 to 50 °C (32 to 122 °F)
Storage Temp Range	-40 to 70 °C (-40 to 158 °F)
Humidity Range	0 to 95% non-condensing; indoor use only
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL61010-1, Cat. III, Pollution Degree 2

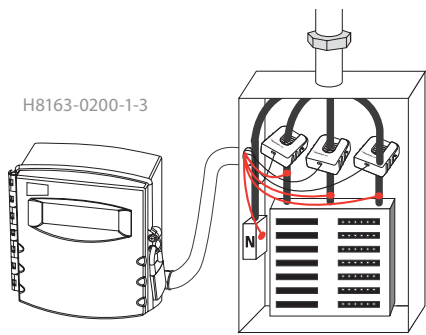


Approved for California CSI Solar applications (check the CSI website for model numbers).
 1. Not supported at >1600 A.
 2. Not supported at >2400 A.
 Note: Meter and CTs serial numbers must match, except for 100A CTs. Neutral voltage connection is required.



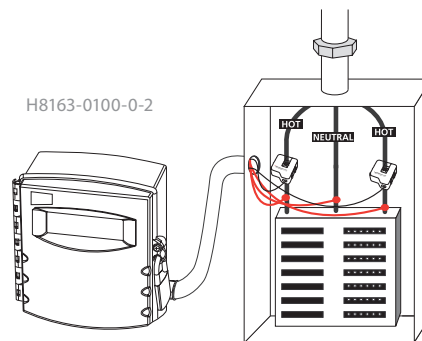
208/120 Vac, 4-WIRE, 3Ø, 200 A SERVICE

Wiring Diagram



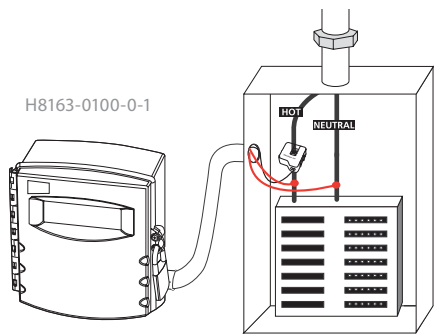
240 Vac, 3-WIRE, SINGLE PHASE, 100 A SERVICE

Wiring Diagram

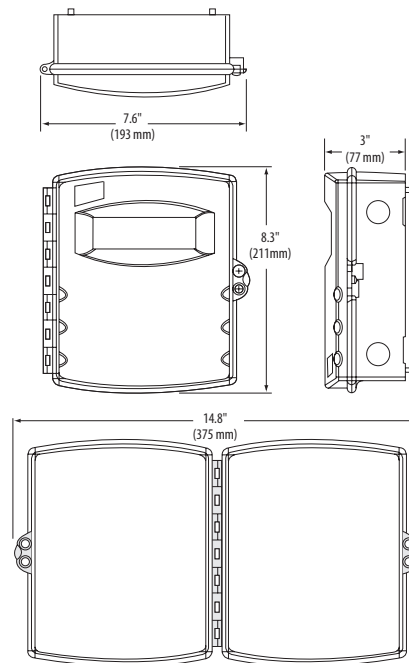


120 Vac, 2-WIRE, SINGLE PHASE, 100 A SERVICE

Wiring Diagram



DIMENSIONAL DRAWING



DATA OUTPUTS

- kWh, Consumption
- kW, Real power
- kVAR, Reactive power
- kVA, Apparent power
- Power factor
- Voltage, line to line
- Voltage, line to neutral
- Amps, Average current
- kW, Real Power ØA
- kW, Real Power ØB
- kW, Real Power ØC
- Power factor ØA
- Power factor ØB
- Power factor ØC
- Voltage, ØA to ØB

- Voltage, ØB to ØC
- Voltage, ØA to ØC
- Voltage, ØA to Neutral
- Voltage, ØB to Neutral
- Voltage, ØC to Neutral
- Amps, Current ØA
- Amps, Current ØB
- Amps, Current ØC
- Demand kW and kVAR *
- Peak Demand *
- Time Stamp *

* With H8163-CB Communications Board installed

ORDERING INFORMATION

120 Vac to 240 Vac (nom.)

AMPS	1 CT	2 CTs	3 CTs	VOLTAGE	OUTPUT
100 Micro	H8150-0100-0-1	H8150-0100-0-2	H8150-0100-0-3	120 Vac L-N	Display Only
200 Mini	H8150-0200-1-1	H8150-0200-1-2	H8150-0200-1-3		
300 Small	H8150-0300-2-1	H8150-0300-2-2	H8150-0300-2-3		
400 Med		H8150-0400-3-2	H8150-0400-3-3		
800 Med		H8150-0800-3-2	H8150-0800-3-3		
800 Lg			H8150-0800-4-3		
1600 Lg			H8150-01600-4-3		
2400 Lg			H8150-2400-4-3		

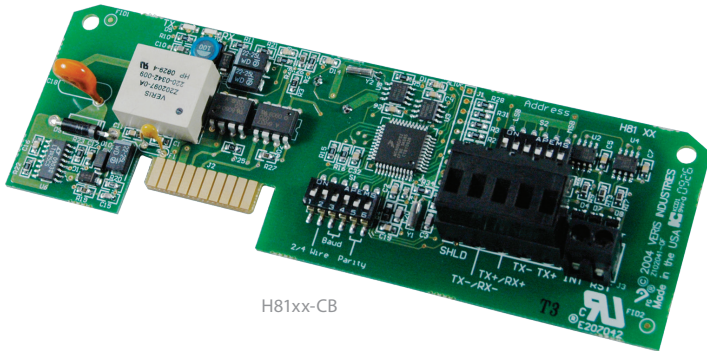
120 Vac to 480 Vac (nom.) with Pulse and Phase Loss Outputs

AMPS	1 CT	2 CTs	3 CTs	VOLTAGE	OUTPUT
100 Micro	H8163-0100-0-1	H8163-0100-0-2	H8163-0100-0-3	120 to 480 Vac	Pulse & Phase Loss
200 Mini	H8163-0200-1-1	H8163-0200-1-2	H8163-0200-1-3		
300 Small	H8163-0300-2-1	H8163-0300-2-2	H8163-0300-2-3		
400 Med		H8163-0400-3-2	H8163-0400-3-3		
800 Med		H8163-0800-3-2	H8163-0800-3-3		
800 Lg			H8163-0800-4-3		
1600 Lg			H8163-01600-4-3		
2400 Lg			H8163-2400-4-3		



H81XX-CB SERIES

Available with Modbus, BACnet, or N2 Protocols



H81xx-CB

With the optional H81xx Communications Board, the H81xx Series energy meters connect easily to control/data systems networks using Modbus, BACnet, and Metasys (N2) protocols. The H81xx-CB reports energy and power diagnostic information including kW, kWh, kVAR, PF, amps, volts, and more.

The H81xx-CB is easy to install in the field. On-board switches provide a convenient means of setting network configuration parameters such as parity, baud rate, and network wiring (2-wire or 4-wire).* Status LEDs provide quick confirmation of successful installation.

* H8163-CB only

Field-selectable baud rate

Field-selectable baud rate: 2400, 4800, 9600, or 19200 (9600, 19200, or 38400 for H8186-CB)

Dual demand measurement

Measure interval demand and sub-interval demand*

Easy networking

Easily network to existing systems via RS-485 connection

2- & 4-wire

Works with 2-wire and 4-wire systems*

Field-selectable parity

Field-selectable parity: odd/even/none*

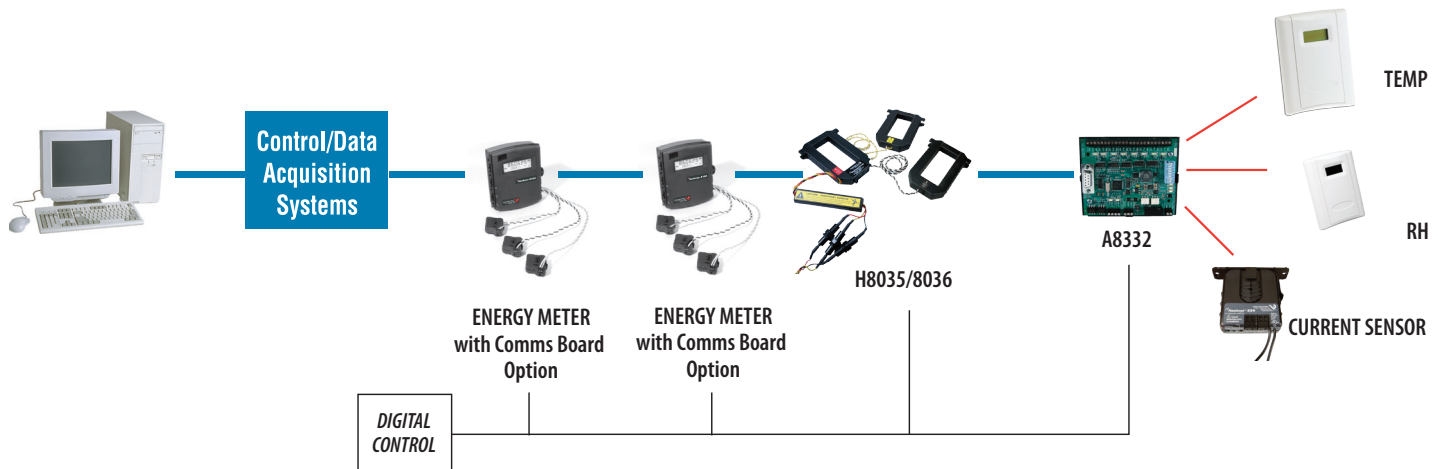
*H8163-CB only.

APPLICATIONS

- Commercial tenant sub-metering
- Performance contracting
- Cost allocation
- Real-time power monitoring through control/data acquisition systems
- Facility trending



MODBUS APPLICATION



ORDERING INFORMATION



MODEL	DESCRIPTION
H8163-CB	Modbus Communications Board for H81xx Series
H8186-CB	BACnet Communications Board for H81xx Series
H8126-CB	Metasys N2 Communications Board for H81xx Series

For other communication protocols, contact factory.
 For Modbus to LON conversion, use H8163-CB and H8920-3 gateway.

ATTENTION
 H81xxCB Series interfaces are sold as open devices.
 Observe handling precautions for static sensitive
 devices to avoid damage to the circuitry which
 would not be covered under the factory warranty.



H84XXV, H84XXVB, & H84XXVBS SERIES

Revenue Grade Power Meter for Voltage Mode CTs



The H84xxV, H84xxVB, and H84xxVBS Series digital power meters deliver high accuracy and high value at a competitive price.

Whether you are looking for a 1-phase pulse output meter to monitor kWh, or a 3-phase communicating meter to monitor THD, the H84xxV Series has the right meter for you, in panel and wall mounting styles for your convenience.

The pulse output unit offers two pulse outputs. While kWh is standard, the second pulse output provides a field-selectable choice between phase loss or kVARh.

The Modbus communications unit offers a choice between two data outputs, Full Data Set (FDS) or Extended Data Set (EDS). Data points are listed on the next page.

SPECIFICATIONS

INPUTS	
Control Power	100 to 415 ± 10% Vac, 5 VA, 45 to 60 Hz*
DC	125 to 250 Vdc ± 20% Vdc, 3 W, external current limiting required
Voltage Input	UL: 600 Vac; CE: 300 Vac (L-N)
CURRENT INPUT	
CT Scaling	Primary: Adjustable from 5 A to 32,767 A
Measurement Input Range	1 V RMS full scale (+20% over-range). CTs must be rated for use with Class 1 voltage inputs
ACCURACY	
Current and Voltage	0.5%
Power	ANSI C12.16, 1%
Measurement - True RMS	True RMS up to 15th harmonic, 3-phase AC System
OUTPUTS	
Pulse Output #1	(kWh) N.O. Static Output (240 Vac or 300 Vdc, 100 mA max. @ 25 °C, derate 0.56 mA per °C above 25 °C) 2.41 kV RMS isolation

Revenue grade measurements

Meets ANSI C12.20 Class 0.2 standards

Mounting flexibility

Panel, wall, DIN rail mount

Intuitive navigation

Context-sensitive menus for easy use

Real-time

Real-time power monitoring via local display or through control/data acquisition systems

Trouble-free installation

Automatically detects and corrects phase reversal, eliminating the need to be concerned with CT load orientation

Large display

Large, easy-to-read display

APPLICATIONS

- Energy monitoring in building automation systems
- Renewable energy
- Energy management
- Commercial sub-metering
- Industrial monitoring
- Cost allocation

Pulse Output #2 (H8463V/VB/VBS)	(Phase Loss or kVARh) N.C. Static Output (240 Vac or 300 Vdc, 100 mA max. @ 25 °C, derate 0.56 mA per °C above 25 °C) 2.41 kV RMS isolation
---------------------------------	---

MECHANICAL	
Weight	H84xxV: 0.8 lbs; H84xxVB: 6.35 lbs; H84xxVBS: 9.15 lbs
Protection Class	V: IP40 front, IP30 back; VB: NEMA 1, IP40
ENVIRONMENTAL	
Altitude of Operation	3000 m
Operating Temp Range	Meter: 0 to 60 °C (32 to 140 °F); Display: -10 to 50 °C (14 to 122 °F)
Storage Temp Range	Meter and Display: -40 to 85 °C (-40 to 185 °F)
Humidity Range	0 to 95% non-condensing; indoor use only
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL508; Cat. III, Pollution Degree 2, for distribution systems up to 347VAC (L-N)/600VAC (L-L); CE per IEC61010-1, Cat. III, Pollution Degree 2, for distribution systems up to 300 Vac (L-N)/480 Vac (L-L)



* For control voltages >415 Vac to 600 Vac order H84xxVBS.

**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

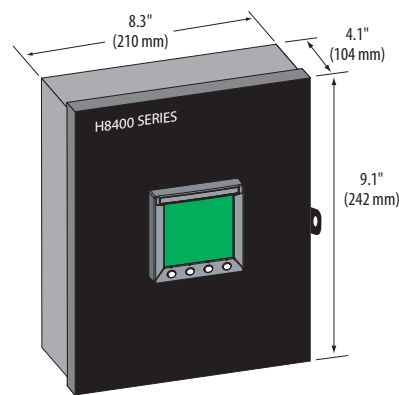
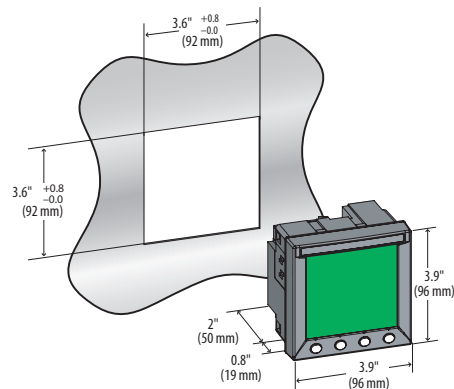


ORDERING INFORMATION

MODEL	DESCRIPTION	DATA OUTPUT		DISPLAY SCREENS	
	PANEL MOUNT - 120 to 480 V (For Control Voltages > 415 Vac to 600 Vac, order H84xxVBS)	Pulse	Modbus	FDS	EDS
H8463V*	Panel Mount, 1 V, CT Input, FDS	•		•	
H8453V*	Panel Mount, 1 V, CT Input, FDS	•		•	
H8436V	Panel Mount, 1 V, CT Input, FDS		•	•	
H8437V	Panel Mount, 1 V, CT Input, EDS		•		•
	WALL MOUNT - 120 to 480 V (For Control Voltages > 415 Vac to 600 Vac, order H84xxVBS)	Pulse	Modbus	FDS	EDS
H8463VB*	Wall Mount, 1 V, CT Input, FDS	•		•	
H8453VB*	Wall Mount, 1 V, CT Input, FDS	•		•	
H8436VB	Wall Mount, 1 V, CT Input, FDS		•	•	
H8437VB	Wall Mount, 1 V, CT Input, EDS		•		•
	WALL MOUNT - 240-600V	Pulse	Modbus	FDS	EDS
H8463VBS*	Wall Mount, 1 V, CT Input, FDS, 240 to 600 V	•		•	
H8453VBS**	Wall Mount, 1 V, CT Input, FDS, 240 to 600 V	•		•	
H8436VBS	Wall Mount, 1 V, CT Input, FDS, 240 to 600 V		•	•	
H8437VBS	Wall Mount, 1 V, CT Input, FDS, 240 to 600 V		•		•

*The H8453 has two normally open solid-state outputs: one kWh and one field-selectable for phase loss or kVARh. The H8463 has one normally open output (kWh) and one normally closed output (field selectable for phase loss or kVAR).

DIMENSIONAL DRAWINGS



DATA OUTPUTS

H8436: Full Data Set (FDS)

- kWh, Consumption
- kW, Real Power
- kVAR, Reactive power
- kVA, Apparent power
- Power factor
- Voltage, line to line
- Voltage, line to neutral
- Amps, Average current
- kW, Real power ØA
- kW, Real power ØB
- kW, Real power ØC
- Power factor ØA
- Power factor ØB
- Power factor ØC
- Voltage, ØA to ØB
- Voltage, ØB to ØC
- Voltage, ØA to ØC
- Voltage, ØA to Neutral
- Voltage, ØB to Neutral
- Voltage, ØC to Neutral
- Amps, Current ØA
- Amps, Current ØB
- Amps, Current ØC

H8437: Extended Data Set (EDS)

- (FDS Plus):
- Amps, Current Neutral
- Frequency
- kVAh, Consumption
- kVARh, Consumption
- Minimum Real power
- Maximum Real power
- KVA, Apparent Power, Per Phase
- KVAR, Reactive Power, Per Phase
- KW, Total Real Power Present Demand
- KVA, Total Apparent Power Present Demand
- KVAR, Total Reactive Power Present Demand
- KW, Total Real Power Max Demand
- KVA, Total Apparent Power Max Demand
- KVAR, Total Reactive Power Max Demand
- THD, Voltage A-N, B-N, C-N
- THD, Voltage A-B, B-C, A-C
- THD, Current, Per Phase
- Usage Hours
- Usage Minutes
- Total Hours
- Total Minutes

COMPANION CURRENT TRANSFORMERS

(Model/Amps) (Output Type)

H681 - 1V = 0 to 1 Vac

Small:
 0-100 = 100 A
 0-200 = 200 A
 0-300 = 300 A

Medium:
 1-400 = 400 A
 1-600 = 600 A
 1-800 = 800 A

Large:
 2-800 = 800 A
 2-1600 = 1600 A
 2-2000 = 2000 A
 2-2400 = 2400 A

Example:
 H681 2-800 - 1V





POWER MONITORING MULTI-CIRCUIT

Veris leads the way with a complete line of innovative power monitoring solutions that save time and money. Veris power monitors are available with popular communication protocols that allow for labor-saving networked wiring, and standard pulse and analog outputs as well. Earn LEED™ points and make Veris power monitors part of your energy conservation plan.

MODEL	DESCRIPTION	PAGE
E34	Multi-circuit Meter	43
E30, E31	Panelboard Monitoring System	45

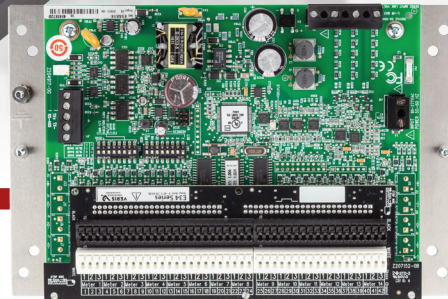
See following pages for selection guides.

Minimize Costs and Space per Meter

Install one device and add
up to 28 three-phase meters



E34E



E34A

E34x Series Multi-Circuit Meter

Affordable Metering Point

Add many metering points with low equipment and installation costs.

Common CTs, 1/3V Outputs

Eliminates need for shorting blocks and allows long CT lead extensions without compromising accuracy.

Revenue Grade Measurement

ANSI & IEC Class 0.5% accuracy, ideal for tenant billing.

Configure the Meters You Want

User-configurable to any combination of 1, 2, or 3-phase meters.

Interested in learning more about the innovative E34x capabilities capabilities and applications?

Contact a Power Monitoring Multi-Circuit Specialist today: 800.354.8556 or at sales@veris.com

See Product Specifications on page 43



800.354.8556

| +1 503.598.4564

| sales@veris.com

| intl@veris.com

| www.veris.com

MULTI-CIRCUIT ENERGY/ POWER METERS GUIDE

NEW PANELBOARDS

90 TO 300 V LINE-TO-NEUTRAL SERVICE VOLTAGE, WITH LOADS UP TO 120 A PER BRANCH

MAX. # OF BRANCHES:	24	36	42	48	72	84
3/4" CT spacing			E30x042			E30x084
1" CT spacing			E30x142			E30x184
18 mm CT spacing	E30x224	E30x236	E30x242	E30x248	E30x272	E30x284

For BACnet IP or MS/TP on A, B, or C models, add the E8951 Modbus-to-BACnet converter (see Network Integration section for more information).

Four levels of functionality available (x = A, B, C or E):

- A = Power/Energy for Branches & Mains
- B = Power/Energy for Mains, Current only for Branches
- C = Current only for Branches & Mains
- E = Power/Energy for Branches & Mains; integrated Ethernet with Modbus TCP, BACnet and SNMP

PANELBOARD RETROFITS

90 TO 300 V LINE-TO-NEUTRAL SERVICE VOLTAGE, WITH LOADS UP TO 240 A PER BRANCH

MAX. # OF BRANCHES:	42	84
With 50A Branch CTs & 4' round ribbon cables	E31x42	E31x84
Order Branch CTs & ribbon cables separately	E31x002	E31x004

For BACnet IP or MS/TP on A, B, or C models, add the E8951 Modbus-to-BACnet converter (see Network Integration section for more information).

Four levels of functionality available (x = A, B, C or E):

- A = Power/Energy for Branches & Mains
- B = Power/Energy for Mains, Current only for Branches
- C = Current only for Branches & Mains
- E = Power/Energy for Branches & Mains; integrated Ethernet

MULTIPLE 3-PHASE LOADS

90 TO 300 V LINE-TO-NEUTRAL SERVICE VOLTAGE, SUPPORTS CTS WITH 0.333 V SECONDARY

'A' - MODBUS RTU ONLY	'E' - INTEGRATED ETHERNET	NUMBER OF METERS			
		3-PHASE WITHOUT NEUTRAL	3-PHASE WITH NEUTRAL	2-PHASE	1-PHASE
E34A04	E34E04	4	3	6	12
E34A08	E34E08	8	6	12	24
E34A14	E34E14	14	10	21	42
E34A28	E34E28	28	21	42	84

For BACnet IP or MS/TP on 'A' models, add the E8951 Modbus-to-BACnet converter (see Network Integration section for more information).

Branch Circuit Power Monitoring for New Panels
E30, E30E

Branch Circuit Power Monitoring for existing Panel Retrofits
E31

Power Monitoring up to 28 3-Phase Meters
E34



FLEXIBLE POWER MONITORING

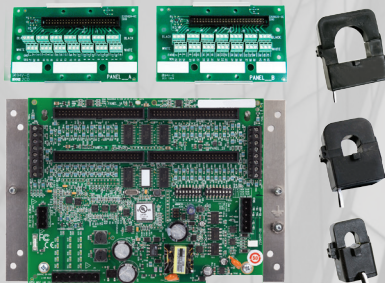


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NEW PANELBOARD INSTALLATIONS

E30 SERIES

Monitor up to 84 branch circuits, two 3-phase mains, and two neutrals in one compact meter. Designed to be integrated into any brand of panelboard, the E30 provides the data you need to monitor multiple PDUs, RPPs, key areas of buildings, or customer spaces.



page 45

RETROFIT PANELBOARD INSTALLATIONS

E31 SERIES

Monitor up to 84 branch circuits, two 3-phase mains, and two neutrals in one flexible meter. Designed to be field installed into existing panels, the E31 offers a main board and two or four adapter boards that can be integrated into the existing panel or remote mounted in a separate enclosure. Varying the ribbon cable and CT lead length gives you the ultimate flexibility to install metering in tight spaces and/or critical power panels.



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MULTI-CIRCUIT METER

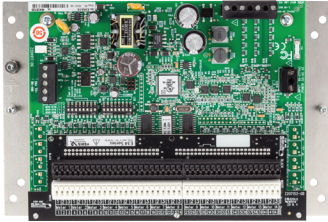
E34 SERIES

Add many 1-phase, 2-phase or 3-phase metering points with a single product. Saves on both equipment and installation costs as compared to individual meters.



E34X SERIES

Add Up to 28 3-Phase Meters by Installing One Device



E34A



E34E

The E34x Series Multi-Circuit Meters make it easy to add many revenue grade metering points without having to purchase, mount, wire and commission individual energy meters. Simply add a single device with common voltage inputs and communication interface that can measure the current, voltage, power and energy consumption of up to (14) 3-phase circuits with a single board or up to (28) 3-phase circuits with a two board configuration. Save on the cost of both equipment and installation.

To aid in commissioning, a configuration software tool, an Ethernet discovery tool (for the E34E) and a Commissioning Guide are available at no cost at www.veris.com/modbus.

SPECIFICATIONS

VOLTAGE INPUTS

Measurement Voltage	90 to 300 Vac line-to-neutral, 50/60 Hz
Control Power	E34A: 90 to 277 Vac line-to-neutral, 50/60 Hz, 8 VA E34E: 100 to 277 Vac line-to-neutral, 50/60 Hz, 15 VA

ACCURACY

Power/Energy	IEC 62053-21 Class 0.5, ANSI C12.20 class 0.5
Voltage	±0.5% of reading 90 to 277 V line-to-neutral
Current	±0.5% of reading from 2% to 100% of full-scale

OPERATION

Sampling Frequency	2560 Hz
Update Rate	2 seconds (both panels)
Overload Capability	22 kAIC

E34A SERIAL COMMUNICATION

Physical Interface	DIP switch-selectable 2-wire or 4-wire, RS-485
Protocols Supported	Modbus RTU
Address	DIP switch-selectable address 1 to 247 (in pairs of 2)*
Baud Rate	DIP switch-selectable 9600, 19200, 38400
Parity	DIP switch-selectable NONE, ODD, EVEN

E34E SERIAL COMMUNICATION

Physical Interface	2-wire RS-485
Protocols Supported	Modbus RTU or BACnet MSTP

Affordable metering points

Add many metering points with lower equipment and installation cost than traditional alternatives.

Common CTs, 1/3V outputs

Eliminates need for shorting blocks and allows long CT lead extensions without compromising accuracy. Choose from a range of CT styles & sizes.

Configure the meters you want

Choose 4, 8, 14 or 28 3-phase meters. User-configurable to any combination of 1-, 2-, 3-phase meters. Reconfigure channels as needed to monitor neutral current.

Revenue grade measurements

ANSI & IEC Class 0.5% provides the accuracy needed for tenant billing applications.

The protocol you need

Modbus RTU standard on all models. E34E models add BACnet MS/TP and Modbus TCP, BACnet IP (with BBMD support) and SNMP via Ethernet.

APPLICATIONS

- Commercial and residential sub-tenant billing
- Demand/response
- Load-based cost allocation
- Overload protection
- Load balancing
- Energy management

Address Range	1 to 247 for Modbus RTU; 0-127 for BACnet MS/TP
Baud Rate	9600, 19200, 38400
Parity	Modbus RTU: NONE, ODD, EVEN BACnet MS/TP: NONE (fixed)

E34E ETHERNET COMMUNICATION

Physical Interface	RJ45 connector with 10/100 Mbit Ethernet
Protocols Supported	Modbus TCP, BACnet IP, SNMP V2c

TERMINAL BLOCK TORQUE

Removable Connectors	4.4 to 5.3 in-lb (0.5 to 0.6 N-m)
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OPERATING CONDITIONS

Operating Temp. Range	0 to 60 °C (32 to 140 °F) (<95% RH non-condensing)*
Storage Temp. Range	-40 to 70 °C (-40 to 158 °F)
Altitude of Operation	3000 m

WARRANTY

Limited Warranty	5 years
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COMPLIANCE INFORMATION

Agency Approvals	UL508 open type device, IEC/EN61010-1
Installation Category	Cat III, pollution degree 2



*Indoor use only.
**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



MEASUREMENTS

Real Time Measurements	Current: multi-phase average and per phase
	Current phase angle per branch
	Real power (kW): multi-phase total and per phase
	Apparent power (kVA): multi-phase total and per phase
	Power factor: multi-phase average and per phase
Demand Measurements	Current present demand: multi-phase average and per phase
	Real power (kW) present demand: multi-phase average and per phase
Historic Maximums	Maximum instantaneous current: multi-phase average and per phase
	Maximum current demand: multi-phase average and per phase
	Maximum real power demand: multi-phase total and per phase
Accumulated Energy	Energy (kWh): multi-phase total and per phase
Energy Snapshots	Energy (kWh): multi-phase total and per phase
MODBUS ALARMS	
Alarms	Voltage over/under
	Branch current over/under
	Mains current over/under

NUMBER OF METERS SUPPORTED

E34A MODBUS RTU ONLY	E34E INTEGRATED ETHERNET	NUMBER OF METERS			
		3-PHASE WITHOUT NEUTRAL	3-PHASE WITH NEUTRAL	2-PHASE	1-PHASE
E34A04	E34E04	4	3	6	12
E34A08	E34E08	8	6	12	24
E34A14	E34E14	14	10	21	42
E34A28	E34E28	28	21	42	84

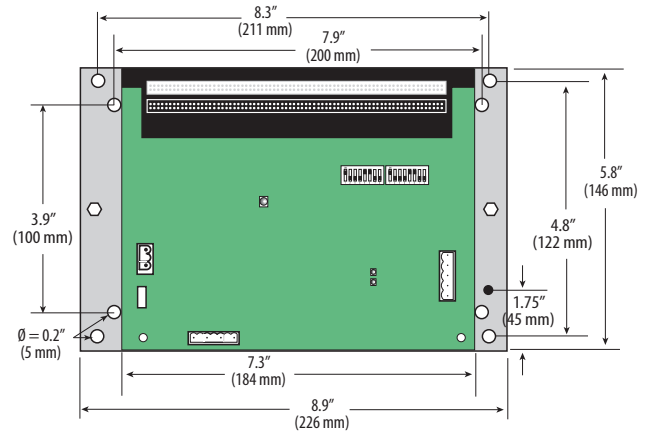
ORDERING INFORMATION

<p>Communication Option</p> <p>E34 <input type="checkbox"/></p> <p>A = Modbus RTU Only E = Integrated Ethernet with Modbus, BACnet & SNMP</p>	<p>Number of 3-Phase Meters</p> <p><input type="checkbox"/></p> <p>4 = 4 (3-phase) meters 8 = 8 (3-phase) meters 14 = 14 (3-phase) meters 28 = 28 (3-phase) meters</p>	<p>Example:</p> <p>E34 <input type="checkbox"/> A <input type="checkbox"/> 14 <input type="checkbox"/></p>
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Note: CTs must be ordered separately. Use 0 to 0.333 V CTs rated for use with Class 1 voltage inputs.

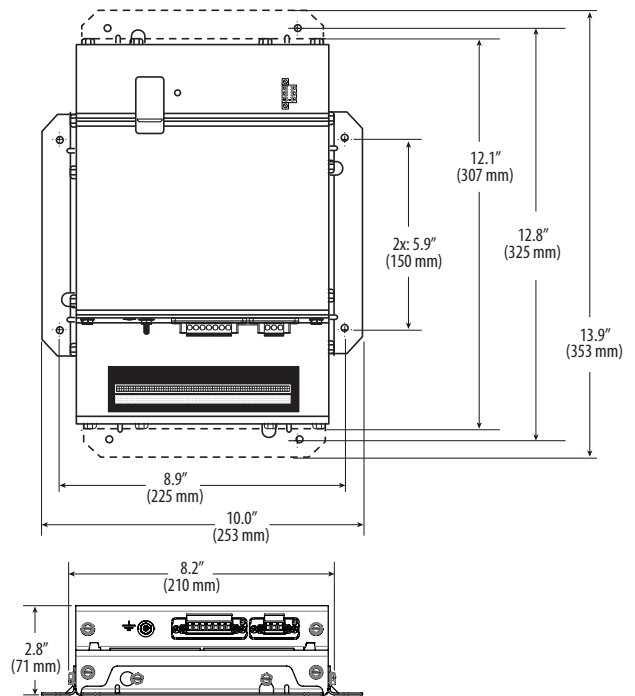
E34A BASE BOARD

Dimensional Drawing



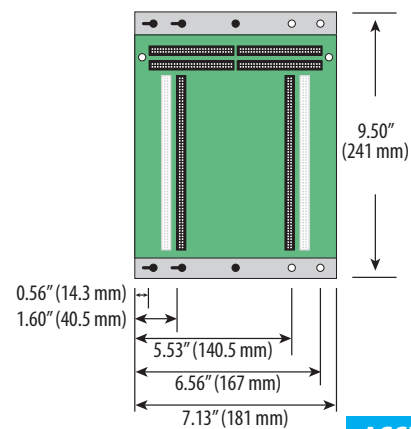
E34E MAIN UNIT

Dimensional Drawing



28-METER CT ADAPTER ASSEMBLY

Dimensional Drawing

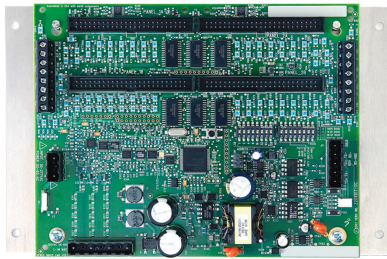


ACCESSORIES P. 81



E30 & E31 SERIES

Monitor Entire Panelboards with One Device



E3xA/B/C



E3xE

Integrated Ethernet with SNMP, BACnet, & Modbus

The E30 & E31 Series Panelboard Monitoring System provides a cost effective solution for electrical load management, making it ideally suited for applications where loads are dynamic, such as the data storage industry, lighting panels, etc.

The E30 & E31 Series monitors the current, voltage, instantaneous power, demand, and energy consumption of each circuit in a panelboard including the main feed.* As a circuit approaches the user-configured thresholds, alarm indicators are triggered, preventing costly downtime from overloaded circuits or failed loads. (See graph, facing page).

* E3xB/C models have less capability.

SPECIFICATIONS

INPUTS	
Input Power	E3xA/B/C: 90 to 277 Vac line-to-neutral, 50/60 Hz, 8 VA E3xE: 100 to 277 Vac line-to-neutral, 50/60 Hz, 15 VA
ACCURACY	
Power/Energy	IEC 62053-21 Class 1, ANSI C12.1-2008. 1% system accuracy (includes main board and 50 A or 100 A branch CTs)
Voltage	±0.5% of reading 90 to 277 Vac line-to-neutral
Current	±0.5% of reading
Minimum ON Current	50 mA
OPERATION	
Sampling Frequency	2560 Hz
Update Rate	2 seconds (both panels)
Overload Capability	22 kAIC
OUTPUTS	
Serial Protocols	All: Modbus RTU E3xE models: BACnet MSTP
Serial Connection	All: 2-wire, RS-485 E3xA/B/C models: 4-wire RS-485
Address	E3xA/B/C models: Selectable address 1 to 247 (uses 2 addresses for Modbus RTU) E3xE models: Selectable at address 1 to 247 for Modbus RTU; 0 to 127 for BACnet MS/TP
Baud Rate	All: 9600, 19200, 38400 (selectable on A/B/C models)

Revenue grade

ANSI and IEC Class 1 metering system accuracy including branch CTs

50 mA to 100 A

Widest dynamic range in the industry, 50 mA to 100 A monitoring

Versatility

Flexible installation with 3/4", 1", or 18 mm spaced solid-core branch CT strips

Retrofit or new construction

New construction and retrofit applications with solid-core and split-core CT models

Up to 92 Channels

Monitor up to 92 circuits per unit providing unlimited possibilities for monitoring

Configure the meters you want

Choose 4, 8, 14 or 28 3-phase meters. User-configurable to any combination of 1-, 2-, 3-phase meters. Reconfigure channels as needed to monitor neutral current.

APPLICATIONS

- Load-based cost allocation
- Overload protection
- Data center PDUs
- Sub-tenant billing
- Lighting control panels
- Load management
- Load balancing
- Energy management

Parity	All: Modbus RTU: NONE, ODD, EVEN (selectable on A/B/C models) E3xE models: BACnet MS/TP: NONE (fixed)
Terminal Block Torque	4.4 to 5.3 in-lb (0.5 to 0.6 N-m)
Ethernet Protocols	All: Modbus TCP E3xE models: BACnet IP, SNMP V2c
Ethernet Connection	E3xE models only: RJ-45 10/100 Mbit

ENVIRONMENTAL

Operating Range	0 to 60 °C (32 to 140 °F) (<95% RH non-condensing)*
Storage Temp Range	-40 to 70 °C (-40 to 158 °F)
Altitude of Operation	3000 m

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL508, EN61010-1, Cat. III, pollution degree 2
Type Approval***	California Code of Regulations, Title 4, Division 9, Article 1. National Uniformity Exceptions and Additions, 2016 edition



* Indoor use only.

**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

***E30xxx (solid-core) models only.



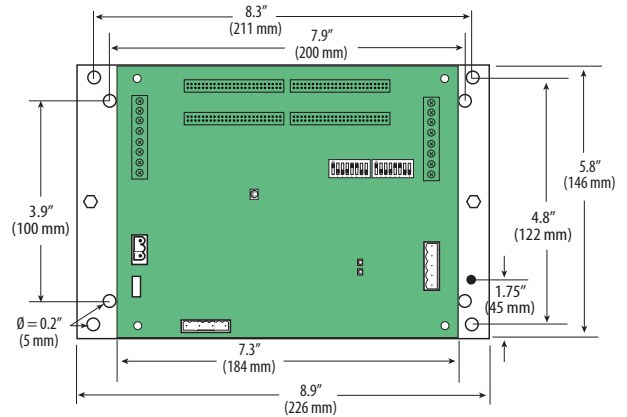
PRODUCT CAPABILITIES

	E3xA	E3xB	E3xC	E3xE
MONITORING AT MAINS				
Current per phase	•	•	•	•
Max. current per phase	•	•	•	•
Current demand per phase	•	•	•	•
Max. current demand per phase	•	•	•	•
Current phase angle	•	•		•
Energy (kWh) per phase	•	•		•
Real Power (kW) per phase	•	•		•
Apparent Power (kVA)	•	•		•
Power factor total*	•	•		•
Power factor per phase	•	•		•
Voltage, L-L and average	•	•		•
Voltage, L-N and average	•	•		•
Voltage, L-N and per phase	•	•		•
Frequency (phase A)	•	•		•
MONITORING AT BRANCH CIRCUIT				
Current	•	•	•	•
Max. current	•	•	•	•
Current demand	•	•	•	•
Max. current demand	•	•	•	•
Current phase angle	•	•		•
Real power (kW)	•	•		•
Real power (kW) demand	•	•		•
Real power (kW) demand max.	•	•		•
Energy (kWh) per circuit	•	•		•
Power factor	•	•		•
Apparent Power (kVA)	•	•		•
MODBUS ALARMS				
Voltage over/under	•	•		•
Current over/under	•	•	•	•
PROTOCOLS SUPPORTED				
Modbus RTU	•	•	•	•
Modbus TCP	**	**	**	•
BACnet MS/TP	†	†	†	•
BACnet IP with BBMD support	†	†	†	•
SNMP V2	‡	‡	‡	•

* Based on a 3-phase breaker rotation.
 ** With UO13-0012 or E8951 added.
 † With E8951 added.
 ‡ With E8951 added; requires one E8951 for each meter.

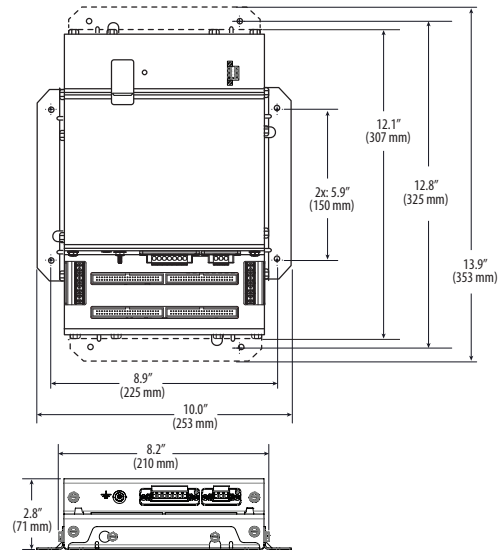
E30A/B/C & E31A/B/C MAIN BOARD

Dimensional Drawing

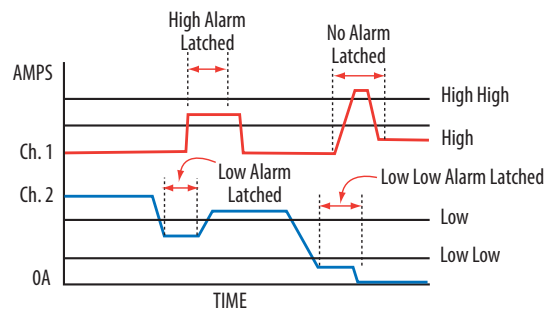


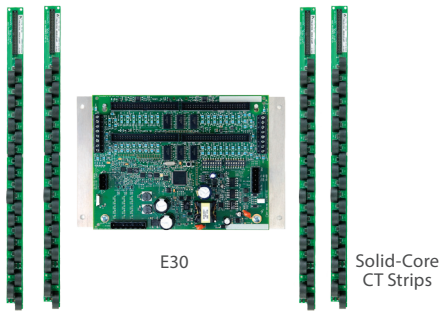
E30E & E31E

Dimensional Drawing

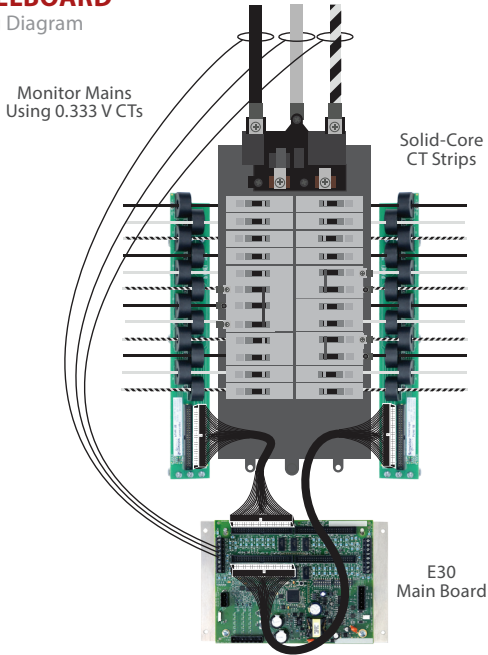


OPERATION EXAMPLE





PANELBOARD
Wiring Diagram



SOLID-CORE BRANCH CTs

	100 A SOLID-CORE BRANCH CT
Voltage Rating	300 Vac
Temperature	0 to 60 °C
Agency	EN61010-1

ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

Observe precautions for handling static sensitive devices to avoid damage to the circuitry that is not covered under the factory warranty.

E30 (SOLID-CORE) ORDERING INFORMATION

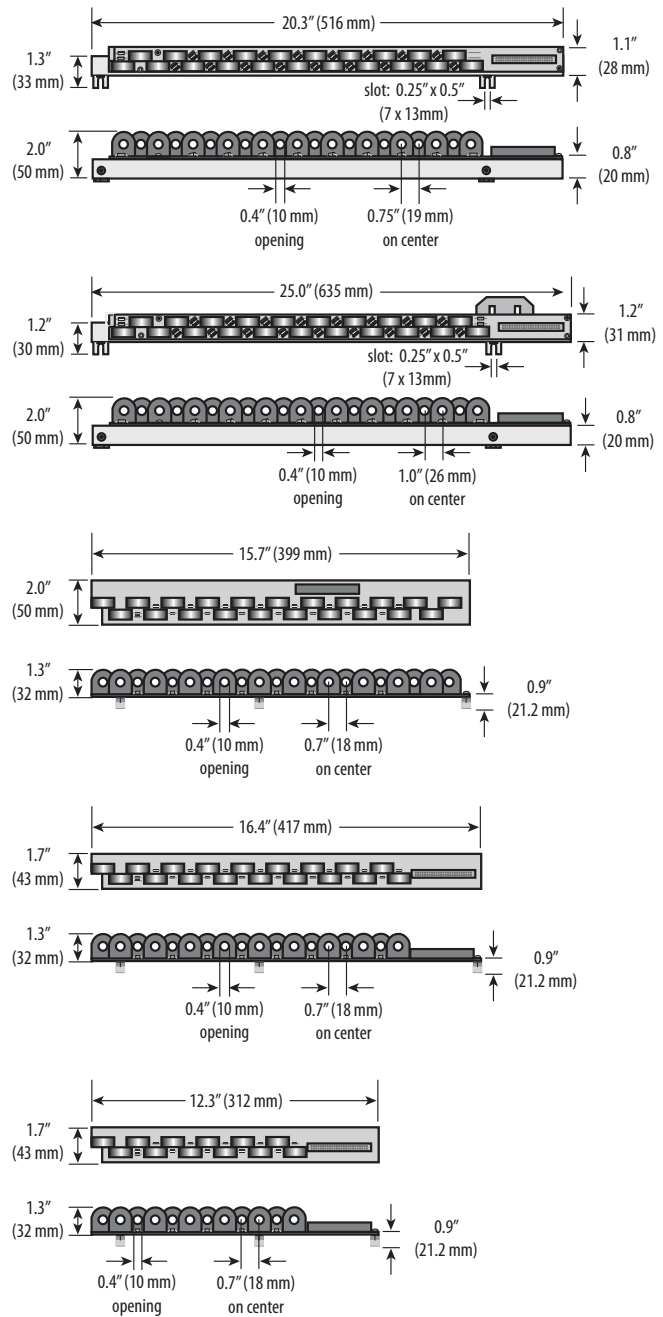
Description	Branch CT Spacing	# of Branch CTs & Ribbon Cables
E30 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A = Advanced	0 = 100 A, 3/4" spacing	24 = 2 strips of 12 branch CTs (18 mm only) and two 4-ft. round ribbon cables
B = Intermediate	1 = 100 A, 1" spacing	36 = 2 strips of 18 branch CTs (18 mm only) and two 4-ft. round ribbon cables
C = Basic	2 = 100 A, 18 mm spacing	42 = 2 strips of 21 branch CTs (3/4", 1", or 18 mm) and two 4-ft. round ribbon cables
E = Advanced w/Ethernet		48 = 4 strips of 12 branch CTs (18 mm only) and four 4-ft. round ribbon cables
		72 = 4 strips of 18 branch CTs (18 mm only) and four 4-ft. round ribbon cables
		84 = 4 strips of 21 branch CTs (3/4", 1", or 18 mm) and four 4-ft. round ribbon cables

Example:

E30

NOTE: CTs for mains (not used on E3xC models) must be ordered separately. Use 0 to 0.333V CTs rated for use with Class 1 voltage inputs.

BRANCH CT STRIPS
Dimensional Drawing



Free configuration tool available from www.veris.com. Consult factory for additional mounting options.



E31 (SPLIT-CORE) ORDERING INFORMATION

1 Boards

Description	# of CTs
E31	
A = Advanced board	002 = 2 adapter boards, no CTs, no cables
B = Intermediate board	004 = 4 adapter boards, no CTs, no cables
C = Basic board	42 = 2 adapter boards, 42 50A CTs, 2 4 ft. round ribbon cables
E = Advanced with Ethernet	84 = 4 adapter boards, 84 50A CTs, 4 4 ft. round ribbon cables
	Y63 = 2 adapter boards, flat ribbon cables, pre-assembled on one bracket, CTs not included (not available with E31E models)

2 Branch CTs (up to 21 CTs per adapter board)

Description	
E31CT	
0 = 6-pack, 50A Branch CT, 6 ft. (1.8 m) lead	3 = Single CT, 200A Branch CT, 6 ft. (1.8 m) lead
OR20 = 6-pack, 50A Branch CT, 20 ft. (6 m) lead	
1 = 6-pack, 100A Branch CT, 6 ft. (1.8 m) lead	3R20 = Single CT, 200A Branch CT, 20 ft. (6 m) lead
1R20 = 6-pack, 100A Branch CT, 20 ft. (6 m) lead	

3 Ribbon Cable (order 1 cable per adapter board)

Description	
CBLO	
34 = Round Ribbon Cable, 1 ft. (0.3 m)	08 = Flat Ribbon Cable, 18 in. (0.5 m)
31 = Six-pack, 50A Branch CT, 20 ft. (6 m) lead	16 = Flat Ribbon Cable, 4 ft. (1.2 m)
32 = Six-pack, 100A Branch CT, 6 ft. (1.8 m) lead	17 = Flat Ribbon Cable, 5 ft. (1.5 m)
22 = Six-pack, 100A Branch CT, 20 ft. (6 m) lead	18 = Flat Ribbon Cable, 6 ft. (1.8 m)
33 = Round Ribbon Cable, 8 ft. (2.4 m)	19 = Flat Ribbon Cable, 8 ft. (2.4 m)
23 = Round Ribbon Cable, 10 ft. (3 m)	20 = Flat Ribbon Cable, 10 ft. (3 m)
24 = Round Ribbon Cable, 20 ft. (6 m)	21 = Flat Ribbon Cable, 20 ft. (6 m)

Ordering Examples:

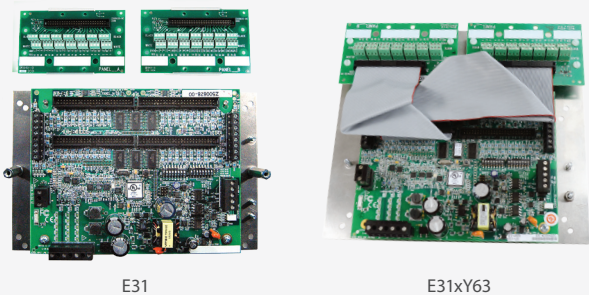
Option A: For monitoring 42 or 84 circuits, order a pre-made kit from Group 1 only (see Application/Wiring Diagram above). Example: E31x42 or E31x84

Option B: For monitoring other configurations, build your own kit by selecting from Groups 1, 2, and 3.

Example kit for an 18-circuit panel retrofit:

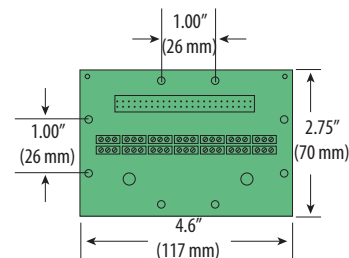
- 1 E31A002 - Advanced board, 2 adapter boards (1 unit)
- 2 E31CT0 - 50A Branch CT six-pack (3 units)
- 3 CBL023 - 10 ft. round ribbon cable (2 units)

NOTE: CTs for mains (not used on E3xC models) must be ordered separately. Use 0 to 0.333 V CTs rated for use with Class 1 voltage inputs.



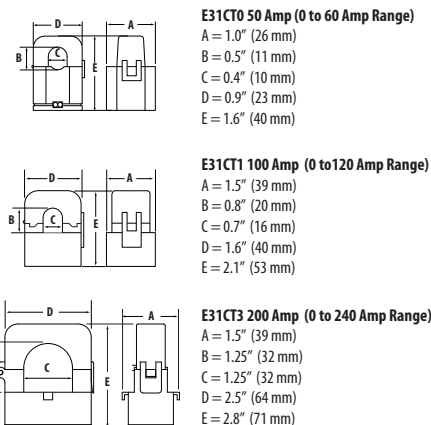
E31 ADAPTER BOARD

Dimensional Drawing



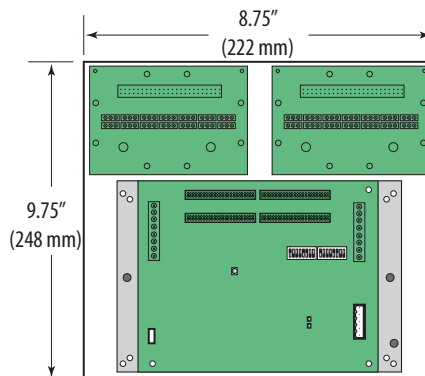
BRANCH CTs

Dimensional Drawing



E31XY63 BOARDS WITH BRACKET

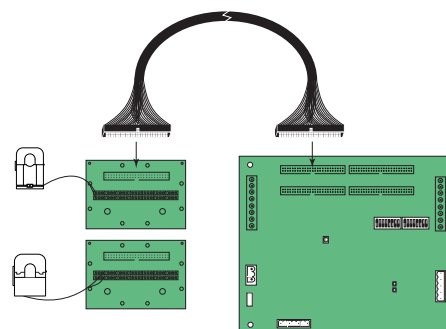
Dimensional Drawing



SPLIT-CORE BRANCH CTs

	50 A SPLIT-CORE BRANCH CT	100 A SPLIT-CORE BRANCH CT	200 A SPLIT-CORE BRANCH CT
Voltage Rating	300 Vac	300 Vac (CE), 600 Vac (UL)	300 Vac (CE), 600 Vac (UL)
Measurement Range	0 to 60 A	0 to 120 A	0 to 240 A
Temperature	0 to 60 °C	0 to 60 °C	0 to 60 °C
Agency	UL 61010-1 Recognized, EN61010-1	UL 61010-1 Recognized, EN61010-1	UL 61010-1 Recognized, EN61010-1

WIRING DIAGRAM



Observe precautions for handling static sensitive devices to avoid damage to the circuitry that is not covered under the factory warranty.





POWER METERING CTs

Veris provides a complete line of current transformers/transducers to suit many applications. We offer both voltage and amperage outputs for compatibility with other devices and systems, as well as a variety of core sizes and styles to fit into tight spaces. Browse our extensive offering to find the ideal solution for your needs.

MODEL	DESCRIPTION	PAGE
H681x-5A/ALx/BLx/CLx Series	5 A Output, Solid-core and Split-core	51
H681x-V Series	1 V and 0.333 V Output, Medium Current Rating, Split-core	53
E681x/E682x Series	0.333 V Output, Medium Current Rating, Solid-core and Split-core	55
SCT Series	0.333 V Output, Low Current Rating, Split-core	57
FCL Series	5 A, 1 V, or 0.333 V Output, Flexible Core, Split-core	59
E683x Series	Rope-Style Core AC Current Transducer (for use only with E5xxxA and E2x Series meters)	61

METERING CT SELECTION GUIDE

	MODEL	RANGE	ID	MODEL	RANGE	ID	MODEL	RANGE	ID
SOLID-CORE	ALxxx page 51	50 to 400 Amp	1.1" (26 mm)				E682Axxx3 page 55	50 to 100 Amp	0.4" (10 mm)
	BLxxx page 51	60 to 1200 Amp	2.0" (52 mm)				E682Cxxx3 page 55	200 Amp	1.0" (25 mm)
	CLxxx page 51	1200 to 2000 Amp	3.0" (76 mm)				E682Dxxx3 page 55	400 Amp	1.25" (31 mm)
SPLIT-CORE							E681A051V3 page 55	50 Amp	0.4" (10 mm)
							E681B101V3 page 55	100 Amp	0.6" (16 mm)
							E681C201V3 page 55	200 Amp	1.25" (31 mm)
	H6810-xxxA-5A page 51	200 to 300 Amp	1.2" x 1.3" (30 x 32 mm)	H6810-xxxA-1V page 53	100 to 300 Amp	1.2" x 1.3" (30 x 32 mm)	H6810-xxxA-0.3V page 53	100 to 300 Amp	1.2" x 1.3" (30 x 32 mm)
	H6811-xxxA-5A page 51	400 to 800 Amp	2.5" x 2.9" (62 x 73 mm)	H6811-xxxA-1V page 53	400 to 800 Amp	2.5" x 2.9" (62 x 73 mm)	H6811-xxxA-0.3V page 53	400 to 800 Amp	2.5" x 2.9" (62 x 73 mm)
	H6812-xxxA-5A page 51	800 to 1600 Amp	2.5" x 5.5" (62 x 139 mm)	H6812-xxxA-1V page 53	800 to 2400 Amp	2.5" x 5.5" (62 x 139 mm)	H6812-xxxA-0.3V page 53	800 to 2400 Amp	2.5" x 5.5" (62 x 139 mm)
	FCL-xxxx/5-x page 59	200 to 6000 Amp	round 4" (101 mm) to rect. 4" x 11" (101 x 279 mm)	FCL-xxxx/1VAC-x page 59	200 to 6000 Amp	round 4" (101 mm) to rect. 4" x 11" (101 x 279 mm)	FCL- xxxx/0.333VAC-x page 59	200 to 6000 Amp	round 4" (101 mm) to rect. 4" x 11" (101 x 279 mm)
							SCT-0750-xxx page 57	5 to 200 Amp	0.75" (20 mm)
						SCT-1250-xxx page 57	50 to 600 Amp	1.25" (32 mm)	

If using an E2x or E5xxxA power meter, order the E683x Rogowski rope style CTs, page 61.



Easily Transform Electrical Service Amperages to Voltages Compatible with Monitoring Equipment



E683x Series Rogowski CTs

Fast CT Connection

Built-in power supply and integrator (compatible with E2x and E5xxxA power & energy meters).

1% Accuracy

From 50 to 5000 A...monitor a wide range of loads with breakers from 400 to 5000 A.

Enhanced Accuracy

Phase angle <math><0.5</math> degrees measures at 50% rated current.

Installation Ease and Flexibility

Flexible core fits in tight enclosures and insulated leads.

Interested in learning more about E683x Series Rogowski CTs?

Contact a Power Monitoring Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 61



AL, BL, CL & H681X-A SERIES

Split-core and Solid-core Designs for Flexibility



Easy installation

Unique hinge design on split cores

UL Recognized

UL Recognized

5 Amps standard

5 Amp standard output... compatible with existing systems

Veris' split-core and solid-core current transformers provide a 0 to 5A AC output for use with transducers, data loggers, and chart recorders.

SPECIFICATIONS

Solid-core

INPUTS	
Frequency Range	50 to 400 Hz
Leads	2 ft (0.6 m)
ACCURACY	
Accuracy	Specified at 60 Hz (see Ordering Information)
OUTPUTS	
Output at Rated Current	5 A
MECHANICAL	
Insulation	600 Vac (basic)
ENVIRONMENTAL	
Operating Temp Range	-30 to 55 °C (-22 to 131 °F)
Storage Temp Range	-30 to 105 °C (-22 to 221 °F)
WARRANTY	
Limited Warranty	1 year
AGENCY APPROVALS	
Agency Approvals	ANSI/IEEE C57.13, "Standard Requirements for Instrument Transformers," IEEE C57.13.2, "IEEE Standard Conformance Test Procedures for Instrument Transformers," and cURus.



APPLICATIONS

- Data logging
- Recording
- Power monitoring
- Energy management
- Alternative energy monitoring
- Cost allocation

SPECIFICATIONS

Split-core

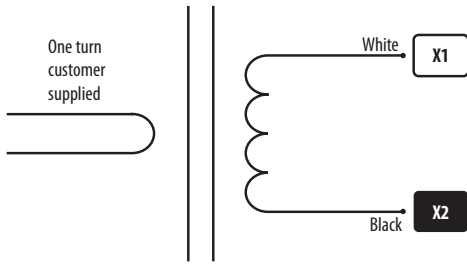
INPUTS	
Frequency Range	50/60 Hz
Leads	6 ft (1.8 m)
ACCURACY	
Accuracy	±1% of reading from 10% to 100% of rated current
OUTPUTS	
Output at Rated Current	5 A
MECHANICAL	
Insulation	600 Vac (basic)
ENVIRONMENTAL	
Installation Category	Category III, Pollution Degree 2
Operating Temp Range	2400A models only: -15 to 50 °C (5 to 122 °F); All other models: -15 to 60 °C (5 to 140 °F)
Storage Temp Range	-40 to 70 °C (-40 to 158 °F)
Humidity Range	0 to 95% non-condensing
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL61010-1, EN61010-1



*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

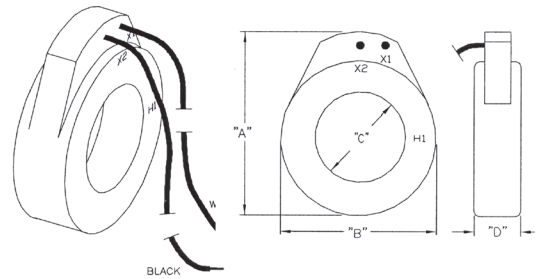


WIRING EXAMPLE



AL/BL/CL SOLID-CORE

Dimensional Drawings



AL/SMALL

50 Amp, 100 Amp, 150 Amp, 200 Amp, 250 Amp, 300 Amp, 400 Amp
 A = 2.7" (70 mm)
 B = 2.5" (63 mm)
 C = 1.1" (26 mm)
 D = 1.1" (26 mm)

BL/MEDIUM

500 Amp, 600 Amp, 800 Amp, 1000 Amp, 1200 Amp
 A = 3.7" (90 mm)
 B = 3.4" (88 mm)
 C = 2" (52 mm)
 D = 1.1" (26 mm)

CL/LARGE

1200 Amp, 1500 Amp, 1600 Amp, 2000 Amp
 A = 4.9" (124 mm)
 B = 4.5" (115 mm)
 C = 3" (76 mm)
 D = 1.1" (26 mm)

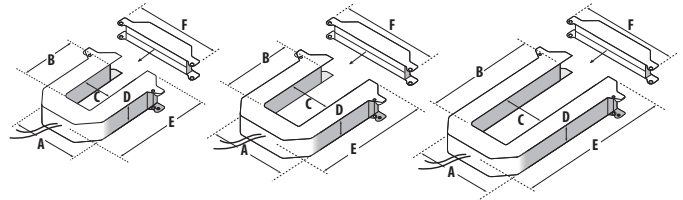
ORDERING INFORMATION

Solid-core

MODEL	RATIO	ACCURACY AT 60 Hz	BURDEN CAPACITY IN VA	
AL500	50:5	3%	2.0	
AL101	100:5		2.0	
AL151	150:5		4.0	
AL201	200:5		4.0	
AL251	250:5		6.0	
AL301	300:5		8.0	
AL401	400:5		10.0	
BL501	500:5		1%	12.5
BL601	600:5			15.0
BL801	800:5			8.0
BL102	1000:5			10.0
BL122	1200:5			12.5
CL122	1200:5	10.0		
CL152	1500:5	12.5		
CL162	1600:5	12.5		
CL202	2000:5	15.0		

H681X-5A SPLIT-CORE

Dimensional Drawings



H6810/SMALL

200 Amp, 300 Amp
 A = 3.8" (96 mm)
 B = 1.2" (30 mm)
 C = 1.3" (32 mm)
 D = 1.2" (30 mm)
 E = 4.0" (100 mm)
 F = 4.8" (121 mm)

H6811/MEDIUM

400 Amp, 600 Amp, 800 Amp
 A = 4.9" (125 mm)
 B = 2.9" (73 mm)
 C = 2.5" (62 mm)
 D = 1.2" (30 mm)
 E = 5.2" (132 mm)
 F = 6.0" (151 mm)

H6812/LARGE

800 Amp, 1000 Amp, 1200 Amp, 1600 Amp, 2000 Amp, 2400 Amp
 A = 4.9" (125 mm)
 B = 5.5" (139 mm)
 C = 2.5" (62 mm)
 D = 1.2" (30 mm)
 E = 7.9" (201 mm)
 F = 6.0" (151 mm)

Split-core

MODEL	RATIO	ACCURACY FROM 10% TO 100% OF MAX LOAD	BURDEN CAPACITY IN VA
H6810-200A-5A	200:5	1%	2.5
H6810-300A-5A	300:5		2.5
H6811-400A-5A	400:5		5.0
H6811-600A-5A	600:5		5.0
H6811-800A-5A	800:5		12.5
H6812-800A-5A	800:5		5.0
H6812-1000A-5A	1000:5		22.5
H6812-1200A-5A	1200:5		22.5
H6812-1600A-5A	1600:5		22.5
H6812-2000A-5A	2000:5		22.5
H6812-2400A-5A	2400:5		22.5



H681X-V SERIES

Medium Current Ranges



H681x-V

The H681x-V Series of current transducers provide a standard voltage output for use with data loggers, chart recorders, and power monitoring equipment. H681x CTs are split-core and have 0 to 0.333 Vac and 1 Vac output options.

High accuracy

±1% from 10% to 100% of rated current

UL Recognized

UL Recognized

1 V or 0.333 V

1 V or 0.333 V output versions available

SPECIFICATIONS

INPUTS

Frequency Range	50/60 Hz
Leads	6 ft (1.8 m) 20 ft (6 m)

ACCURACY

Accuracy	±1% of reading from 10% to 100% of rated current
----------	--

OUTPUTS

Output at Rated Current	0.333 or 1 Vac
-------------------------	----------------

MECHANICAL

Insulation	600 Vac (basic)
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ENVIRONMENTAL

Installation Category III	Pollution Degree 2
Operating Temp Range	2400A models only: -15 to 50 °C (5 to 122 °F); All other models: -15 to 60 °C (5 to 140 °F)
Storage Temp Range	-40 to 70 °C (-40 to 158 °F)
Humidity Range	0 to 95% non-condensing

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL61010-1 Recognized, EN61010 -1
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APPLICATIONS

- Data logging
- Recording
- Power monitoring
- Energy management
- Alternative energy monitoring
- Cost allocation



*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

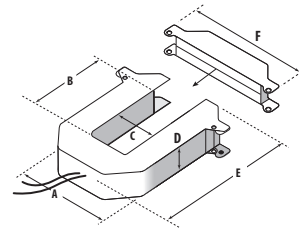


ORDERING INFORMATION

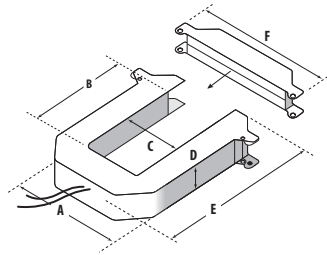
MODEL*	DESCRIPTION
H6810-100A-.3V (R20)	Split-core CT, Size 2, 100 A: 0.333 V
H6810-200A-.3V (R20)	Split-core CT, Size 2, 200 A: 0.333 V
H6810-300A-.3V (R20)	Split-core CT, Size 2, 300 A: 0.333 V
H6811-400A-.3V (R20)	Split-core CT, Size 3, 400 A: 0.333 V
H6811-600A-.3V (R20)	Split-core CT, Size 3, 600 A: 0.333 V
H6811-800A-.3V (R20)	Split-core CT, Size 3, 800 A: 0.333 V
H6812-800A-.3V (R20)	Split-core CT, Size 4, 800 A: 0.333 V
H6812-1000A-.3V (R20)	Split-core CT, Size 4, 1000 A: 0.333 V
H6812-1200A-.3V (R20)	Split-core CT, Size 4, 1200 A: 0.333 V
H6812-1600A-.3V (R20)	Split-core CT, Size 4, 1600 A: 0.333 V
H6812-2000A-.3V (R20)	Split-core CT, Size 4, 2000 A: 0.333 V
H6812-2400A-.3V (R20)	Split-core CT, Size 4, 2400 A: 0.333 V
H6810-100A-1V	Split-core CT, Size 2, 100 A: 1 V
H6810-200A-1V	Split-core CT, Size 2, 200 A: 1 V
H6810-300A-1V	Split-core CT, Size 2, 300 A: 1 V
H6811-400A-1V	Split-core CT, Size 3, 400 A: 1 V
H6811-600A-1V	Split-core CT, Size 3, 600 A: 1 V
H6811-800A-1V	Split-core CT, Size 3, 800 A: 1 V
H6812-800A-1V	Split-core CT, Size 4, 800 A: 1 V
H6812-1000A-1V	Split-core CT, Size 4, 1000 A: 1 V
H6812-1200A-1V	Split-core CT, Size 4, 1200 A: 1 V
H6812-1600A-1V	Split-core CT, Size 4, 1600 A: 1 V
H6812-2000A-1V	Split-core CT, Size 4, 2000 A: 1 V
H6812-2400A-1V	Split-core CT, Size 4, 2400 A: 1 V

*Models ending with R20 have 20 ft (6 m) leads. Example: H6810-100A-.3VR20.

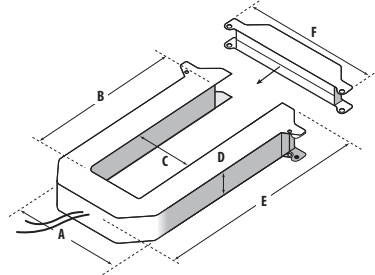
DIMENSIONAL DRAWINGS



**H6810
SMALL (SIZE 2)
100/300 Amp**
 A = 3.8" (96 mm)
 B = 1.2" (30 mm)
 C = 1.3" (31 mm)
 D = 1.2" (30 mm)
 E = 4.0" (100 mm)
 F = 4.8" (121 mm)

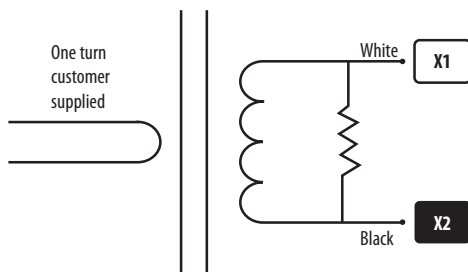


**H6811
MEDIUM (SIZE 3)
400/800 Amp**
 A = 4.9" (125 mm)
 B = 2.9" (73 mm)
 C = 2.5" (62 mm)
 D = 1.2" (30 mm)
 E = 5.2" (132 mm)
 F = 6.0" (151 mm)



**H6812
LARGE (SIZE 4)
800/1600/2400 Amp**
 A = 4.9" (125 mm)
 B = 5.5" (139 mm)
 C = 2.5" (62 mm)
 D = 1.2" (30 mm)
 E = 7.9" (201 mm)
 F = 6.0" (151 mm)

WIRING EXAMPLE



E681X & E682X SERIES

Medium Current Ranges



High accuracy

±0.5% from 5% to 120% of rated current for E682x or ±1% from 10% to 100% of rated current for E681x

UL Recognized

UL Recognized

0.333 V output

0.333 V output

APPLICATIONS

- Data logging
- Recording
- Power monitoring
- Energy management
- Alternative energy monitoring
- Cost allocation

The E681x and E682x Series of current transducers provide a standard voltage output for use with data loggers, chart recorders, and power monitoring equipment. Both series have 0.333 V output. E682x devices are solid-core, while E681x CTs are split-core.

SPECIFICATIONS

Split-Core

Output at Rated Current	0.333 Vac
Accuracy	1% from 10% to 100% of rated current
Frequency Range	50/60 Hz
Leads	22 AWG, 600 Vac, UL 1015 bonded pair, 6 ft. (1.8 m) standard length
Max. Voltage L-N Sensed Conductor*	E681A051V3: 300 Vac (basic insulation rating), 150 Vac (reinforced insulation rating) E681B101V3 and E681C201V3: 600 Vac (basic insulation rating), 300 Vac (reinforced insulation rating)
Operating Temp Range	0 to 70 °C (32 to 158 °F)
Storage Temp Range	-40 to 105 °C (-40 to 221 °F)
Humidity Range	0 to 95% non-condensing
Altitude of Operation	3 km max.
Installation Category	Category III, pollution degree 2

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL61010-1, EN61010-1
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SPECIFICATIONS

Solid-Core

Output at Rated Current	0.333 Vac
Accuracy	±0.5% of reading from 5% to 120% of rated current
Frequency Range	50/60 Hz
Leads	22 AWG, 600 Vac, UL 1015 bonded pair, 6 ft. (1.8 m) standard length
Max. Voltage L-N Sensed Conductor**	600 Vac (basic insulation rating), 300 Vac (reinforced insulation rating)
Operating Temp Range	-40 to 85 °C (40 to 185 °F)
Storage Temp Range	-50 to 105 °C (-58 to 221 °F)
Humidity Range	0 to 95% non-condensing
Altitude of Operation	3 km max.
Agency Approvals	UL61010-1, EN61010-1
Installation Category	Category III, pollution degree 2

WARRANTY

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

AGENCY APPROVALS



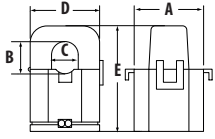
*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

** Do not apply these current transducers to circuits having a phase-to-phase voltage greater than the maximum rated voltage (300 Vac or 600 Vac, see above), unless adequate additional insulation is applied between the primary conductor and the current transducers. Veris assumes no responsibility for damage of equipment or personal injury caused by products operated on circuits above their published ratings.

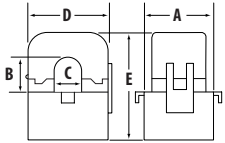


E681X

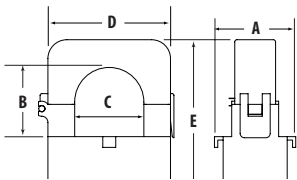
Dimensional Drawings



50 Amp
 A = 1.0" (26 mm)
 B = 0.5" (11 mm)
 C = 0.4" (10 mm)
 D = 0.9" (23 mm)
 E = 1.6" (40 mm)



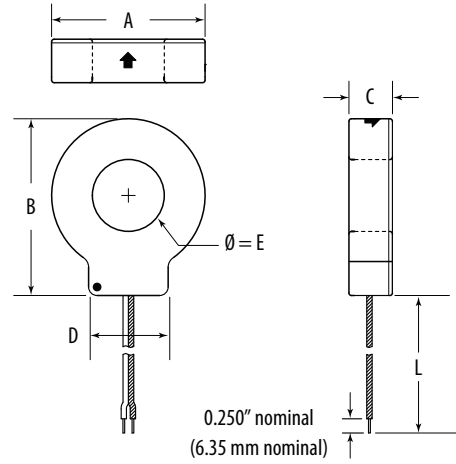
100 Amp
 A = 1.5" (37.5 mm)
 B = 0.6" (16 mm)
 C = 0.6" (16 mm)
 D = 1.85" (47 mm)
 E = 2.1" (53 mm)



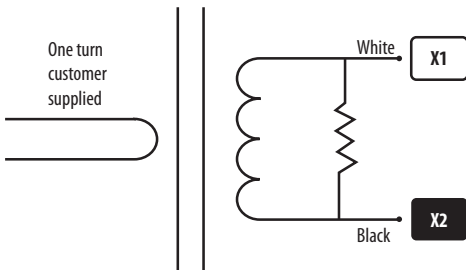
200 Amp
 A = 1.5" (39 mm)
 B = 1.25" (32 mm)
 C = 1.25" (32 mm)
 D = 2.5" (64 mm)
 F = 2.8" (71 mm)

E682X

Dimensional Drawing



WIRING EXAMPLE



MODEL	L	A	B	C	D	E
E682A051V3	6' (1.8 m)	1.3" (33 mm)	1.5" (38 mm)	0.7" (18 mm)	0.8" (21 mm)	0.4" (10 mm)
E682A101V3						
E682C201V3	6' (1.8 m)	2.3" (59 mm)	2.6" (66 mm)	0.7" (18 mm)	1.2" (31 mm)	1.0" (25 mm)
E682D401V3	6' (1.8 m)	2.8" (70 mm)	3.2" (82 mm)	1.0" (25 mm)	1.4" (36 mm)	1.25" (31 mm)

ORDERING INFORMATION

Split-core

MODEL	DESCRIPTION
E681A051V3	Split-core CT, 50 A: 0.333 V, 0.4 in ID, 6 ft leads
E681B101V3	Split-core CT, 100 A: 0.333 V, 0.6 in ID, 6 ft leads
E681C201V3	Split-core CT, 200 A: 0.333 V, 1.25 in ID, 6 ft leads

ORDERING INFORMATION

Solid-core

MODEL	DESCRIPTION
E682A051V3	Solid-core CT, 50 A: 0.333 V, 0.4 in ID, 6 ft leads
E682A101V3	Solid-core CT, 100 A: 0.333 V, 0.4 in ID, 6 ft leads
E682C201V3	Solid-core CT, 200 A: 0.333 V, 1.0 in ID, 6 ft leads
E682D401V3	Solid-core CT, 400 A: 0.333 V, 1.25 in ID, 6 ft leads

Note: Other lead lengths are available. Consult factory.



SCT SERIES

Low Current Ranges



SCT

SCT AC current sensors have center hole sizes and current ratings to suit many application. SCT models have a split core that is perfect for retrofits. Output is the industry standard of 0.333 Vac.

SPECIFICATIONS

INPUTS

Frequency Range	50 to 400 Hz
Leads	8 ft (2.43 m)

ACCURACY

Accuracy	±1% of reading from 10% to 130% of rated current
----------	--

OUTPUTS

Output @ Rated Current	0.333 Vac
------------------------	-----------

MECHANICAL

Insulation	600 Vac
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ENVIRONMENTAL

Installation Category III	Pollution Degree 2
Operating Temp Range	-10 to 55 °C (14 to 131 °F)
Storage Temp Range	-40 to 70 °C (-40 to 158 °F)

WARRANTY

Limited Warranty	3 years
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AGENCY APPROVALS

Agency Approvals	cURus, ANSI/IEEE 57.13, CE, RoHS
------------------	----------------------------------



*The CE mark indicates RoHS2 compliance.

High accuracy

±1% from 10% to 130% of rated current

Interleaving joints

Interleaving joints for reliability with a self-locking mechanism and no exposed metal

Compatible with existing systems

0.333 Vac standard output

UL Recognized

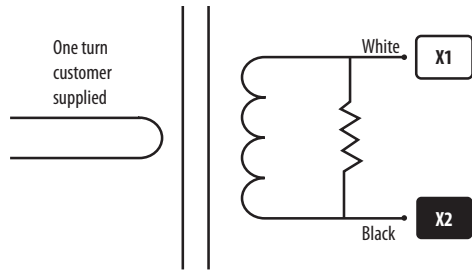
UL Recognized

APPLICATIONS

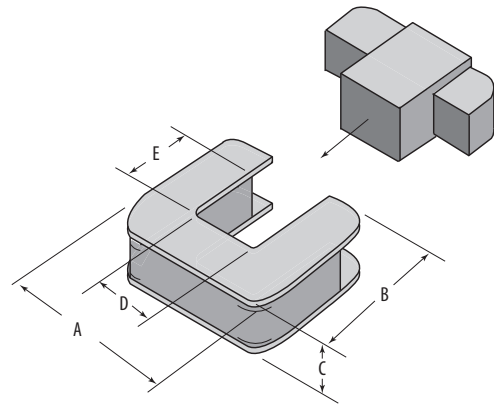
- Data logging
- Recording
- Power monitoring
- Energy management
- Alternative energy monitoring
- Cost allocation



WIRING EXAMPLE



DIMENSIONAL DRAWING



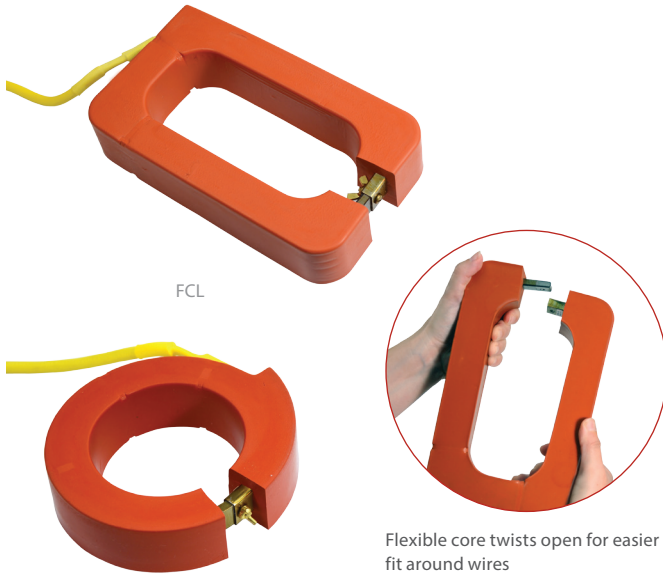
ORDERING INFORMATION

MODEL	MANUF. PART NUMBER	RATING (A)	DESCRIPTION
U004-0030	SCT-0750-005	5	CT, Split-core, 5 A: 0.333 Vac, 0.750" ID
U004-0031	SCT-0750-010	10	CT, Split-core, 10 A: 0.333 Vac, 0.750" ID
U004-0032	SCT-0750-030	30	CT, Split-core, 30 A: 0.333 Vac, 0.750" ID
U004-0033	SCT-0750-050	50	CT, Split-core, 50 A: 0.333 Vac, 0.750" ID
U004-0034	SCT-0750-070	70	CT, Split-core, 70 A: 0.333 Vac, 0.750" ID
U004-0035	SCT-0750-100	100	CT, Split-core, 100 A: 0.333 Vac, 0.750" ID
U004-0036	SCT-0750-150	150	CT, Split-core, 150 A: 0.333 Vac, 0.750" ID
U004-0037	SCT-0750-200	200	CT, Split-core, 200 A: 0.333 Vac, 0.750" ID
U004-0039	SCT-1250-070	70	CT, Split-core, 70 A: 0.333 Vac, 1.250" ID
U004-0040	SCT-1250-100	100	CT, Split-core, 100 A: 0.333 Vac, 1.250" ID
U004-0041	SCT-1250-150	150	CT, Split-core, 150 A: 0.333 Vac, 1.250" ID
U004-0042	SCT-1250-200	200	CT, Split-core, 200 A: 0.333 Vac, 1.250" ID
U004-0043	SCT-1250-250	250	CT, Split-core, 250 A: 0.333 Vac, 1.250" ID
U004-0044	SCT-1250-300	300	CT, Split-core, 300A : 0.333 Vac, 1.250" ID
U004-0045	SCT-1250-400	400	CT, Split-core, 400 A: 0.333 Vac, 1.250" ID
U004-0046	SCT-1250-600	600	CT, Split-core, 600 A: 0.333 Vac, 1.250" ID

MODEL	A	B	C	D	E
SCT-0750-xxx	2.0" (51 mm)	2.1" (54 mm)	0.61" (16 mm)	0.75" (20 mm)	0.75" (20 mm)
SCT-1250-xxx	3.25" (83 mm)	3.35" (86 mm)	1.0" (26 mm)	1.25" (32 mm)	1.25" (32 mm)

FCL SERIES

Flexible Split-core Design for Large Size Applications



Multiple sizes

Multiple sizes to fit your applications

Easy installation

Flexible core design

Compatible with existing systems

Output available in 5 A, 1 V, or 0.333 V

APPLICATIONS

- Data logging
- Recording
- Power monitoring
- Energy management
- Alternative energy monitoring
- Cost allocation

FCL round and rectangular flexible CTs are designed for large bus and large wire applications where standard sized CTs will not fit.

SPECIFICATIONS

INPUTS

Frequency Range	50 to 400 Hz
Leads	12 ft. (3.7 m)

ACCURACY

Accuracy	Varies at full scale (see Ordering Information)
----------	---

OUTPUTS

Output at Rated Current	5 A, 0.333 Vac, or 1 Vac
-------------------------	--------------------------

MECHANICAL

Insulation	600 Vac
------------	---------

ENVIRONMENTAL

Installation Category III	Pollution Degree 2
Operating Temp Range	-45 to 55 °C (-49 to 131 °F)
Storage Temp Range	-45 to 65 °C (-49 to 149 °F)

WARRANTY

Limited Warranty	15 months
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AGENCY APPROVALS

Agency Approvals	cURus, ANSI/IEEE 57.13, CE, RoHS
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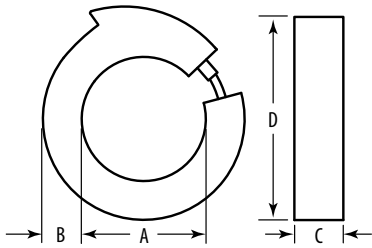


*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



ROUND FLEXIBLE-CORE

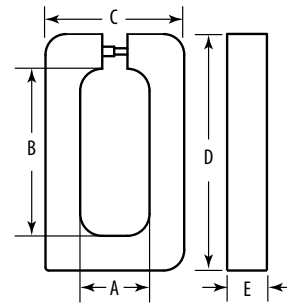
Dimensional Drawing



	-4 Model	-6 Model	-8 Model	-11 Model	-18 Model
A	4.0" (101 mm)	6.0" (152 mm)	8.0" (203 mm)	11.0" (279 mm)	18.0" (457 mm)
B	1.25" (32 mm)	1.25" (32 mm)	1.25" (32 mm)	1.25" (32 mm)	1.25" (32 mm)
C	1.5" (38 mm)	1.5" (38 mm)	1.5" (38 mm)	1.5" (38 mm)	1.5" (38 mm)
D	6.5" (165 mm)	8.5" (216 mm)	10.5" (267 mm)	13.5" (343 mm)	20.5" (521 mm)

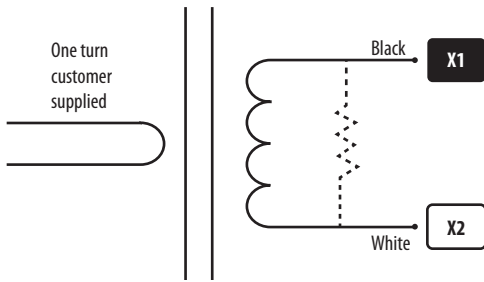
RECTANGULAR FLEXIBLE-CORE

Dimensional Drawing



	-R Model	-R411 Model
A	2.75" (70 mm)	4.0" (101 mm)
B	6.6" (168 mm)	11.0" (279 mm)
C	5.5" (140 mm)	6.5" (165 mm)
D	9.4" (240 mm)	13.4" (340 mm)
E	1.5" (38 mm)	1.5" (38 mm)

WIRING EXAMPLE



Notes:
This model uses X1 and X2 the opposite of other models in this catalog.
No resistor on 5 A models.

ORDERING INFORMATION

<p>FCL <input type="text"/> / <input type="text"/> - <input type="text"/></p> <p>Current</p> <p>200 = 200 A 250 = 250 A 300 = 300 A 400 = 400 A 500 = 500 A 600 = 600 A 800 = 800 A 1000 = 1000 A 1200 = 1200 A 1500 = 1500 A 1600 = 1600 A 2000 = 2000 A 2400 = 2400 A 2500 = 2500 A 3000 = 3000 A 3500 = 3500 A 4000 = 4000 A 5000 = 5000 A 6000 = 6000 A</p>	<p>Output</p> <p>5 = 5A 1V = 0-1VAC 0.3V = 0-0.333VAC</p>	<p>I.D.</p> <p>4 = 5 A, Round, 4" (200 to 2000 A) 6 = 5 A, Round, 6" (300 to 3000 A) 8 = 5 A, Round, 8" (1000 to 5000 A) 11 = 5 A, Round, 11" (1500 to 6000 A) 18 = 5 A, Round, 18" (2000 to 6000 A) R = 5 A, Rectangular, 2.75" x 6.625" (300 to 4000 A) R411 = 5 A, Rectangular, 4" x 11" (1500 to 6000 A) 4 = 1 V, Round, 4" (200A to 1000 A) 6 = 1 V, Round, 6" (500 to 2000 A) 8 = 1 V, Round, 8" (1000 to 2000 A) 11 = 1 V, Round, 11" (1500 to 3500 A) 18 = 1 V, Round, 18" (2000 to 6000 A) R = 1 V, Rectangular, 2.75" x 6.625" (500 to 1600 A) R411 = 1 V, Rectangular, 4" x 11" (1000 to 2500 A) 4 = 0.3 V, Round, 4" (200 to 1500 A) 6 = 0.3 V, Round, 6" (500 to 4000 A) 8 = 0.3 V, Round, 8" (1000 to 6000 A) 11 = 0.3 V, Round, 11" (1500 to 6000 A) 18 = 0.3 V, Round, 18" (2000 to 6000 A) R = 0.3 V, Rectangular, 2.75" x 6.625" (500 to 4000 A) R411 = 0.3 V, Rectangular, 4" x 11" (1000 to 6000 A)</p>	<h4>Accuracy at Full Scale</h4> <p>200:5 thru 300:5.....4% 400:5 thru 500:5.....3% 600:5 thru 800:5.....2% 1000:5 thru 6000:5.....1% For 1 Vac and 0.333 Vac...1% at full scale</p>
---	---	---	---

Example:

FCL / -

2000 A CT with 11" inside diameter and 5 A output

E683X SERIES

Exclusively for E2x and E5xxxA
Power and Energy Meters (sold separately)



The E683x Series of Rogowski flexible rope style current transducers (CTs) provide secondary AC voltage proportional to the primary (sensed) current. For use with E5xxxA and E2x Series power meters, the E683x Series CTs provide a cost-effective means to transform electrical service amperages to a voltage compatible with monitoring equipment. The flexible core makes it easy to fit in tight enclosures.

These products provide reinforced insulation between the sensed conductor and the output leads.

The E683x Series works exclusively with the E2x and E5xxxA power and energy meters and is a U018 equivalent. These meters have a built-in power supply and integrator, so CT connection is fast and simple.

SPECIFICATIONS

INPUTS	
Frequency Range	50/60 Hz
Cable	1000 Vac UL Style 21223 cable with 22 AWG leads
ACCURACY	
Accuracy	±1% from 50 to 5000 A
OUTPUT	
Output at Rated Current	Custom for E5xxxA and E2x Series power meters
MECHANICAL	
Insulation category	600 V Cat IV, Pollution Degree 2
ENVIRONMENTAL	
Installation Category IV	Pollution Degree 2
Operating Temp. Range	-15 to 60 °C (5 to 140 °F)
Storage Temp. Range	-40 to 70 °C (-40 to 158 °F)
WARRANTY	
Limited Warranty	3 years
AGENCY APPROVALS	
Agency Approvals	EN61010-1; UL61010-1; EN61010-2-032; UL61010-2-032



* The CE mark indicates RoHS2 compliance.

Easy installation

Insulated leads

Maximum flexibility

Fits difficult spaces

Fast CT connection

Compatible with E2x and E5xxxA power and energy meters with built-in power supply and integrator for fast CT connection... see the E2xxx and E5xxxA datasheets

APPLICATIONS

- Data logging
- Recording
- Power monitoring
- Energy management
- Alternative energy monitoring
- Cost allocation

UL Recognized

UL Recognized

1% accuracy

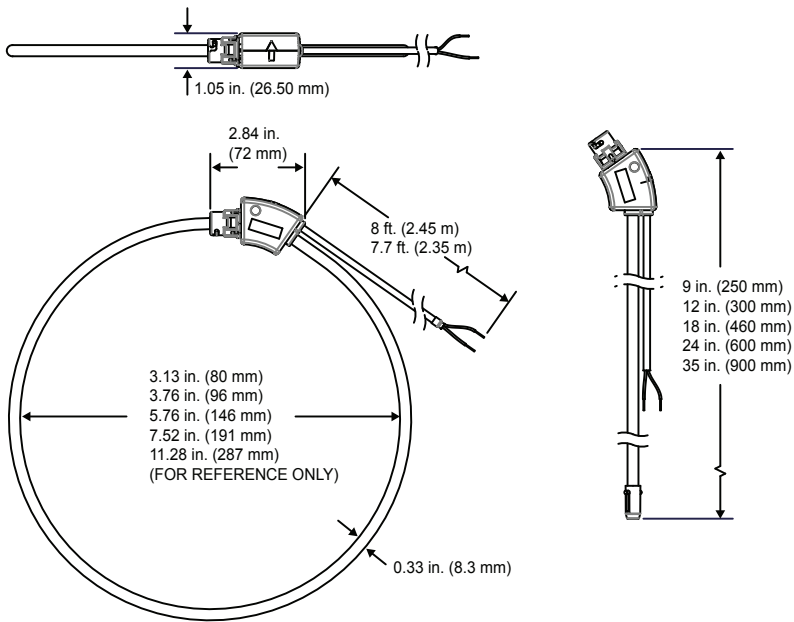
1% accuracy from 50 to 5000 A... monitor a wide range of loads with breakers from 400 to 5000 A

Enhanced accuracy

Phase angle <0.5 degrees, measured at 50% rated current



DIMENSIONAL DRAWING



CT CORE LENGTH	APPROXIMATE INSIDE DIAMETER WITH CLOSED CONNECTOR
9" (250 mm)	Ø 3.13 in. (80 mm)
12 in. (300 mm)	Ø 3.76 in. (96 mm)
18 in. (460 mm)	Ø 5.76 in. (146 mm)
24 in. (600 mm)	Ø 7.52 in. (191 mm)
35 in. (900 mm)	Ø 11.28 in. (287 mm)

ORDERING INFORMATION

MODEL	DESCRIPTION
E683C502	Rogowski CT, 250 mm (9"), 600 V, 5 kA, U018 equivalent
E683D502	Rogowski CT, 300 mm (12"), 600 V, 5 kA, U018 equivalent
E683G502	Rogowski CT, 460 mm (18"), 600 V, 5 kA, U018 equivalent
E683J502	Rogowski CT, 600 mm (24"), 600 V, 5 kA, U018 equivalent
E683L502	Rogowski CT, 900 mm (35"), 600 V, 5 kA, U018 equivalent

Note: These CTs are only compatible with the E2x and E5xxxA Series meters.



NETWORK INTEGRATION

Veris Network Integration devices allow the collection, storage, transmission, and display of power monitoring information. Devices include data loggers, signal conditioners, wireless transmitters, protocol converters, and local displays for power monitoring projects and installations, helping you to complete a solution.

MODEL	DESCRIPTION	PAGE
H8822/H8822GSM	Data Acquisition System, Full-featured Model	65
A7810/A8810	Data Acquisition Systems, For Embedded Applications	67
A8332-8F2D	Flexible I/O Module	69
A8911-23	Pulse Input Module	71
H8920-x Series	LonTalk Integration Nodes	73
H8936/H8932	Network Display	75
E8951	Modbus-to-BACnet Protocol Converter	77
U0012-0012/U0012-0013 & U013-0015	Modbus Gateway/BACnet Router	79

NETWORK INTEGRATION SELECTION GUIDE

	MODEL	PAGE
Add Modbus TCP (Ethernet) Communication to a Modbus Meter	H8822, A8810, U013-0012	65, 67, 79
Add BACnet MS/TP (Serial) Communication to a Modbus Meter	E8951	77
Add BACnet IP (Ethernet) Communication to a Modbus Meter	E8951	77
Add BACnet IP (Ethernet) Communication to a BACnet MS/TP Meter	U013-0013/U013-0015	79
Add LON Communication to a Modbus Meter	H8920-x	73
Add SNMP (Ethernet) Communication to an E30A/E31A Meter	E8951	77
Log Data from Modbus Devices	H8822, A8810	65, 67
Access a Modbus Meter with a Web-Enabled Interface	H8822, A8810	65, 67
Access Pulse Output Meters/Sensors with a Web-Enabled Interface	A7810	67
Generate Alarm Notifications from Modbus Devices	H8822, A8810	65, 67
GSM-Enabled Output	H8822GSM	65
Convert Pulse/Analog Outputs to Modbus	A8332-8F2D, A8911-23	69, 71
Add a Local Display to a Modbus (Serial) Meter	H8936	75
Add Local Control of Alarms to a Modbus Multi-Circuit Meter	H8936	75



Need BACnet, But Your Meter Communicates Modbus?



E8951 Protocol Converter

Multi-Communicate

Supports BACnet IP and Modbus TCP access simultaneously.

A Great Integration Tool

Compatible with Veris' H80xx Series, H8163 with H8163-CB, H8238, H84xx Series, E5x Series, E3x Series.

Points of Collection

Each converter can support over 10,000 BACnet measurement points for maximum data collection.

Interested in learning more about the E8951 capabilities and applications?

Contact a Network Integration Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 77



H8822 ACQUISUITE™

Modbus Protocols, Data Logging and Server Capabilities



H8822

The H8822 AcquiSuite™ data acquisition system is the perfect do-it-yourself solution for your energy logging needs. This server combines the flexibility of Ethernet LAN, WAN, or internet communication paths with a low installed cost. It is an ideal device for recording electrical, natural gas, water, and other building energy usages.

The AcquiSuite has eight flexible I/O options. After installation, data from a connected device is time-stamped and stored in nonvolatile memory at user-selected intervals until the next scheduled upload to the SQL database server. Using the built-in phone modem, Ethernet port, or cellular modem, the AcquiSuite sends data to the Building Manager Online™ server or to other third party software providers (cellular modem is only available on the H8822GSM model).

SPECIFICATIONS

Input Power	120 to 240 Vac 50/60Hz transformer to 24 Vdc, included
Operating System	Linux
Flash ROM	16 MB NOR Flash (expandable with USB memory device)
Memory	32 MB RAM
LEDs	8x pulse input, 4 modem activity, Modbus TX/RX, power status
LCD	2 x 16 LCD character, two buttons
LAN	10/100, auto-crossover detection
Protocols	Modbus/RTU, Modbus/TCP, TCP/IP, PPP, HTTP/HTML, FTP, SNMP, SMTP, XML
Serial Port	RS-485 Modbus
Interval Recording	User selectable 1 to 60 minutes. Default 15-minute interval.
Inputs	8x, user selectable - 0-10V - Min/Max/Ave/Instantaneous; 4 to 20 mA - Min/Max/Ave/Instantaneous; Pulse - Consumption, Rate; Resistance - Min/Max/Ave/Instantaneous; Runtime - Runtime, Status
Outputs	2x, Dry contact 30VDC, 150mA max.

PROCESSORS

Main Processor	ARM 9
I/O Co-Processor	ARM 7

Plug and play

Install and configure in minutes

LCD display

Easy installation and troubleshooting

Flexible data formats

Hardware and software provide data in flexible, industry-standard formats for databases, spreadsheets, etc.

Integrated web server

Provides setup and configuration using any standard web browser

APPLICATIONS

- Aggregating energy and operational information from remote sites
- Developing load profiles for energy purchases
- Measurement and verification
- Gathering “near real-time” performance data

MODEMS

Phone	V.34 bis, 33,600 bps (H8822)
Cellular	GSM/GPRS Class 10, 85 kbps (H8822GSM)

WARRANTY

Limited Warranty	2 years
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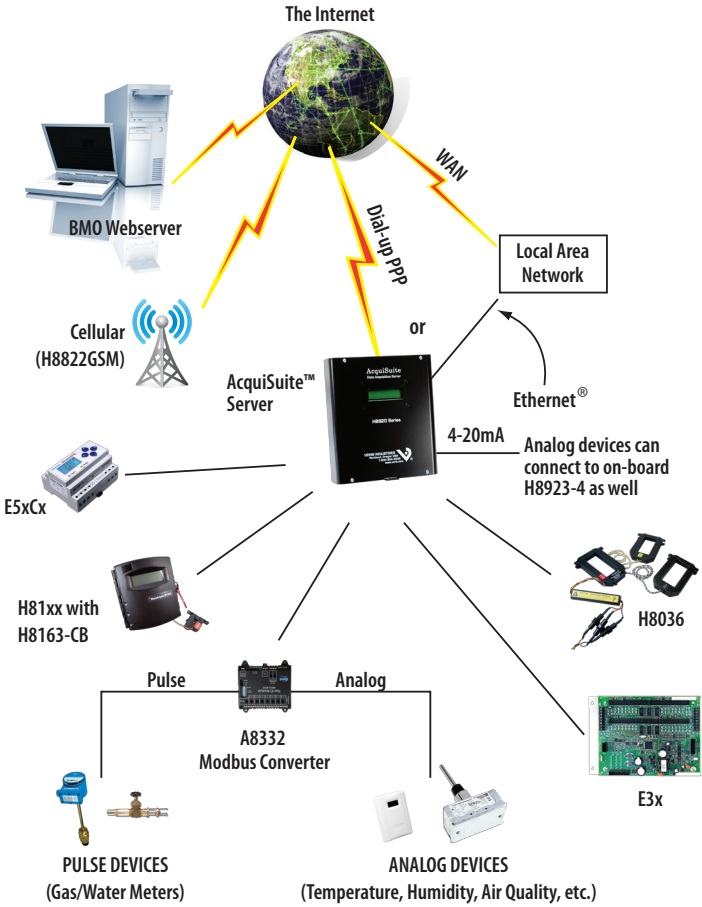
AGENCY APPROVALS

Agency Approvals	FCC Part 15, Class A
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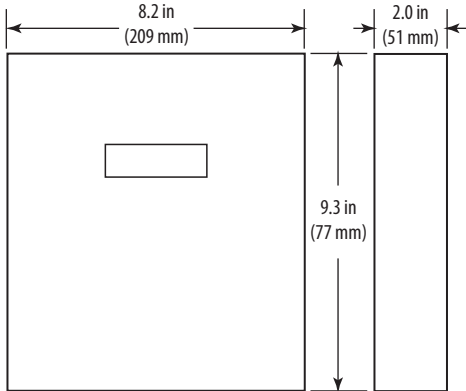
Note: Indoor use only.



APPLICATION EXAMPLE



DIMENSIONAL DRAWING



THE ACQUISUITE SYSTEM ALLOWS

Internet Display of Data Using the BMO Website	View performance data in an easy graphical format. Store, display, and download historical data in a secure SQL database. Design custom views of data from one or more buildings or systems.
Security and Flexibility	Store data on board in non-volatile memory. Protect information in the event of a power failure. Time-stamp all interval data with an on-board real-time clock.
Compatibility with Existing Systems	Use the I/O module to connect to existing sensors and meters. Use TCP/IP protocols to interface with spreadsheets, databases, text files, etc.

ORDERING INFORMATION

MODEL	DESCRIPTION
H8822	AcquiSuite Demand Response System: 8 Flexible I/O Inputs
H8822GSM	AcquiSuite Demand Response System; GSM/GPRS Cellular Modem



A7810 ACQUILITE™ & A8810 ACQUISUITE™

Flexible Data Servers for Embedded Applications



The A7810 AcquiLite™ and A8810 AcquiSuite™ data acquisition server for embedded applications allows users to collect energy data from meters and environmental sensors and send it via Modbus communication protocol (wired or wireless using the H8830) to IP-based applications. No software is required. Operation is plug-and-play, and information can be accessed using any web browser. The A7810 supports four pulse inputs, while the A8810 supports Modbus serial input.

The compact housing and industrial temperature range make the A7810 and A8810 ideal for embedded applications. Reduce development time and speed up integration by collecting and distributing energy data directly from your equipment.

SPECIFICATIONS

Input Power	24 Vdc, 500 mA*
Isolation	
A7810	RJ45 Ethernet isolated to 1500 Vdc from main board (power and pulse inputs not isolated)
A8810	RJ45 Ethernet and RS-485 port isolated to 1500 Vdc from main board (power and USB not isolated)
Main Processor	ARM 9 embedded CPU
Operating System	Linux 2.6
Flash ROM	16 MB NOR Flash
Memory	32 MB RAM
LEDs	
A7810	Ethernet, pulse (x4), power, alarm
A8810	Ethernet, Modbus TX/RX, power, alarm
Console	2 x 16 LCD character, two push buttons
Interval Recording	1 to 60 minutes, user selectable (default 15 minutes)
Pulse Inputs A7810	4 inputs, dry contact, standard or KYZ, closure threshold 100 Ω to 2.5 kΩ user selectable; max. rate 10 Hz; min. width 50 msec
Serial Port Input	
A8810	RS-485 Modbus, supports up to 32 external devices (expandable)

Track data in real time

Provides the right information for trending, planning, and identifying waste

Alarm notification

For data points above or below target levels...quick notification for optimal performance maintenance

Industrial temp. range

Industrial temperature range (-30 to 70 °C), perfect for embedded applications...speeds up development and integration of energy data

Communications

Compatible with multiple communication protocols... push or pull data to energy dashboards and software applications for easy system integration

Easy installation

DIN rail mounting

APPLICATIONS

- Measurement and verification (M&V)
- Reduce energy costs
- Access energy information from local and remote sites
- Benchmark building energy usage
- Demand response
- Renewable energy

COMMUNICATION

Protocols	
A7810	Modbus/TCP, TCP/IP, PPP, HTTP/HTML, FTP, NTP, XML, SNMP-Trap
A8810	Modbus/RTU, Modbus/TCP, TCP/IP, PPP, HTTP/HTML, FTP, NTP, XML, SNMP-Trap
LAN	RJ45 10/100 Ethernet, auto polarity

ENVIRONMENTAL

Operating Temp Range	-30 to 70 °C (-22 to 158 °F)
Operating Humidity Range	0 to 95% RH non-condensing; indoor use only

WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS

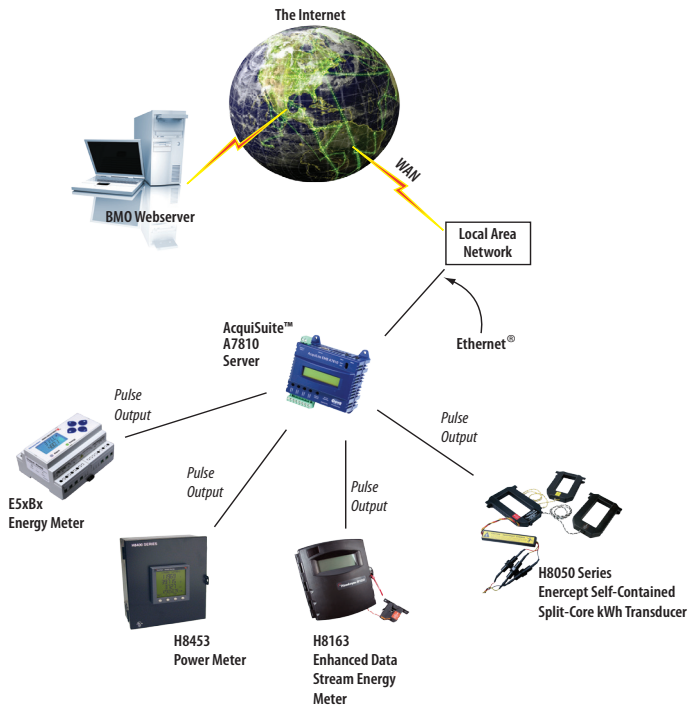
A7810	FCC CFR 47 Part 15, Class A; EN 61000; EN 61326; UL61010 recognized; EN 61010
A8810	CE; FCC Part 15, Class A; EN 61000; EN 61326; UL61010 recognized



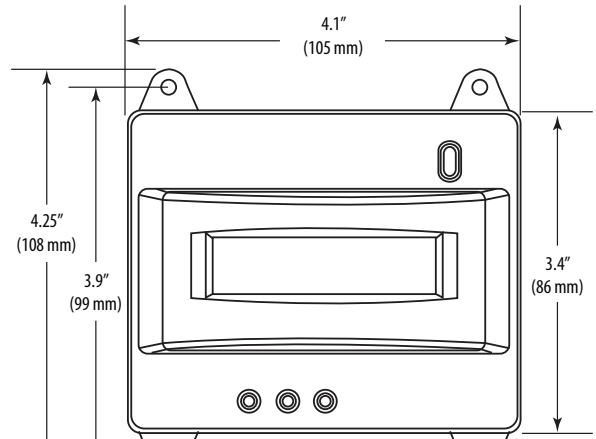
*This unit is to be sourced by a Class 2 power supply with the following output: 24 Vdc, 500 mA min. not to exceed 8 A.



A7810
Application Example



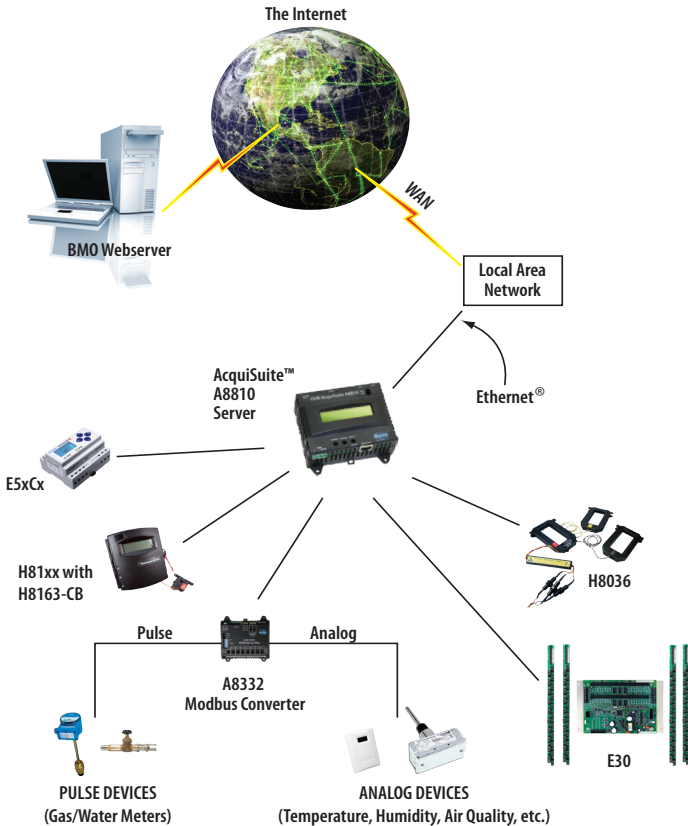
A7810 & A8810
Dimensional Drawing



THE ACQUISUITE SYSTEM ALLOWS

Internet Display of Data Using the BMO Website	View performance data in an easy graphical format. Store, display, and download historical data in a secure SQL database. Design custom views of data from one or more buildings or systems.
Security and Flexibility	Store data on board in non-volatile memory. Protect information in the event of a power failure. Time-stamp all interval data with an on-board real-time clock.
Compatibility with Existing Systems	Use the I/O module to connect to existing sensors and meters. Use TCP/IP protocols to interface with spreadsheets, databases, text files, etc. (A8810 only).

A8810
Application Example

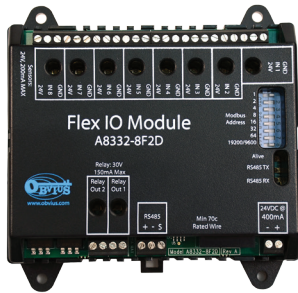


ORDERING INFORMATION

MODEL	DESCRIPTION
A7810	AcquiLite EMB data acquisition server, pulse input
A8810	AcquiSuite EMB data acquisition server, Modbus serial input

A8332-8F2D

Pulse/Analog-to-Modbus® Converter



A8332-8F2D

The A8332-8F2D Input Module provides a convenient way to optimize energy use and accurately allocate costs. Add eight standard pulse and/or analog sensors to a data acquisition network. Integrate your Veris network sensors through the A8332-8F2D to a Veris H8822 Data Acquisition Server.

The A8332-8F2D is the first truly flexible input module that allows incorporation of virtually any industry-standard sensor through a single device. The module can be incorporated with cost-effective data acquisition and wireless metering solutions such as the H8822 AcquiSuite DR™ server, which, as a properly integrated system, provides high performance and low cost. This system can be incorporated into a new or existing Building Automation System (BAS). Using the AcquiSuite data acquisition system, users can set input types (pulse, analog, resistive, etc.), giving access to real time resource consumption for a facility on a single board.

SPECIFICATIONS

Processor	ARM 7, field upgradable firmware
LED	8 input status LEDs (red), 2 Modbus TX/RX (yellow), 1 power/alive status (green)
Protocols	Modbus/ RTU
Power Supply	24 Vdc, 200 mA (not included)
Serial Port	RS-485 Modbus, 19200 or 9600 baud. 8N1
Inputs	8x, user selectable; 0-10V: Min/Max/Ave/Instantaneous; 4 to 20 mA: Min/Max/Ave/Instantaneous; Pulse: Consumption, Rate; Resistance: 0 to 10 V: Min/Max/Ave/Instantaneous
Maximum Pulse Rate	10 Hz
Contact Closure Threshold	1 kΩ
Isolation	RS-485 port is optically isolated

OPERATING ENVIRONMENT

	Indoor use only; -30 to 70 °C (32 to 122 °F), 0 to 95% RH non-condensing
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WARRANTY

Limited Warranty	2 years
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Connect up to eight sensors

Connect up to eight industry-standard sensors to the AcquiSuite data acquisition network

DIP switch

Field-selectable address DIP switch...no software or PC configuration required at device

Universal inputs

Universal inputs simplify setup... just connect sensors and select device output type via the AcquiSuite or using Obvius configuration software

High reliability

Non-volatile memory retains configuration and pulse data during power failures

LEDs

Check device status at a glance... LED indicators allow for fast recognition of on/off status, TX/RX communications, and 8 input notifications

Prevent data loss

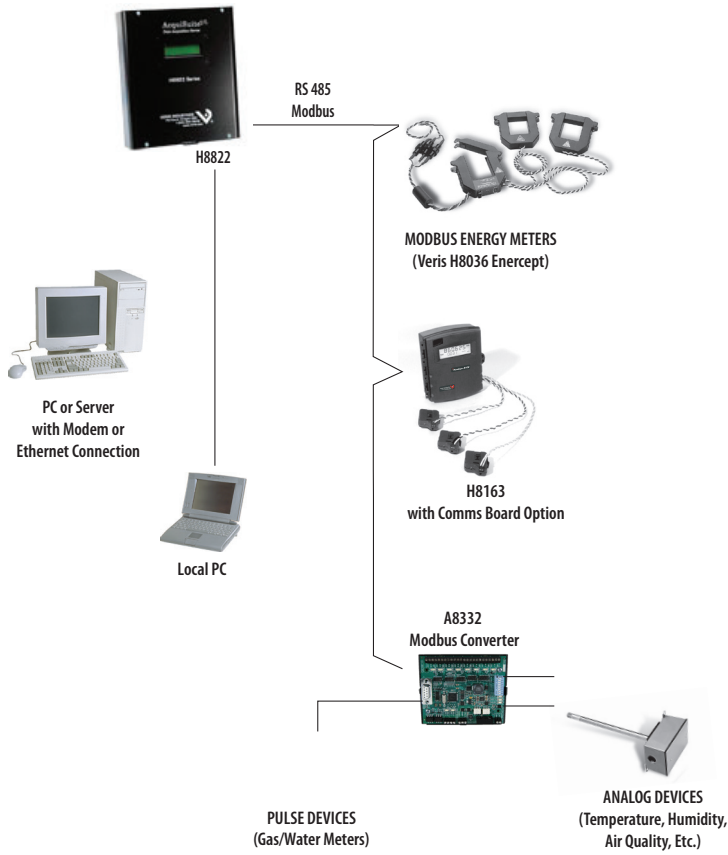
All configuration information and input data is stored in non-volatile memory to prevent data loss in the event of power failure

APPLICATIONS

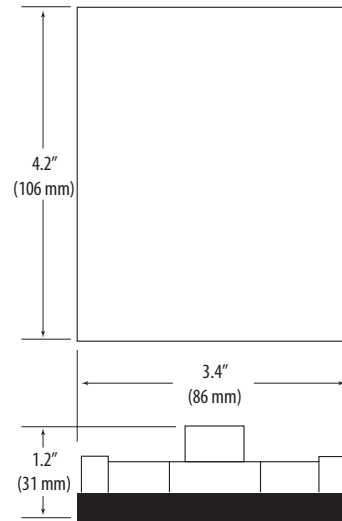
- Demand response program control and reporting
- Cost allocation to tenants and third parties
- Measurement and verification of energy savings
- Converting pulse inputs from water and gas flow meters to a Modbus network
- Monitoring performance of building systems (e.g., chillers, boilers, fans)



APPLICATION EXAMPLE



DIMENSIONAL DRAWING

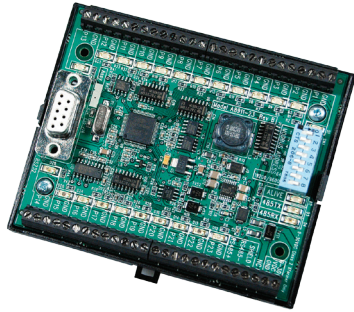


ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U013-0011	A8332-8F2D	Flexible I/O Module

A8911-23

Up to 23 Separate Pulse Inputs



A8911-23

The A8911-23 Input Module provides an easy way to integrate multiple pulse output devices to Modbus systems such as the Veris AcquiSuite data acquisition network. The A8911-23 accepts up to 23 standard pulse sensors and can function as a slave device with any Modbus master. This data can be networked to other critical energy sensors such as Veris Modbus power meters to provide a comprehensive energy monitoring solution.

SPECIFICATIONS

Processor	ARM 7, field upgradable firmware
LED	23 input status LEDs (red), 2 Modbus TX/RX (yellow), 1 power/alive status (green)
Protocols	Modbus/ RTU
Power Supply	9 Vdc to 30 Vdc, 200 mA (not included)
Serial Port	RS-485 2-wire, 19200 or 9600 baud. N81
Pulse Inputs	23 independent pulse count inputs; 32-bit pulse counter; rolls over at 4.295 billion per channel; Intended for use with dry contact outputs; pulse count values stored in nonvolatile memory; Pulse rate/width user selectable to 10 Hz, 50 Hz, or 100 Hz

MINIMUM PULSE WIDTH

10 Hz Mode	50 msec
50 Hz Mode	10 msec
100 Hz Mode	5 msec
Contact Closure Threshold	100 Ω to 5 kΩ (user selectable)
Isolation	Pulse inputs, power inputs and RS-485 are non-isolated

OPERATING ENVIRONMENT

	Indoor use only; 0 to 50 °C (32 to 122 °F), 0 to 95% RH non-condensing
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WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS

Agency Approvals	FCC CFR 47 Part 15, Class A
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4000 ft. communication

External communications via shielded twisted pair 18 to 22 gauge wire...allows communication up to 4000 feet

200 ft. pulse communication

Pulse input communication up to 200 feet using 18 to 24 gauge control wire

DIN rail mount

Quick and easy installation

APPLICATIONS

- Demand response program control and reporting
- Cost allocation to tenants and third parties
- Measurement and verification of energy savings
- Gas, water, steam, and BTU meters
- Monitoring performance of building systems (e.g., chillers, boilers, fans)

DIP switches

Onboard DIP switches for Modbus addressing

Pulse inputs

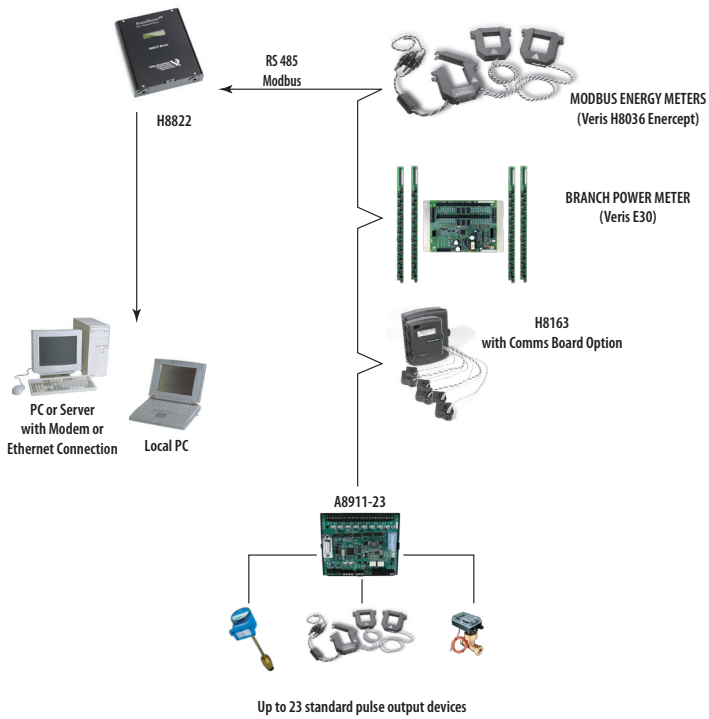
Industry standard pulse inputs connect to most pulse output meters

LED verification

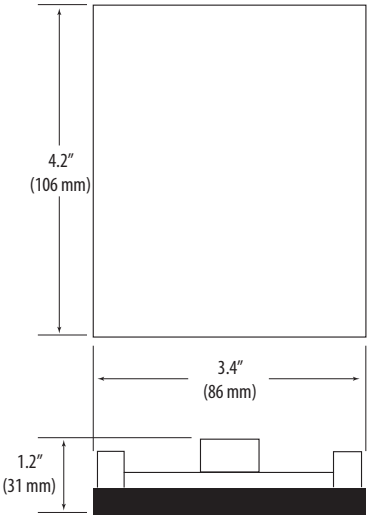
LED verification of RS-485 Modbus TX/RX communications



APPLICATION EXAMPLE



DIMENSIONAL DRAWING



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U013-0010	A8911-23	Pulse input module (up to 23 standard pulse devices)

H8920-X SERIES

Convert Modbus Data To Lontalk Protocol



H8920-x

To answer the need for open-protocol standards and cost-effective energy information, Veris Industries offers the H8920 Series of LonTalk Integration Nodes. Transducers can be connected to LonWorks networks through the H8920 devices.

Using an indexing method, H8920 devices can report data from multiple Veris power meters on the downstream Modbus network. Just select the Modbus address of a specific meter by sending a SNVT, and that meter's data is provided in LonTalk. Acquire and record the desired data, and move on to select another device.

SPECIFICATIONS

LonWorks Network	Free topology transceiver, 78 kbps
Modbus Network	RTU 9600 BAUD, 8N1 format
Input Power	16 to 24 Vac/dc, 100mA (max.)
Temperature Range	0 to 60 °C (32 to 140 °F)
Humidity Range	0 to 95% non-condensing; indoor use only

WARRANTY

Limited Warranty	5 years
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Pre-configured

Pre-configured to pass points acquired by Veris transducers to a Lon controller

Save time and money

Flexible mounting and wiring options

Connect to LonWorks

Easy cost-effective connectivity to LonWorks systems...makes open connectivity possible

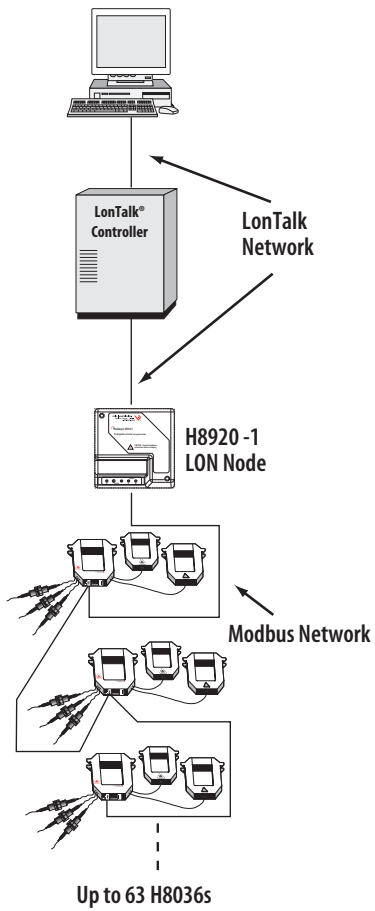
APPLICATIONS

- Submetering for commercial tenants...allocate costs
- Energy managing and performance contracting
- Load shedding and demand control
- Activity-based costing in commercial and industrial facilities



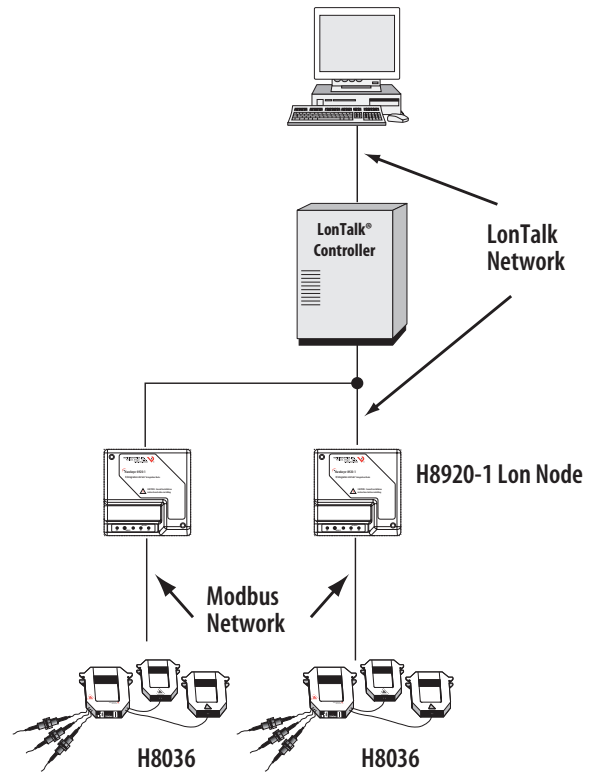
INDEXED OPTION

Application Example

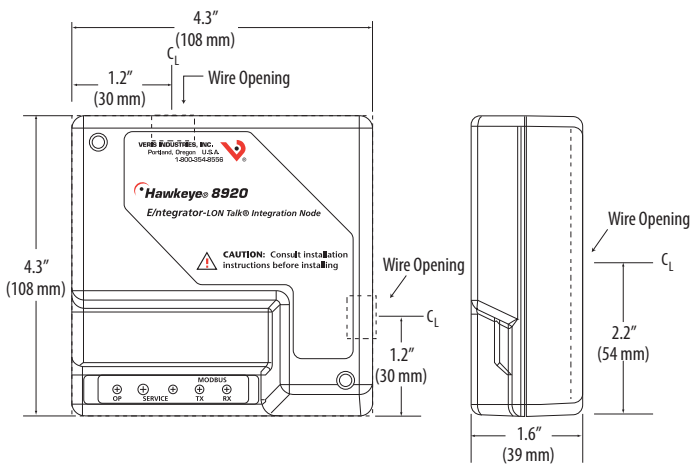


BOUND OPTION

Application Example



DIMENSIONAL DRAWING



ORDERING INFORMATION

MODEL	DESCRIPTION
H8920-1	Enercept™ H8036 to LonTalk® integration node
H8920-3	H81xx Energy Meter to LonTalk® integration node
H8920-5	Enercept™ H8035 to LonTalk® integration node

H8932 & H8936

Modbus-to-Bridgepoint



The H8932/H8936 serves as a display for Modbus data. The product sits in series between downstream metering devices & the upstream master, providing a display of the data passing through it. Registers of the H8238, H8035, H8036, E50Cx, and E51Cx energy monitors can be viewed. The E30 and E31 meters are also supported, but the H8932/H8936 only presents a subset of the most important data points measured. The H8936 is enclosed in a box for easy installation, while the H8932 is available with no box for fast mounting to a panel.

SPECIFICATIONS

AC Power Source	120 Vac 50/60 Hz, line-to-neutral; internal fuse
Fuse Ratings	200 mA@250 5x20 mm Fast-Blow
AC Power Voltage Tolerance	(90 to 132 Vac) for 120 V
AC Power Frequency	50/60 Hz
AC Power Termination	2-position Euro-style pluggable connector (max. wire size 12 gauge)
Alternate DC Power Source	12 Vdc, 300 mA external current limiting required (auxiliary input disabled if line connected)
Terminal Block Torque	4.9 in-lb (0.56 N-m)
Operating Temperature Range	0 to 50 °C (32 to 122 °F); <95% RH non-condensing; indoor use only
Storage Temperature Range	-20 to 70 °C (-4 to 158 °F)

NETWORK COMMUNICATIONS

Interface	Downstream: RS-485; Upstream: RS-485, RS-232
Protocol	Modbus RTU
Baud Rate	UI-selectable 2400, 4800, 9600, 19200
Parity	UI-selectable NONE, ODD, EVEN
Communication Format	8 data bits, 1 start bit, 1 stop bit
RS-485	¼ load transceivers; duplex is UI-selectable 2-wire or 4-wire; 5-position Euro-style pluggable connector
RS-232 (Upstream Only)	DCE, no handshaking; DB-9 connection; pin 2: transmitted data from display; pin 3: received data to display; pin 5: ground
Terminal Block Torque	4.4 in-lb (0.5 N-m)

Pass-through communications

Pass-through communications to other Modbus® devices

Monitor from a single location

Monitor a variety of Veris power transducers from a single location

Multi-color LED

Shows alarm status at a glance

Simple setup

Easy keypad setup

Large LCD

1" x 4" backlit LCD with adjustable brightness control for easy viewing

Report Slave ID

Other Modbus devices must respond to the "Report Slave ID" command (11h) to allow pass-through communications from upstream network

APPLICATIONS

- Allocating load-based costs
- Collecting energy data
- Managing loads
- Tenant submetering
- Overload protection

UI-SWITCH INPUTS

Number/Function	Four (METER, UP, DOWN, SELECT)
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AUXILIARY INPUT (REMOTE ALARM)

Type	Contact closure or pull-to-ground (10 mA max.)
Isolation	Optical to 2500 Vac
Sense	UI-selectable N.O. or N.C. (i.e. Closed = Alarm or Open = Alarm)
Terminal Block Torque	3.5 to 4.4 in-lb (0.4 to 0.5 N-m)

LCD

Size	1" x 4" visible area, 2 lines x 16 characters per line
Backlight	Green, UI-adjustable brightness in 10 steps
Status (Tri-Color LED)	Green = normal operation; Yellow = warning; Red = alarm

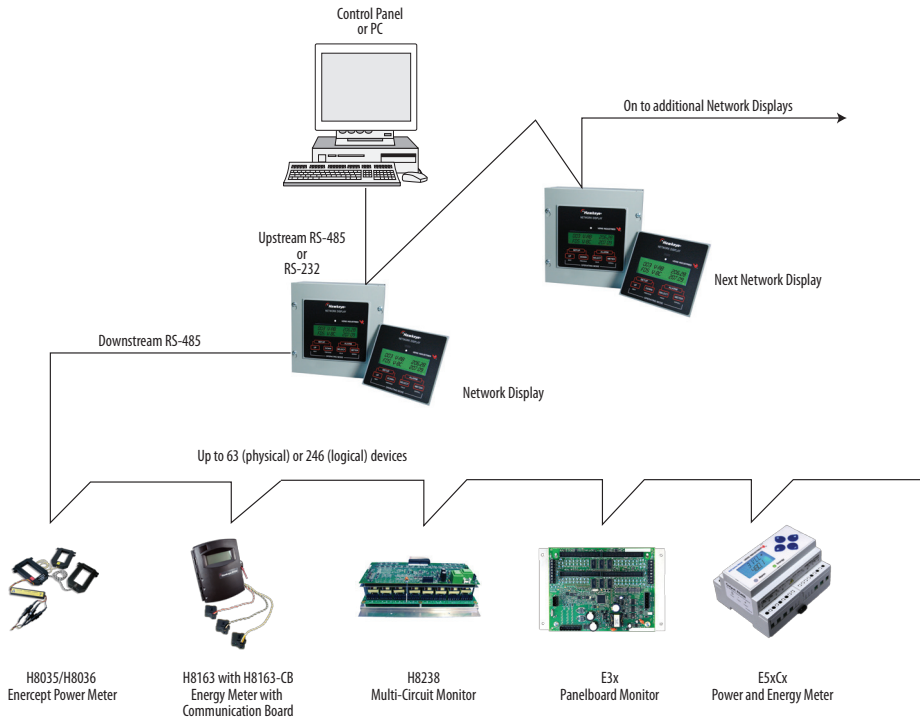
WARRANTY

Limited Warranty	5 years
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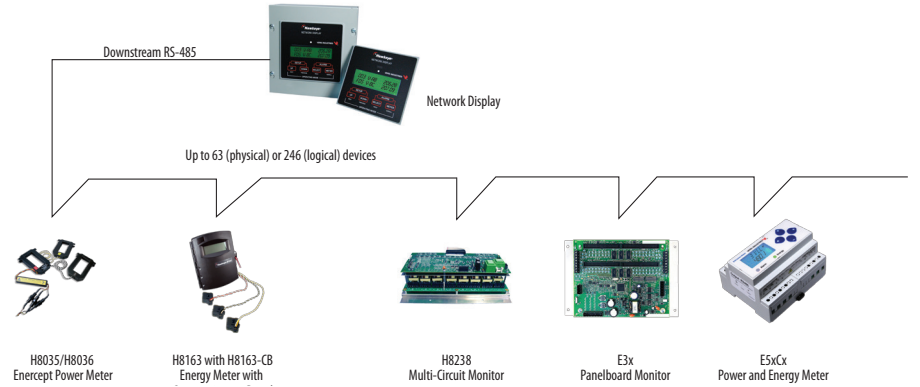
NETWORK HOST MODE

Application Example

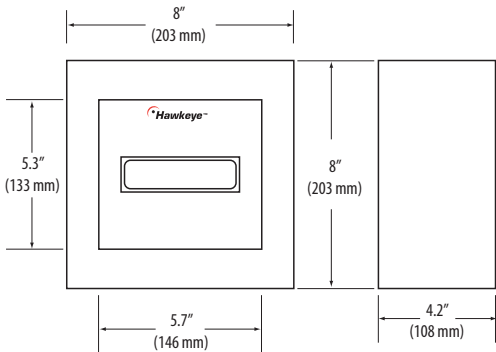


LOCAL DISPLAY MODE

Application Example



DIMENSIONAL DRAWING



ORDERING INFORMATION

MODEL	DESCRIPTION
H8936	Modbus network display enclosed in NEMA box
H8932	Modbus network display panel mount, no box



E8951

Integrate Multiple Modbus Meters into a BACnet Network



The E8951 Modbus-to-BACnet Protocol Converter enables easy integration of a broad selection of Veris meters with Building Automation Systems via BACnet protocol. When networked, the E8951 detects supported Modbus meters and gives them a unique BACnet Device ID and full set of measurement data and configuration objects. Simply select the desired protocol settings using DIP switches and the integral web server, and the supported Veris Modbus meters are available as fully-supported BACnet devices.

SPECIFICATIONS

DOWNSTREAM (DEVICE) INTERFACES

Physical Layer	2-wire RS-485
Line Termination	Internal, 120 Ω
Line Polarization	Internal
Protocol	Modbus RTU
Baud Rate	9600 to 38400 (selections vary with Modbus devices used)
Number of Devices Supported	BACnet mode - Up to 32 devices (10,000+ total BACnet data objects) SNMP mode - One 84-channel E30A/E31A or two 42-channel E30A per E8951 Modbus mode - 32 devices

UPSTREAM (CONTROLLER) ETHERNET INTERFACE

Physical Layer	10/100 Mb Ethernet
Protocol	BACnet IP, Modbus TCP, SNMP

UPSTREAM (CONTROLLER) SERIAL INTERFACE

Physical Layer	2-wire RS-485
Protocol	BACnet MS/TP or Modbus RTU
Baud Rate	9600, 19200, 38400, 76800
Parity	Even, Odd or None (Modbus RTU only, BACnet MS/TP is always none)

INPUT POWER REQUIREMENTS

Supply Voltage	Class 2; 9 to 30 Vdc or 12 to 24 Vac 50/60Hz
Nominal Current Draw @ 12V	240 mA

BACnet, Modbus, SNMP

Enables access to most Veris Modbus RTU meters via standard building automation protocols - BACnet MS/TP, BACnet IP, Modbus TCP and SNMP*

Simultaneous support

Supports BACnet IP and Modbus TCP access simultaneously

Application flexibility

Supports a broad range of Veris meters: H8035, H8036, H8163 with H8163-CB, H8238, H8436, H8437, E50C2, E51C2, E50C3**, E51C3**, E30xxxx, E31xxxx, E34xxx and U013-0010/0011 I/O modules

Extensive data collection

Each E8951 can support over 10,000 BACnet measurement points (32 meters max.)

Mixed meter support

Simultaneously supports mixed meter types (with common baud rate)...versatility in the field

Easy setup

Automatically detects supported meters and configures BACnet objects...no programming or manual mapping of Modbus points required

APPLICATIONS

- Energy management systems
- Building automation systems
- Integrated metering of HVAC systems and chillers
- SNMP access to E30A/E31A products in data centers*

* Supports SNMP with a single E30A or E31A meter per E8951.
** The logging functionality of these meters is not supported.

ENVIRONMENTAL

Operating Temp Range	-40 to 60 °C (-40 to 140 °F)
Operating Humidity Range	5 to 90% RH non-condensing; indoor use only

WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS

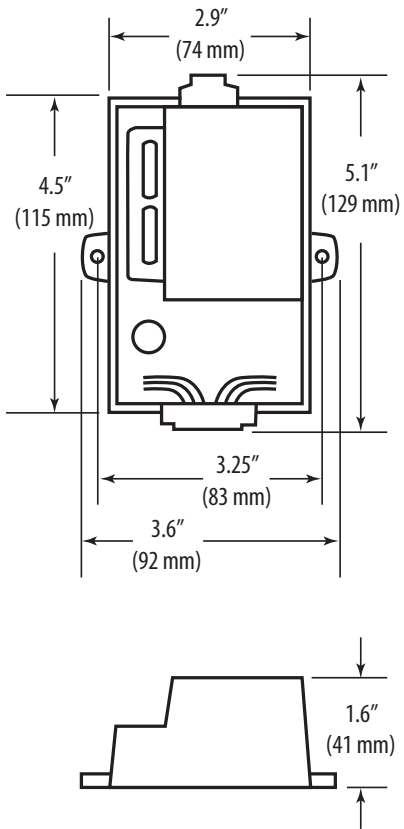
Agency Approvals	CE; TUV approved to UL916; FCC Part 15 Class A; BTL
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*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



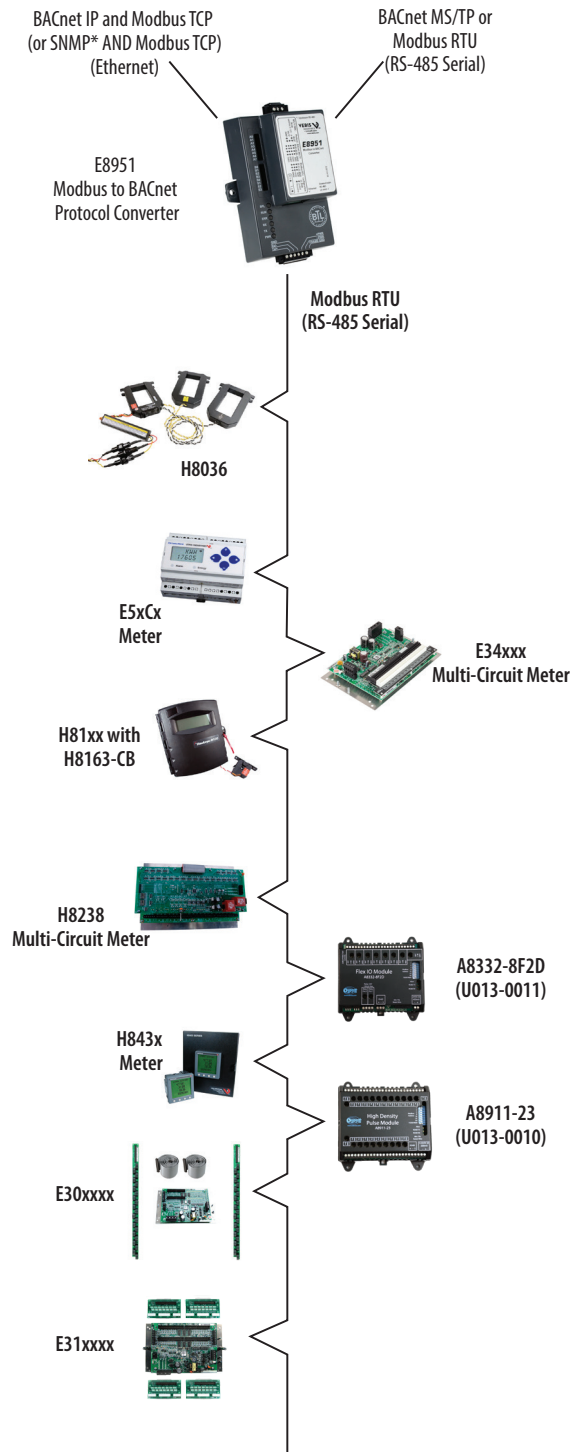
DIMENSIONAL DRAWING



ORDERING INFORMATION

MODEL	DESCRIPTION
E8951	Modbus-to-BACnet Protocol Converter

APPLICATION EXAMPLE



*Supports SNMP only with a single E30A or E31A meter per E8951.

U013-0012, U013-0013 & U013-0015

Easy Translation of Protocols to Integrate into a Network



U013-0012 Modbus Gateway provides access to all Veris Modbus RTU products over a network using Modbus TCP protocol.

U013-0013 and U013-0015 BACnet routers provide access to all Veris BACnet MS/TP products over a network using BACnet IP protocol. The U013-0015 (LX model) offers a faster operation speed and supports more BBMD entries.

Integral web browsers enable quick and simple setup of network configuration and serial communication parameters. All three products provide easy translation of serial protocols to the corresponding network protocol without requiring any device-specific translation.

SPECIFICATIONS

U013-0012

DOWNSTREAM (DEVICE) INTERFACES

Physical Layer	2-wire or 4-wire RS-485
Protocol	Modbus RTU
Baud Rate	50 to 921,600

UPSTREAM (CONTROLLER) ETHERNET INTERFACE

Physical Layer	10/100 Mb Ethernet, Fixed IP or DHCP
Protocol	Modbus TCP

INPUT POWER REQUIREMENTS

Supply Voltage	12 to 48 Vdc
Nominal Current	400 mA@12 Vdc, 130 mA@48 Vdc

ENVIRONMENTAL

Storage Temperature	-40 to 85 °C (-40 to 185 °F)
Operating Temperature	0 to 55 °C (32 to 131 °F)
Relative Humidity	5 to 95% RH noncondensing; indoor use only

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL; CE; FCC Part 15 Class A; RoHS
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Easy setup

Requires no product-specific configuration

DIN rail mount

Easy installation

Connect multiple devices

Connect multiple devices to one network drop

Wireshark®

U013-0015 MS/TP slave devices are discoverable via automatic slave discovery and built-in MS/TP traffic capture using Wireshark with web page display*

APPLICATIONS

- Energy management systems
- Data center management
- Building automation systems

SPECIFICATIONS

U013-0013 & U013-0015

DOWNSTREAM (DEVICE) INTERFACES

Physical Layer	2-wire RS-485
Protocol	BACnet MS/TP
Baud Rate	U013-0013: 9600 to 78,600 U013-0015: 9600 to 115,200

UPSTREAM (CONTROLLER) ETHERNET INTERFACE

Physical Layer	10/100 Mb Ethernet, Fixed IP
Protocol	BACnet IP
BBMD Support	U013-0013: 5 entries U013-0015: 50 entries

INPUT POWER REQUIREMENTS

Supply Voltage	U013-0013: 24 Vdc±10%, 2 W; or 24 Vac ±10%, 4 VA, 50/60 Hz U013-0015: 24 Vdc±10%, 6 W; or 24 Vac ±10%, 10 VA, 50/60 Hz
Frequency	47 to 63 Hz

ENVIRONMENTAL

Storage Temperature	-40 to 85 °C (-40 to 185 °F)
Operating Temperature	0 to 60 °C (32 to 140 °F)
Relative Humidity	10 to 95% RH non-condensing

WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS

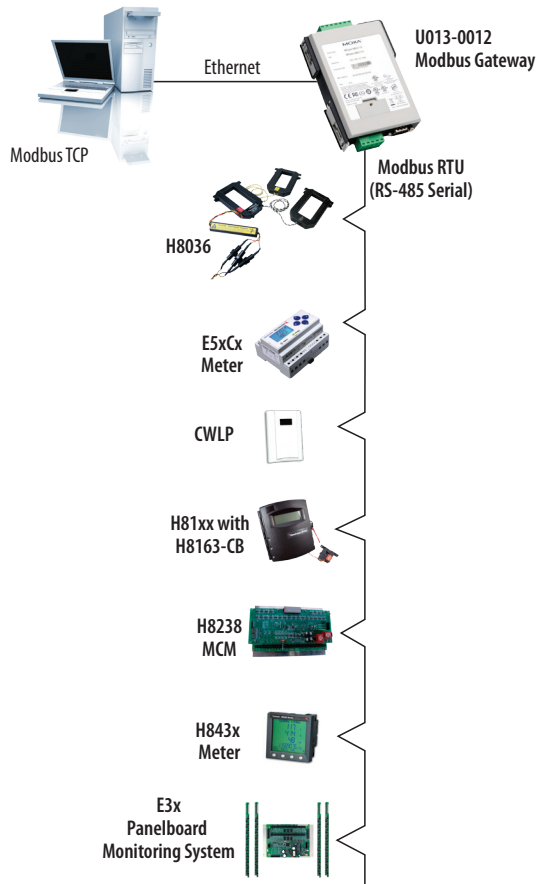
Agency Approvals	CE; FCC Part 15 Class A; RoHS
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*Wireshark is an open source packet analyzer for network traffic available from www.wireshark.org. Wireshark is a registered trademark of the Wireshark Foundation.



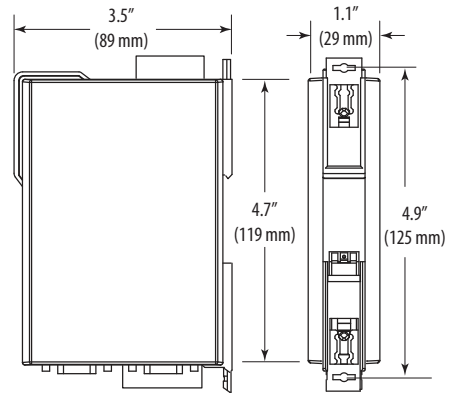
U013-0012

Application Example



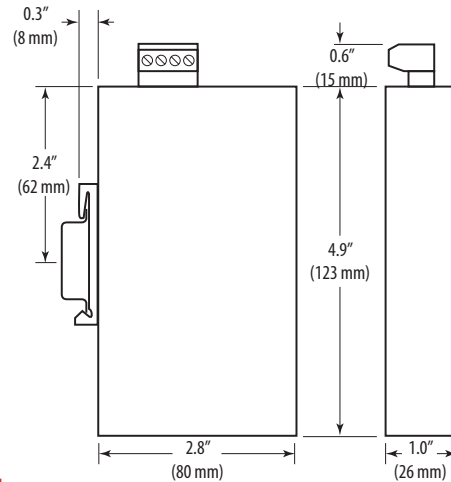
U013-0012

Dimensional Drawing



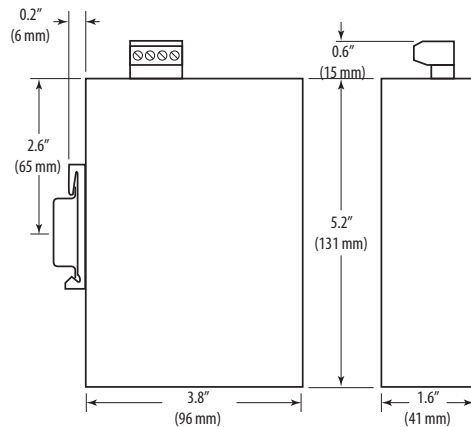
U013-0013

Dimensional Drawing



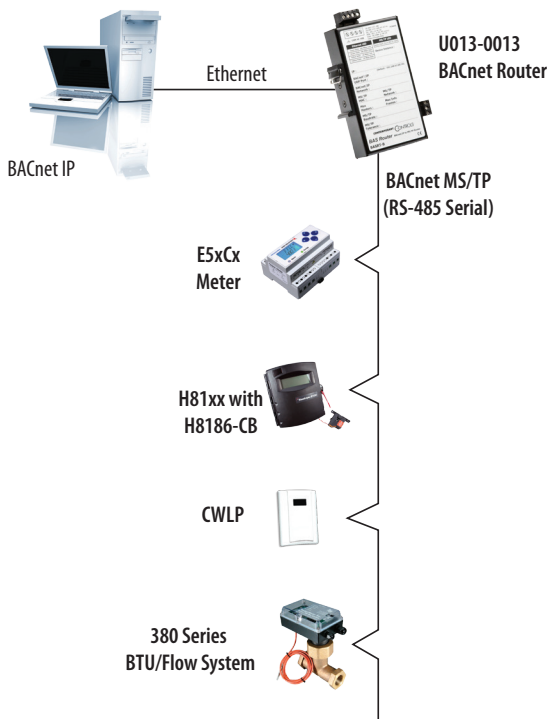
U013-0015

Dimensional Drawing



U013-0013/U013-0015

Application Example



ORDERING INFORMATION

MODEL	DESCRIPTION
U013-0012	Modbus Gateway (RTU to TCP)
U013-0013	BACnet Router (MS/TP to IP)
U013-0015	BACnet Router (MS/TP to IP)-LX Model



ACCESSORIES SELECTION GUIDE: POWER MONITORING

Product	Description	Single-Circuit									Multi-Circuit			Power CTs		Page
		E20 FLEX	H8035 & H8036	H804x & H805x	E5x	E5xxxA	E53/E54	E61C20	H81xx	H84xxx	E30	E31	E34	AL, BL, CL & H681x-A	H681xV	
AE001	E3x MCB Cover, Veris Brand										•	•	•			
AE004	Replacement Mounting Clips for E5x				•	•										
AE006	E30 Solid-Core CT Repair Kit											•				
AE012	NEMA4X Enclosure for Single DIN Meter				•	•										
AE013	NEMA4X Enclosure for 4 DIN Meters				•	•										
AE014	Metal Enclosure for 92x92 mm DIN Devices							•	•							
AH02/03/04	Fuse Pack	•	•	•	•	•	•			•	•	•	•	•		
AH06	CT Mounting Bracket		•	•				•							•	•
AH08	20T Coil: 100A - 5A CT Adapter							•	•							
AH09	60T Coil: 300A - 5A CT Adapter							•	•							
AH11	Bonding Kit for H81xx Series Meters									•						
AH23	DIN Rail Mtg. Kit for H8400 Series															
AL/BL/CL	5A Solid-Core CTs							•	•							51
AV01	35 mm DIN Rail - 1 Meter Long	•			•	•	•			•			•			
AV02	DIN Rail Stop Clip	•			•	•	•						•			
AV03	2.75 in Wide SnapTrack - 12 in Length												•			
AV05	2.75 in Wide SnapTrack - 2 in Length												•			
CBLxxx	Ribbon Cables for E3x Series											•	•	•		45
E31CTDB	Pair of E31 Adapter Boards with Mtg Kits												•			45
E31CTx	Split-Core branch CTs for E3x Series												•			45
E681x	Split-Core CTs with 1/3V Outputs	•			•				•			•*	•*	•		55
E682x	Split-Core CTs with 1/3V Outputs	•										•*	•*	•		55
E683x	Rogowski CTs for E20 Flex and E5xxxA	•				•										61
E8951	Modbus to Bacnet Protocol Converter	•			•	•		•	•	•	•	•	•	•		61
H681x-A	Split-Core CTs with 5A Outputs							•	•							51
H681x-V	Split-Core CTs with 1/3V Outputs	•		•	•	•	•			•	•*	•*	•			53
H81xx-CB	Communication Card for H81xx Series									•						35
H8920	LON Protocol Adapter		•							•						73
H8932/H8936	Remote Display (2-line LCD)	•	•		•	•				•		•	•			75
U002-000x	Shorting Blocks for Use with 5A CTs							•	•						•	
U013-0012	Modbus Gateway, RTU to TCP	•	•		•	•	•			•	•	•	•			79
U013-0013	BACnet Router, MS/TP to IP	•			•	•				•						79
U013-0015	BACnet Router LX, MS/TP to IP				•	•				•						79

* For aux CT inputs (not branch CTs).

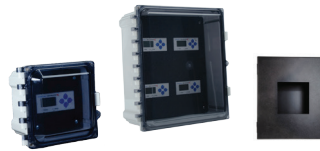




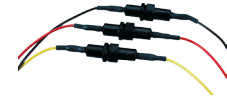
AE001
E3x MCB Cover, Veris Brand



AE006
E30 Solid-Core CT Repair Kit



AE012, AE013, AE014
NEMA4X Enclosure for Single DIN Meter
NEMA4X Enclosure for 4 DIN Meters
Metal Enclosure for 92x92 mm DIN Devices



AH02, AH03, AH04
AC Fuse Kits with Hi-interrupt Capability



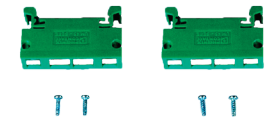
AH06
CT Mounting Brackets



AH08
20T Coil: 100A - 5A CT Adapter



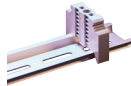
AH09
60T Coil: 300A - 5A CT Adapter



AH23
DIN Rail Mtg. Kit for H8400 Series



AV01
35 mm DIN Rail - 1 Meter Long



AV02
DIN Rail Stop Clip



AV03, AV05 (2.75")
2.75 in Wide SnapTrack, 12-in. Length (AV03)
2.75 in Wide SnapTrack, 2-in. Length (AV05)



CBLXXX
Ribbon Cables for E3x Series



E31CT0, E31CT0, E31CT3
Split-Core branch CTs for E3x Series



E681X
Split-Core CTs with 1/3V Outputs



E682X
Split-Core CTs with 1/3V Outputs



E683X
Rogowski Rope Style CT



E8951
Modbus to Bacnet Protocol Converter



H681X
Split-Core CTs with 1/3V Outputs



H81XX-CB
Communication Card for H81xx Series



H8920
LON Protocol Adapter



H8932, H8936
Remote Display (2-line LCD)



U002-000X
Shorting Blocks for Use with 5A CTs



U013-0012
Modbus Gateway, RTU to TCP



U013-0013
BACnet Router, MS/TP to IP



AIR QUALITY/ GAS DETECTION

Veris offers an extensive line of CO, CO₂ 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
CDL, CWL	Deluxe Wall Duct and Wall CO ₂ Sensors	85
CWLP/CWXP	Deluxe Wall CO ₂ Sensors, Protocol Communication	87
CDE/CWE	Standard Duct and Wall CO ₂ Sensors	89
CRLSXX	Remote Mount CO ₂ Sensor with Field-Selectable Outputs	91
CWV	Wall CO ₂ Sensor, Dual Analog Outputs	93
GWN	Platform, CO/NO ₂ Gas Sensors	95
GWNP	Platform, CO/NO ₂ Gas Sensors, Protocol Communication	97

AIR QUALITY SELECTION GUIDE

CO₂ SENSORS

FEATURES	Wall Mount	Duct Mount	Remote Mount
Analog Output	CWL, CWE, CWV pages 85, 89, 93	CDL, CDE pages 85, 89	
Field-Selectable Output	CWL, CWE pages 85, 89	CDL, CDE pages 85, 89	CRLSXX page 91
Resistive Temperature Output	CWL, CWE, CWV pages 85, 89, 93	CDL page 85	
Relay Output	CWL, CWV pages 85, 93	CDL page 85	
Protocol Output (BACnet and Modbus)	CWLP, CWXP page 87		
LCD Display with Humidity and Temperature Options	CWL page 85	CDL page 85	

CO SENSORS

FEATURES	Wall Mount	Duct Mount	Remote Mount
Selectable Output 4 to 20 mA/0-5 or 0-10 Vdc	GWN, GWNP pages 95, 97		

NO₂ SENSORS

FEATURES	Wall Mount	Duct Mount	Remote Mount
Selectable Output 4 to 20 mA/0-5 or 0-10 Vdc	GWN, GWNP pages 95, 97		



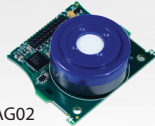
Simplified CO & NO₂ Gas Monitoring with Communicating, Modular Design



AG01



AG01E



AG02



GWN



AGPE Enclosure
(sold separately)

GWNP Series CO & NO₂ Sensor

Seamless System Integration

Interface to control system via BACnet or Modbus.

Simplified Installation

Modular platform allows for easy in-field sensor replacement.

Status Viewing

Via three colored LEDs – red, yellow, & green.

Removable Terminal Blocks

Add flexibility and freedom to your installation schedule.

Interested in learning more about the innovative GWN & GWNP design?

Contact an Air Quality/Gas Monitoring Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on pages 95 & 97



C SERIES

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



CDL/CWL 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 CWL/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: CDL CWL	0 to 50 °C (32 to 122 °F) No humidity option: 0 to 50 °C (32 to 122 °F); With humidity option: 10 to 35 °C (50 to 95 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High impact ABS plastic
Terminal Block Torque: CDL CWL	0.2 N-m (2.0 in-lbf) max. 0.22 N-m (2.0 in-lbf) max.
Terminal Block Wire Size: CDL CWL	28 to 14 AWG (0.5 to 1.5mm ²) 30 to 18 AWG (0.08 to 0.5mm 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

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

APPLICATIONS

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

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

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)
Output Range	10 to 35°C (50 to 95°F)

RELAY CONTACTS

1 Form C (SPDT) (on wall models, relay is only available in units without the setpoint slider option)	1 A@30 Vdc, resistive; 30 W max.
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WARRANTY

Limited Warranty	5 years
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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.

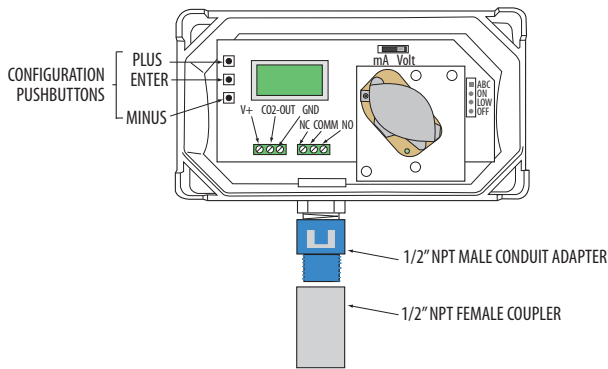
**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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.



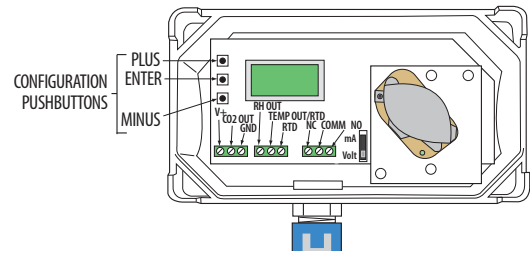
CDL (CO₂ ONLY)

Wiring Diagram



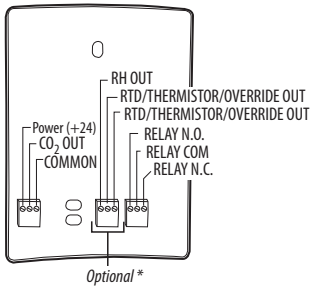
CDL (TEMP AND/OR RH OPTIONS)

Wiring Diagram



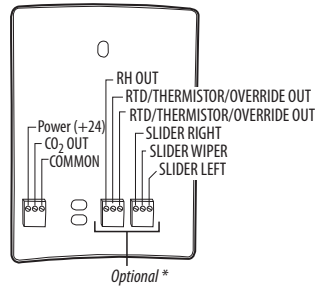
CWL

CO₂, RH, Thermistor, Pushbutton Override, and Relay Options



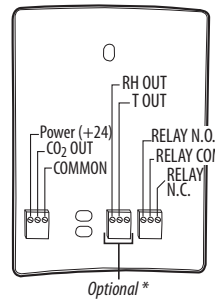
CWL

CO₂, RH, Thermistor, Pushbutton Override, and Setpoint Slider Options



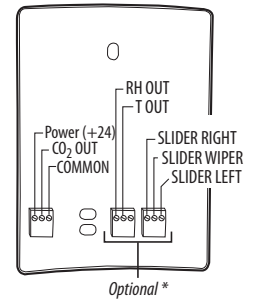
CWL

CO₂, RH, Temperature Transmitter Options, and Relay Options



CWL

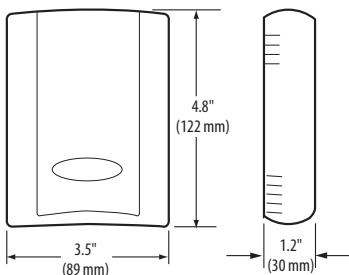
CO₂, RH, Temperature Transmitter, and Setpoint Slider Options



*Connector blocks and headers for optional features are not included with non-option models.

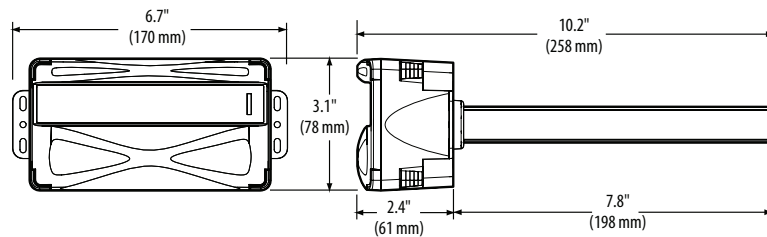
CWL WALL MOUNT

Dimensional Drawing



CDL DUCT MOUNT

Dimensional Drawing



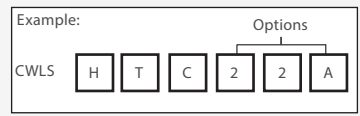
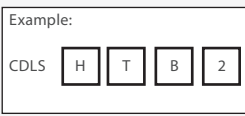
ORDERING INFORMATION

Duct Mount

RH Option	Temp	Sensor Type	Optional Cal Cert
CDLS			
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**

Wall Mount

RH Option	Temp.	Sensor Type	Temp Cal Cert	Option	Setpoint Slider Value	Housing
CWLS						
H = RH 2% X = No RH	T = Temp X = No (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	X = No 1 = 1pt Temp Cert** 2 = 2pt Temp Cert**	1 = Push Button Override* 2 = Set Point Slider 3 = Push Button Override*+Set Point Slider	A = 1k F = 10k G = 20k K = 50k M = 100k	Blank = Cloud white B = Black



*The Push Button Override feature is not available with temperature transmitter models. Only resistive temperature models qualify for this feature.
**Not available with W and Y high accuracy thermistors.



CW PROTOCOL SERIES

Individual or 3-in-1 with Modbus or BACnet Protocol



CW Protocol Series is a non-dispersive infrared (NDIR) sensor designed for measuring CO₂ concentration in ventilation systems and indoor living spaces. Its measurement range of 0 to 5000 ppm makes it the premier solution for meeting ASHRAE and other ventilation efficiency standards.

CW Protocol devices feature embedded BACnet and Modbus communication protocols, as well as optional temperature and humidity sensors. An adjustable setpoint relay is provided for direct control and alarm applications, and the optional setpoint slider and pushbutton override offer additional local input.

SPECIFICATIONS

Input Power	Class 2; 12 to 30 Vdc, 24 Vac 50/60 Hz; 100 mA max.
Operating Temp Range	No humidity option: 0 to 50 °C (32 to 122 °F); With humidity option: 10 to 35 °C (50 to 95 °F)
Operating Humidity Range	0 to 95% RH non-condensing
Housing Material	High impact ABS plastic, UL 94 V0
Terminal Block Torque	0.22 N-m (2.0 in-lbf) max.
Terminal Block Wire Size	30 to 18 AWG (0.08-0.5mm ²)
Protocol	BACnet or Modbus (selectable)
Connection	2-wire RS-485
Data Rate	9600, 19200, 38400, 57600 (Modbus), bps (selectable); 9600, 19200, 38400, 76800 (BACnet), bps (selectable)
Parity	None/Odd/Even (selectable-Modbus); None (BACnet)
Address Range	1 to 127
Setpoint Slider Resolution Option	1% full scale
Override Button Option	Remotely readable and resettable

Communicating

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

Feature override

Local feature override capability from the building control system...added control and flexibility

Configurable baud rates

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

Self-calibrating

Innovative self-calibration algorithm...maximizes performance. Field calibratable...minimizes downtime.

CO₂, RH, temp

CO₂, humidity, and temperature sensors in one device at one address...provides more information and maximizes system capacity

NIST or standard

Available with 2% NIST or 2% standard RH

APPLICATIONS

- Controlling ventilation in response to occupancy
- Office buildings, conference rooms, schools, retail stores, etc.

CO₂ TRANSMITTER

Sensor Type	Non-dispersive infrared (NDIR) diffusion sampling
Measurement Range	0 to 5000 ppm
Accuracy*	±30 ppm ±2% of measured value
Repeatability	±20 ppm ±1% of measured value

RH TRANSMITTER OPTION

HS Sensor	Replaceable digitally profiled thin-film capacitive ; (32-bit mathematics); U.S. Patent 5,844,138
Accuracy**	±1% from 12 to 60% RH; ±2% from 10 to 80% RH; NIST traceable multi-point calibration
Reset Rate***	24 hours
Stability	±1% @ 20 °C (68 °F) annually for two years
Hysteresis	1.5% typical
Temperature Coefficient	±0.1% RH/°C above/below 25 °C (typical)

TEMPERATURE TRANSMITTER OPTION

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



SPECIFICATIONS, CONT.

Resolution	0.1 °C (0.2 °F)
Range	10 to 35 °C (50 to 95 °F)

RELAY CONTACTS

1 Form C (SPDT)	1 A@30 Vdc, resistive; 30 W max.
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WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



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 61000-6-1:2007 specification requirements)
 * Measured at NTP

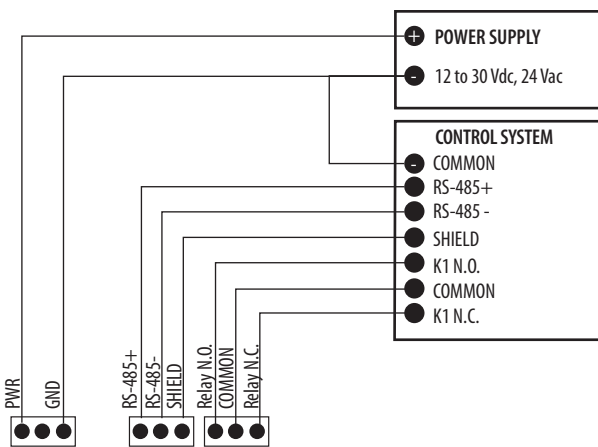
** Specified accuracy with 24 Vdc supplied power with rising humidity.

*** Reset rate is the time required to recover to 50% RH after exposure to 90% RH for 24 hours.

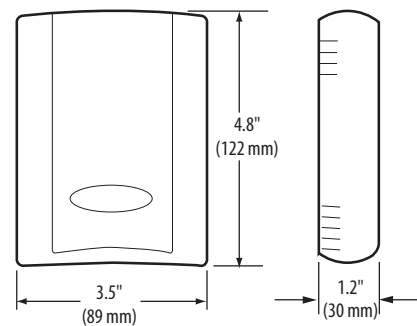
† The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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.

WIRING DIAGRAM



DIMENSIONAL DRAWING



ORDERING INFORMATION

Local Display	Protocol	RH Option	Temp. Option	Temp Cal. Cert.	Option	Housing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L = LCD X = No Display	P = Protocol	X = No RH 2 = RH 2% NIST H = RH 2%	X = No Temp T = Temp Transmitter	X = None 1 = 1 pt. cal. cert.* 2 = 2 pt. cal. cert.*	Blank = None 1 = Pushbutton override 2 = Set point slider 3 = Pushbutton override + setpoint slider	Blank = Cloud white B = Black

Example: CW [L] [P] [H] [T] [X] [3]

*Only available if temperature option is selected.



CDE & CWE SERIES

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



The CDE and CWE are non-dispersive infrared (NDIR) sensors designed for measuring environmental CO₂ concentration in ventilation systems and indoor living spaces. Their measurement range of 0 to 2000 ppm makes them compliant with ASHRAE and other standards for ventilation control.

The CWE/CDE Series 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:	
CDE	0.5 to 0.6 N-m (4.4 to 5.3 in-lbf) max.
CWE	0.2 N-m (2.0 in-lbf) max.
Terminal Block Wire Size:	
CDE	24 to 12 AWG (0.25 to 2.5mm ²)
CWE	28 to 20 AWG (0.08 to 0.5mm ²)
Sensor Type	Non-dispersive infrared, diffusion sampling
Output Range	0 to 2000 ppm
Accuracy	±30 ppm ±2% of measured value*

Microprocessor based

Microprocessor-based design increases accuracy and reduces installation time

NDIR

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

Sensitivity

Low ambient sensitivity

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)

APPLICATIONS

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

Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change

WARRANTY

Limited Warranty	3 years
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AGENCY APPROVALS



RTD/Thermistors in wall housings 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

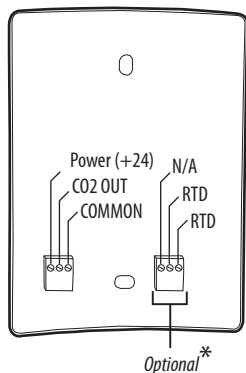
**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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.



CWE WALL MOUNT

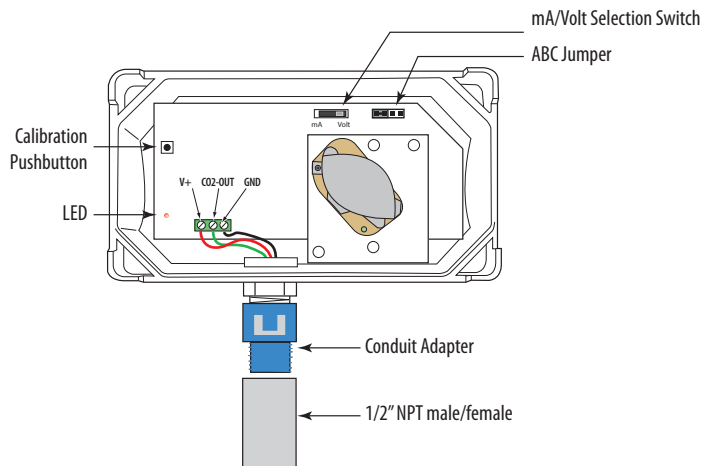
Wiring Diagram



* Note: Connector blocks and headers for optional features are not included with non-option models.

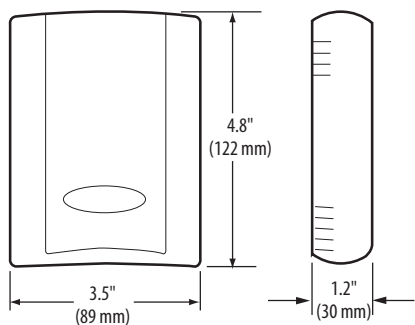
CDE DUCT MOUNT

Wiring Diagram



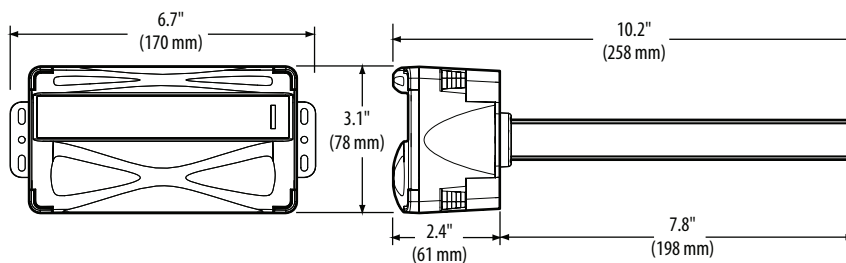
CWE WALL MOUNT

Dimensional Drawing



CDE DUCT MOUNT

Dimensional Drawing



ORDERING INFORMATION

Duct Mount	Wall Mount, Temp. Option	Wall Mount, No Temp. Option
CDE (No Options)	<p>Sensor Type</p> <p>CWE</p> <ul style="list-style-type: none"> SB= 100R Platinum, RTD SC= 1k Platinum, RTD SD= 10k T2, RTD, Thermistor SE= 2.2k, Thermistor SF= 3k, Thermistor SG= 10k CPC, Thermistor SH= 10k T3, Thermistor SJ= 10k Dale, Thermistor SK= 10k with 11k shunt, Thermistor SM= 20k NTC, Thermistor SN= 1800 ohm, Thermistor SR= 10k US, Thermistor SS= 10k 3A221, Thermistor ST= 100k, Thermistor SU= 20k "D" Thermistor SW= 10k T2 high accuracy, Thermistor SY= 10k T3 high accuracy, Thermistor <p>Housing</p> <p>Blank = Cloud white B = Black</p> <p>Example: CWE SH B</p>	<p>Housing</p> <p>CWE</p> <p>Blank = Cloud white B = Black</p> <p>Example: CWE B</p>

CRLSXX

Suitable for Outside Air Measurement Applications



CRL



The CRLSXX remote mount carbon dioxide sensor is designed for use in HVAC control applications. Inside buildings, people are the major source of CO₂. By controlling fresh air based on CO₂ levels, energy can be saved and tenant comfort improved.

The remote capability of the CRLSXX provides flexibility for unique applications.

SPECIFICATIONS

Input Power	Class 2; 20 to 30 Vdc/24 Vac 50/60 Hz; 100 mA maximum
Analog Output	4 to 20mA (clipped & 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	0.5 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)

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

NDIR

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

Sensitivity

Low ambient sensitivity

Microprocessor based

Microprocessor-based design reduces long-term drift and calibration requirements

APPLICATIONS

- Controlling HVAC in response to occupancy
- Improving tenant comfort
- Facilitating compliance with ASHRAE 62.1 standard for air quality
- Direct measuring of outside air or sample from other remote area

Self-calibrating

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

LCD

LCD display for visibility

Field-selectable

Field-selectable 4 to 20 mA/0 to 5 V/0 to 10 V output for system flexibility

Repeatability	±20 ppm ±1% of measured value
Response Time***	<60 seconds for 90% step change

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



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).

*When directly measuring outside air, ensure the temperature of the air as it reaches the sensor is between 0 and 50 °C.

**Measured at NTP

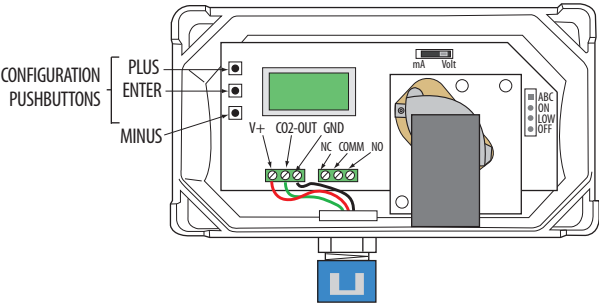
***Response time when used with 3ft long sampling tube, Veris part number AA50.

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.

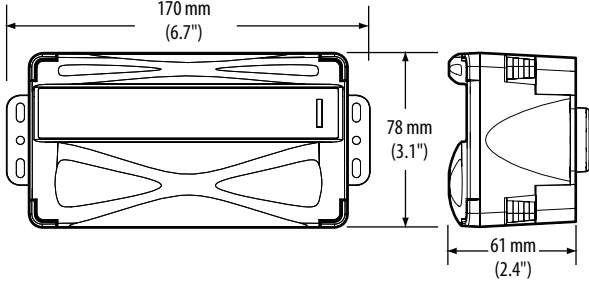
†The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



WIRING DIAGRAM



DIMENSIONAL DRAWING

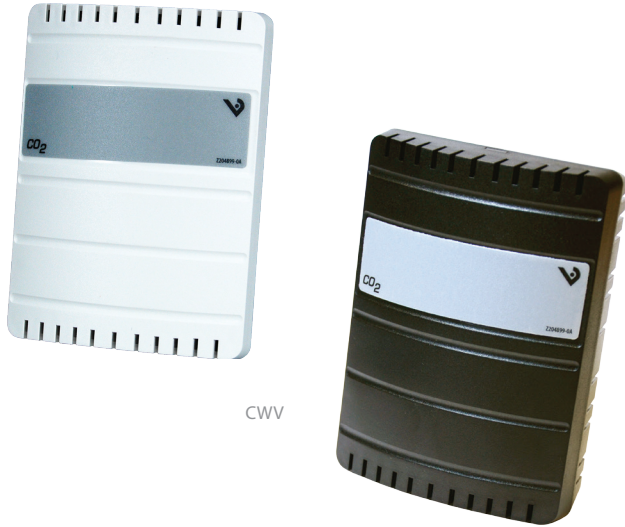


ORDERING INFORMATION

MODEL	DESCRIPTION
CRLSXX	Remote mount CO ₂ sensor.

CWV SERIES

Dual Analog Outputs, Switchable 0 to 3/5/10 Vdc,
4 to 20 mA Output



CWV

The CWV Series is a non-dispersive infrared sensor designed for measuring CO₂ concentration in office and living spaces. Its 2000 ppm measurement range makes it an ideal solution for meeting ASHRAE and other ventilation control standards.

The CWV Series features multiple output options, microprocessor-based digital technology, and a unique self-calibration algorithm which improves long-term stability and accuracy.

SPECIFICATIONS

Input Voltage	Class 2; 20 to 30 Vdc, 24 Vac 50/60 Hz
Analog Output #1	4 to 20 mA (clipped & capped) or 0 to 3 Vdc/ 0 to 5 Vdc/0 to 10 Vdc (jumper selectable)
Analog Output #2	4 to 20 mA (clipped & capped) or 0 to 3 Vdc/ 0 to 5 Vdc/0 to 10 Vdc (jumper selectable)
Sensor Current Draw	200 mA Maximum
Operating Humidity Range	0 to 95% RH non-condensing
Operating Temp Range	0 to 50 °C (32 to 122 °F)
Housing Material	High impact ABS plastic
Terminal Block Torque	0.4 to 0.5 N-m (3.6 to 4.4 in-lbf) max.
Terminal Block Wire Size	24 to 14 AWG (02 to 2.5 mm ²)
Relay Contacts	1 A@30 Vdc, resistive; 30 W max.

CO₂ TRANSMITTER

Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Measurement Range	0 to 2000 ppm
Accuracy	±40 ppm ±5.5% of measured value
Repeatability	±30 ppm ±4.5% of measured value
Response Time	<60 seconds for 90% step change

Microprocessor based

Microprocessor-based design reduces long-term drift and calibration requirements

NDIR

Non-dispersive infrared technology (NDIR) repeatable to ±30 ppm ±4.5% of measured value...high accuracy

Self-calibrating

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

Sensitivity

Low ambient sensitivity

ASHRAE 62.1

Improve comfort and facilitate compliance with ASHRAE 62.1 standard for air quality

DCV

Demand control ventilation (DCV) provides reduction in energy costs...helps with green branding initiatives

APPLICATIONS

- Controlling HVAC in response to occupancy
- Improving tenant comfort
- Schools, museums, airports, commercial buildings, etc.
- OEM applications
- Home automation
- Big-box retail

WARRANTY

Limited Warranty 1 year

AGENCY APPROVALS



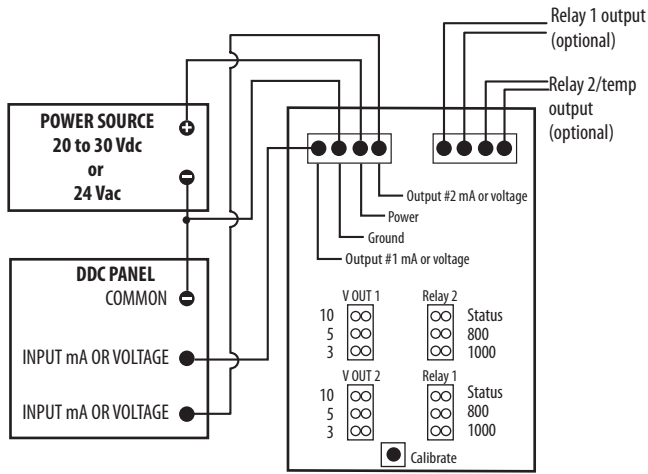
*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

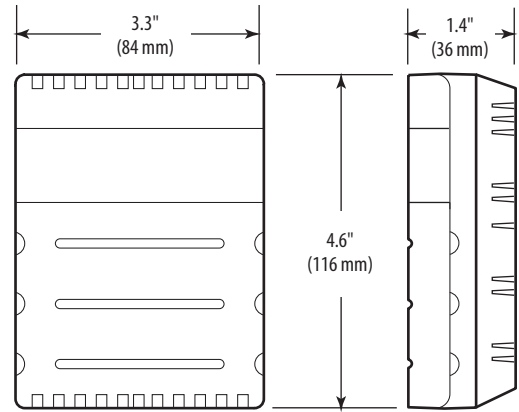
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).



WIRING DIAGRAM



DIMENSIONAL DRAWING



ORDERING INFORMATION

Outputs	Relay Option	Thermistor/2nd Relay option	Warranty	Housing
CWVS <input type="checkbox"/> 1 = 0-3/5/10VDC and 4-20mA 2 = Dual 4-20mA 3 = Dual 0-3/5/10VDC	<input type="checkbox"/> X = None 1 = Relay	<input type="checkbox"/> X = No option B = 100R Platinum C = 1k Platinum D = 10k T2 E = 2.2k F = 3k H = 10k T3 J = 10k Dale K = 10k w/11k with shunt M = 20k NTC N = 1800 ohm P = 10m V/C R = 10k US S = 10k 3A 221 U = 20k "D", Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor 1 = Relay	<input type="checkbox"/> 1 = 1 Year 3 = 3 Years 5 = 5 Years	<input type="checkbox"/> Blank = White/gray B = Black
Example: CWVS <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				

GWN

Modular Gas Sensor Platform Accepts AG Series Gas Sensors



GWN



AGAE Enclosure
(sold separately)

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*
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COMPLIANCE INFORMATION

Agency Approvals	Intertek ETL Listed to UL 61010-1
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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.

**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.





AG01 CO Sensor



AG01E CO Sensor



AG02 NO₂ Sensor

SENSOR TYPE	Electrochemical	Electrochemical	Electrochemical
MEASUREMENT RANGE	0 to 300 ppm	0 to 500 ppm	0 to 15 ppm
ACCURACY	±3% of range	±5% of range	±5% of range at 25 °C
ANALOG OUTPUT SCALING	0 to 200 ppm	0 to 200 ppm	0 to 15 ppm
RESOLUTION	1 ppm	1 ppm	0.1 ppm
SENSOR WARRANTY	2 years from manufacture date	1 year 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)
HIGH SETPOINT VALUE	180 ppm (fixed)	180 ppm (fixed)	3 ppm (fixed)
OPERATING TEMPERATURE RANGE	-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

ORDERING INFORMATION - PLATFORM

Output: GWN* □ X X

Housing Color: □

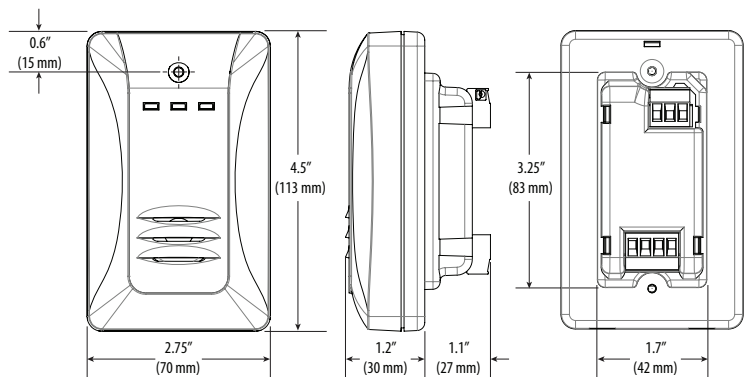
V = Field-selectable, 0-5/0-10 Vdc with relay
 M = 4 to 20 mA with relay
 1 = Relay only

Blank = Black
 W = White

Example: GWN M X X W

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

DIMENSIONAL DRAWING



ORDERING INFORMATION – REQUIRED SENSORS

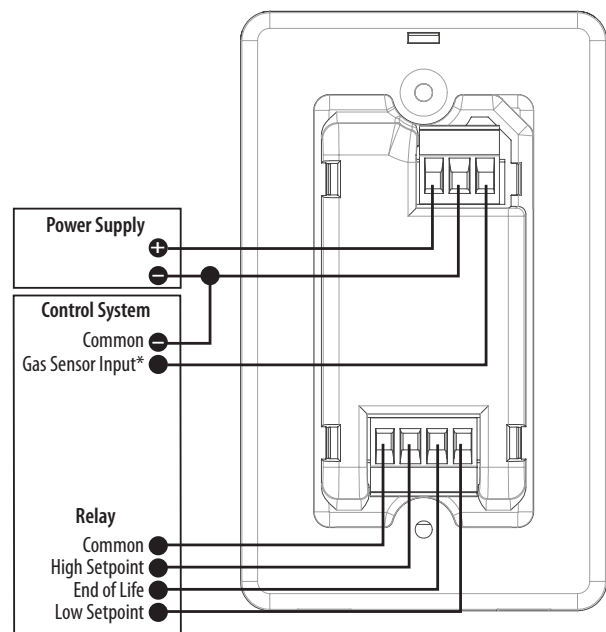
MODEL	DESCRIPTION
AG01	CO sensor, 3% accuracy. CO sources include exhaust from gasoline engines, gasoline powered furnaces, gasoline powered water heaters, gasoline generators.
AG01E	CO sensor, 5% accuracy. CO sources include exhaust from gasoline engines, furnaces, water heaters, generators
AG02	NO ₂ sensor. NO ₂ sources include exhaust from diesel engines and diesel powered generators

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

WIRING DIAGRAM



* Not available on relay only models.



GWNP

Modular Gas Sensor Platform Accepts AG Series Gas Sensors



GWNP



AGPE Enclosure
(sold separately)

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

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

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

SPECIFICATIONS

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

WARRANTY

Limited Warranty	5 years*
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COMPLIANCE INFORMATION

Agency Approvals	Intertek ETL Listed to UL 61010-1
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Communication

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

Microprocessor based

Microprocessor controlled for excellent stability

Modular platform

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

No calibration

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

LEDs

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

Versatile interface

Interface to DDC systems or direct fan control

APPLICATIONS

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

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

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

**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.





AG01 CO Sensor



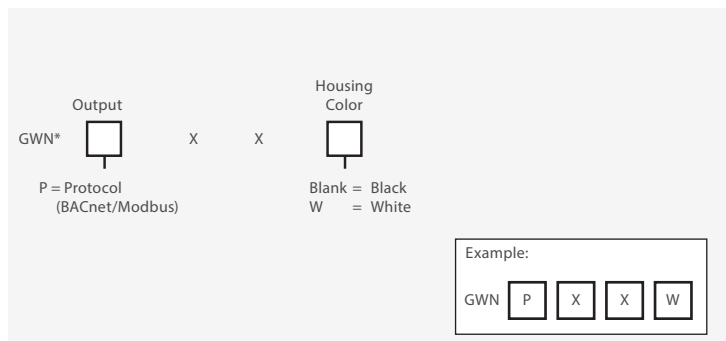
AG01E CO Sensor



AG02 NO₂ Sensor

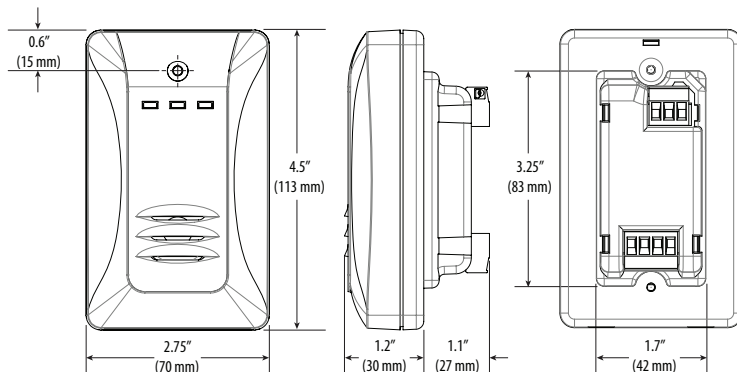
SENSOR TYPE	Electrochemical	Electrochemical	Electrochemical
MEASUREMENT RANGE	0 to 300 ppm	0 to 500 ppm	0 to 15 ppm
ACCURACY	±3% of range	±5% of range	±5% of range at 25 °C
ANALOG OUTPUT SCALING	0 to 200 ppm	0 to 200 ppm	0 to 15 ppm
RESOLUTION	1 ppm	1 ppm	0.1 ppm
SENSOR WARRANTY	2 years from manufacture date	1 year 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)
HIGH SETPOINT VALUE	180 ppm (fixed)	180 ppm (fixed)	3 ppm (fixed)
OPERATING TEMPERATURE RANGE	-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

ORDERING INFORMATION - PLATFORM



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

DIMENSIONAL DRAWING



ORDERING INFORMATION – REQUIRED SENSORS

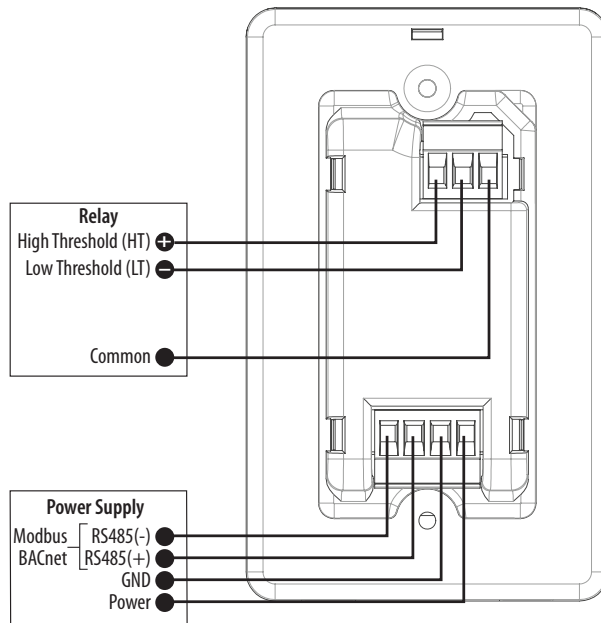
MODEL	DESCRIPTION
AG01	CO sensor, 3% accuracy. CO sources include exhaust from gasoline engines, gasoline powered furnaces, gasoline powered water heaters, gasoline generators.
AG01E	CO sensor, 5% accuracy. CO sources include exhaust from gasoline engines, furnaces, water heaters, generators
AG02	NO ₂ sensor. NO ₂ sources include exhaust from diesel engines and diesel powered generators

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

WIRING DIAGRAM





FLOW MONITORING

Veris Industries offers an extensive range of 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 Series	Insert Meter, Small Diameter Impeller (SDI)	101
220x, 228x	Insertion Meters, Standard Impeller/Hot Tap	103
225x, 226x	Insertion Meters, Standard Impeller/Hot Tap	104
250x	Tee Meter, Brass	105
228PV, 735, 4000	Tee Meter, Plastic	107
380	Tee Meter, BTU System	109
3000, 3050	Monitor: Local Display Output and BTU	111
310, 320, 340	Transmitter: Analog, BTU, Pulse, and Protocol Output	113
Magnetoflow	Electromagnetic (Mag) Meter	115
DXN	Portable Clamp-On Ultrasonic Flow Meter	118
FST/FSR	Ultrasonic Flow and Energy BTU Meter	119
170, RCDL	Nutating Disc Meter	121
450, 1000	Turbine Meter	123
B142 Series	Gas Turbine Flow Meter	125
B30xx Series	Monitor for Gas Turbine Flow Meter	127

FLOW SENSOR SELECTION GUIDE

FLOW SENSORS

	INSERT	PLASTIC TEE	METAL TEE
Basic Model	220x/228x page 103	228PV/735/4000 page 107	228x, 250x pages 103, 105
Hot Tap Capability	SDI, 225x/226x pages 101, 104		
BTU Measurement			380 page 109
Small Diameter Impeller	SDI page 101		
Built-in Transmitter	SDI page 101		

(manufacturer's part number)

TRANSMITTERS AND MONITORS

	ANALOG OUTPUT	SCALED PULSE OUTPUT	PROTOCOL OUTPUT
Transmitter	310 page 113	320 page 113	
Transmitter with BTU Calculation	340 page 113		340 page 113
Flow Monitor with LCD Display	3000 page 111	3000 page 111	3000 page 111
Flow Monitor with LCD Display and BTU Calculation	3050 page 111	3050 page 111	3050 page 111

(manufacturer's part number)

SPECIALITY METERS

Non-Impeller Styles	Electromagnetic page 115	Nutating Disc page 121	Turbine page 123	Ultrasonic page 119
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Simplify Installation, Maximize Efficiency

Take the particulates out of liquid flow monitoring



FSR & FST Series Ultrasonic Flow and Energy BTU Meter

Fast and Inexpensive Installation

No cutting, welding or drilling.

Wide Array of Fluid Monitoring

Including water, brine and raw sewage.

Interested in learning more about the FSR/FST Series products?

Contact a Flow Monitoring Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on pages 109 & 119

Complete System View

Forward flow, reverse flow and net total measurement.

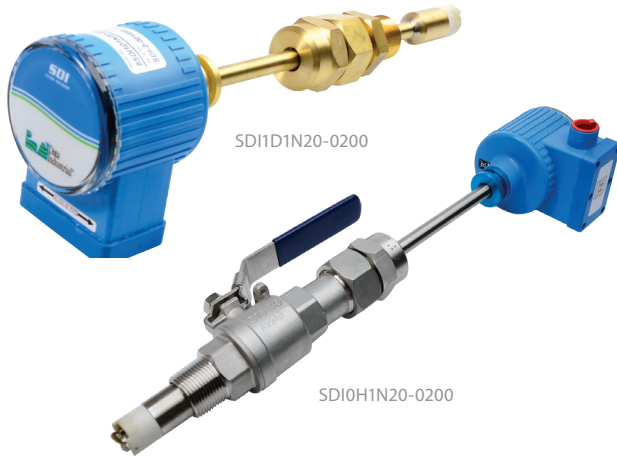
Easy System Integration

Via Modbus RTU and BACnet/IP.



SDI SERIES

For Pipe Sizes 1-1/2" To Over 36"



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 on facing page.

Fewer leaks

Viton® O-ring seal standard

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

This sensor is available with or without hot tap capability. In the hot tap installation, the sensor is mounted in the pipe under pressure by attaching a service saddle or weld-on fitting to the pipe. Then the sensor assembly is attached to an isolation valve & 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 A1027 tool is also needed (see Ordering Information).

APPLICATIONS

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

SPECIFICATIONS

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

WARRANTY

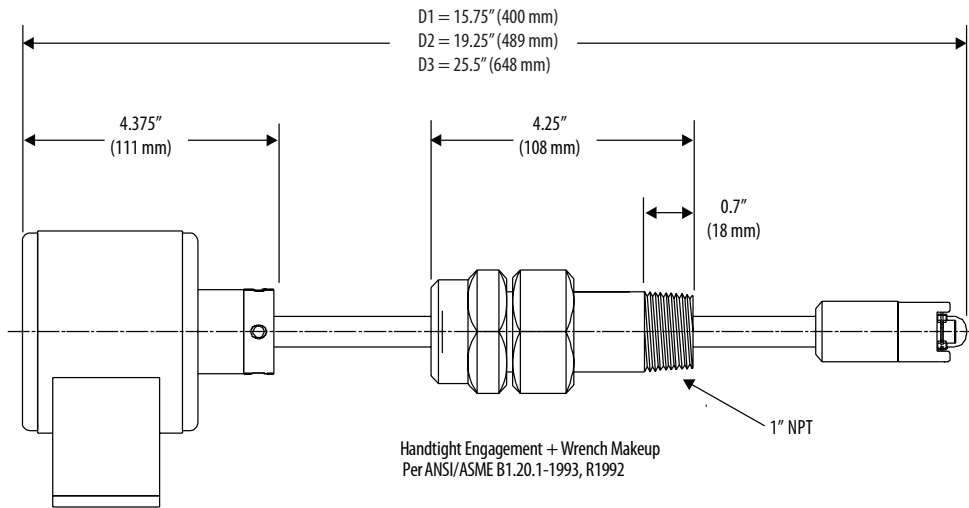
Limited Warranty	1 year
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* ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.



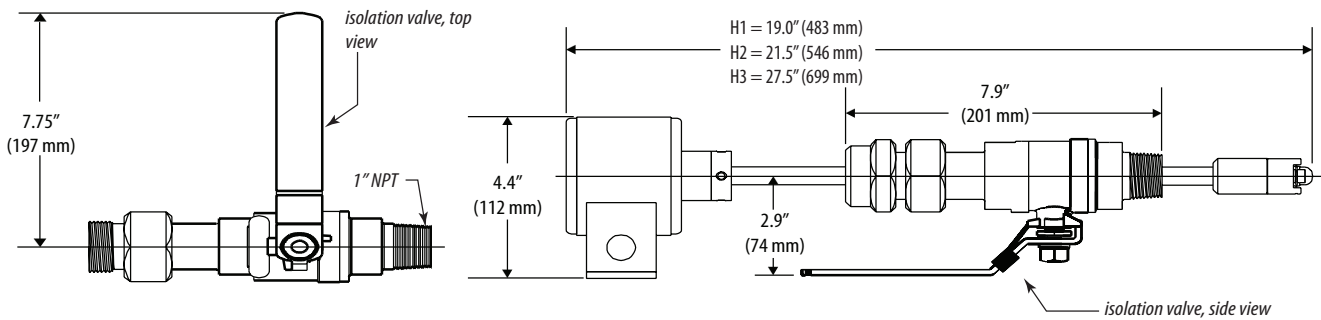
SDI1D1N20-0200

Dimensional Drawing



SDI0H1N20-0200

Dimensional Drawing



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0020	A301-20*	Flow, Programming Cable with CD for Badger/DI Prod, Serial PC Connector
U001-0149	40134-0002*	Flow, Programming Data Converter with Cable and CD, USB PC Connector
U001-0021	SDI0D1N10-0200	Flow, SDI, SS, 1.5 to 10, 4 to 20 mA, No Display
U001-0022	SDI0H1N10-0200	Flow, SDI, Hot Tap, SS, 1.5 to 10, 4 to 20 mA, No Display
U001-0050	A1027**	Flow, Tool, Hot Tap Adapter, 1" Machine to 1" NPT
U001-0063	SDI0D1N00-0200	Flow, SDI, SS, 1.5 to 10, Frequency, No Display
U001-0064	SDI0H1N00-0200	Flow, SDI, SS, 1.5 to 10, Hot Tap, Frequency, No Display

* Software and programming cable are required for analog, Modbus, LonWorks, BACnet transmitter and meter products.

** A1027 required to adapt SDI hot tap sensor 1" machine thread to 1" NPT for hot tap drilling tools.

Other models available:

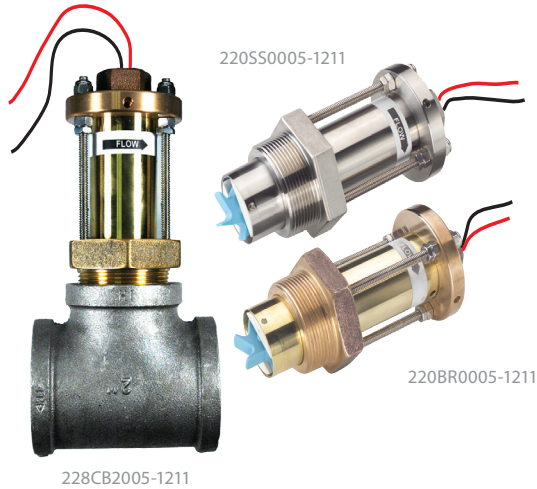
Material	Type	Electronic Housing	Output	Display	O-Ring	Shaft	Impeller	Bearing
SDI <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 0	<input type="checkbox"/> 0
0 = Stainless Steel/ PPS plastic Tip 1 = Brass/PPS plastic Tip (no Hot Tap) 2 = Stainless Steel/ PEEK plastic Tip	D1 = Direct Insert for Pipe 1½ - 10" D2 = Direct Insert for Pipe 12 - 36" D3 = Direct Insert 36" and up H1 = Hot Tap for Pipe 1½ - 10" H2 = Hot Tap for Pipe 12 - 36" H3 = Hot Tap 36" and up	= NEMA 4X	0 = Frequency (standard) 1 = Analog 4 to 20 mA 2 = Scaled Pulse 5 = Bidirectional, analog, 4 to 20 mA (hot tap SS only) 6 = Bidirectional, scaled pulse (hot tap SS only)	0 = No Display 1 = LCD Option (requires output option 1 or 2)	0 = Viton® (standard) 1 = EDPM 2 = AFLAS*	0 = Zirconia Ceramic (optional) 1 = Hastelloy® C-276 (optional) 2 = Tungsten Carbide (standard)	= Stainless Steel	

Example:
 SDI 1 D3 N 6 0 0 2 0 0



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
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* ≥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

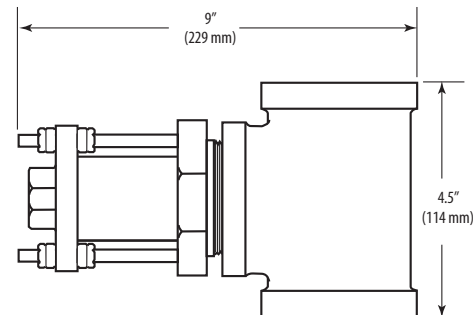
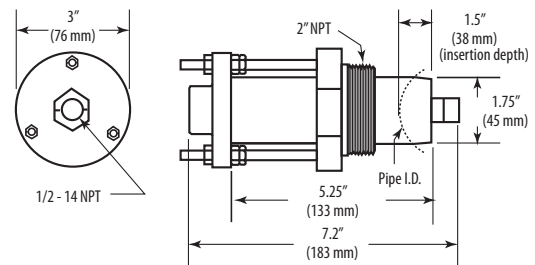
Cable options

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

Non-magnetic sensing

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

DIMENSIONAL DRAWINGS



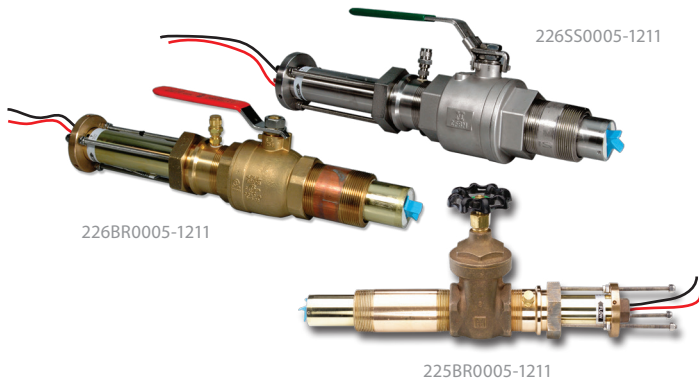
ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0001	220BR0005-1211	Flow, Sensor, Insert, Brass Sleeve, 3" to 40" (77 to 1016 mm) pipe
U001-0002	2205S0005-1211	Flow, Sensor, Insert, SS Sleeve, 3" to 40" (77 to 1016 mm) pipe
U001-0006	228BR2005-1211	Flow, Sensor, Insert, Brass, 2" Brass Tee
U001-0007	228CB2005-1211	Flow, Sensor, Insert, Brass, 2" Iron Tee
U001-0025	228BR2505-1211	Flow, Sensor, Insert, Brass, 2.5" Brass Tee
U001-0030	228CB2505-1211	Flow, Sensor, Insert, Brass, 2.5" Iron Tee
U001-0072	228BR2004-0211	Flow, Sensor, Insert, Brass, 2", Viton



225X & 226X SERIES

Permits Service While System is Pressurized



Insert-style hot tap liquid flow sensors with brass or stainless steel sleeves feature a ball or gate valve for pipe sizes 3" to 40" (77 to 1016 mm). These devices are designed for hot tap applications in pipes that cannot be drained for service. The HTT tool is required for hot tap installation. Use with a flow monitor or transmitter for a complete flow monitoring system.

SPECIFICATIONS

Temperature Rating	105 °C (221 °F) continuous
Pressure Rating	At 38° C (100 °F) 225BR: 300 psi; 226BR/226SS: 400 psi; At 105 °C (221 °F) 225BR: 210 psi; 226BR: 250 psi; 226SS: 300 psi
Wetted Materials	UHMW-PE bearing, polyamide impeller, tungsten carbide shaft, EPDM O-rings
Accuracy	±1.0% of full scale over recommended design flow range; ±4.0% 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
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* ≥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 PTLC cable (105 °C rated)

Non-magnetic sensing

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

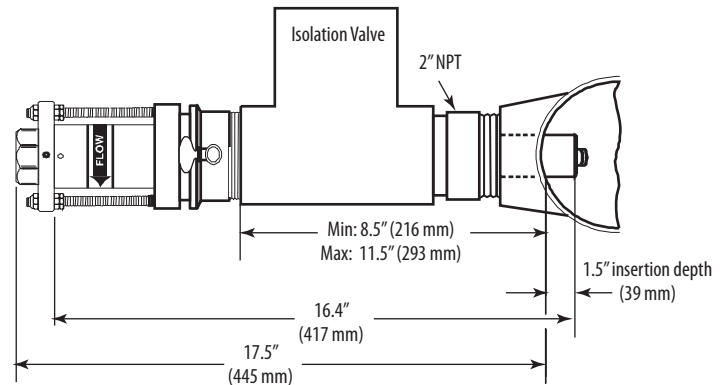
Hot tap design

Hot tap design for use in applications where the pipe cannot be drained for service after installation...reduce downtime for maintenance

APPLICATIONS

- Measuring liquid flow rates

DIMENSIONAL DRAWING



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0003	225BR0005-1211*	Flow, Sensor, Hot Tap, Brass, Gate Valve
U001-0004	226BR0005-1211*	Flow, Sensor, Hot Tap, Brass, Ball Valve
U001-0005	226SS0005-1211*	Flow, Sensor, Hot Tap, SS, Ball Valve
U001-0071	HTT	Flow, Tool, HotTap, 200 Series, Insert/Remove

250X SERIES

For Pipe Sizes 1/2" To 1 1/2" NPT



250BR0505-1211

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, tungsten-carbide 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
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* ≥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

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

No amplification

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

Cable options

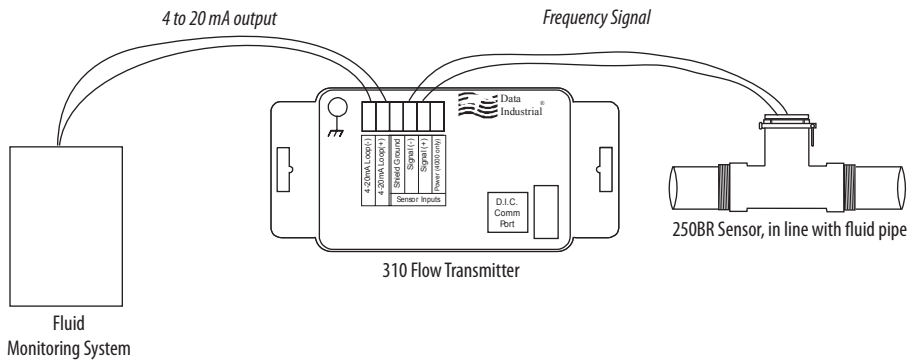
Supplied with 20 ft (6 m) of 2-conductor AWG 20 UL type PTLC cable (105 °C rated)

Highly durable

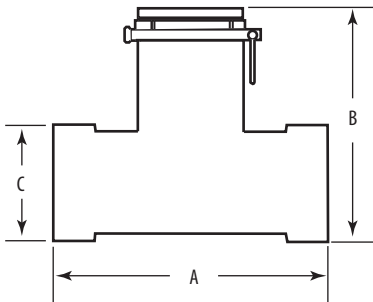
PPS electronics housing



APPLICATION DIAGRAM



DIMENSIONAL DRAWING



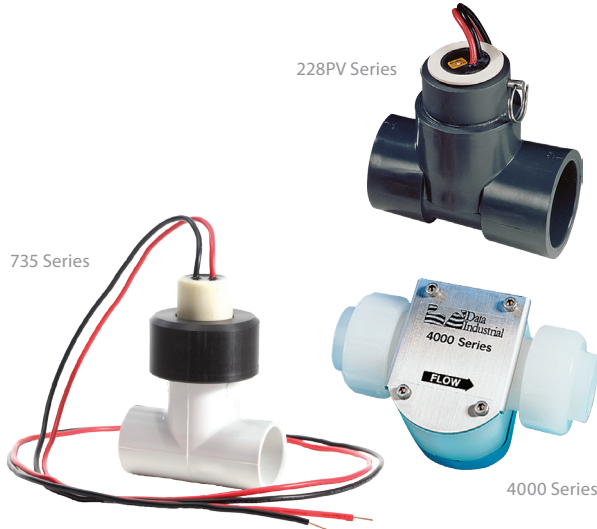
Model	A	B	C
U001-0008	4.0" (102 mm)	4.7" (120 mm)	1.7" (44 mm)
0009	4.0" (102 mm)	4.7" (120 mm)	1.7" (44 mm)
0010	5.5" (140 mm)	4.8" (121 mm)	2.2" (56 mm)
0011	6.1" (155 mm)	5.0" (127 mm)	2.4" (61 mm)
0012	6.5" (165 mm)	5.2" (132 mm)	2.7" (69 mm)

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0008	250BR0505-1211	Flow, Sensor, 1/2" Cast Brass Tee
U001-0009	250BR0705-1211	Flow, Sensor, 3/4" Cast Brass Tee
U001-0010	250BR1005-1211	Flow, Sensor, 1" Cast Brass Tee
U001-0011	250BR1205-1211	Flow, Sensor, 1-1/4" Cast Brass Tee
U001-0012	250BR1505-1211	Flow, Sensor, 1-1/2" Cast Brass Tee

228PV, 735 & 4000 SERIES

For Pipe Sizes 1/2" To 4"



Corrosion & impact resistant

Glass filled PPS plastic electronics housing (228PV)

Wide flow rate range

Handles flow rates from 2 ft/sec to 20 ft/sec (735 Series)

Durable & reliable Low flow accuracy

Tungsten carbide impeller shaft (228PV)

measure flow rates as low as 0.25 ft/sec (4000 Series)

Budget friendly 4-20 mA output

Cost effective for tight budgets (735 Series)

4 to 20 mA output, programmable in the field for compatibility with standard control systems (4000 Series)

Plastic tee-style flow sensor for plastic pipe or corrosive applications. Use in conjunction with flow monitor or transmitter for a complete flow monitoring system.

SPECIFICATIONS

228PV Series

Flow Range	0.5 to 30 ft/sec
Operating Temp Range	0 to 60 °C (32 to 140 °F)
Operating Pressure Range	Up to 25 °C (77 °F): 100 psi; from 25 to 60 °C (77 to 140 °F): pressure decreases linearly with increasing temperature; at 60 °C (140 °F): 40 psi
Accuracy	±1.0% of full scale over recommended flow range
Repeatability	±0.3% of full scale over recommended flow range
Linearity	±0.2% of full scale over recommended flow range
Output Frequency	3.2 to 200 Hz, 5 ms ± 25% output pulse width

735 Series

Flow Range	2 to 20 ft/sec
Operating Temperature/Pressure Range	150 psig @ 22 °C (73 °F); 75 psig @ 38 °C (110 °F)
Accuracy	±3.0% of full scale over recommended flow range
Repeatability	±1.5% of full scale over recommended flow range
Linearity	±1.5% of full scale over recommended flow range
Output Frequency	3.2 to 200 Hz, 5 ms ± 25% output pulse width

4000 Series

Flow Range	Design range: 1 to 20 ft/sec; Low flow: Flow range 0.25 to 20 ft/sec
Max. Operating Temperature	PVC: 60 °C (140 °F); PVDF: 104 °C (220 °F)
Max. Operating Pressure	PVC: 350 psi @ 60 °C (140 °F); PVDF: 275 psi @ 105 °C (220 °F)
Accuracy	<1%
Repeatability	±0.5%
Output	Pulse, factor calibration or 4 to 20 mA analog (requires A302 programming cable)

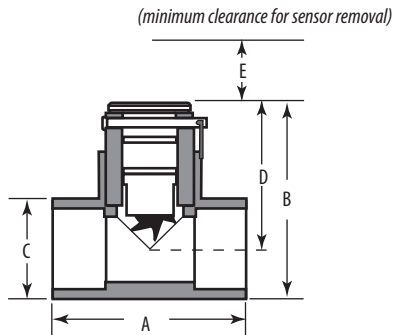
WARRANTY

Limited Warranty	1 year
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228PV SERIES

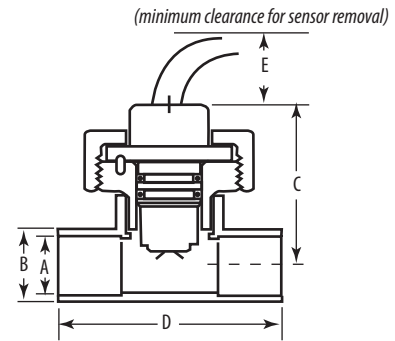
Dimensional Drawing



228PV1505	228PV3005	228PV4005
A = 5.0" (127 mm)	A = 6.5" (165 mm)	A = 7.4" (187 mm)
B = 5.2" (131 mm)	B = 6.9" (173 mm)	B = 6.9" (199 mm)
C = 2.4" (61 mm)	C = 4.3" (107 mm)	C = 5.4" (137 mm)
D = 4.0" (102 mm)	D = 4.7" (119 mm)	D = 5.1" (130 mm)
E = 5.0" (127 mm)	E = 5.0" (127 mm)	E = 5.0" (127 mm)

735 SERIES

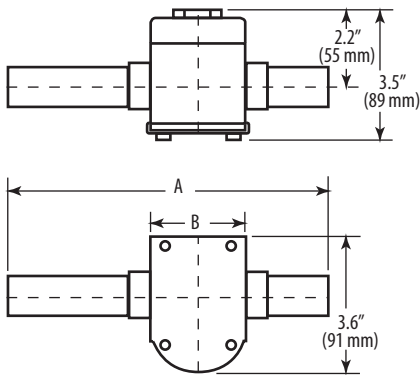
Dimensional Drawing



735PV0506	735PV0706	735PV1006
A = 0.5" (13 mm)	A = 0.75" (19 mm)	A = 1.0" (26 mm)
B = 0.9" (23 mm)	B = 1.1" (27 mm)	B = 1.3" (34 mm)
C = 3.9" (98 mm)	C = 3.9" (98 mm)	C = 3.9" (98 mm)
D = 3.1" (78 mm)	D = 3.3" (84 mm)	D = 3.5" (89 mm)
E = 4.0" (107 mm)	E = 4.0" (107 mm)	E = 4.0" (107 mm)

4000 SERIES

Dimensional Drawing



400210-0021	411210-0021	402210-0021
A = 8.7" ± 0.25" (222 mm ± 7 mm)	A = 10.6" ± 0.25" (268 mm ± 7 mm)	A = 13.1" ± 0.25" (332 mm ± 7 mm)
B = 4.4" (105 mm)	B = 4.7" (119 mm)	B = 5.4" (137 mm)

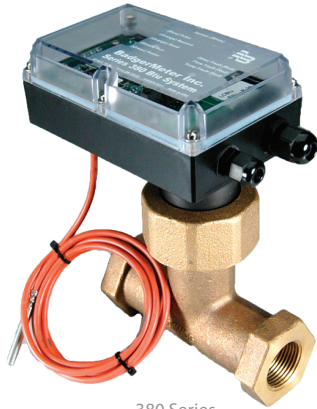
ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0032	402210-0021	Flow, Sensor, Pure H ₂ O, PVC80, 1", 4 to 20 mA
U001-0033	411210-0021	Flow, Sensor, Pure H ₂ O, PVC80, 3/4", 4 to 20 mA
U001-0034	400210-0021	Flow, Sensor, Pure H ₂ O, PVC80, 1/2", 4 to 20 mA
U001-0036	228PV1505-1211	Flow, Sensor, Insert, 1-1/2" PVC Tee
U001-0040	228PV3005-1211	Flow, Sensor, Insert, 3" PVC Tee
U001-0041	228PV4005-1211	Flow, Sensor, Insert, 4" PVC Tee
U001-0046	735PV0506-1201	Flow, Sensor, 1/2", PVC, Tee, Pulse, IR, Sch40
U001-0047	735PV0706-1201	Flow, Sensor, 3/4", PVC, Tee, Pulse, IR, Sch40
U001-0048	735PV1006-1201	Flow, Sensor, 1", PVC, Tee, Pulse, IR, Sch40
U001-0049	401210-0021	Flow, Sensor, Ln, Pure H ₂ O, PVC80, 3/4", 4 to 20 mA
U001-0020	A301-20	Programming Cable with CD for Analog/Modbus/BACnet/LonWorks Outputs, Serial PC Connector



380 SERIES

Measures Temperature and Flow Rate and Calculates Energy



380 Series

Series 380 BTU system provides a low-cost system for metering cold or hot 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

MATERIALS

Housing	Polycarbonate
Flow Sensor	PEEK
Potting Material	Polyurethane
Tee Material	Bronze

ENVIRONMENTAL

Fluid Temperature	Cold Service: -20 to 60 °C (-4 to 140 °F); Hot Service: 4 to 125 °C (39 to 257 °F)
Ambient Temperature	-20 to 65 °C (-4 to 149 °F)

WARRANTY

Limited Warranty	1 year
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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

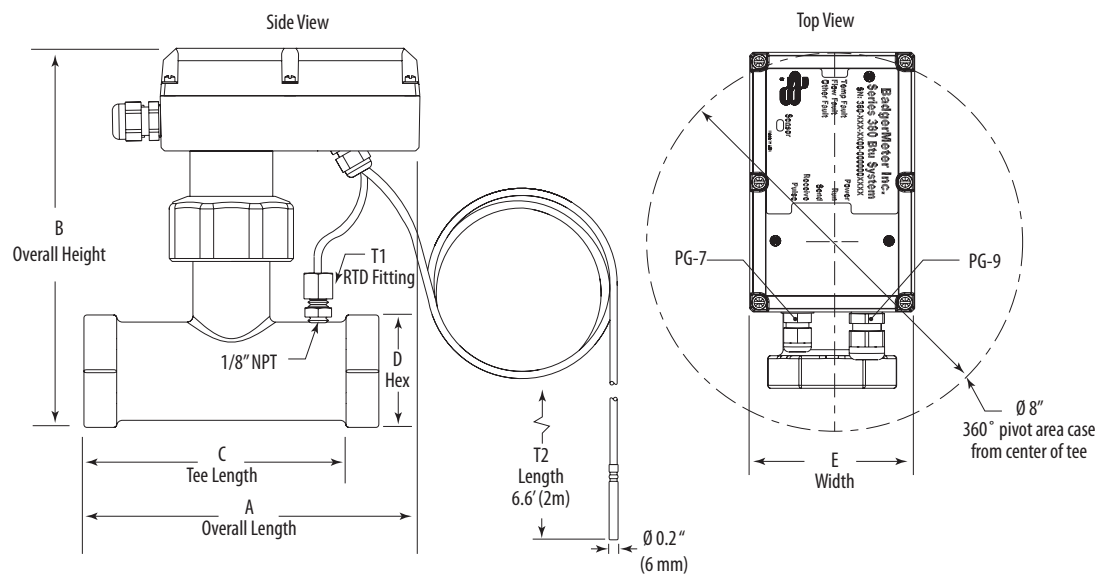
Rugged, compact design with two temperature probes

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)
U001-0098	380007000-1200*, **	BTU system, cold service, 3/4" tee NPT, with pulse, Modbus and BACNet outputs	25
U001-0099	380010000-1200*, **	BTU system, cold service, 1" tee NPT, with pulse, Modbus and BACNet outputs	40
U001-0100	380012000-1200*, **	BTU system, cold service, 1-1/4" tee NPT, with pulse, Modbus and BACNet outputs	70
U001-0101	380015000-1200*, **	BTU system, cold service, 1-1/2" tee NPT, with pulse, Modbus and BACNet outputs	95
U001-0102	380020000-1200*, **	BTU system, cold service, 2" tee NPT, with pulse, Modbus and BACNet outputs	150
U001-0103	380107000-2202**	BTU system, hot service, 3/4" tee NPT, with pulse, Modbus and BACNet outputs	25
U001-0104	380110000-2202**	BTU system, hot service, 1" tee NPT, with pulse, Modbus and BACNet outputs	40
U001-0105	380112000-2202**	BTU system, hot service, 1-1/4" tee NPT, with pulse, Modbus and BACNet outputs	70
U001-0106	380115000-2202**	BTU system, hot service, 1-1/2" tee NPT, with pulse, Modbus and BACNet outputs	95
U001-0107	380120000-2202**	BTU system, hot service, 2" tee NPT, with pulse, Modbus and BACNet outputs	150
U001-0114	A304-1M***	Programming Cable with CD for 380 Series	n/a

* Consult factory for availability information.

** 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



3000 & 3050 SERIES

Displays Flow Rate, Flow Total, and Energy



3000 Digital Flow Monitor

3000 Series digital flow monitors are designed for HVAC submetering applications. With panel and wall mounting options, these compact devices display flow rate & flow total on an alphanumeric LCD display. Calibration, selection of measurement units, and output programming are keypad controlled. Two pulse outputs are available for connection to external systems.

The 3050 Series BTU monitor has all of the features and programming flexibility of the 3000 flow monitor with the added ability to accept temperature inputs from 10 kΩ Dale thermistors and a single pulse output for energy total. This monitor provides an accurate measurement of total thermal energy along with temperature and liquid flow in closed pipe systems.

SPECIFICATIONS

3000 & 3050 Series

Input Power	12 to 24 Vdc/Vac; limits: 8 to 35 Vdc, 8 to 28 Vac
Input Frequency	0.4 to 160 Hz
Totalizer	0.000001 to 1,000,000
Operating Temperature	-20 to 70 °C (-4 to 158 °F)
Storage Temperature	-30 to 80 °C (-22 to 176 °F)
Max. Sinking Current	150 mA @ 24 Vdc
Display	16 x 2 alphanumeric backlit LCD

WARRANTY

Limited Warranty	1 year
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Convenient viewing

Displays energy rate, energy total, flow rate, and total flow with user-configurable units for convenient viewing (BTU products only). 2-line x 16-character backlit LCD for easy visibility

Non-volatile memory

No power required for memory backup of calibration information, units of measure, and flow totals

Password security NEMA 4 rated

Password-based access control for added security

NEMA 4 rated front panel... durable

DIN 96 mm compatible

Conforms to DIN 96 mm standard dimensions...compatible with existing panels and enclosures

USB, Modbus & BACnet

High-level communication with optional USB, RS-485 Modbus, and BACnet/MSTP

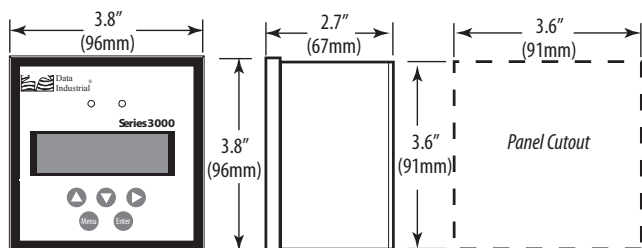
APPLICATIONS

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



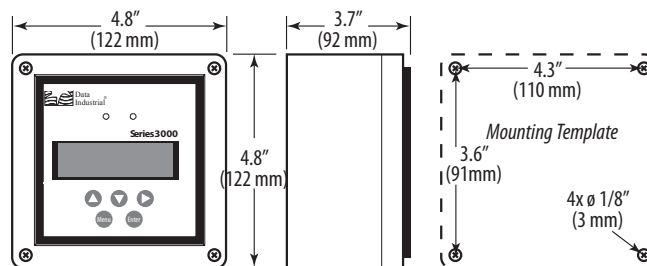
PANEL MOUNT

Dimensional Drawing



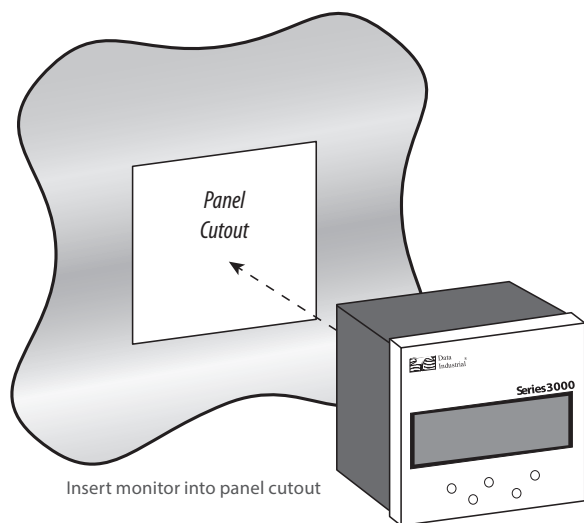
WALL MOUNT

Dimensional Drawing



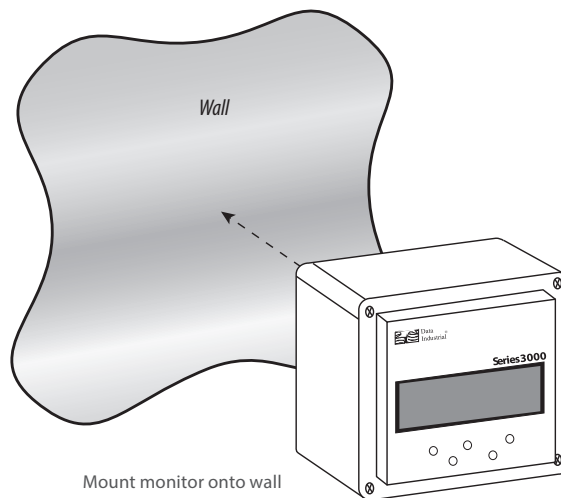
PANEL MOUNT

Mounting Diagram



WALL MOUNT

Mounting Diagram



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0023	3000-10	Flow, Monitor, Panel Mount, Analog Output, USB, RS-485 with BACnet and Modbus
U001-0024	3050-11	Flow, BTU Monitor, Wall Mount, Analog Output, USB, RS-485 with BACnet and Modbus
U001-0086	3050-10	Flow, BTU Monitor, Panel Mount, Analog Output, USB, RS-485 with BACnet and Modbus
U001-0087	3000-11	Flow, Monitor, Wall Mount, Analog Output, USB, RS-485 with BACnet and Modbus
U001-0091	3000-00	Flow, Monitor, Panel Mount, Pulse Output
U001-0092	3000-01	Flow, Monitor, Wall Mount, Pulse Output
U001-0093	3050-00	Flow, BTU Monitor, Panel Mount, Pulse Output
U001-0094	3050-01	Flow, BTU Monitor, Wall Mount, Pulse Output

Note: For programming analog output versions, use a USB Type A to mini-B cable. Software is available from the manufacturer's website, www.badgermeter.com. Navigate to the product page to find a link to the software. Product is also programmable from the keypad.



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 & programming cables are required for installation; see Ordering Information).

SPECIFICATIONS

310-00	
Power Requirements	Loop input voltage 9 to 35 Vdc
Input Frequency	0.4 Hz to 10 kHz
Load Resistance	Max 750 Ω @ 24 Vdc
Operating Temp Range	-29 to 70 °C (-20 to 158 °F)
Storage Temp Range	-40 to 85 °C (-40 to 185 °F)
Accuracy	±0.04% of reading over entire span
Linearity	0.1% of full scale

WARRANTY	
Limited Warranty	1 year

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
- Connecting flow sensors to BAS panels
- Increasing wire run length limit for flow sensors

320-00	
Power Requirements	12 to 24 Vac 85 mA max.; 12 to 35Vdc, 30 mA max.; reverse and over voltage protected to 40 Vdc
Input Frequency	0.4 to 10 kHz
Transient Suppression	Complies with IEC-801-4 electrical burst, fast transient specification
Pulse Output	Isolated solid state switch in any standard or custom flow total units; adjustable 50 ms to 1.0 sec pulse output width in 50 ms increments
Maximum Sinking Current	100 mA @ 35 Vdc
Operating Temp Range	-29 to 70 °C (-20 to 158 °F)
Storage Temperature Range	-40 to 85 °C (-40 to 185 °F)

WARRANTY	
Limited Warranty	1 year

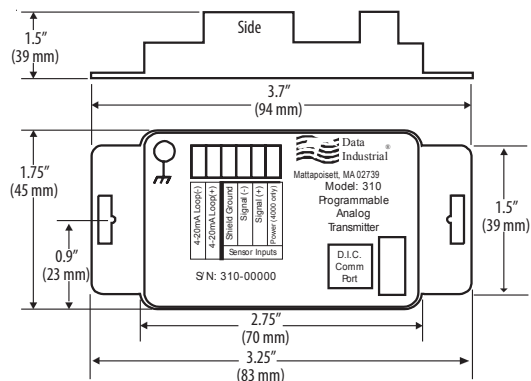
340-00	
Power Requirements	12 to 24 Vdc or 12 to 24 Vac, 70 mA max.
Flow Sensor Input	Excitation voltage 3-wire sensors: 9.1 Vdc 500Ω source impedance
Frequency	4 to 10000 Hz
Temp Sensor Input	10k Dale Thermistor (requires two, sold separately)
Operating Temp Range	-29 to 70 °C (-20 to 158 °F)
Storage Temp Range	-40 to 85 °C (-40 to 185 °F)

UNITS OF MEASURE	
Flow Rate	gpm, gph, l/sec, l/min, l/hr, ft³/sec, ft³/min, ft³/hr, m³/sec, m³/min, m³/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

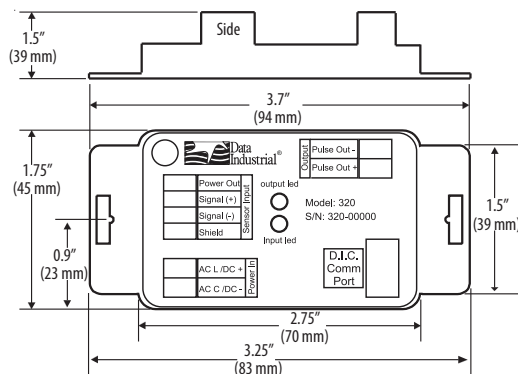
WARRANTY	
Limited Warranty	1 year



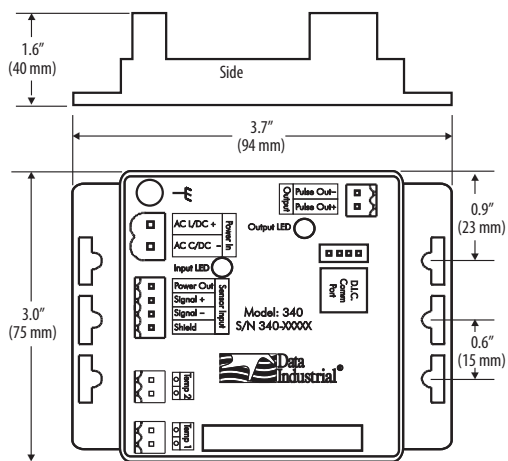
310-00
Dimensional Drawing



320-00
Dimensional Drawing



340-00
Dimensional Drawing



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0013	310-00*	Flow Transmitter, Analog, Programmable, 4 to 20 mA Output
U001-0027	340LW-00*	Flow Transmitter, BTU, Analog, Programmable, LonWorks Output
U001-0029	340N2-00**	Flow Transmitter, BTU, Analog, Programmable, N2 Output
U001-0035	310-04*	Flow Transmitter, Analog, 4 to 20 mA, DIN Mounting
U001-0038	340N2-02**	Flow Transmitter, BTU, Analog, Programmable, N2 Output, Metal Enclosure
U001-0042	310-01*	Flow Transmitter, Analog, 4 to 20 mA, NEMA 4X Enclosure
U001-0136	340BN/MB-00***	Flow Transmitter, BTU, BN-MB, No Enclosure
U001-0137	340BN/MB-02***	Flow Transmitter, BTU, BN-MB, Metal Enclosure
U001-0138	340BN/MB-03***	Flow Transmitter, BTU, BN-MB, Plastic Enclosure
U001-0139	340BN/MB-04***	Flow Transmitter, BTU, BN-MB, with DIN Clips
U001-0060	320-00*	Flow Transmitter, Programmable, Scaled Pulse Output
U001-0109	340-00***	Flow Transmitter, Programmable, Frequency Output
U001-0020	A301-20	Programming Cable with CD for Analog/Modbus/BACnet/LonWorks Outputs, Serial PC Connector
U001-0075	A302-20	Programming Cable with CD for N2 Output, Serial PC Connector
U001-0149	40134-0002	Programming Cable with CD for Analog/Modbus/BACnet/LonWorks Outputs, USB PC Connector

* Software and programming cable are required for analog, Modbus, LonWorks, BACnet transmitter and meter products.

** Software and programming cable required for N2 products.

*** 340 Series also requires two 10k Dale thermistors for energy (BTU) measurement.

Other models available:

<p>Model</p> <p>310 = Analog 320 = Pulse 340 = BTU 340N2 = BTU; N2 protocol 340BN/MB = BTU; BACnet & Modbus protocol 340LW = BTU; LonWorks</p>	<p>Options</p> <p>00 = Transmitter only 01 = NEMA 4 enclosure (310, 320 only) 02 = Metal weathertight enclosure 03 = Plastic weathertight enclosure 04 = DIN rail mounting clips</p>
--	--

Example:

340 02



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 0.25% 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	±0.25% of rate for velocities greater than 1.64 fps (0.50 m/s); ±0.004 fps (±0.001 m/s) for velocities less than 1.64 fps (0.50 m/s)
Repeatability	±0.1%
Analog Outputs	4 to 20 mA, 0 to 20 mA, 0 to 10 mA, 2 to 10 mA (programmable and scalable) Voltage sourced 24 Vdc (isolated); max. loop resistance < 800 Ω
Digital Outputs	Four total, configurable 24 Vdc sourcing active output (up to two), 100 mA total, 50 mA each; sinking open collector output (up to four), 30 Vdc max., 100 mA each; AC solid-state relay (up to two), 48 Vac, 500 mA max.
Pulse Outputs	Scalable up to 10 kHz, passive open collector up to 10 kHz, active switched 24 Vdc. Up to two outputs (forward and reverse) Pulse width programmable from 1 to 1100 ms or 50% duty cycle
Flow Direction	Unidirectional or bidirectional, two separate totalizers (programmable)
Coil Power	Pulsed DC
Minimum Conductivity	5.0 micromhos/cm
Electrode Materials	Standard: alloy C; Optional: 316 stainless steel, gold/platinum plated, tantalum, platinum/rhodium
Liner Material	PFA up to 3/8", PTFE 1/2" thru 24", soft or hard rubber from 1" thru 54"

Reliable, durable design

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

Password security

Protect against unwanted program changes

0.25% accuracy

0.25% accuracy independent of fluid viscosity, density, and temperature

Wide flow range

Exceeds operating characteristics of turbine and propeller meters

Bi-directional

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

Well & reclaimed water

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

APPLICATIONS

- Monitoring flow in systems likely to contain solids

NSF Listed	Models with hard rubber liner 4" size and up; Models with PTFE liner all sizes
Fluid Temperature	With remote amplifier: PFA, PTFE, 155 °C (311 °F) With Meter Mounted Amplifier: Rubber 80 °C (178 °F); PFA, PTFE 100 °C (212 °F)
Pipe Spool Material	316 stainless steel
Meter Housing Material	Carbon steel welded
Flanges	Standard (ANSI B16.5 Class 150 RF): carbon steel; Optional: 316 stainless steel
Meter Enclosure Classification	NEMA 4X (IP66); Optional: Submersible NEMA 6P (remote amplifier required)
Junction Box Enclosure Protection	For remote amplifier option: powder coated die-cast aluminum, NEMA 4 (IP65)
Cable Entries	½" NPT cord grip
Optional Stainless Steel Grounding Ring Thickness	For meter sizes up to 10": 0.135" thickness per ring; For meter sizes above 10": 0.187" thickness per ring

POWER SUPPLY

AC	85 to 265 Vac; typical power: 20 VA or 15 W; max. power: 26 VA or 20 W
DC (optional)	10 to 36 Vdc; Typical power: 10 W; max. power: 14 W

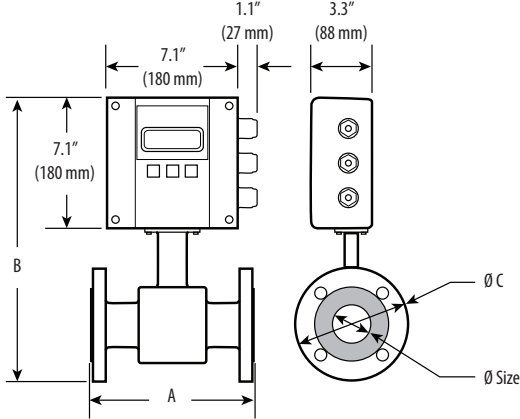
WARRANTY

Limited Warranty	2 years
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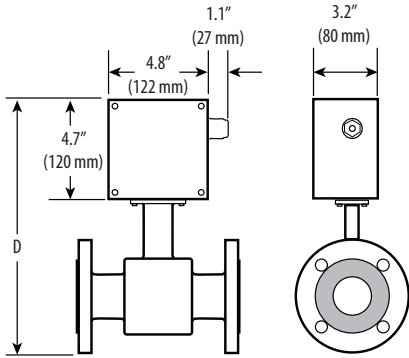


ELECTROMAGNETIC SERIES

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			
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lb	kg	LPM		GPM	
												min	max	min	max
1/4	6	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.063	20	0.02	5
5/16	8	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.114	34	0.03	9
3/8	10	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.177	53	0.05	14
1/2	15	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.416	125	0.11	33
3/4	20	6.7	170	14.2	361	3.9	99	11.5	293	13	5.5	0.75	225	0.2	59
1	25	8.9	225	14.4	366	4.3	108	11.7	298	18	8.0	1.20	350	0.3	93
1-1/4	32	8.9	225	15.2	386	4.6	117	12.5	318	20	9.0	2.00	575	0.5	152
1-1/2	40	8.9	225	15.4	390	5.0	127	12.7	322	21	9.5	3.00	900	0.8	239
2	50	8.9	225	15.9	403	6.0	152	13.2	335	26	11.5	4.70	1400	1	373
2-1/2	65	11.0	280	17.1	434	7.0	178	14.4	366	52	23.5	8	2400	2	631
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
5	125	15.8	400	19.6	498	10.0	254	16.9	430	58	26.0	30	8800	8	2334
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
12	300	19.7	500	28.9	734	19.0	483	26.2	666	207	94.0	170	50800	45	13444
14	350	19.7	500	30.8	782	21.0	533	28.2	716	258	117	230	69200	60	18299
16	400	23.6	590	33.7	856	23.5	597	31.0	788	306	139	300	90400	80	23901
18	450	23.6	590	35.0	890	25.0	635	32.4	822	400	181	380	114000	100	30250
20	500	23.6	590	38.2	969	27.5	699	35.5	901	493	224	470	140000	125	37346
22	550	23.6	590	39.6	1005	29.5	749	36.9	937	523	237	570	170000	150	45188
24	600	23.6	590	42.2	1071	32.0	813	39.5	1003	552	251	680	200000	180	53778
28	700	23.6	590	46.2	1173	36.5	927	44.0	1118	648	294	920	275000	240	73100
30	750	31.5	800	48.3	1228	39.0	984	45.7	1161	702	319	1060	315000	280	84000
32	800	31.5	800	52.2	1325	41.4	1015	49.5	1257	768	349	1200	361000	320	95600
36	900	31.5	800	55.3	1405	46.0	1168	54.1	1374	848	385	1500	457000	400	121000
40	1000	31.5	800	60.0	1525	50.2	1230	57.4	1457	922	419	1900	565000	500	149300
42	1050	36.0	914	66.0	1675	53.0	1346	63.4	1610	1198	499	2100	620000	550	164600
48	1200	39.4	1000	69.9	1775	59.4	1455	67.2	1707	1208	549	2700	814000	720	215100
54	1400	39.4	1000	78.5	1995	68.4	1675	75.9	1927	1362	619	3700	1100000	980	292700

ORDERING INFORMATION ON NEXT PAGE



ELECTROMAGNETIC SERIES (CONT.)

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U020-0002	M20HR020F15SACXX-MMXXVACGRXX	Flow, Mag, 2", Hard Rubber Liner, Grounding Ring, Amp
U020-0003	M20HR030F15SACXX-MMXXVACGRXX	Flow, Mag, 3", Hard Rubber Liner, Grounding Ring, Amp
U020-0004	M20HR040F15SACXX-MMXXVACGRXX	Flow, Mag, 4", Hard Rubber Liner, Grounding Ring, Amp
U020-0005	M20HR050F15SACXX-MMXXVACGRXX	Flow, Mag, 5", Hard Rubber Liner, Grounding Ring, Amp
U020-0006	M20HR060F15SACXX-MMXXVACGRXX	Flow, Mag, 6", Hard Rubber Liner, Grounding Ring, Amp
U020-0007	M20HR060F15SACXX-RM030VACGRXX	Flow, Mag, 6", Hard Rubber Liner, Grounding Ring, Remote Amp
U020-0008	M20HR080F15SACXX-MMXXVACGRXX	Flow, Mag, 8", Hard Rubber Liner, Grounding Ring, Amp
U020-0021	M20TE020F15SACXX-MMXXVACGRXX	Flow, Mag, 2", PTFE Liner, Grounding Ring, Amp
U020-0022	M20TE020F15SACXX-RM030VACGRXX	Flow, Mag, 2", PTFE Liner, Grounding Ring, Remote Amp
U020-0023	M20TE030F15SACXX-MMXXVACGRXX	Flow, Mag, 3", PTFE Liner, Grounding Ring, Amp
U020-0024	M20TE030F15SACXX-RM030VACGRXX	Flow, Mag, 3", PTFE Liner, Grounding Ring, Remote Amp
U020-0025	M20TE040F15SACXX-MMXXVACGRXX	Flow, Mag, 4", PTFE Liner, Grounding Ring, Amp
U020-0026	M20TE060F15SACXX-MMXXVACGRXX	Flow, Mag, 6", PTFE Liner, Grounding Ring, Amp

Note: Other meter sizes and configurations are available. Consult Veris for availability.



DXN SERIES

Troubleshoot Flow Performance



The DXN Portable Ultrasonic Flow Meter provides a non-intrusive way to accurately capture and store flow measurements from multiple locations in a piped system. A truly mobile and flexible data acquisition platform, the DXN is available with large and small pipe transit time transducers, Doppler transducers, and an energy monitoring kit for BTU measurement.

SPECIFICATIONS

Measurement Type	Flow: Ultrasonic transit time and Doppler (reflection of acoustic signals); Hybrid operation.
Liquid Types	Liquid dominant fluids
Velocity Range	Transit Time: Bi-directional to 40 FPS (12 MPS) Doppler: Uni-directional to 40 FPS (12 MPS)
Flow Rate Accuracy	Transit Time: ±1% of reading or ±0.01 FPS (0.003 MPS), whichever is greater Doppler: 2% of full scale
Pipe Surface Temperature	Transit Time: -40 to +121 °C (-40 to +250 °F) Doppler: -40 to 121 °C (-40 to +250 °F)
Power	10 to 30 Vdc via 3-pin connector, 40 W min; 3.6 A resettable fuse
Power Adapter	Desktop adapter: 100 to 240 Vac 50/60 Hz 50 W; 12 Vdc car adapter: 5 A fused
Pipe Sizes	1/2" and larger; US standard pipe tables are built into the user interface
Display	800 x 480 WVGA Color Outdoor Readable Display; Gloved-operation resistive touch screen
User Menu	Windows.NET fully integrated user menu; multi-language: English, Spanish, German, French, Portuguese, Japanese, Russian, Italian, Dutch, Norwegian, and Swedish
Logging	>300 sites stored in 1 GB; downloads to USB Flash drive
Cable Length	Transit time: 20' (6 m) paired coaxial cable, BNC to BNC Doppler: 20' (6 m) paired coaxial cable, BNC to 4-pin
Regulatory	Safety: UL61010-1, CSA C22.2 No. 61010-1, EN61010-1 Directives: 2006/95/EC Low Voltage, 2004/108/EC EMC

WARRANTY

Limited Warranty 1 year

AGENCY APPROVALS



Note: The CE mark indicates RoHS2 compliance.

Accuracy (±1)

Sampling more than five times per second

Data capture

Stores >300 readings...USB and TCP/IP connectivity

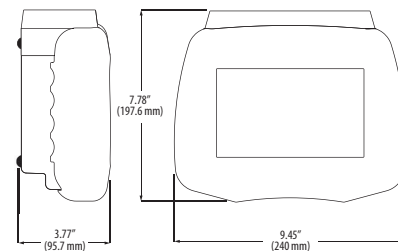
Customizable display

Full color, Windows.net-based screen is highly customizable... includes on-screen keyboard

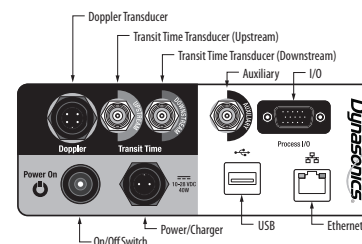
APPLICATIONS

- Flow system commissioning and troubleshooting
- Water and wastewater, boilers and chillers
- Energy monitoring (BTU measurement) and baselining

DIMENSIONAL DRAWING



DXN Connection Panel



ORDERING INFORMATION

PART #	DESCRIP.	PARTS INCLUDED
U024-0001	Basic Kit	Meter, North American* charging cord, carrying case, small pipe and standard pipe transit time transducers. (1) Couplant, grease; 5.3 oz; Dow 111 (1) Couplant, Ultrasound gel; 0.25 liter bottle (4) Stainless steel straps (1/2" wide, 12-5/16" max dia., worm drive clamp)
U024-0002	All Transit Time Kit	Basic Kit and large pipe transducers**
U024-0003	Hybrid Kit	Basic Kit and Doppler transducers
U024-0004	Energy Kit	Basic Kit and non-invasive RTDs (1) Silicone Heat Sink Compound; 5 oz syringe (1) RTD Installation tape, 36 ft
U024-0005	Full Kit	Basic Kit plus all, transit time, Doppler, RTDs and pipe wall thickness gauge (1) Silicone Heat Sink Compound; 5 oz syringe (1) RTD Installation tape, 36 ft (2) Stainless steel straps (1/2" wide, 21-1/4" max dia., worm drive clamp)

*UK/Singapore, Euro, China, and Japan charging cords available.

**For pipes 24" and larger.



FSR & FST SERIES

Accurate Readings From Outside the Pipe



FSR Monitor



FST4R Transducer



Temperature Sensors



FST1, FST2, FST3 Transducers



FST4, FST5 Transducer

Ultrasonic Flow and energy metering systems clamp onto the outside of pipes without contacting the internal liquid. The technology has many advantages over other products including low-cost installation, no pressure head loss, no moving parts to maintain or replace, excellent fluid compatibility, and a wide bi-directional measuring range that provides reliable readings even at very low and very high flow rates. Veris ultrasonic metering products are available in a variety of configurations that permit selection of an ideal system, no matter what the application.

The monitor is available in two versions: standard flow and energy flow. Energy versions are used in conjunction with dual clamp-on or insert RTD temperature sensors. The energy flow meter calculates energy usage in BTU or tons, and it is ideal for retrofit, chilled water, and other HVAC and building automation applications.

SPECIFICATIONS

SYSTEM	
Velocity Range	All models: Bidirectional flow FST1, FST2, FST3: 2 to 40 FPS (0.6 to 12.1 MPS); (min. 2' per sec.) FST4, FST5: 1 to 40 FPS (0.3 to 12.1 MPS); (min. 1' per sec.)
Flow Accuracy	FST1, FST2, FST3: 1" and larger units: 1% of reading from 4 to 40 FPS (1.2 to 12 MPS); ± 0.04 FPS (0.012 MPS) at rates < 4 FPS 91.2 to 12 MPS). Units smaller than 1": 1% of full scale. FST4, FST5 : 1% of reading at rates > 1 FPS (0.3 MPS); within 0.01 FPS (0.003 MPS) at lower rates
Flow Repeatability	±0.01% of reading
Flow Sensitivity	0.001 FPS (0.0003 MPS)
Temperature Accuracy (Energy Versions Only)	0 to 100 °C (32 to 212 °F); Absolute 0.25 °C (0.45 °F), Difference 0.1 °C (0.18 °F)
Temperature Sensitivity	0.025 °C (0.05 °F)
Temperature Repeatability	±0.05% of reading
MONITOR	
Power	AC: fused, 95 to 264 Vac, 47 to 63 Hz at 17 VA max.; DC: auto-reset fuse, 10 to 28 Vdc at 5.0 W, reverse polarity and transient suppression protected

Wide range of measurable fluids

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

Communicating

Modbus RTU and BACnet/IP communications available...easy integration with existing data collection systems

Bi-directional

Measure forward flow, reverse flow, and net total

Rugged housing

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

No fluid contact

Safe from fouling and damage from system pressure

LCD display

Easy to read

APPLICATIONS

- Commercial and industrial installations involving clean liquids or liquids containing small amounts of suspended solids or aeration

Display	Two-line backlit LCD
Engineering Units (User Configured) Rate	Gal, liters, million gal, ft ³ , m ³ , acre-ft, oil barrels (42 gal); liquor barrels (31.5 gal), ft, m, lb, kg
Energy Version	BTU, MBTU, MMBTU, Ton
Time	Sec, min, hr, days
Totalizer	Gal, liters, million gal, ft ³ , m ³ , acre-ft, oil barrels (42 gal), liquor barrels (31.5 gal), lb, kg
Ambient Conditions	-40 to +85 °C (-40 to +185 °F), 0 to 95% RH (non-condensing)
Response Time (Flow)	0.3 to 30 sec, user configured, for 10% to 90% step change in flow
Security	Keypad lockout, user selected 4-digit password code

TRANSDUCERS

Environment	IP 67
Pipe Surface Temperature	FST1, FST2, FST3: -40 to +85 °C (-40 to +185 °F) FST4, FST5: -40 to +121 °C (-40 to +250°F);
Ambient Conditions	-40 to +85 °C (-40 to +185 °F), 0 to 95% RH (non-condensing)
Software Compatibility	Windows® 95, Windows® 98, Windows® 2000, Windows® XP, Windows® Vista

WARRANTY

Limited Warranty	1 year
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AGENCY APPROVALS

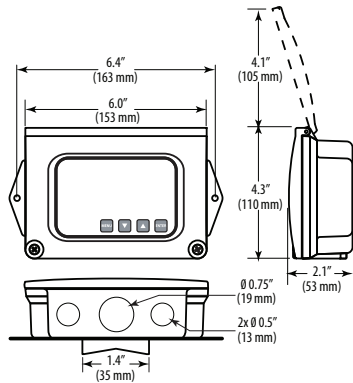


Note: The CE mark indicates RoHS2 compliance.



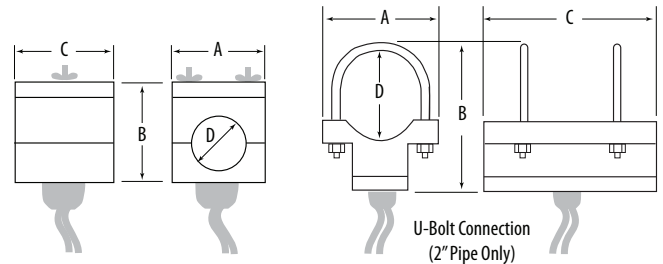
FSR MONITOR

Dimensional Drawing



FST1, FST2, FST3 TRANSDUCERS

Dimensional Drawing



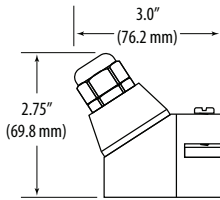
U-Bolt Connection
(2" Pipe Only)

PIPE SIZE	PIPE MATERIAL	A	B	C	D
1/2"	ANSI	2.46" (63 mm)	2.36" (60 mm)	2.66" (68 mm)	0.840 (22 mm)
	Copper	2.46" (63 mm)	2.36" (60 mm)	3.33" (85 mm)	0.625" (16 mm)
	Tubing	2.46" (63 mm)	2.28" (58 mm)	3.33" (85 mm)	0.500" (13 mm)
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)
	Tubing	2.46" (63 mm)	2.50" (64 mm)	3.56" (91 mm)	0.750" (19 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)
	Tubing	2.46" (63 mm)	2.75" (70 mm)	3.80" (97 mm)	1.000" (26 mm)
1 1/4"	ANSI	2.79" (71 mm)	3.18" (81 mm)	3.14" (80 mm)	1.660" (43 mm)
	Copper	2.46" (63 mm)	3.00" (77 mm)	4.04" (103 mm)	1.375" (35 mm)
	Tubing	2.46" (63 mm)	3.00" (77 mm)	4.04" (103 mm)	1.250" (32 mm)
1 1/2"	ANSI	3.02" (77 mm)	3.42" (87 mm)	3.33" (85 mm)	1.900" (49 mm)
	Copper	2.71" (69 mm)	2.86" (73 mm)	4.28" (109 mm)	1.625" (42 mm)
	Tubing	2.71" (69 mm)	3.31" (85 mm)	4.28" (109 mm)	1.500" (39 mm)
2" ¹	ANSI	3.71" (95 mm)	3.42" (87 mm)	5.50" (140 mm)	2.375" (61 mm) ²
	Copper	3.71" (95 mm)	3.38" (86 mm)	5.50" (140 mm)	2.125" (54 mm) ²
	Tubing	3.21" (82 mm)	3.85" (98 mm)	4.75" (121 mm)	2.000" (51 mm) ²

1. U-bolt only.
2. Varies due to U-bolt feature.

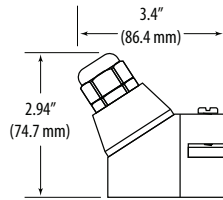
FST4 TRANSDUCER

Dimensional Drawing



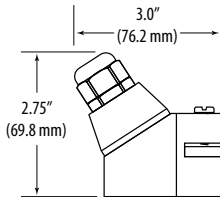
FST5 TRANSDUCER

Dimensional Drawing



FST4R TRANSDUCER

Dimensional Drawing



ORDERING INFORMATION

Monitors

Type	Power	Output
FSR <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 = Flow Meter 2 = Energy/BTU Meter	A = AC, 95-264 V D = DC C = AC, 20-28 Vac	K <input type="checkbox"/> X <input type="checkbox"/>
		1 = Analog 4 to 20 mA, Modbus, frequency or temperature* 2 = 10/100 Base-T, ethernet, BACnet, Modbus, TCP-IP 3 = BACnet MS/TP; 10/100 Base-T, ethernet, BACnet, Modbus, TCP-IP

Energy/BTU Included Temp. Sensor

Temp. Sensor Cable Length	Temp. Sensor Type
<input type="checkbox"/>	<input type="checkbox"/>
02 = 20 ft. (6.1 m) 05 = 50 ft. (15.2 m)** 10 = 100 ft. (30.4 m)**	A = Clamp-on RTD (up to 130 °C) B = Insertion RTD (up to 260 °C)

Transducers:

Pipe Type	Pipe Size	Cable Length
FST <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 = ANSI pipe, 1/2 to 2" 2 = Copper pipe, 1/2 to 2" 3 = Rigid tube, 1/2 to 2"†	A = 1/2" B = 3/4" C = 1" D = 1 1/4" E = 1 1/2" F = 2"	020 = 20 ft. (6.1 m)‡
FST <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 = most materials 2" to 24" 5 = most materials >24"	A = greater than 2"†	020 = 20 ft. (6.1 m)‡

*If Flow version is selected, this option includes frequency; if Energy version is selected, this option includes temperature (not frequency).
**Contact the factory for availability.
† Works with most pipe materials. See www.veris.com for details.
‡ Call for other length options.

Examples:
Example Monitor: FSR1AK1X or FSR2DKX02A
Example Transducer: FST2C020



NUTATING DISC SERIES

Cost-effective Metering for Industrial Applications



Model 170
(shown with optional test port)

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.

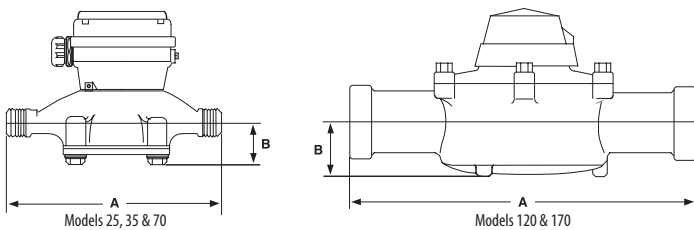
SPECIFICATIONS

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
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DIMENSIONAL DRAWINGS



DIMENSIONS IN INCHES WITHOUT REGISTER					FLOW RATE IN GALLONS	
METER MODEL	METER SIZE	HOUSING MATERIAL	A METER LENGTH	B CENTERLINE TO BASELINE	COLD LIQUIDS 32°...120°F	APPROX. WEIGHT
M25	5/8"	BZ or PL	7-1/2"	1-3/8"	1/2...25 gpm	5 lbs.
M25	3/4"	BZ or PL	7-1/2"	1-3/8"	1/2... 30 gpm*	5 lbs.
M35	3/4"	BZ	9"	1-3/4"	3/4... 35 gpm	6 lbs.
M40	1"	PL	10-3/4"	2-1/4"	3/4... 50 gpm	5 lbs.
M70	1"	BZ	10-3/4"	2-1/4"	1...70 gpm*	12 lbs.
M120	1-1/2"	BZ	12-5/8"	2-5/8"	2...120 gpm	20 lbs.
M170	2"	BZ	15-1/4"	3-3/8"	2...170 gpm	30 lbs.

BZ = Bronze; PL = Plastic. NPT connection set assemblies available. *For 250 °F M25 (3/4") and M70 (1") LCP option.

Wide flow range

Increased accuracy at high and low flow rates

Durable components

Minimal maintenance required

Rugged construction

Rugged bronze or plastic construction

Increased versatility

Optional pulse output transmitter

Easy maintenance

No need to remove from the line... reduce costly downtime

Simple operation

Mechanical dial display

APPLICATIONS

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

ORDERING INFORMATION

Common configurations are shown below with Veris part numbers. For custom configurations, see table on next page. Consult Veris for custom configuration part numbers.

MODEL	MANUF. PART NUMBER	DESCRIPTION
U015-0011	M25-625LNSA-TS-GAXX	Flow, Disc, Bronze, 25GPM, 1/2in, RTR, Pulse
U015-0012	M25-625PNSA-TS-GAXX	Flow, Disc, Polymer, 25GPM, 1/2in, RTR, Pulse
U015-0013	M25-750LNSB-TS-GAXX	Flow, Disc, Bronze, 25GPM, 3/4in, RTR, Pulse
U015-0014	M25-750PNSB-TS-GAXX	Flow, Disc, Polymer, 25GPM, 3/4in, RTR, Pulse
U015-0015	M35-750LNSB-TS-GAXX	Flow, Disc, Bronze, 35GPM, 3/4in, RTR, Pulse
U015-0016	M40-100PNSC-TS-GAXX	Flow, Disc, Polymer, 40GPM, 1in, RTR, Pulse
U015-0017	M70-100LNSC-TS-GAXX	Flow, Disc, Bronze, 70GPM, 1in, RTR, Pulse
U015-0018	M120-150LNSD-TS-GAXX	Flow, Disc, Bronze, 120GPM, 1.5in, RTR, Pulse
U015-0019	M170-200LNSE-TS-GAXX	Flow, Disc, Bronze, 170GPM, 2in, RTR, Pulse

Note: Also see the 225x & 226x Series Ordering Information table.



TURBINE SERIES

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



Model 450

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

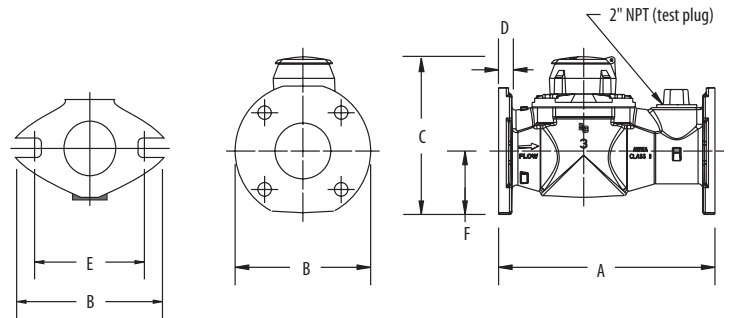
Reliable bearings

Long lasting ceramic bearings

APPLICATIONS

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

DIMENSIONAL DRAWING

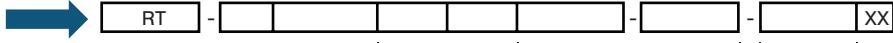


MODEL	160	200	200	450	1000	2000	3500	5500	6200
Meter Flanges	1-1/2" Elliptical	2" Elliptical	2" Round	3" Round	4" Round	6" Round	8" Round	10" Round	12" Round
Qty. of Bolts	2	2	4	4	8	8	8	12	12
Length (A)	13" (330 mm)	10" (254 mm)	10" (254 mm)	12" (305 mm)	14" (356 mm)	18" (457 mm)	20" (508 mm)	26" (660.4 mm)	19-11/16" (500 mm)
Width (B)	5-7/32" (133 mm)	5-27/32" (148 mm)	6" (152 mm)	7-1/2" (191 mm)	9" (229 mm)	11" (280 mm)	13-1/2" (343 mm)	16" (406.4 mm)	19" (482 mm)
Height (C)	6-9/32" (159 mm)	6-1/2" (165 mm)	7-3/32" (180 mm)	8-11/16" (220 mm)	9-21/32" (245 mm)	13-5/16" (338 mm)	15-3/16" (385 mm)	17-15/32" (443 mm)	19-11/16" (500 mm)
Flange (D)	51/64" (20 mm)	25/32" (20 mm)	5/8" (16 mm)	3/4" (19 mm)	13/16" (21 mm)	7/8" (22 mm)	1" (25 mm)	1-1/16" (27 mm)	1.26" (32 mm)
Bolt Circle (E)	4" (102 mm)	4-1/2" (114 mm)	4-3/4" (121 mm)	6" (152 mm)	7-1/2" (191 mm)	9-1/2" (241 mm)	11-3/4" (298 mm)	14-1/4" (362 mm)	17" (432 mm)
Centerline (F)	1-27/32" (47 mm)	2-1/16" (52 mm)	2-5/8" (67 mm)	3-11/32" (85 mm)	4-5/16" (109 mm)	5-1/4" (133 mm)	6-3/8" (162 mm)	7-7/8" (199.4 mm)	8-7/8" (226 mm)

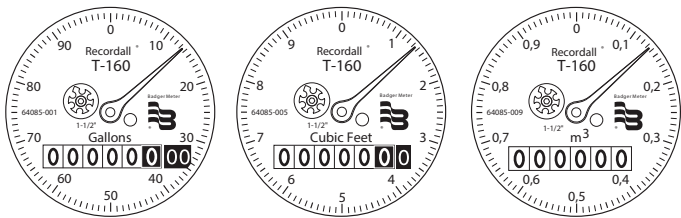


BADGER TURBINE METER BUILD-A-PART NUMBER FOR CUSTOM CONFIGURATIONS

Build the number by selecting the options left-to-right



Size	1.5" (Model 160)	150	X																									
	2" (Model 200)	200	X	X																								
	3" (Model 450)	300		X																								
	4" (Model 1000)	400		X																								
	6" (Model 2000)	600		X																								
	8" (Model 3500)	800		X																								
	10" (Model 5500)	1000		X																								
	12" (Model 6200)	1200			X																							
	16" (Model 6600)	1600			X																							
	20" (Model 10000)	2000			X																							
Housing	Bronze with Elliptical Flanges				BE																							
	Bronze with Round Flanges					BR																						
	Cast Iron with Round Flanges						CI																					
Test Plug	Test Plug							WP																				
	No Test Plug								NP																			
Strainer	With Test Plug									IS																		
	No Integral Strainer										NS																	
Connections	Bronze NL with 316 SS Hardware																					B						
	Cast Iron with Zinc Plated Hardware																											C
	No Connections																											X
Unscaled Meter Mounted Pulse Transmitters																												
	PFT-2 (Reed Switch, Plastic Housing)																											TD
	RST-6P (Reed Switch, Plastic Housing, NEMA 6P)																											TG
Scaled Meter Mounted Pulse Transmitter with Register																												
	(Standard) RTR (Piezo, Bronze Lid, Plastic Housing, Register, 25" Cable)																											TS
Meter Mounted Mechanical Registers																												
	RCDL (Non-Resetable Totalizer, Bronze Lid & Bronze Shroud, 120°F Max.)																											RA
Meter Mounted Electronic Registers																												
	ER-10 Single (Scaleable Rate/Flow Counter, 130°F Max.)																											RD
	ER-10 Single with 4-20mA (Scaleable Rate/Flow Counter, 130°F Max.)																											RE
	ER-9 Single (Scaleable Rate/Flow Counter, Scaled Pulse, 130°F Max.)																											RF
	ER-9 Single with 4-20mA (Scaleable Rate/Flow Counter, Scaled Pulse, 130°F Max.)																											RG
	ER-420 Single (Scaleable Rate/Flow Counter with 4-20mA, 115-230 VAC)																											RH
	ER-420 Single (Scaleable Rate/Flow Counter with 4-20mA, 24 VDC)																											RI
	ER-420 Single (Scaleable Rate/Flow Counter with 4-20mA, Loop Powered)																											RJ
Meter Only																												
	None																											XX
Unit of Measure (RTR and RCDL Monitors Only)																												
	Gallons																											GA
	Cubic Feet																											CU
	Cubic Meters																											M3
	Liters																											LT
	Quarts																											QT
	Ounces																											OZ
	Pounds																											LB
	Kilograms																											KG
	Millimeters																											ML
	Imperial Gallons																											IG
	Barrels																											BR
	Acre Feet																											AF



Example:

RT	-	150	BE	WP	IS	B	-	TD	-	GA	XX
----	---	-----	----	----	----	---	---	----	---	----	----

ORDERING INFORMATION

See table above. Due to the complexity of this offer, consult Veris for part number.

B142 SERIES

Accurately Measures Gas Flow



B142

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.

SPECIFICATIONS

FLOW MEASUREMENT RANGE

B142-20L	7 to 70 ACFM*; 10 to 100 MCFD**; 423 to 4230 MBH† 365 pulses per ACF (12900 pulses per m ³)
B142-20M	14 to 210 ACFM*; 20 to 300 MCFD**; 846 to 12690 MBH† 190 pulses per ACF (6710 pulses per m ³)
B142-20H	35 to 350 ACFM*; 50 to 500 MCFD**; 2115 to 21150 MBH† 85 pulses per ACF (3000 pulses per m ³)

SYSTEM

Working Pressure	Vacuum to 2220 psig (15.3 MPa)
Pressure Drop	3" of water column (7.5 mbar) at maximum rated flow rate (dry air)
Pressure Port	1/8" NPTF (plugged)
Operating Temperature Range	-40 to +165 °C (-40 to +330 °F)
Output Voltage	100 mVP-P minimum when used with B111113 magnetic pickup

ACCURACY

Linearity	±2% of reading over the specified measurement range
Uncertainty	±1% of reading when calibration data is entered into an intelligent monitor/transmitter
Repeatability	±0.5%

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

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
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COMPLIANCE INFORMATION

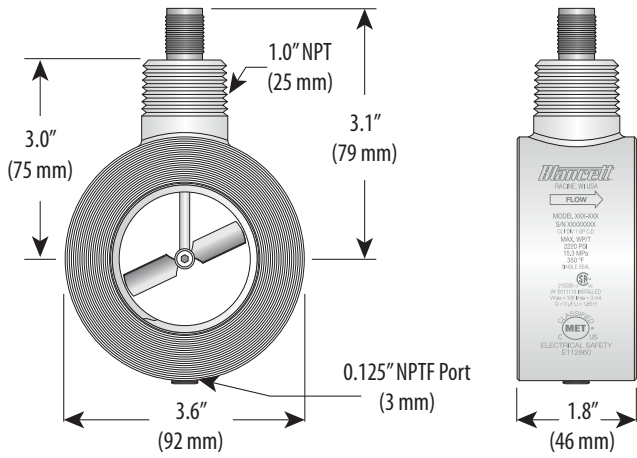
Agency Approvals	UL913; CSA 22.2 No. 157-92; Class 1 Division 1 Groups C, D
Explosion Proof	UL1203; CSA 22.2 No. 30-M1986; Class 1 Division 1 Groups C, D
Seal	ANSI/ISA 12.27.01-2003

AGENCY APPROVALS

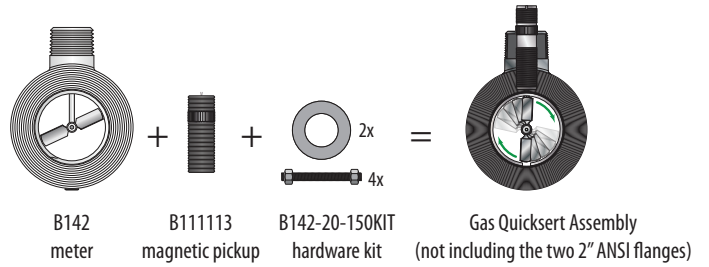


B142 METER WITH B111113 MAGNETIC PICKUP INSTALLED

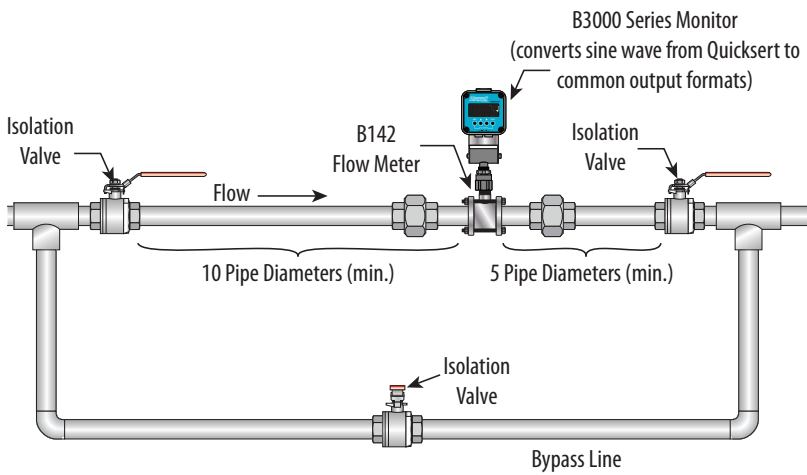
Dimensional Drawing



FLOW SYSTEM ELEMENTS



APPLICATION EXAMPLE



ORDERING INFORMATION

PART #	MANUFACTURER PART #	DESCRIPTION
U021-0001	B142-20L	Flow, Gas, Quicksert, 2", SS, Low Rate,Pulse
U021-0002	B142-20M	Flow, Gas, Quicksert, 2", SS, Med Rate,Pulse
U021-0003	B142-20H	Flow, Gas, Quicksert, 2", SS, High Rate,Pulse
U021-0004	B111113	Flow, Gas, Quicksert, Magnetic Pickup, SS
U021-0005	B142-20-150KIT	Flow, Gas, Quicksert, Bolt and Gasket Kit

B30XX SERIES

Accurately Displays Flow Data



B30xx Series flow monitors are offered for use with the B142 gas Quicksert gas flow meter. The B30xx Series provides a flexible, durable, easy-to-use platform for flow metering applications.

SPECIFICATIONS

INPUT POWER	
4 to 20 mA, Pulse, and Modbus Models	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
Solar Models Only	Internal battery (3.6 Vdc NiCd) provides up to 30 days of power after 6 to 8 hours exposure of the integrated photovoltaic cell to direct sunlight
SENSOR INPUTS	
Magnetic Pickup	Frequency Range: 1 to 3500 Hz Frequency Measurement Accuracy: $\pm 0.1\%$ Over Voltage Protection: 28 Vdc Trigger Sensitivity: 30mVp-p (High) or 60mVp-p (Low) (selected by circuit board jumper)
SYSTEM	
Accuracy	$\pm 0.05\%$
Response Time	1 to 100 sec response to a step change input, user adjustable
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

NEMA 4X enclosure

NEMA 4X (IP66) enclosure with meter mount, remote mount, and swivel mount options. Explosion-proof housing available.

Power options

Solar, battery, and 4 to 20 mA loop power options...can be installed in remote locations and be up and running immediately

8-year battery life

Battery-life up to 8 years...maintain readings and settings during power loss

APPLICATIONS

- Monitor natural gas flow in boiler systems
- Monitor propane or gas flow in industrial systems

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
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OPERATING CONDITIONS

Operating Temp. Range	-30 to +70 °C (-22 to +158 °F)
Operating Humidity Range	0 to 90% RH, non-condensing

MATERIALS AND ENCLOSURE RATINGS

Standard	Polycarbonate, stainless steel, polyurethane, thermoplastic elastomer, acrylic; NEMA 4X/IP66
Explosion Proof	Copper free, epoxy-coated aluminum, buna seal, NEMA 4X/IP66

ENGINEERING UNITS

Liquid*	Gallons, Liters, Oil Barrels (42 gallon), Liquid Barrels (31.5 gallon), Cubic Meters, Million Gallons, Cubic Feet, Million Liters, Acre Feet
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

COMPLIANCE INFORMATION

Agency Approvals, Standard Housing	Class I Division 1, Groups C, D; Class II, Division 1 Groups E, F, G; Class III for US and Canada. Complies with UL 913 and CSA C22.2 No. 153
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Selectable display

Selectable display and totalization options...simultaneous display of rate and total, as well as standard, batch and grand totals

Pulse & 4-20 mA

All models feature pulse and 4 to 20 mA outputs, advanced output models also feature Modbus RTU...communication versatility

Robust alarm parameters

Faster warning when something in the system changes



SPECIFICATIONS, CONT.

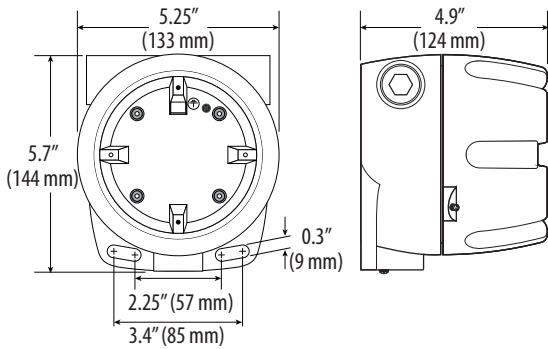
Agency Approvals, Explosion Proof	Class I Division 1 Groups B, C, D; Class II, Division 1, Groups E, F, G; Class III for US and Canada Complies with UL 1203 and CSA C22.2 No. 30 ATEX II 2 G Ex d IIC T4 Gb and ATEX II D Ex tb IIIC T125 °C Db Complies with Directive 94/9/EC
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WARRANTY	
Limited Warranty	1 year

* B30xx may be used with non-gas meters. Consult Veris for specific liquid applications.

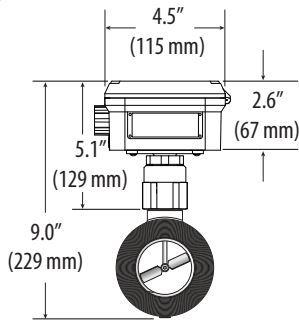
EXPLOSION-PROOF BOX

Dimensional Drawing



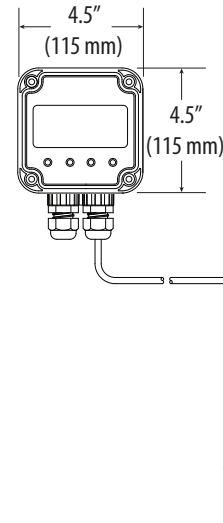
METER MOUNT, SHOWN WITH B142 METER INSTALLED

Dimensional Drawing



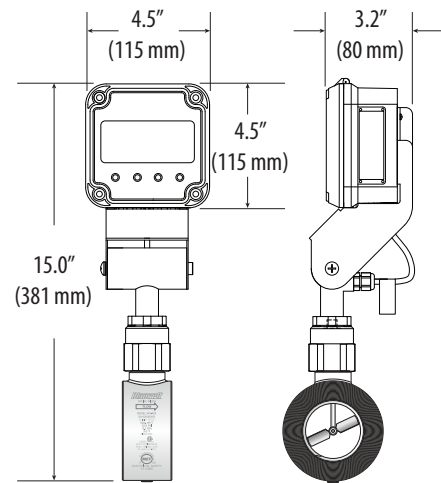
REMOTE MOUNT, SHOWN WITH B142 METER INSTALLED AND B220 REMOTE CABLE

Dimensional Drawing



SWIVEL MOUNT, SHOWN WITH B142 METER INSTALLED

Dimensional Drawing



ORDERING INFORMATION

PART #	MANUFACTURER PART #	DESCRIPTION
U021-0006	B30AM-CS	Flow Monitor, Standard Housing, Advanced Output, Meter Mount
U021-0007	B30AR-CS	Flow Monitor, Standard Housing, Advanced Output, Remote Mount**
U021-0008	B30AS-CS	Flow Monitor, Standard Housing, Advanced Output, Swivel Mount
U021-0009	B30BM-CS	Flow Monitor, Standard Housing, Basic Output, Meter Mount
U021-0010	B30BR-CS	Flow Monitor, Standard Housing, Basic Output, Remote Mount**
U021-0011	B30BS-CS	Flow Monitor, Standard Housing, Basic Output, Swivel Mount
U021-0012	B30SM-CS	Flow Monitor, Standard Housing, Solar Display Only, Meter Mount
U021-0013	B30SR-CS	Flow Monitor, Standard Housing, Solar Display Only, Remote Mount**
U021-0014	B30SS-CS	Flow Monitor, Standard Housing, Solar Display Only, Swivel Mount
U021-0015	B30XR-CS	Flow Monitor, Explosion Proof Housing, Basic Output, Remote Mount**
U021-0016	B30ZR-CS	Flow Monitor, Explosion Proof Housing, Advanced Output, Remote Mount**
U021-0017	B220-221	Remote Cable Assembly with 10 ft connector**
U021-0018	B220-221-30	Remote Cable Assembly with 30 ft connector**
U021-0019	B220-221-50	Remote Cable Assembly with 50 ft connector**

** B220 remote cable is required for all remote mount options.





HUMIDITY MONITORING

Veris Industries 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	131
HWL	Deluxe Wall Humidity Sensors	133
HWxP	Deluxe Wall Humidity and Temperature Sensors, Protocol Communication	135
HED	Standard Duct Humidity Sensors	137
HEW	Standard Wall Humidity Sensors	139
HN/HP	Specialty Humidity Sensors	141
HS	Replaceable Humidity Element	143

HUMIDITY SENSOR SELECTION GUIDE

	WALL MOUNT	DUCT MOUNT	OUTDOOR MOUNT	PROBE
Analog Output	HEW page 139	HD, HED pages 131, 137	HO page 131	HN/HP page 141
Protocol Communication	HWxP page 135			
NIST Traceable Accuracy Down to 1%	HWL page 133	HD page 131	HO page 131	HN/HP page 141
Resistive Temperature Sensing	HWL page 133	HD page 131	HO page 131	HN/HP page 141
LCD Display	HWL, HWLP pages 133, 135			



Maintain Ideal Environmental Conditions, Minimizing Energy Use



HD Duct Mount Humidity Sensor

Flexible System Compatibility

Polarity insensitive, two-wire
4-20 mA or 3-wire 0-5/0-10 Vdc.

No Calibration

Fully interchangeable element to 1%,
2%, 3%, or 5% accuracy.

Replaceable Element

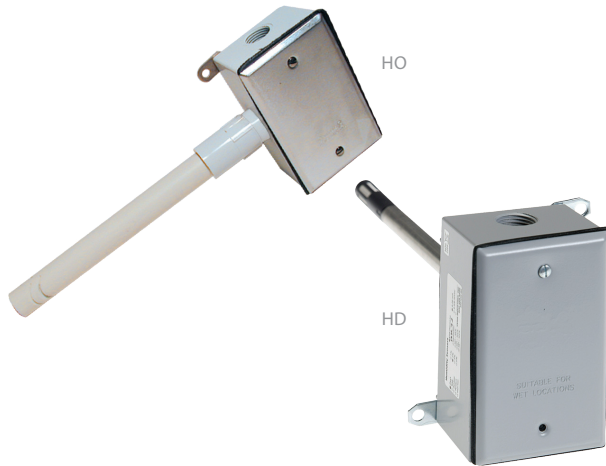
Sensor element can be serviced
without disturbing conduit.

Interested in learning more about the innovative HD capabilities and applications?
Contact a Humidity Sensors Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 131



HD & HO SERIES

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



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

SPECIFICATIONS

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

Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Accuracy

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

Field replacable

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

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

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

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 †
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AGENCY APPROVALS



† 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.

†† The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

* 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.

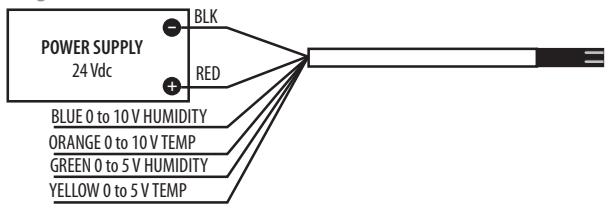
Shielded cabling is required for conformance to EMC standards. Technical information is available from the factory upon request or from the Veris website at www.veris.com. EMC Conformance - CE Option: Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.

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).



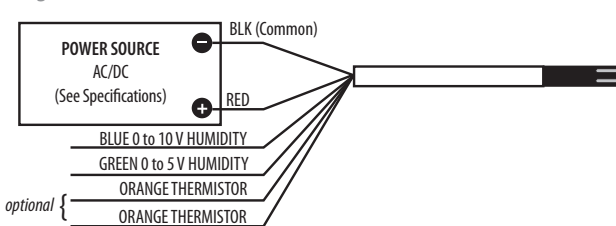
HD/HO (0-5V/0-10V TEMPERATURE TRANSMITTER VERSIONS)

Wiring Diagram



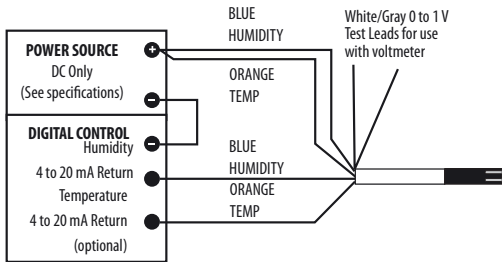
HO (0-5V/0-10V RESISTANCE VERSIONS)

Wiring Diagram



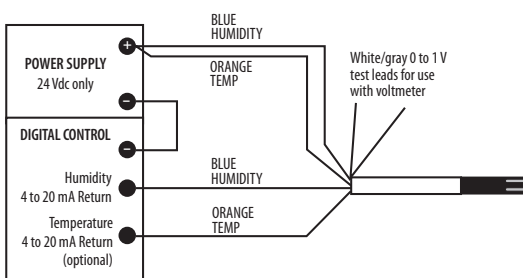
HD/HO (4-20 mA TEMPERATURE TRANSMITTER VERSIONS)

Wiring Diagram



HO (4-20 mA RESISTANCE VERSIONS)

Wiring Diagram



ORDERING INFORMATION

Enclosure	Accuracy	NIST	Output	US or EU	Temp.
H <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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:

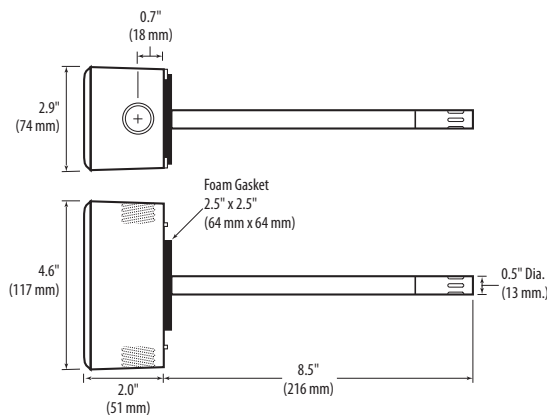
H

No Temp:

H

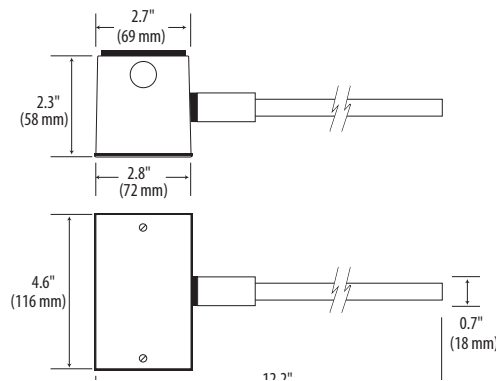
HD

Dimensional Drawing



HO

Dimensional Drawing



Humidity Transmitter Combination

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

Humidity RTD/Thermistor Combination

Sensor Type	OPTION Temp. Cert
<input type="checkbox"/> 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	<input type="checkbox"/> Blank = None 1 = 1pt cal** 2 = 2pt cal**



HW SERIES

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



HWL

HW Series deluxe humidity transmitters provide an ideal solution for measuring relative humidity in all 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 wall-mounted HW model features a low-profile housing with an optional LCD display for easy visibility. All Deluxe models come with a standard five-year warranty. †

SPECIFICATIONS

INPUT POWER

4 to 20 mA Mode	Class 2; Loop powered 12 to 30 Vdc only, 30 mA max. (observe polarity)
0-5/0-10 V Mode*	Class 2; 12 to 30 Vdc/24 Vac, 15 mA max. (observe polarity)

HUMIDITY

HS Element††	Digitally profiled thin-film capacitive (32-bit mathematics) U.S. Patent 5,844,138
Accuracy at 25 °C from 10 to 80% RH**	±1% at 20 to 40% RH in mA output mode; (multi-point calibration, NIST traceable) ±2%, 3%, or 5% models; ±1% at 12 to 60% RH in voltage output mode; ±1% at 12 to 60% RH in mA output mode with temp transmitter
Reset Rate***	24 hours
Stability	±1%@20 °C (68 °F) annually, for two years
Operating Humidity Range	0 to 100% RH non-condensing
Hysteresis	1.5% typical
Linearity	Included in accuracy spec.
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (typical)
Analog Output	4 to 20 mA mode: 2-wire, not polarity sensitive (clipped and capped); 0-5/0-10 V mode: 3-wire, observe polarity
Scaling	0 to 100% RH
Operating Temp Range	10 to 35 °C (50 to 95 °F)

TEMPERATURE

Temp Transmitter Option	Digital, 4 to 20 mA (clipped and capped) or 0-5/0-10 V output; accuracy ±0.5 °C (±1 °F) typical
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Sensor element

Thin-film capacitive sensor element recovers from 100% saturation

Interchangeable element

Fully interchangeable element to 1%, 2%, 3%, or 5% accuracy...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

On-board memory

HS element is microprocessor profiled with on-board non-volatile memory

Calibration free

Calibration-free interchangeable NIST traceable HS element

Operating Temp Range	10 to 35 °C (50 to 95 °F and 0 to 50 °C (32 to 122 °F) (switchable)
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WARRANTY

Warranty	5 years †
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AGENCY APPROVALS



† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.

†† The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

* One side of transformer secondary is connected to signal common, so an Isolation transformer or dedicated power supply may be required.

** Specified accuracy with 24VDC 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.

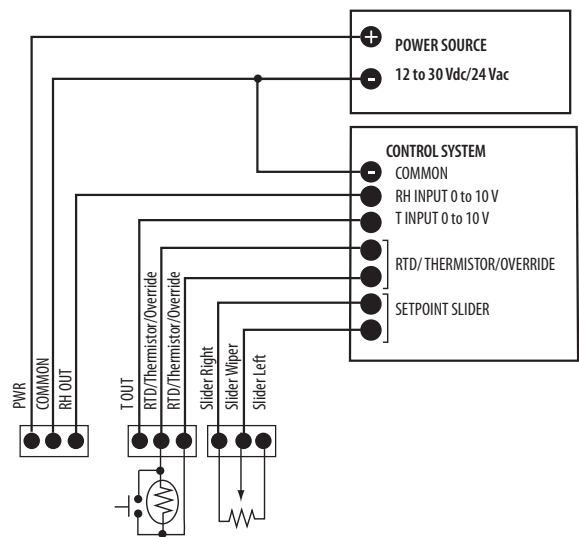
Shielded cabling is required for conformance to EMC standards. Technical information is available from factory upon request or is available on our website: www.veris.com. EMC Conformance - CE Option: Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.

EMC 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).



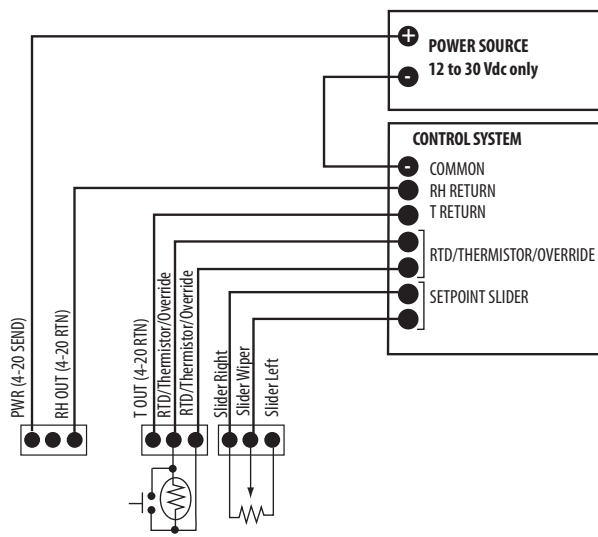
HW VOLTAGE OUTPUT (3-WIRE, 0-5V/0-10V)

Wiring Diagram



HW CURRENT OUTPUT (2-WIRE, 4 TO 20 mA)

Wiring Diagram



ORDERING INFORMATION

<p>Display</p> <p>HW <input type="checkbox"/> L</p> <p>= LCD</p>	<p>Accuracy</p> <p><input type="checkbox"/> 1 = 1%</p> <p><input type="checkbox"/> 2 = 2%</p> <p><input type="checkbox"/> 3 = 3%</p> <p><input type="checkbox"/> 5 = 5%</p>	<p>NIST</p> <p><input type="checkbox"/> N = NIST (1% & 2% only)</p> <p><input type="checkbox"/> X = No (2%, 3%, & 5% only)</p>	<p>US or EU</p> <p><input type="checkbox"/> S = Standard</p> <p><input type="checkbox"/> C = CE</p>	<p>Temp</p> <p><input type="checkbox"/> T = Temp†</p> <p><input type="checkbox"/> X = No Temp (Stop here)</p>	<p>Sensor Type</p> <p><input type="checkbox"/> A = Transmitter: 10 to 35 °C (50 to 95 °F) & 0 to 50 °C (32 to 122 °F) (switchable)</p> <p><input type="checkbox"/> B = 100R Platinum, RTD</p> <p><input type="checkbox"/> C = 1k Platinum, RTD</p> <p><input type="checkbox"/> D = 10k T2, Thermistor</p> <p><input type="checkbox"/> E = 2.2k, Thermistor</p> <p><input type="checkbox"/> F = 3k, Thermistor</p> <p><input type="checkbox"/> G = 10k CPC, Thermistor</p> <p><input type="checkbox"/> H = 10k T3, Thermistor</p> <p><input type="checkbox"/> J = 10k Dale, Thermistor</p> <p><input type="checkbox"/> K = 10k with 11k shunt, Thermistor</p> <p><input type="checkbox"/> M = 20k NTC, Thermistor</p> <p><input type="checkbox"/> N = 1800 ohm TAC, Thermistor</p> <p><input type="checkbox"/> Q = 1uA/C, Linitemp</p> <p><input type="checkbox"/> R = 10k US, Thermistor</p> <p><input type="checkbox"/> S = 10k 3A 221</p> <p><input type="checkbox"/> T = 100k, Thermistor</p> <p><input type="checkbox"/> U = 20k "D", Thermistor</p> <p><input type="checkbox"/> W = 10k T2 high accuracy, Thermistor</p> <p><input type="checkbox"/> Y = 10k T3 high accuracy, Thermistor</p>	<p>Options Available</p> <table border="0"> <tr> <td> <p>Temp Cal Cert</p> <p><input type="checkbox"/> X = No cert</p> <p><input type="checkbox"/> 1 = 1pt cal*</p> <p><input type="checkbox"/> 2 = 2pt cal*</p> </td> <td> <p>Option</p> <p><input type="checkbox"/> 1 = Push Button Override</p> <p><input type="checkbox"/> 2 = Set Point Slider</p> <p><input type="checkbox"/> 3 = Push Button Override and Set Point Slider</p> </td> <td> <p>Value</p> <p><input type="checkbox"/> A = 1k</p> <p><input type="checkbox"/> F = 10k</p> <p><input type="checkbox"/> G = 20k</p> <p><input type="checkbox"/> K = 50k</p> <p><input type="checkbox"/> M = 100k</p> </td> <td> <p>Housing</p> <p><input type="checkbox"/> Blank = Cloud white</p> <p><input type="checkbox"/> B = Black</p> </td> </tr> </table>	<p>Temp Cal Cert</p> <p><input type="checkbox"/> X = No cert</p> <p><input type="checkbox"/> 1 = 1pt cal*</p> <p><input type="checkbox"/> 2 = 2pt cal*</p>	<p>Option</p> <p><input type="checkbox"/> 1 = Push Button Override</p> <p><input type="checkbox"/> 2 = Set Point Slider</p> <p><input type="checkbox"/> 3 = Push Button Override and Set Point Slider</p>	<p>Value</p> <p><input type="checkbox"/> A = 1k</p> <p><input type="checkbox"/> F = 10k</p> <p><input type="checkbox"/> G = 20k</p> <p><input type="checkbox"/> K = 50k</p> <p><input type="checkbox"/> M = 100k</p>	<p>Housing</p> <p><input type="checkbox"/> Blank = Cloud white</p> <p><input type="checkbox"/> B = Black</p>
<p>Temp Cal Cert</p> <p><input type="checkbox"/> X = No cert</p> <p><input type="checkbox"/> 1 = 1pt cal*</p> <p><input type="checkbox"/> 2 = 2pt cal*</p>	<p>Option</p> <p><input type="checkbox"/> 1 = Push Button Override</p> <p><input type="checkbox"/> 2 = Set Point Slider</p> <p><input type="checkbox"/> 3 = Push Button Override and Set Point Slider</p>	<p>Value</p> <p><input type="checkbox"/> A = 1k</p> <p><input type="checkbox"/> F = 10k</p> <p><input type="checkbox"/> G = 20k</p> <p><input type="checkbox"/> K = 50k</p> <p><input type="checkbox"/> M = 100k</p>	<p>Housing</p> <p><input type="checkbox"/> Blank = Cloud white</p> <p><input type="checkbox"/> B = Black</p>							

<p>Display</p> <p>HW <input type="checkbox"/> L</p> <p>= LCD</p>	<p>Accuracy</p> <p><input type="checkbox"/> 1 = 1%</p> <p><input type="checkbox"/> 2 = 2%</p> <p><input type="checkbox"/> 3 = 3%</p> <p><input type="checkbox"/> 5 = 5%</p>	<p>NIST</p> <p><input type="checkbox"/> N = NIST (1% & 2% only)</p> <p><input type="checkbox"/> X = No (2%, 3%, & 5% only)</p>	<p>US or EU</p> <p><input type="checkbox"/> S = Standard</p> <p><input type="checkbox"/> C = CE</p>	<p>Temp.</p> <p><input type="checkbox"/> T = Temp†</p> <p><input type="checkbox"/> TA = Transmitter only</p> <p><input type="checkbox"/> D = Transmitter & resistive element</p> <p><input type="checkbox"/> X = No Temp (Stop here)</p>	<p>Sensor Type</p> <p><input type="checkbox"/> None = Select for TA temp option only</p> <p><input type="checkbox"/> B = 100R Platinum, RTD</p> <p><input type="checkbox"/> C = 1k Platinum, RTD</p> <p><input type="checkbox"/> D = 10k T2, Thermistor</p> <p><input type="checkbox"/> E = 2.2k, Thermistor</p> <p><input type="checkbox"/> F = 3k, Thermistor</p> <p><input type="checkbox"/> G = 10k CPC, Thermistor</p> <p><input type="checkbox"/> H = 10k T3, Thermistor</p> <p><input type="checkbox"/> J = 10k Dale, Thermistor</p> <p><input type="checkbox"/> K = 10k with 11k shunt, Thermistor</p> <p><input type="checkbox"/> M = 20k NTC, Thermistor</p> <p><input type="checkbox"/> N = 1800 ohm TAC, Thermistor</p> <p><input type="checkbox"/> Q = 1uA/C, Linitemp</p> <p><input type="checkbox"/> R = 10k US, Thermistor</p> <p><input type="checkbox"/> S = 10k 3A 221</p> <p><input type="checkbox"/> T = 100k, Thermistor</p> <p><input type="checkbox"/> U = 20k "D", Thermistor</p> <p><input type="checkbox"/> W = 10k T2 high accuracy, Thermistor</p> <p><input type="checkbox"/> Y = 10k T3 high accuracy, Thermistor</p>	<p>Options Available</p> <table border="0"> <tr> <td> <p>Temp Cal Cert</p> <p><input type="checkbox"/> X = No cert</p> <p><input type="checkbox"/> 1 = 1pt cal*</p> <p><input type="checkbox"/> 2 = 2pt cal*</p> </td> <td> <p>Option</p> <p><input type="checkbox"/> 1 = Push Button Override</p> <p><input type="checkbox"/> 2 = Set Point Slider</p> <p><input type="checkbox"/> 3 = Push Button Override and Set Point Slider</p> </td> <td> <p>Value</p> <p><input type="checkbox"/> A = 1k</p> <p><input type="checkbox"/> F = 10k</p> <p><input type="checkbox"/> G = 20k</p> <p><input type="checkbox"/> K = 50k</p> <p><input type="checkbox"/> M = 100k</p> </td> <td> <p>Housing</p> <p><input type="checkbox"/> Blank = Cloud white</p> <p><input type="checkbox"/> B = Black</p> </td> </tr> </table>	<p>Temp Cal Cert</p> <p><input type="checkbox"/> X = No cert</p> <p><input type="checkbox"/> 1 = 1pt cal*</p> <p><input type="checkbox"/> 2 = 2pt cal*</p>	<p>Option</p> <p><input type="checkbox"/> 1 = Push Button Override</p> <p><input type="checkbox"/> 2 = Set Point Slider</p> <p><input type="checkbox"/> 3 = Push Button Override and Set Point Slider</p>	<p>Value</p> <p><input type="checkbox"/> A = 1k</p> <p><input type="checkbox"/> F = 10k</p> <p><input type="checkbox"/> G = 20k</p> <p><input type="checkbox"/> K = 50k</p> <p><input type="checkbox"/> M = 100k</p>	<p>Housing</p> <p><input type="checkbox"/> Blank = Cloud white</p> <p><input type="checkbox"/> B = Black</p>
<p>Temp Cal Cert</p> <p><input type="checkbox"/> X = No cert</p> <p><input type="checkbox"/> 1 = 1pt cal*</p> <p><input type="checkbox"/> 2 = 2pt cal*</p>	<p>Option</p> <p><input type="checkbox"/> 1 = Push Button Override</p> <p><input type="checkbox"/> 2 = Set Point Slider</p> <p><input type="checkbox"/> 3 = Push Button Override and Set Point Slider</p>	<p>Value</p> <p><input type="checkbox"/> A = 1k</p> <p><input type="checkbox"/> F = 10k</p> <p><input type="checkbox"/> G = 20k</p> <p><input type="checkbox"/> K = 50k</p> <p><input type="checkbox"/> M = 100k</p>	<p>Housing</p> <p><input type="checkbox"/> Blank = Cloud white</p> <p><input type="checkbox"/> B = Black</p>							

Examples:

HW L 2 N C T A Stop Here

HW L 2 N C T C 2 2 F

HW X 5 X S X Stop Here

† In order for unit to display both temp and RH, use the TA or D temp selection.
 Temp displayed on LCD is read from temperature transmitter, not resistive element. If only the resistive output is selected for temp. output, LCD will not display temp.
 * Not available with W and Y high-accuracy thermistors.

HW PROTOCOL SERIES

Modbus and BACnet Protocol Communication



HWLP

HW Protocol Series Deluxe humidity transmitters provide an ideal solution for measuring relative humidity in all 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.

The HWLP features embedded BACnet and Modbus communication protocols with humidity and temperature sensing capability. The setpoint slider and pushbutton override options offer additional local control.

The wall-mounted HWLP features a low-profile housing with an LCD display for local indication. All models come with a standard five-year warranty. †

SPECIFICATIONS

INPUT POWER	
Voltage Model	Class 2; 12 to 30 Vdc, 24 Vac; 100 mA max.
Housing	
Material	High-impact ABS plastic, UL 94 VO
COMMUNICATION	
Protocol	BACnet or Modbus (selectable)
Connection	2-wire RS-485
Data Rate	9600, 19200, 38400, 57600 (Modbus), bps (selectable); 9600, 19200, 38400, 76800 (BACnet), bps (selectable)
Parity	None/Odd/Even (selectable-Modbus); None (BACnet)
Address Range	1 to 127
HUMIDITY	
HS Element*	Replaceable digitally profiled thin-film capacitive; (32-bit mathematics); U.S. Patent 5,844,138
Accuracy**	±2% from 10 to 80% RH; NIST traceable multi-point calibration
Reset Rate***	24 hours
Stability	±1% @20°C (68°F) annually for two years
Hysteresis	1.5% typical
Operating Humidity Range	0 to 100% RH non-condensing
Operating Temp. Range	10 to 35 °C (50 to 95 °F)

BACnet & Modbus Local control

Embedded BACnet and Modbus communication protocols... compatible with many existing control systems

Pushbutton override capability to the building control system... local control in individual rooms to maximize comfort

RH & temperature Self-calibration algorithm

Humidity and temperature sensors in one device at one address... provides more information and maximizes system capacity

Innovative self-calibration algorithm...maximizes performance. Field calibratable.

Sensor element Multiple baud rates

Thin-film capacitive sensor element recovers from 100% saturation

Configurable to many baud rates

APPLICATIONS

- Office buildings, schools, or other systems utilizing BACnet or Modbus protocol

Temperature Coefficient	±0.1% RH/°C above or below 25 °C (typical)
OPERATING ENVIRONMENT	
Operating Temp. Range	10 to 35 °C (50 to 95 °F)
TEMPERATURE TRANSMITTER OPTION	
Sensor Type	Solid-state, integrated circuit
Accuracy	±0.5 °C (±0.9 °F) typical
Resolution	0.1 °C (0.2 °F)
Range	10 to 35 °C (50 to 95 °F)
Setpoint Slider Resolution Option	1% full scale
Override Button Option	Remotely readable and resettable
WARRANTY	
Limited Warranty	5 years †

AGENCY APPROVALS



† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.

†† The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

*The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.

** Specified accuracy with 24 Vdc supplied power with rising humidity.

*** Reset rate is the time required to recover to 50% RH after exposure to 90% RH for 24 hours.

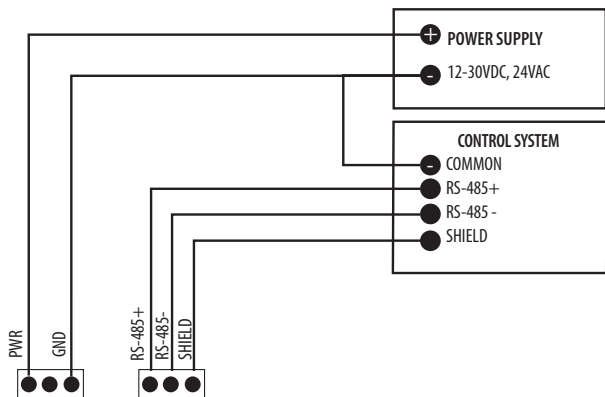
Note: RTD/Thermistors in wall packages are not compensated for internal heating of product.

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

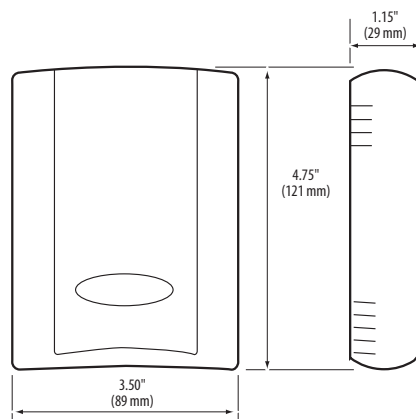
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements)



WIRING DIAGRAM



DIMENSIONAL DRAWING



BACNET DESCRIPTIONS

Standard Object Types Supported

OBJECT TYPE	SUPPORTED OPTIONAL PROPERTIES	WRITABLE PROPERTIES
Analog Input -- AI	Description,† Reliability	
Analog Value -- AV	Description†	Present_Value
Binary Value -- BV	Description†	Present_Value
Device -- DEV	Description,† Location	APDU_Timeout, Description, Location, Max_Master, Object_Identifier, Object_Name

† Description is the same as the Object_Identifier. Reliability is "No Sensor" if no sensor is installed (applies to humidity, temperature, and slider).

Objects Table

OBJECT NAME	TYPE & INSTANCE	DESCRIPTION OF PRESENT_VALUE PROPERTY
Humidity	AI 1	Humidity in percent
Temperature	AI 2	Temperature in Fahrenheit or Celsius
Slider	AI 3	Slider position in percent.
Device_Instance	AV 1	Alternative way to change object_identifier property of device. A negative value will restore the default device instance (133nnn). Fractional values are truncated.
Temp_Offset	AV 2	Temperature offset. Value rounded to nearest tenth of a degree. Units are current units. Initial value is 0.
RH_Offset	AV 3	Relative Humidity offset. Value rounded to the nearest tenth of a percent. Initial value is zero.
Fahrenheit	BV 1	1 if temperature in Fahrenheit, 0 if in Celsius. Initially 1.
Override	BV 2	1 if override button pressed. Store 0 to reset. Initially 0. Volatile.

Device Objects Table

OBJECT NAME	TYPE & INSTANCE	OBJECT PROPERTY	DESCRIPTION
HWxPxxx	Device 133nnn	Object_Identifier (R/W)	Unique value where nnn initially is MS/TP
		Object_Name (R/W)	Unique name, initially a combination of model and serial number. Maximum length is 64 characters
		APDU_Timeout	Default is 3000, maximum value is 60000
		Max_Master	Default is 127
		Description	Maximum length is 64 characters
		Location	Maximum length is 64 characters

ORDERING INFORMATION

Local Display HW <input type="checkbox"/> L = LCD X = No Display	Protocol <input type="checkbox"/> P = Protocol	RH Option <input type="checkbox"/> 1 = RH 1% NIST 2 = RH 2% NIST H = RH 2%	Temp. Option <input type="checkbox"/> X = No temp. T = Temp. transmitter	Temp. Cal. Cert. <input type="checkbox"/> X = None 1 = 1 pt. cal. cert.‡ 2 = 2 pt. cal. cert.‡	Option <input type="checkbox"/> Blank = None 1 = Pushbutton override 2 = Set point slider 3 = Pushbutton override + set point slider	Housing <input type="checkbox"/> Blank = Cloud white B = Black
--	---	---	--	---	--	--

Example: HW L P H T X 3 ‡ Only available if temperature option is selected.



HED SERIES

2%, 3%, and 5% Accuracies



HED

HED Standard 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 Standard 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



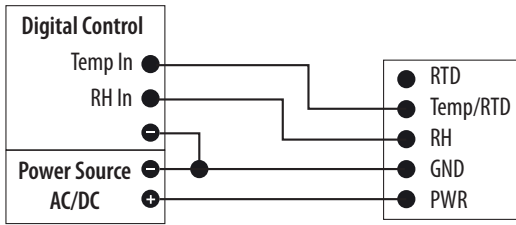
*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

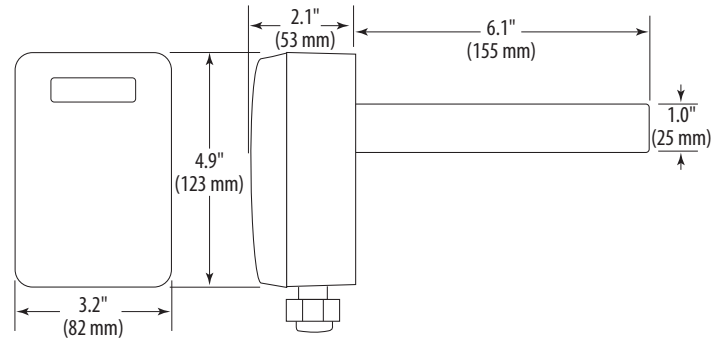


0-5V/0-10V MODELS, TEMPERATURE TRANSMITTER

Wiring Diagram

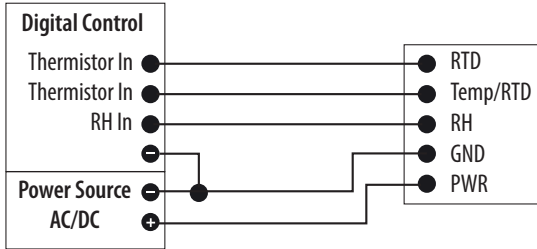


DIMENSIONAL DRAWING



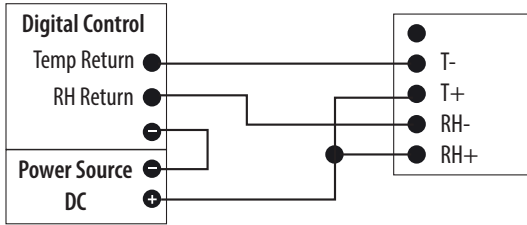
0-5V/0-10V MODELS, THERMISTOR

Wiring Diagram



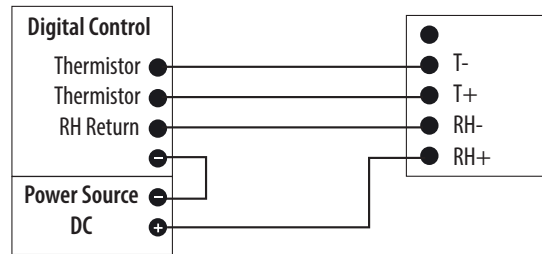
4-20 mA MODELS, TEMPERATURE TRANSMITTER

Wiring Diagram



4-20 mA MODELS, THERMISTOR

Wiring Diagram



ORDERING INFORMATION

<p>Accuracy</p> <p>HED <input type="checkbox"/></p> <p>2 = 2%</p> <p>3 = 3%</p> <p>5 = 5%</p>	<p>Output</p> <p><input type="checkbox"/></p> <p>M = 4 to 20 mA</p> <p>V = 0-5/0-10 Vdc</p>	<p>US or EU</p> <p><input type="checkbox"/></p> <p>S = Standard</p>	<p>Temp.</p> <p><input type="checkbox"/></p> <p>T = Temp</p> <p>X = No Temp (Stop here)</p>	<p>Sensor Type</p> <p><input type="checkbox"/></p> <p>A = Temp. transmitter</p>	<p>Temp Range</p> <p><input type="checkbox"/></p> <p>1 = -40 to 50 °C (-40 to 122 °F)</p> <p>2 = 0 to 50 °C (32 to 122 °F)</p>	<p>Temp Cert</p> <p><input type="checkbox"/></p> <p>Blank = None</p> <p>1 = 1 pt cal</p> <p>2 = 2 pt cal</p>
				<p>Sensor Type</p> <p><input type="checkbox"/></p> <p>B = 100R Platinum, RTD</p> <p>C = 1k Platinum, RTD</p> <p>D = 10k T2, Thermistor</p> <p>E = 2.2k, Thermistor</p> <p>F = 3k, Thermistor</p> <p>G = 10k CPC Thermistor</p> <p>H = 10k T3, Thermistor</p> <p>J = 10k Dale, Thermistor</p> <p>K = 10k with 11k shunt, Thermistor</p> <p>M = 20k NTC, Thermistor</p> <p>N = 1800 ohm TAC, Thermistor</p> <p>R = 10k US, Thermistor</p> <p>S = 10k 3A 221 Thermistor</p> <p>T = 100k, Thermistor</p> <p>U = 20k *D*, Thermistor</p> <p>W = 10k T2 high accuracy, Thermistor</p> <p>Y = 10k T3 high accuracy, Thermistor</p>	<p>Temp Cert</p> <p><input type="checkbox"/></p> <p>Blank = None</p> <p>1 = 1 pt cal*</p> <p>2 = 2 pt cal*</p>	

Examples:

HED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3	M	S	T	C
HED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3	V	S	X	

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

HEW SERIES

2%, 3%, and 5% Accuracies



HEW Standard 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 Standard 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

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

TEMPERATURE OPTION

Active Output Accuracy	±0.5 °C (±.9 °F)
Active Output Temp Scaling	10 to 35 °C (50 to 95 °F)
Self-Heating Error (Resistive temperature only)	≤±0.5 °C at 20 to 30 °C (68 to 86 °F); ≤±0.75 °C outside of 20 to 30 °C (68 to 86 °F)

OPERATING ENVIRONMENT

Operating Temperature	0 to 50 °C (32 to 122 °F)
Operating Humidity	0 to 100% RH non-condensing (Unit will recover from saturation)

HOUSING

Material	ABS plastic with UL V-0 5VB Flame Class
Mounting Holes	US and European junction box

WARRANTY

Limited Warranty	1 year
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AGENCY APPROVALS



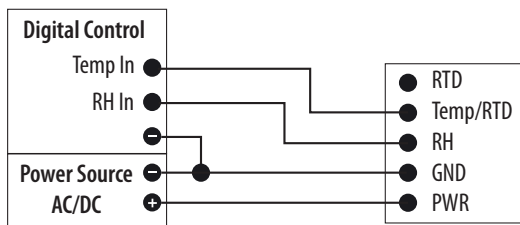
*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

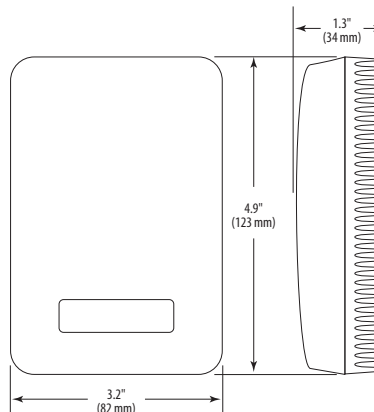


0-5V/0-10V MODELS, TEMPERATURE TRANSMITTER

Wiring Diagram

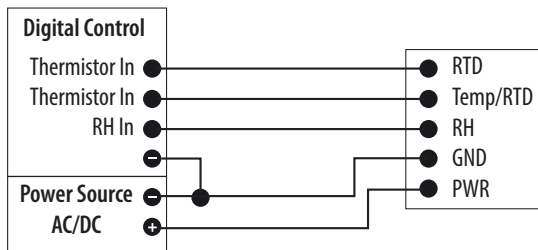


DIMENSIONAL DRAWING



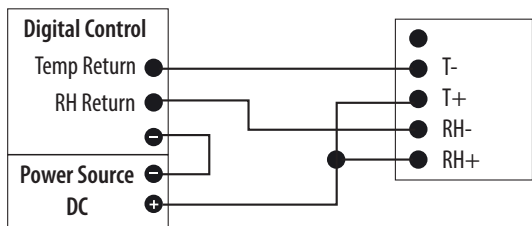
0-5V/0-10V MODELS, TEMPERATURE TRANSMITTER

Wiring Diagram



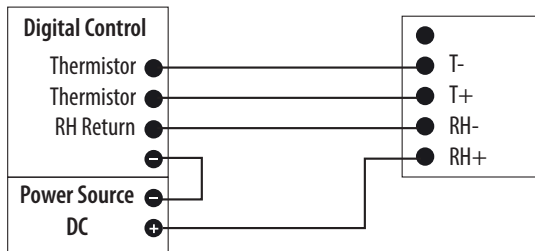
4-20 mA MODELS, TEMPERATURE TRANSMITTER

Wiring Diagram



4-20 mA MODELS, THERMISTOR

Wiring Diagram



ORDERING INFORMATION

Accuracy	Output	US or EU	Temp.	Sensor Type	Temp Cert
HEW <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 = 2% 3 = 3% 5 = 5%	M = 4-20mA V = 0-5 Vdc/0-10 Vdc	= 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 T = 100k, Thermistor U = 20k "D", Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor	Blank = None 1 = 1 pt cal* 2 = 2 pt cal*

Examples:

With Temp:

HEW 3 M S T C

Without Temp:

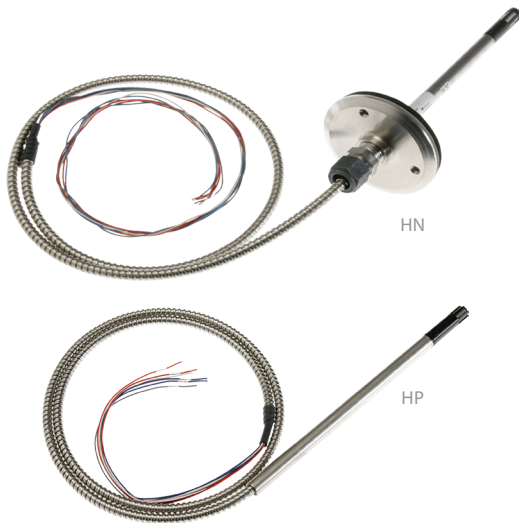
HEW 3 V S X Stop Here

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



HN & HP SERIES

Pendant and Insertion



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
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

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

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 †
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AGENCY APPROVALS



† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.

†† The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

* 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.

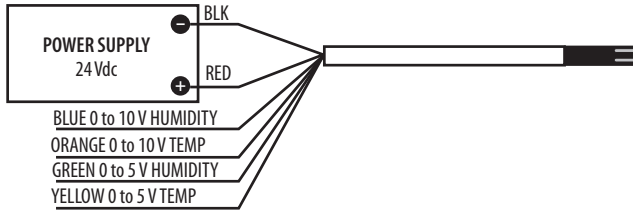
Shielded cabling is required for conformance to EMC standards. Technical information is available from factory upon request or is available on our website: www.veris.com. EMC Conformance - CE Option: Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.

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).



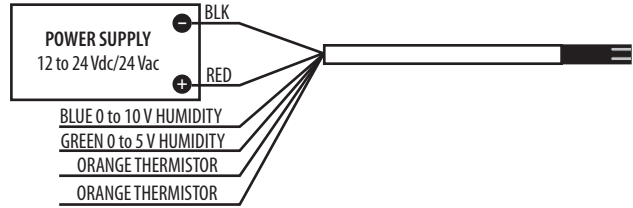
HN/HP (0-5V/0-10V VERSIONS)

Wiring Diagram



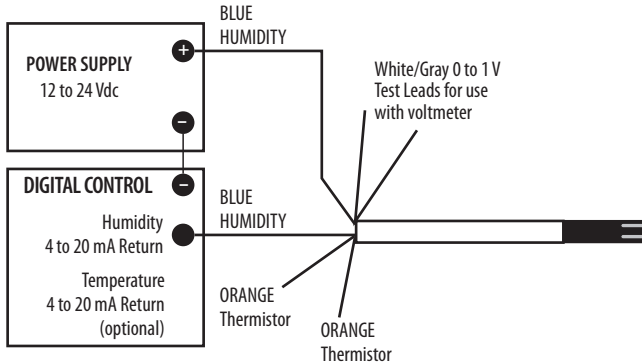
HN/HP WITH RTD/THERMISTOR (0-5V/0-10V VERSIONS)

Wiring Diagram



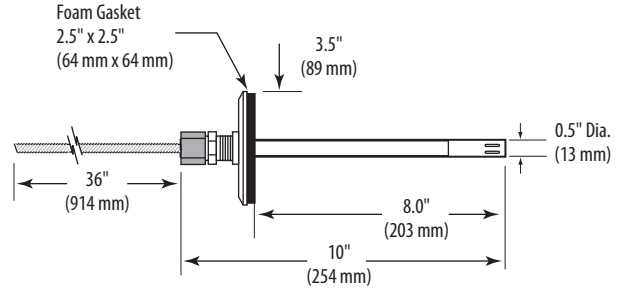
HN/HP WITH RTD/THERMISTOR (4-20 mA VERSIONS)

Wiring Diagram



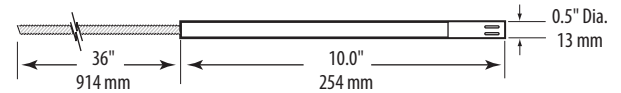
HN SERIES

Dimensional Drawing



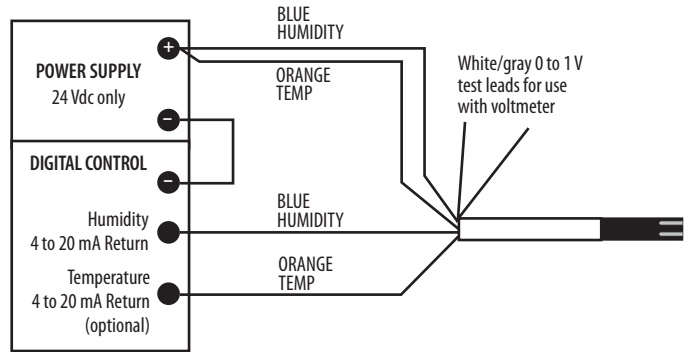
HP SERIES

Dimensional Drawing



HN/HP (4-20 mA VERSIONS)

Dimensional Drawing



ORDERING INFORMATION

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

Example: (No Temp) H P 2 X V S X Stop Here

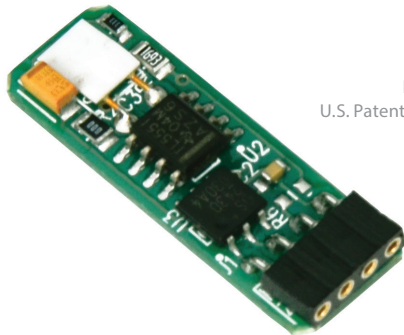
Example: (With Temp) H N 2 X V S T C 2

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



HS SERIES

Easy Field Replacement for Veris Deluxe Humidity Sensors



HS
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

	Accuracy	NIST
HS	<input type="checkbox"/>	<input type="checkbox"/> X
	1 = 1%*	N = NIST
	2 = 2%	(1% & 2% models only)
	3 = 3%	X = None
	5 = 5%	(2%, 3%, & 5% models only)

Example:			
HS	<input type="checkbox"/> 5	<input type="checkbox"/> X	<input type="checkbox"/> X

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

Note: 1-year limited warranty.



Certificate of Performance

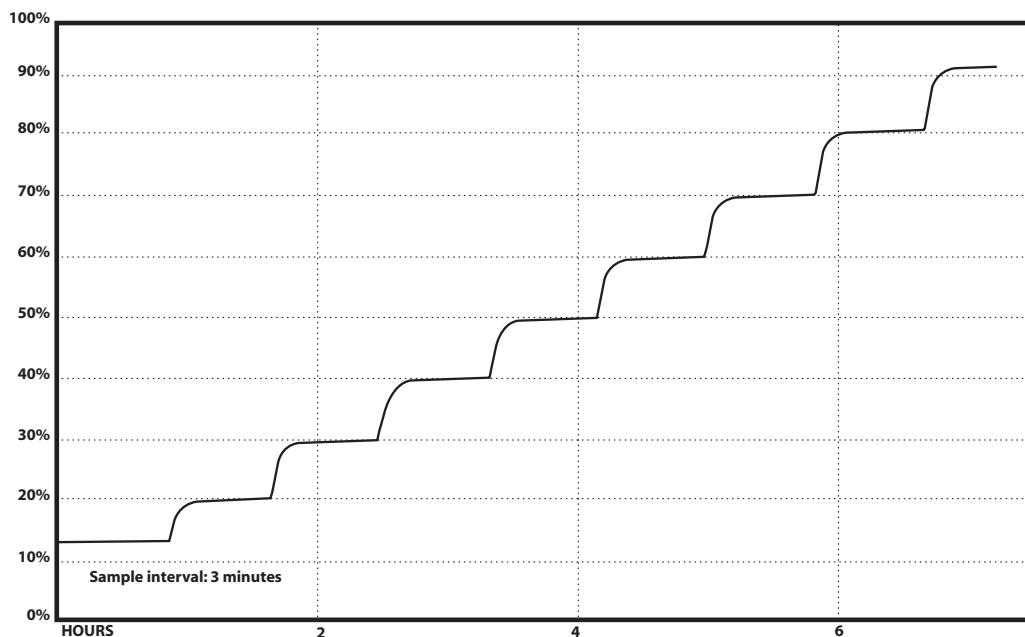
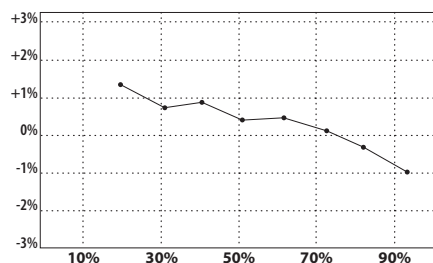
HS Digital Humidity Sensor

Serial Number: SAMPLE Date: _____ Accepted by: _____

This digital 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 an 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%	12.53%	+0.53%
20.0%	20.44%	+0.44%
30.0%	29.94%	+0.06%
40.0%	40.12%	+0.12%
50.0%	49.80%	+0.20%
60.0%	59.98%	-0.02%
70.0%	69.84%	-0.16%
80.0%	79.43%	-0.57%
90.0%	88.80%	-1.20%



VERIS INDUSTRIES, INC.
1-800-354-8556





LEAK DETECTION

To protect expensive electronics from costly water damage, Veris Industries 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	147
LD1500/LD2100	Distance Read Panel	149
LD5200	Distance Read Panel, Touch Screen	151
SD/SD-R01/SD-Z/MX1	Spot Leak Detectors	153
SC/SC-C/NSC	Cables	155
LC-KIT/LC-KIT-M	Leak Detection Kits	157

LEAK DETECTION SENSOR SELECTION GUIDE

SENSORS AND CONTROL PANELS

	SPOT DETECTION	SINGLE ZONE	MULTI-ZONE	DISTANCE READ
Basic Model	SD/SD-Z/MX1 page 153			
Leak Detection with Relay Output	SD-R01 page 153	LD310/LD1000 page 147	LDRA6 page 147	LD1500/LD2100 page 149 LD5200 page 151
Modbus Output			LDRA6 page 147	LD1500/LD2100 page 149 LD5200 page 151

CABLES

	CABLE KITS	CONDUCTIVE FLUIDS	CHEMICAL FLUIDS	NON-SENSING LEADER CABLE
Basic Model	LC-KIT page 157	SC page 155	SC-C page 155	NSC page 155



Make Early Detection as Simple as Possible

With leak detection kits



LD310 Leak Detection Controller Kits

Specify with Ease

Single zone controller kits pre-configured in 3', 10', 17', 25', 50', or 100' lengths.

Quiet and Easy Troubleshooting

LED indicator for alarm status. Fault LED indicates connectivity loss (some models).

Smart Zone Control

Added control with a sensitivity setting for each zone.

Interested in learning more about leak detection kits?

Contact a Leak Detection Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 157



LD310, LD1000, & LDRA6

Zone Leak Detection Controller



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

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

SPECIFICATIONS

Input Power: LD310 LD1000 LDRA6	5 Vdc ±10% 24 Vac/dc (±10%)@300 mA max. (AC: 50/60 Hz) 24 Vac/dc (±10%)@600 mA max. (AC: 50/60 Hz)
Relay Output: LD310 LD1000 LDRA	2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac 2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac 1 Form C summary alarm relay, 1 Form C relay for each zone/alarm; 1 A@24 Vdc, 0.5 A Resistive@120 Vac

INPUTS

Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable kit (LC-Kit) per zone.
Maximum Cable Length: LD310 LD1000, LDRA6	300 ft. (91 m) 1000 ft. (305 m)
Detection Response Time: LD310 LD1000 LDRA6	< 20 sec (10 sec typical) Configurable for 10 sec or 2 min, ± 10% 20 to 3600 sec, software adjustable in 10 sec increments, ± 2%

COMMUNICATION PORTS (LDRA6 ONLY)

RS-232 & RS-485	1200, 2400, 9600, or 19200 selectable; no parity; 8 data bits, 1 stop bit
Terminal Emulation (RS-232)	VT100 Compatible (configuration)
Modbus (RS-485) (LDRA6 only)	Slave; RTU Mode; Supports function codes 03, 04, 06 and 16

Application flexibility

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

LED indicators

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

Sensitivity settings

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

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)

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
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WARRANTY

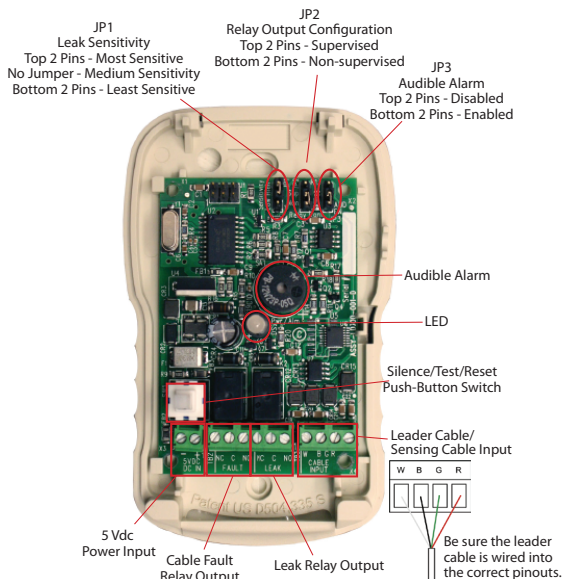
Limited Warranty	2 years
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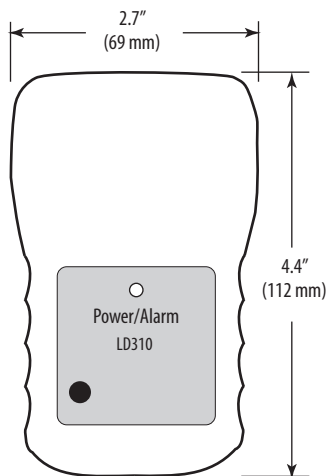
* The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



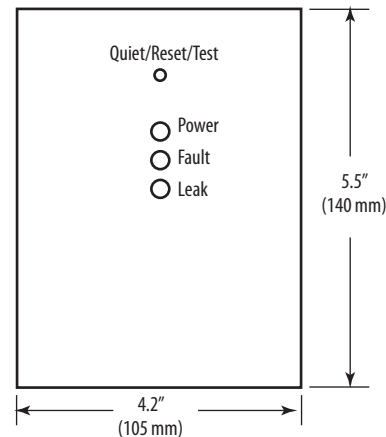
LD310
Wiring Diagram



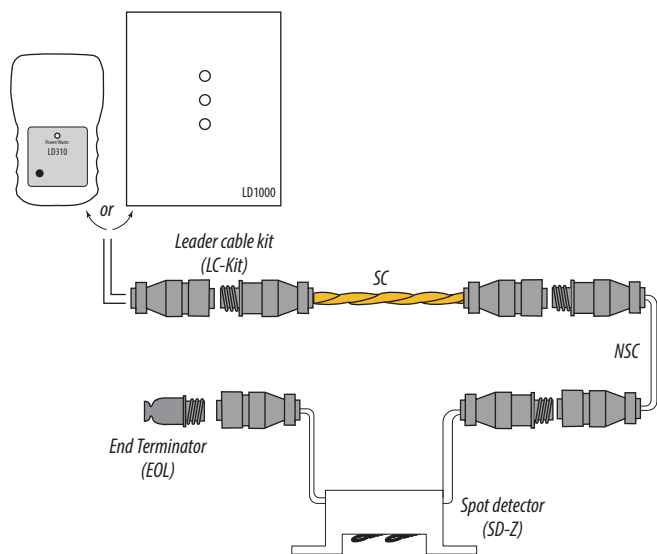
LD310
Dimensional Drawing



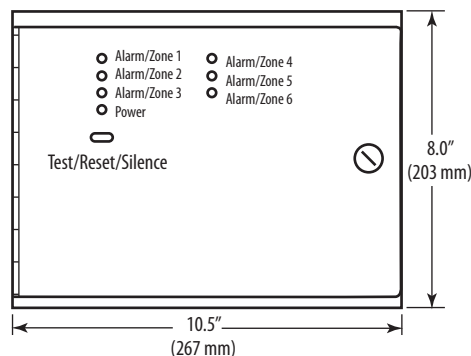
LD1000
Dimensional Drawing



LD310 OR LD1000 BASIC INSTALLATION WITH SC SENSING CABLE AND SD-Z SPOT DETECTOR
Wiring Diagram



LDRA6
Dimensional Drawing



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

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U006-0080*	LD310*	Leak Panel, 1 zone, LED, 2 relay outputs
U006-0001**	LD10003	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)
U006-0061	LC-KIT-M†	Leader cable kit for SC-C and cables (connects from leak panel to SC-C or SC-H cable)
U006-0004	FM1114	Reference map, framed (11" x 14")
U006-0037	WA-DC-05	Power Supply for LD300

* Power supply not included; requires WA-DC-05 power supply.

** Power supply not included; requires Veris PS24-15W power supply or equivalent.

*** Included with LD310 and LD1000.

† Not included with LD310 and LD1000. Required for installation of SC-C cables.



LD1500 & LD2100

Helps Eliminate High Humidity False Alarms



LD2100



LD1500

Together with the SC or SC-C 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: 2000 ft. (609 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 \pm 2 sec, configure in 5 steps
OUTPUTS	
Relay (LD2100 only)	1 A@24 Vdc, 0.5 A resistive@120 Vac
COMMUNICATIONS 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)

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

Visual Alarm: LD1500 LD2100	Red, 4-digit; 7 segment LED display; bi-color status LED Bi-color status LED
Email LD1500/LD2100	4 email recipients; email sent on Alarm and Return to Normal
SNMP Traps LD1500, LD2100	4 community strings
LOGGING CAPABILITIES	
Event Log LD1500 LD2100	Last 10 events Last 500 events
Trend Log LD2100	Cable current level every day, for the last 288 days
LOGIN SECURITY	
Display Access	1 Administrator (password for configuration, no password required to view panel status)
FRONT PANEL INTERFACE	
Display LD2100	Green alphanumeric dot matrix
Push Buttons LD2100	Test/Reset
LED Indicator LD1500 LD2100	1 tri-color Power/Status (green = power on; red = alarm; yellow = cable fault) 1 bi-color Power/Status (green=power on, red=alarm)
OPERATING ENVIRONMENT	
Temperature	0 to 50 °C (32 to 122 °F)
Humidity	5 to 95% RH non-condensing
Altitude	15000 ft. (4572 m) max.
Mounting	Vertical wall mount (DIN rail mounting option available on LD2100 only)
WARRANTY	
Limited Warranty	2 years
AGENCY APPROVALS	
Agency Approvals	CE*; ETL listed: conforms to UL 61010-1, EN 61010-1; CSA C22.2; RoHS compliant

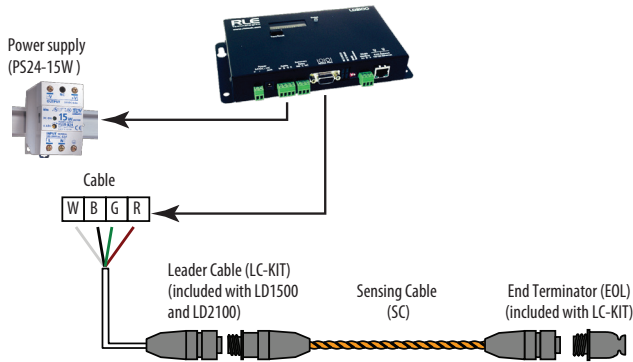


*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



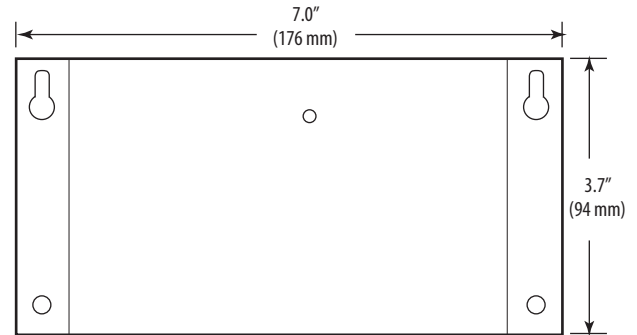
LD1500/LD2100 BASIC SC INSTALLATION

Wiring Diagram



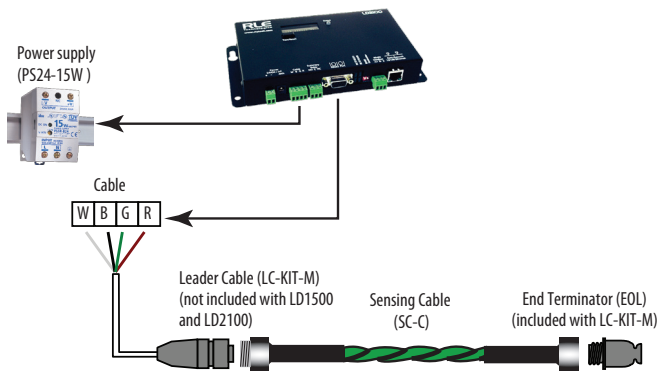
LD1500

Dimensional Drawing



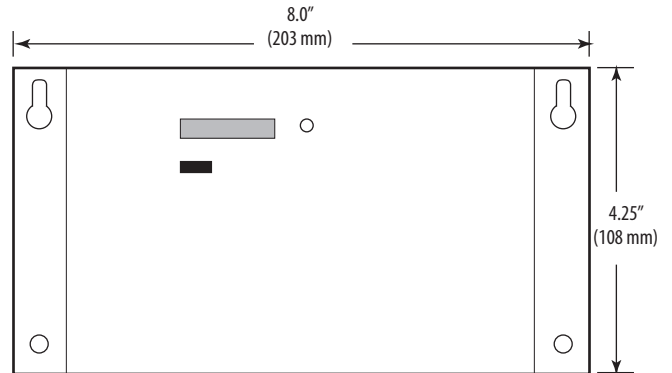
LD1500/LD2100 BASIC SC-C INSTALLATION

Wiring Diagram



LD2100

Dimensional Drawing



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, 2000' 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)
U006-0061***	LC-KIT-M***	Leader cable kit for SC-C cables (connects from leak panel to SC-C cable)
U006-0004	FM1114	Reference map, framed (11" x 14")

* Power supply not included. Use LD-ENC (U006-0045) wall mount enclosure with built-in power supply or Veris PS24-15W power supply or equivalent.

** Included with LD1500 and LD2100.

*** Not included with LD1500 or LD2100. Required for installation of SC-C cables.

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 or SC-C 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), 7,000 ft. SC-C
Minimum Length	35 ft. (1037 m)
Detection Accuracy	± 2 ft (0.6 m) + 0.5% of the cable length
Detection Repeatability	± 2 ft (0.6 m) + 0.25% of the cable length
Detection Response Time	5 to 990 sec ± 2 sec, software adjustable in 5-sec increments
OUTPUTS	
Analog	4 to 20 mA Loop Powered, 18 to 36 Vdc, RL = 500 Ω max.
Relay	2 Form C Leak Relays, 2 Form C Cable Break Relays; 1 A @ 24 Vdc, 0.5 A resistive@120 Vac;configurable for supervised or non-supervised, latched or non-latched
Maintenance Relay	1 A@24 Vdc, 0.5 A resistive @120 Vac; configurable for supervised or non-supervised, latched or non-latched
COMMUNICATIONS PORTS	
EIA-232	9600 baud, No parity, 8 data bits, 1 stop bit
EIA-485 (Port 1, Port 2, Port 3)	9600, 19200, or 38400 baud (selectable); No parity, 8 data bits, 1 stop bit
RJ-45	10/100 Bast T Ethernet port (TCP/IP)
PROTOCOLS	
Terminal Emulation EIA-232	VT100 compatible
Modbus RTU EIA-485	Master and slave; RTU Mode; BACnet MS/TP; N2, slave

Touch screen

Touch screen interface allows access to basic functions... stand-alone configuration and monitoring

Pinpoint leaks

Web interface offers expanded capabilities through the building mapping tool...pinpoint leaks quickly and accurately

Easy integration

Multiple communication protocols available...easy integration into building systems

RJ-45	Ethernet, TCP/IP; Modbus/TCP/UDP, Master and slave; SNMP V1, V2, V3, NTP, SMTP, DNS, BACnet/IP
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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
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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
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AGENCY APPROVALS

Agency Approvals	CE; ETL listed: conforms to UL 61010-1, EN 61010-1; CAN/CSA C22.2 No. 61010-1; RoHS compliant
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*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

Troubleshooting

Detailed alarm history with time and date stamps...assists in troubleshooting

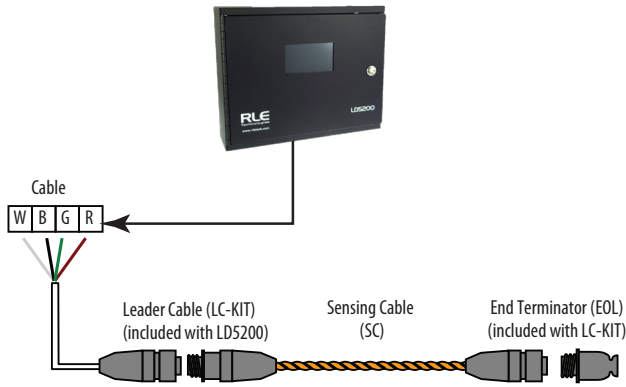
One device

Acts as a master device for up to 127 leak detection units with up to 10,000 feet of SC cable or 7000 feet of SC-C cable...monitor large areas with only one device

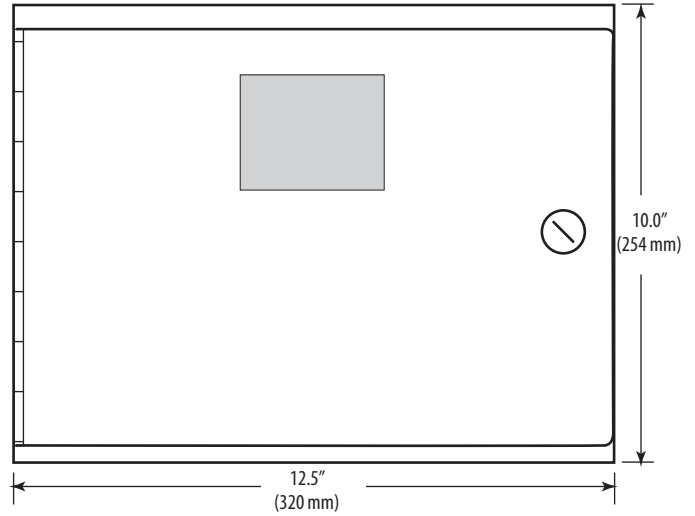


LD5200 BASIC SC INSTALLATION

Wiring Diagrams

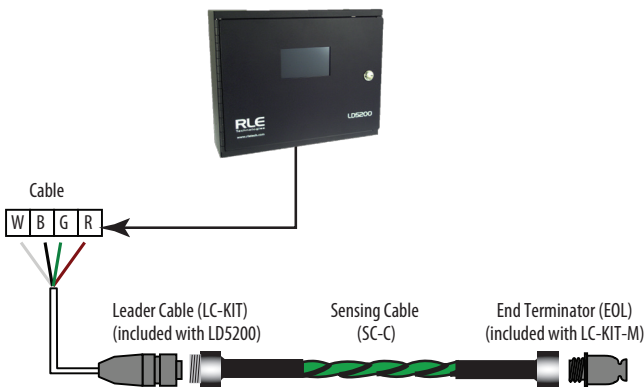


DIMENSIONAL DRAWING



LD5200 BASIC SC-C INSTALLATION

Wiring Diagrams



WEB INTERFACE

A robust web interface supports remote access, any time, any place.

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)
U006-0061**	LC-KIT-M	Leader cable kit for SC-C cables (connects from leak panel to SC-C cable)
U006-0004	FM1114	Reference map, framed (11" x 14")

*Included with LD5200.

**Not included with LD5200. Required for installation of SC-C cables.



SD, SD-R01, SD-Z & MX1

Spot Leak Detectors



SD, SD-R01, SD-Z and MX1 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.

Veris offers four models of spot detectors which can integrate with various building management systems.

SPECIFICATIONS

SD, SD-R01, SD-Z

Input Power: SD-R01 Only	24 Vac/dc ±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 SD-R01 SD-Z	14 ft. (4.2 m) 14 ft. (4.2 m) 10 ft. (0.3 m) (2 cables included)
Connector: SD-Z Only		1 male, 1 female; 4 pin, 0.96" (24.38 mm) diameter; connects to SC or NSC Cable

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
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Simple installation

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

Simple operation Durability

Simple operation...no maintenance

Polymer coated

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

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

Solid-state design

No moving parts to fail

MODEL	DESCRIPTION
SD Spot Detector	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Works with any system that accepts dry contacts Operates on 24 Vac/dc ±10% Automatically resets when conductive fluid is no longer present (AC power only; if DC power is used, device must be reset by disconnecting power momentarily) Includes a 14 ft (4.2 m) leader cable
SD-Z Spot Detector	<ul style="list-style-type: none"> Designed for use with all RLE detection panels, with SC sensing cable to integrate both zone and spot detection into one panel Powered by the LD310, LD1000, LD5200, LDRA6, or LD2000 When used with a distance read panel (LD2000 or LD5200), the location of the leak will be identified (simulates 50 feet) Includes one male and one female end connector, each on a 1 ft (30 cm) lead wire
MX1 Spot Detector	<ul style="list-style-type: none"> Battery-operated or 12 to 30 Vdc/24 Vac powered

SPECIFICATIONS

MX1

Input Power	12 to 30 Vdc/24 Vac, 50/60 Hz; typical 10-year life lithium battery model available
Max Current Draw, MX1V	10 mA
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 intended for continuous submersion in water

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

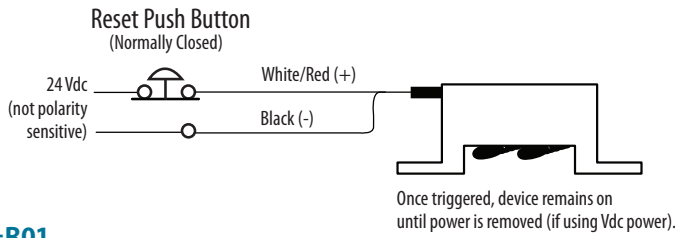


*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



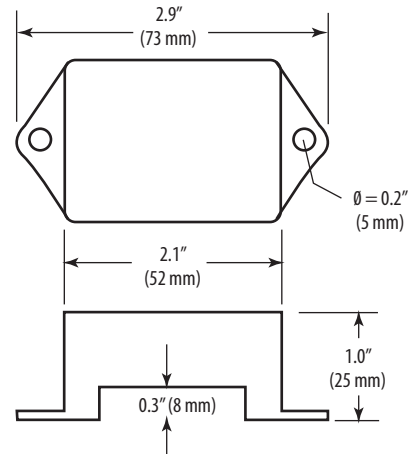
SD

Wiring Diagram



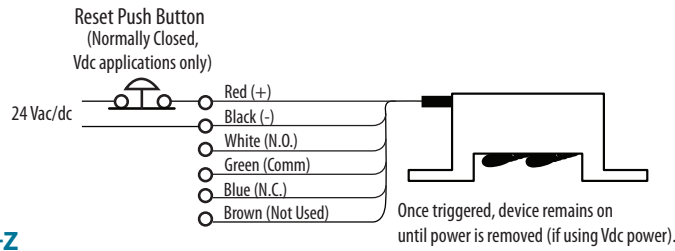
SD SERIES

Dimensional Drawing



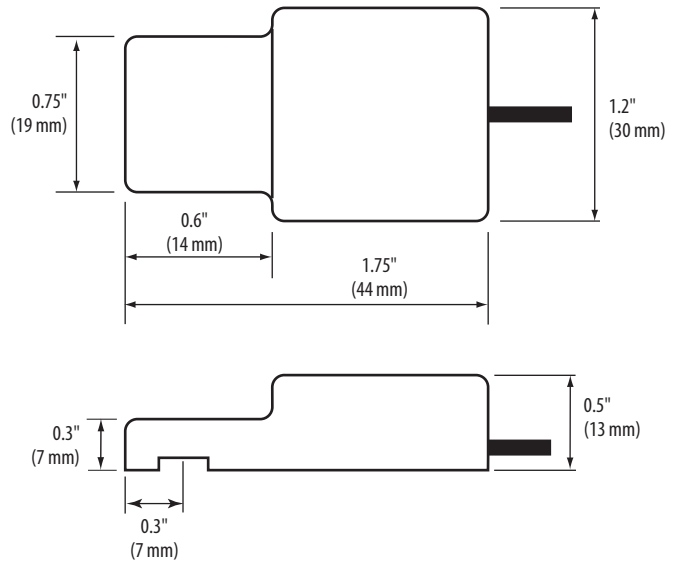
SD-R01

Wiring Diagram



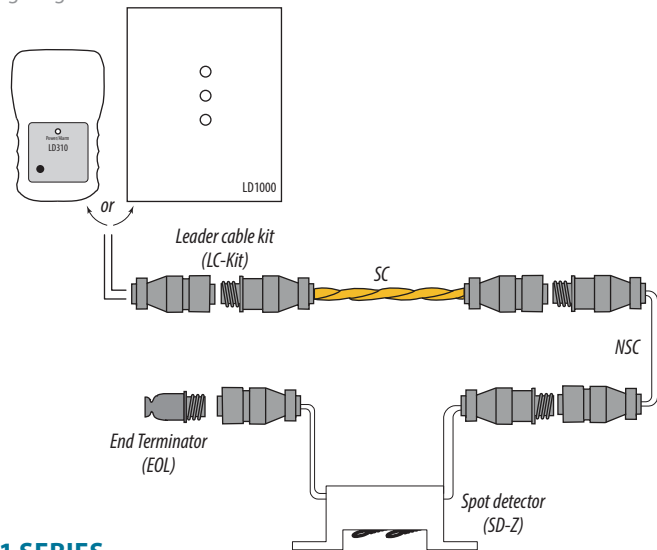
MX1 SERIES

Dimensional Drawing



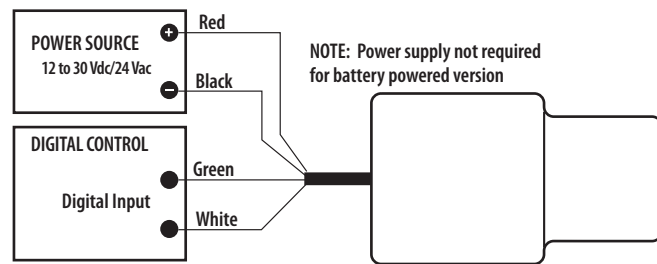
SD-Z

Wiring Diagram



MX1 SERIES

Wiring Diagram



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	•	•
U006-0008	SD-Z*	Spot Detector, 2x10" leader cable	•	•
MX1B	MX1B	Spot Detector, battery		
MX1V	MX1V	Spot Detector, 12 to 30 Vdc/24 Vac		

* The SD-Z uses DIN style connectors. Connect it via the LC-KIT, or integrate it into an LC-KIT-SC/NSC cable configuration.



SC, SC-C & 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. SC-C chemical sensing cable detects the presence of chemicals (see Specifications for list).

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: SC/NSC SC-C	>180 lbs (>81.65 kg) 160 lbs (72.6 kg)
Cut Through Resistance: SC/NSC SC-C	>40 lbs (>18.2 kg) with 0.005" (0.13 mm) blade >50 lbs (>22.7 kg) with 0.005" (0.13 mm) blade
Abrasion Resistance: SC/NSC SC-C	60 cycles per UL 719 >65 cycles per UL719
Connector: SC/NSC SC-C	4-pin, 1" (25.4 mm) dia., circular, locking, 4-pin 0.5" (13 mm) diameter

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

Application versatility

SC and SC-C cables detect the presence of specific fluids

OPERATING ENVIRONMENT

Temperature: SC/NSC SC-C	0 to 75 °C (32 to 167 °F) 90 °C (194 °F) max.
Humidity: SC/NSC	5 to 95% RH non-condensing
Altitude: SC/NSC	15,000 ft. (4,572 m) max.

STANDARD LENGTHS

SC-10/NSC-10	10 ft. (3.1 m)
SC-17	17 ft. (5.1 m)
SC-25/NSC-25	25 ft. (7.7 m)
SC-50/NSC-50	50 ft. (15.3 m)
SC-100/NSC-100	100 ft. (30.5 m)
Storage Environment	-30 to 85 °C (-22 to 185 °F)
Weight	0.02 lbs/ft (29.7 g/m)

Detectable Liquids/ Chemical Resistance: SC-C*	In accordance with ASTM D543, cable functions normally after seven days exposure to the following: fresh deionized water, tap water, sulfuric acid (98%), sulfuric acid (50%), hydrochloric acid (37%), sodium hydroxide (10%), aqua regia, ethylene glycol (60% in DI water)
--	--

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
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WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS



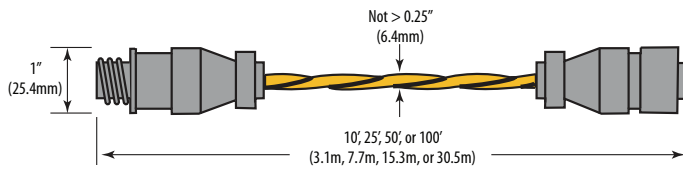
* Prolonged exposure to concentrated ketones may cause temporary reduction of sensitivity; call for details.

** The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



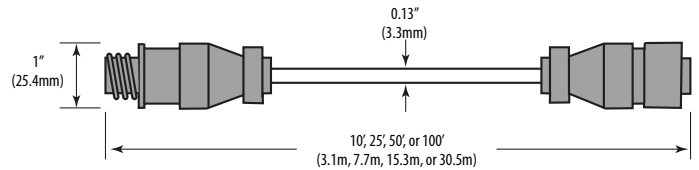
SC

Dimensional Drawing



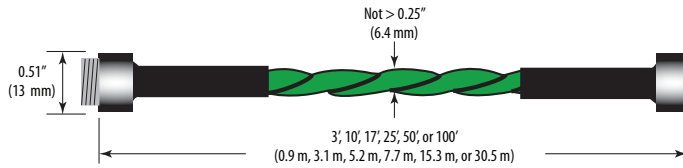
NSC

Dimensional Drawing



SC-C

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
U006-0011*	SC-1000	Sensing Cable, Water, 1000 feet, bulk
U006-0012*	SC-2000	Sensing Cable, Water, 2000 feet, bulk
U006-0049	SC-C-3	Sensing Cable, Chemical, 3 ft
U006-0050	SC-C-10	Sensing Cable, Chemical, 10 ft
U006-0051	SC-C-17	Sensing Cable, Chemical, 17 ft
U006-0052	SC-C-25	Sensing Cable, Chemical, 25 ft
U006-0053	SC-C-50	Sensing Cable, Chemical, 50 ft
U006-0054	SC-C-100	Sensing Cable, Chemical, 100 ft

*CPCE (U006-0039), SPSSL (U006-0040), and SCCS (U006-0041) tools are required for installation. LCDE (U006-0029) is highly recommended.

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
U006-0019*	NSC-1000	Non-Sensing Cable, 1000 feet, bulk
U006-0020*	NSC-2000	Non-Sensing Cable, 2000 feet, bulk

*CPCE (U006-0039), SPSSL (U006-0040), and SCCS (U006-0041) tools are required for installation. LCDE (U006-0029) is highly recommended.

LC-KIT & LC-KIT-M

Single Zone Leak Detection Controller Kits



LC-KIT

Single zone leak detection controller kits are pre-configured in popular lengths for monitoring single areas or rooms. Kits come with everything needed for a complete system, including an LD310 single zone control panel, a leader cable kit with end-of-line terminator, sensing cable, and a WA-DC-05 power supply. LD310 control panels continuously monitor up to 300 ft. of leak detection cable. If the cable detects compatible fluid at any point along its length, the detection panel LED illuminates and an alarm signals the presence of a leak. Additionally, if the cable loses continuity, the panel will activate a cable fault LED pattern.

SPECIFICATIONS

LD310 Controller

Input Power	5 Vdc \pm 10%
Storage Environment	-20 to 70 °C (-4 to 158 °F)
Weight	3 oz. (85 g)

INPUTS

Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable (kit included)
Maximum Cable Length	300 ft. (91 m)
Detection Response Time	<20 sec (10 sec typical)
Relay Output	2 Form C relays (leak and fault); 1 A@24 Vdc, 0.5 A resistive@120 Vac

OPERATING ENVIRONMENT

Temperature	0 to 50 °C (32 to 122 °F)
Humidity	5 to 95% RH non-condensing
Altitude	15,000 ft. (4,572 m) max

SPECIFICATIONS

Cables

Plenum Rating: SC NSC	CL2P/CMP C(UL) CL3P/CMP C(UL) California State Fire Marshall approved
Shear Strength: SC/NSC SC-C	>180 lbs (>81.65 kg) 160 lb (72.6 kg)
Cut Through Resistance: SC/NSC SC-C	>40 lbs (>18.2 kg) w/0.005" (0.13 mm) blade >50 lbs (>22.7 kg) w/0.005" (0.13 mm) blade
Abrasion Resistance: SC/NSC SC-C	60 cycles per UL 719 >65 cycles per UL719
Connector: SC/NSC SC-C	4 pin, 1" (25.4 mm) dia., circular, locking, 4 pin, 0.5" (13 mm) diameter

Application flexibility

Monitor up to 3', 10', 17', 25', 50', or 100' 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

OPERATING ENVIRONMENT

Temperature: SC/NSC SC-C	0 to 75 °C (32 to 167 °F) 90 °C (194 °F) max.
Humidity: SC/NSC:	5 to 95% RH non-condensing
Altitude: SC/NSC:	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)
Chemical Resistance: SC-C*	In accordance with ASTM D543, cable functions normally after seven days exposure to the following: fresh deionized water, tap water, sulfuric acid (98%), sulfuric acid (50%), hydrochloric acid (37%), sodium hydroxide (10%), aqua regia, ethylene glycol (60% in DI water)
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
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AGENCY APPROVALS



*Prolonged exposure to concentrated ketones may cause temporary reduction of sensitivity; call for details.

** The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

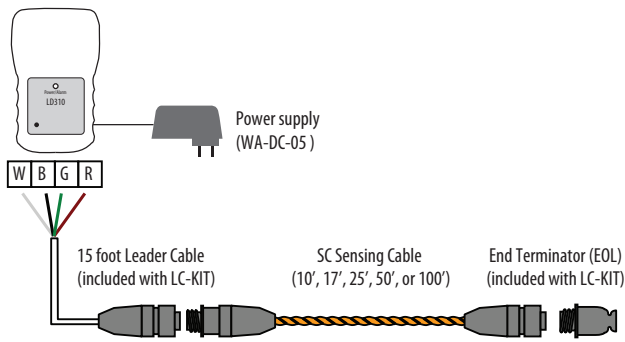
Fast response

Summary alarm relay output



SINGLE ZONE KIT WITH SC SENSING CABLE

Wiring Diagram

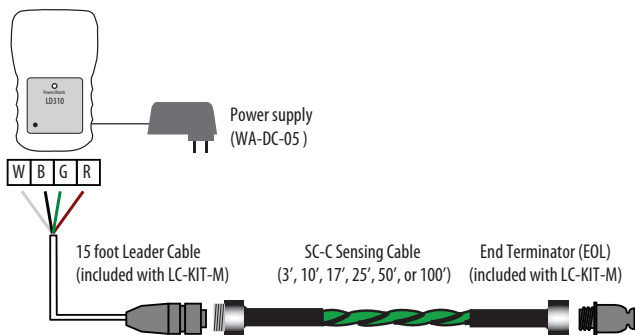


BLINK CODE KEY

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

SINGLE ZONE KIT WITH SC-C SENSING CABLE

Wiring Diagram



ORDERING INFORMATION

MODEL	DESCRIPTION	KIT INCLUDES THESE MANUF. PART #S
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
U006-0066	Kit, LeakDet, LD310, 100' Conductive Fluid	LD310, LC-Kit, SC-100 & WA-DC-05
U006-0067	Kit, LeakDet, LD310, 3' Chemical	LD310, LC-Kit-M, SC-C-3 & WA-DC-05
U006-0068	Kit, LeakDet, LD310, 10' Chemical	LD310, LC-Kit-M, SC-C-10 & WA-DC-05
U006-0069	Kit, LeakDet, LD310, 17' Chemical	LD310, LC-Kit-M, SC-C-17 & WA-DC-05
U006-0070	Kit, LeakDet, LD310, 25' Chemical	LD310, LC-Kit-M, SC-C-25 & WA-DC-05
U006-0071	Kit, LeakDet, LD310, 50' Chemical	LD310, LC-Kit-M, SC-C-50 & WA-DC-05
U006-0072	Kit, LeakDet, LD310, 100' Chemical	LD310, LC-Kit-M, SC-C-100 & WA-DC-05

Cables, EOL, and power supply only.



PRESSURE MONITORING

The Veris selection of pressure sensing devices includes 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
PH	Digitally Controlled Gauge Pressure Transducer	161
PD	Display Digital Pressure/Vacuum Gauges	163
PASxx	Differential Air Pressure Switch	165
PX	Dry Media Differential Pressure Transducers	167
EP2	Electropneumatic Transducers, psi Output	169
EP3	Electropneumatic Transducers, Analog Output (V or mS, Selectable)	171
PG	Gauge Pressure Sensors	173
PW	Wet Media Differential Pressure Transducers (Selectable Pressure Units)	175
PW2	Wet Media Differential Pressure Transducers (Dual Pressure Units)	177
PWR	Wet Media Differential Pressure Remote Transducer	179

PRESSURE SENSOR SELECTION GUIDE

	WET MEDIA	DRY MEDIA
Analog Output	PH, PD, PG, PW, PW2 pages 161, 163, 173, 175, 179	PD, PX, PG pages 163, 167, 173
Negative Pressure	PD page 163	PD page 163
High Pressure (Above 1000 psig)	PG page 173	PG page 173
Differential Pressure Sensing (Uni- and Bidirectional Operation)	PW, PW2 pages 175, 177	PXP/PXD/PXU page 167
LCD Display Option Available	PD, PW, PW2 pages 163, 175, 177	PD, PXP/PXD/PXU pages 163, 167
Duct Mount		PXD/PXU page 167
Panel Mount	PW, PW2 pages 175, 177	PXP/PXU page 167
Remote Mount	PWR page 179	
Transmitter Only (No local display)	PH, PG pages 161, 173	PXP/PXD/PXUX, PG pages 167, 173
Switch		PASxx page 165

ELECTROPNEUMATIC TRANSDUCERS

	WET MEDIA	DRY MEDIA
Pneumatic Systems		EP2, EP3 pages 169, 171



Take the Pressure Off Installation Costs

With the industry's most adaptable remote pressure sensor



PWR Remote Pressure Sensor

Don't Sweat the Requirements

Wiring options no matter the code requirements.

Reduce the Tension

Innovative, modular design for ease of installation at any point.

Alleviate the Burden

Eliminate communication and cable runs with mounting and connection freedom.

Interested in learning more about the innovative PWR design?

Contact a Pressure Monitoring Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 179



PH SERIES

Three Switch-Selectable Ranges with Test Mode



The 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

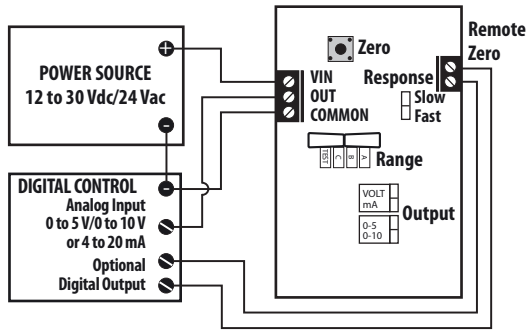
- Chilled and hot water pump monitoring
- HVAC and industrial gas monitoring
- Instrument air pressure
- Hydraulic oil pressure

SENSOR	
Accuracy	±1% F.S. Combined linearity, hysteresis, and repeatability
Long Term Stability	±0.25% per year
Media Compatibility	Media compatible with 17-4 PH stainless steel
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range
Temp Compensated Range	0 to 50 °C (32 to 122 °F)
Media Temperature Limits	-20 to 85 °C (-4 to 185 °F); 0 to 90% RH non-condensing
Fittings	1/4" NPT male thread, 17-4 PH stainless
WARRANTY	
Limited Warranty	5 years

*Minimum input voltage for 4 to 20 mA operation:
250 Ω loop (1 to 5 V) = 12 Vdc
500 Ω loop (2 to 10 V) = 15 Vdc

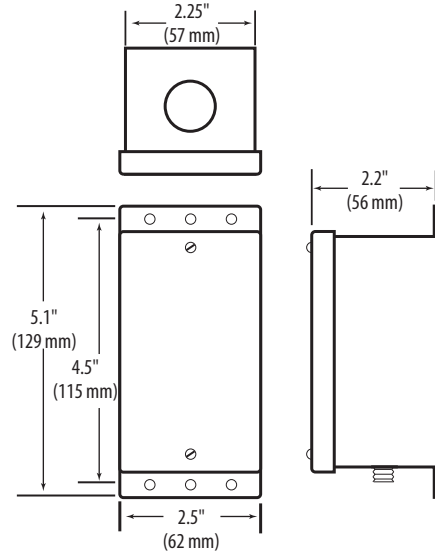


WIRING DIAGRAM

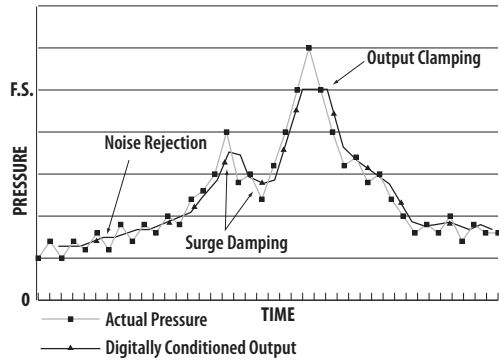


MODEL	RANGE		
	A	B	C
07	25	50	100
08	62.5	125	250
09	125	250	500
10	250	500	1000

DIMENSIONAL DRAWING



SIGNAL CONDITIONING DIAGRAM



ORDERING INFORMATION

NIST Range S
 PH

N = NIST
 X = None

07 = 0-100 psig
 08 = 0-250 psig
 09 = 0-500 psig
 10 = 0-1000 psig

= Standard

Example:
 PH X 07 S

PD SERIES

Rugged, One-Piece Construction



The versatile PD Digital Pressure Gauge can be used with any gas, liquid, or solid that is compatible with 17-4 stainless steel. The one-piece construction employs no silicone oil, welds, O-rings, or seals, making it the ideal universal pressure measurement device. The large LCD display shows the current reading, the selected scale, and the maximum and minimum pressure. All functions are easily controlled from the four panel push buttons located below the display.

SPECIFICATIONS

GENERAL

Input Power: 4 to 20mA Output Models Voltage Output Models	7.5 to 32 Vdc 15 to 32 Vdc
Pressure	See ordering table; consult factory for additional ranges
Measurement Units	psi, bar, kg/cm ² , atm, in. of Hg, in. of H ₂ O* (selectable)
Accuracy**	<± 0.5% BFSL***
Stability (1 yr)	±0.25% of FS Typical
Over Range Protection	2x Rated Pressure
Burst Pressure	5x Rated Pressure or 5000 psi, whichever is less
Pressure Cycles	>100 Million

TEMPERATURE RANGES

Media	-55 to 125 °C (-65 to 257 °F)
Operating (Ambient)	-10 to 70 °C (15 to 158 °F)
Storage: 4 to 20mA and Voltage Output Models	-40 to 65 °C (-40 to 150 °F)

THERMAL LIMITS

Compensated Range	0 to 55 °C (32 to 130 °F)
TC Zero	<±1.5% of FS
TC Span	<±1.5% of FS

Multiple pressure range options

Fits a wide variety of application needs

Rugged

Rugged one-piece construction... provides long product life

Large LCD display

Clear readings at a distance

Switch-selectable

Switch-selectable scales... for maximum resolution and versatility

Pushbutton zero

Maximizes accuracy and prevents callbacks

NEMA 4/IP65

NEMA 4/IP65 housing

APPLICATIONS

- Pump inlet/outlet and compressors
- Inert gas pressure measurement
- Hydraulic/pneumatic systems
- Energy and fluid management
- Refrigeration equipment/fluids/test stands
- Industrial process control
- Vacuum chambers
- Lab and research
- Irrigation

Connection	¼" NPT Male
Update Rate 4 to 20mA and Voltage Output Models	32 times per second
Housing	NEMA 4, IP65, Polycarbonate
Output: Analog Output Models	4 to 20 mA loop powered or 0-5/0-10 Vdc

WARRANTY

Limited Warranty	1 year
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*Inches H₂O units available on ≤250 psi range devices only

**Accuracy includes non-linearity, hysteresis, and non-repeatability, measured at 25 °C (77 °F)

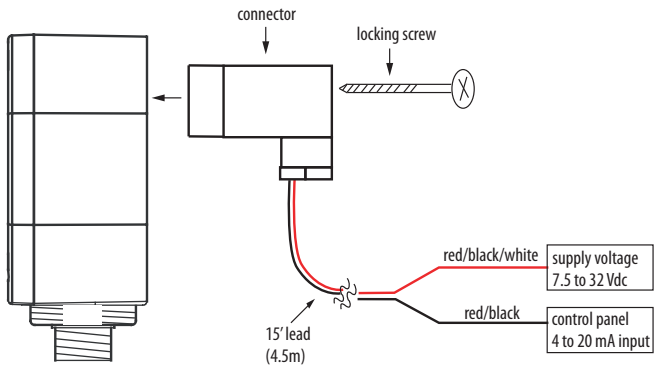
***Best fit straight line

Note: Select a loop power supply and total loop resistance so that when the loop current is 20 mA, the gauge will have at least 7.5 Vdc at its terminals.



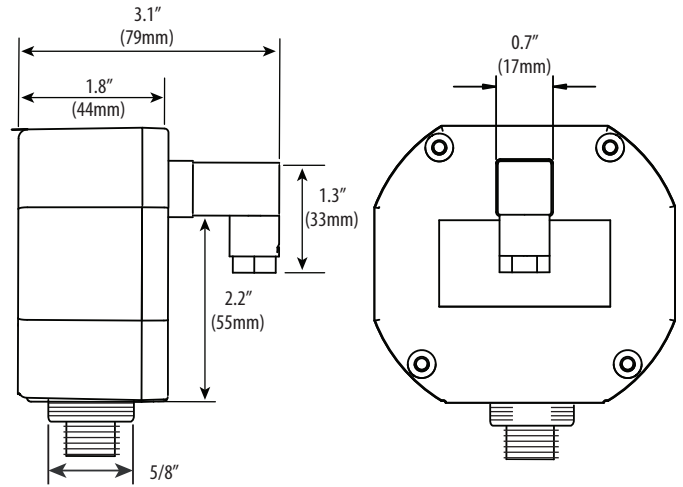
ANALOG OUTPUT VERSION

Wiring Diagram



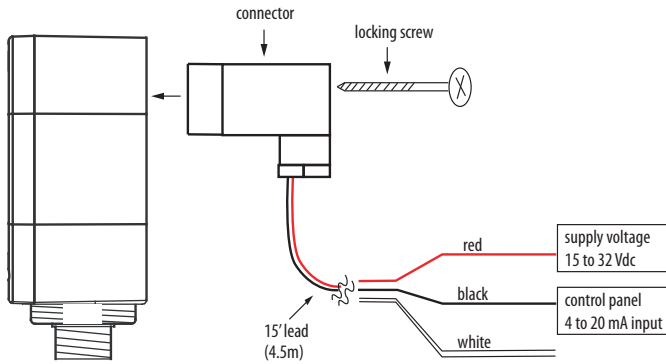
4 TO 20 MA OUTPUT VERSION

Dimensional Drawing



VOLTAGE OUTPUT VERSION

Wiring Diagram



ORDERING INFORMATION

Pressure Range	Material	Output
PD <input type="checkbox"/> 50 = 0 to 50 psig 100 = 0 to 100 psig 250 = 0 to 250 psig	A <input type="checkbox"/> = 17 - 45S	<input type="checkbox"/> M = 4 to 20 mA <input type="checkbox"/> V = 0-5Vdc/0-10Vdc

PASXX SERIES

Monitor Air Ducts, Filters and Fans



PASxx

This series of four 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 > 106 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

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

Pressure connections	Pipe Ø 6.2 mm
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

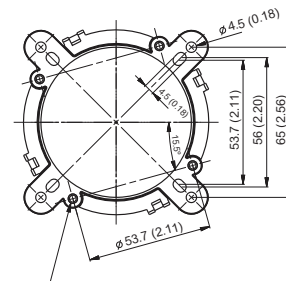
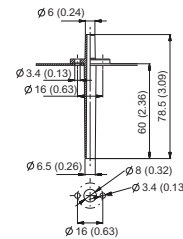
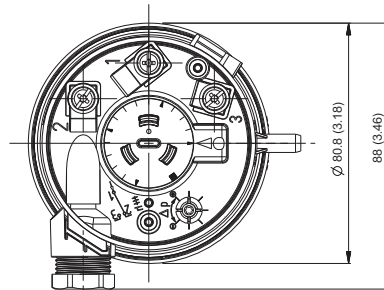
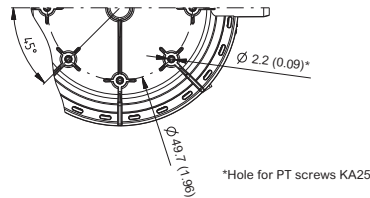
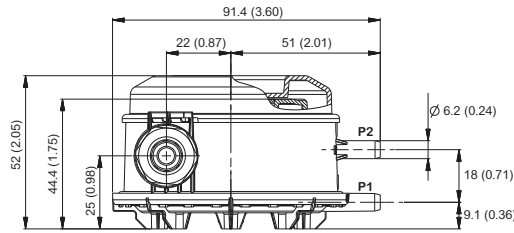
AGENCY APPROVALS



* The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



DIMENSIONAL DRAWING



4 x hole PT - screw d_i = 3.0 mm (0.12 in.)

FUNCTIONALITY

The pressure switch has two separate pressure chambers, each with its own connection. The switch operates when the setpoint is either exceeded or not reached.

Vacuum Monitoring

Connect the pressure switch via P2. Do not connect P1. Leave P1 open. Make sure that debris cannot get into P1.

High Pressure Monitoring

Connect the pressure switch via P1. Do not connect P2. Leave P2 open. Make sure that debris cannot get into P2.

Filter Monitoring

Connect P1 before the filter and P2 after it.

Fan Monitoring

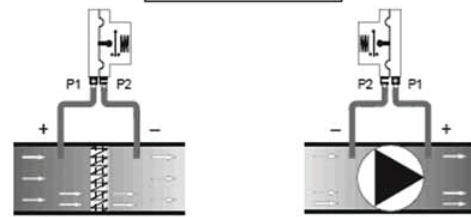
Connect P1 after the fan (in blowing direction) and P2 before the fan.



Vaccum monitoring

High pressure monitoring

P1 - higher pressure
P2 - lower pressure



Filter monitoring

Fan monitoring

ORDERING INFORMATION

PART NUMBER	DESCRIPTION	PRESSURE RANGE
PAS01	Differential Air Pressure Switch	0.08 to 1.2 in. WC (20 to 300 Pa)
PAS02		0.2 to 2.0 in. WC (50 to 500 Pa)
PAS03		0.4 to 4.0 in. WC (100 to 1000 Pa)
PAS04		2.0 to 8.0 in. WC (500 to 2000 Pa)

PX SERIES

Selectable Ranges, LCD Display and Automatic Zero for Easy Operation



The digital PX Series differential pressure transducers utilize highly accurate, microprocessor profiled sensors and an advanced ceramic capacitive sensing element. Designed to monitor duct and room pressure in commercial buildings, the PX Series offers exceptional job-site flexibility. PXD and PXU models feature four field-selectable ranges. The PXU features seven field-selectable ranges, allowing just one model to cover applications for 0 to 0.1" to 0 to 10" W.C. The directional mode jumper is used to configure the transducer in uni-directional or bi-directional mode for room and building static pressure applications. All models feature a pushbutton and digital input terminal to zero the output. The microprocessor is programmed to reduce accidental zero adjustment during normal operation.

SPECIFICATIONS

GENERAL

Media Compatibility	Dry air or inert gas
Input Power	Class 2; 12 to 30 Vdc, or 24 Vac nominal; 2-wire: 20 mA max.; 3-wire: 30 mA max.
Output	Field-selectable: 2-wire, loop-powered 4 to 20 mA (DC only, clipped & capped), or 3-wire 0-5 V/0-10 V *
Mode	Unidirectional or bidirectional, switch selectable
Display (option)	Signed 3-1/2 digit LCD, indicates pressure, overrange indicator
Zero Adjust	Pushbutton auto-zero & digital input (2-pos terminal block)
Fittings	Brass barb; 0.24" (6.1 mm) o.d.
Physical	UL 94 V-0 Fire Retardant ABS

PRESSURE RANGES

PX: 01 Uni-directional Bi-directional	0.1/0.25/0.5/1.0" W.C. F.S., switch selectable ±0.1/±0.25/±0.5/±1.0" W.C. F.S., switch selectable 25 Pa/50 Pa/100 Pa/250 Pa, F.S., switch selectable ±25 Pa/±50 Pa/±100 Pa/±250 Pa, F.S., switch selectable
PX: 02 Uni-directional Bi-directional	1.0/2.5/5.0/10" W.C. F.S., switch selectable ±1.0/±2.5/±5.0/±10" W.C. F.S., switch selectable 0.25 kPa/0.5 kPa/1.0 kPa/2.5 kPa, F.S., switch selectable ±0.25 kPa/±0.5 kPa/±1.0 kPa/±2.5 kPa, F.S., switch selectable

Reduce field failures

Excellent tolerance to overpressure & vibration reduces field failures

High accuracy

High accuracy digital sensor maintains calibration and reduces callbacks

Maintenance free

High reliability sensor technology for long-term, maintenance-free operation

APPLICATIONS

- Static pressure in building, duct or room applications
- Variable air volume system control
- Filter status monitoring
- Clean rooms, hospitals, fume hoods, computer rooms, and other very low differential pressure applications

Reduce setup

Selectable ranges and scales reduce setup time and number of models to stock

Microprocessor

Microprocessor-based design allows for digitally profiled sensor increasing product accuracy and reliability

Circuit protection

Circuit protection avoids damage due to incorrect input wiring

PXU: 05 Uni-directional	0.1/0.25/0.5/1.0/2.5/5/10" W.C. 25 Pa/50 Pa/100 Pa/250 Pa/0.5 kPa/1 kPa/2.5 kPa F.S. switch selectable
Bi-directional	±0.1/0.25/0.5/1.0/2.5/5/10" W.C. 25 Pa/50 Pa/100 Pa/250 Pa/0.5 kPa/1 kPa/2.5 kPa F.S. switch selectable

SENSOR

Response Time	Standard: T95 in 20 sec, Fast: T95 in 2 sec, switch selectable
Proof Pressure	3 psid (20.6 kPa)
Burst Pressure	5 psid (34.5 kPa)
Accuracy	±1%F.S. of selected range (combined linearity and hysteresis)
Temperature Effect	1" (250 Pa) models: 0.05%/°C; 10" (2.5 kPa) models: 0.01%/°C; (Relative to 25°C) 0° to 50°C (32° to 122°F)
Zero Drift (1-year)	1" (250 Pa) models: 2.0% max.; 10" (2.5 kPa) models: 0.5% max.
Operating Environment	0 to 60 °C (32 to 140 °F); 0 to 90% RH non-condensing

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



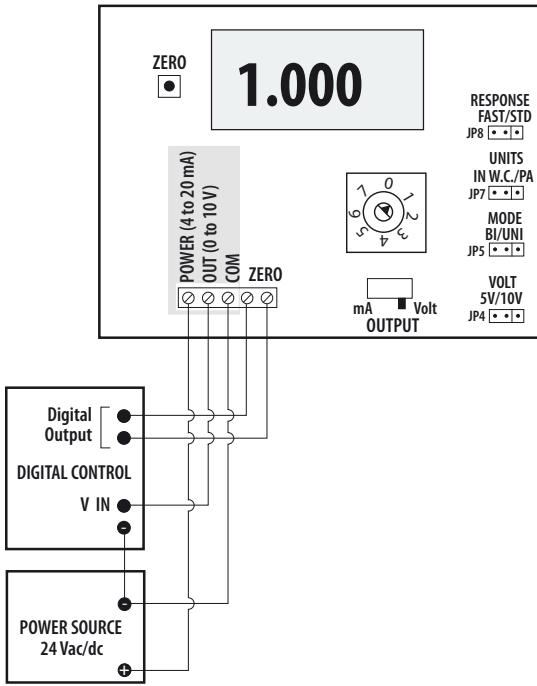
EMC Conformance: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).
*Minimum input voltage for 4 to 20 mA operation: 250 Ω loop = 13 Vdc; 500 Ω loop = 19 Vdc.

*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

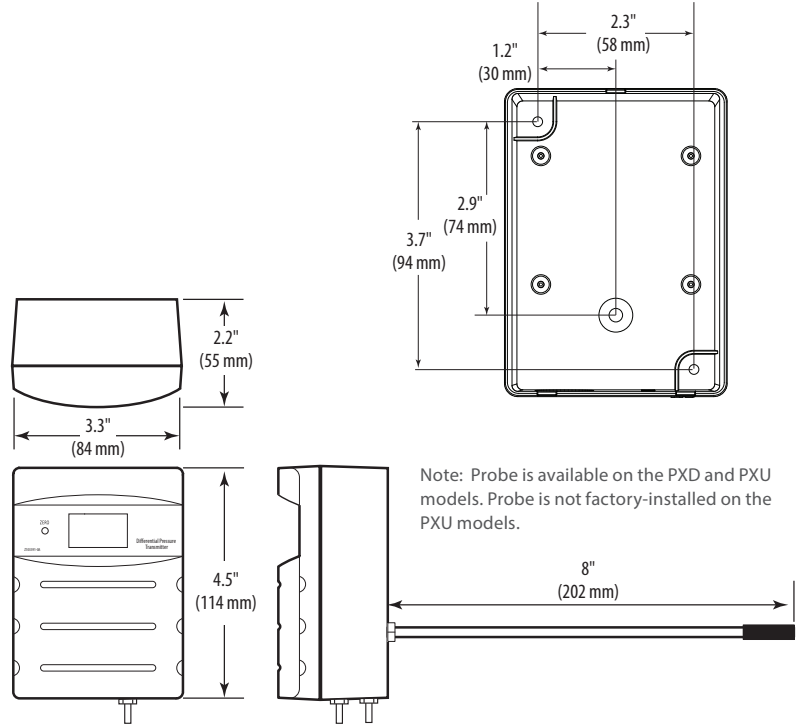


3-WIRE, 0-5 V/0-10 V

Wiring Diagram

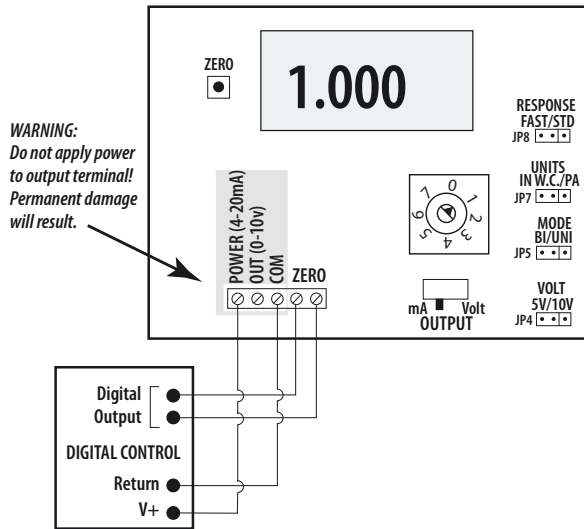


DIMENSIONAL DRAWING



2-WIRE, 4 TO 20 MA

Wiring Diagram



ROTARY SWITCH POSITION	PX01		PX02		PX05	
	INCHES W.C.	PASCAL	INCHES W.C.	PASCAL	INCHES W.C.	PASCAL
0	0.1	25	1	250	0.1	25
1	0.25	50	1	250	0.25	50
2	0.5	100	1	250	0.5	100
3	1	250	1	250	1	250
4	1	250	2.5	0.5kPa	2.5	0.5kPa
5	1	250	5	1kPa	5	1kPa
6	1	250	10	2.5kPa	10	2.5kPa
7	1	250	10	2.5kPa	10	2.5kPa

ORDERING INFORMATION

Enclosure: PX D = Duct, P = Panel

Local Display: L = LCD Display, X = No Display

NIST: N = NIST, X = None

Range: 01 = 0-1"WC/0-250Pa, 02 = 0-10"WC/0-2,500kPa

Response: S = Selectable

Example: PX D L X 01 S

Local Display: PXU L = LCD Display, X = No Display

NIST: N = NIST, X = None

Range: 05 = 0-10"WC/0-2,500kPa

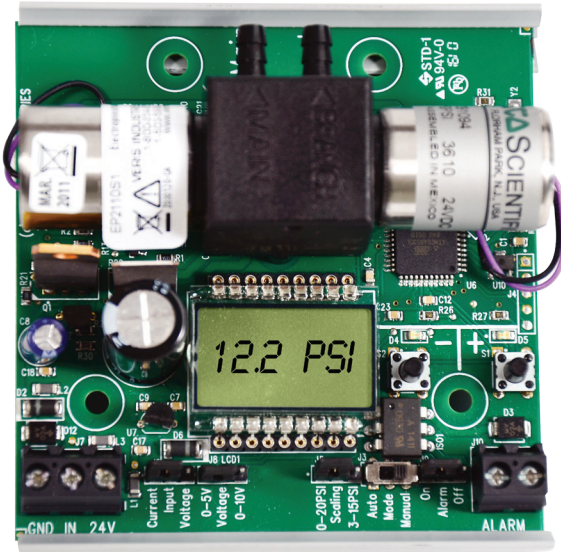
Response: S = Selectable

Example: PXU L N 05 S



EP2 SERIES

Micro-Controlled with High-Performance, Low-Power Coil Poppet Valve Technology



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 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

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 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

Operating Environment	10 to 90% RH non-condensing
Air Capacity	523 in3/min @ 45 psi (8570 cm3/min @ 310.3 kPa); 333 in3/min @ 20 psi (5456 cm3/min @ 137.9 kPa)
Supply Pressure	45 psig max.
Control Range	0 to 20 psig or 3 to 15 psig, jumper-selectable
Pressure Differential	0.1 psig (supply to branch)
Pressure Indication	Electronic, 3-1/2 digit LCD
Minimum Tubing Length	15 feet*
Port Connection	1/8" I.D. poly tubing
Media Connection	Clean, dry air, or inert gas. Do not use with oxygen service

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

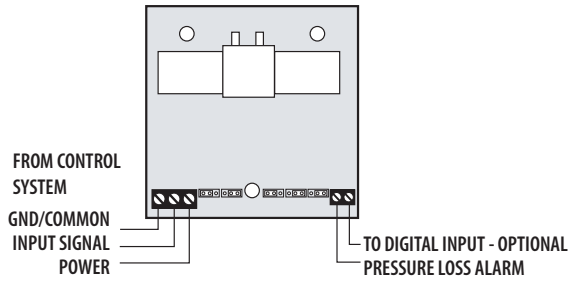


*For shorter tubing runs use AA45 Pneumatic Capacitor
EMC Conformance - CE option: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification requirements).

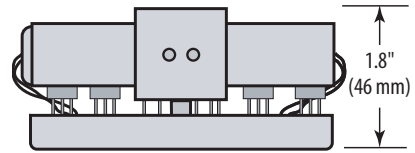
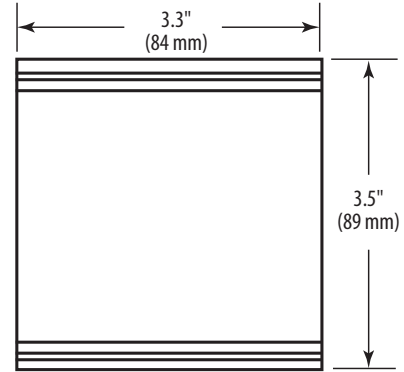
**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



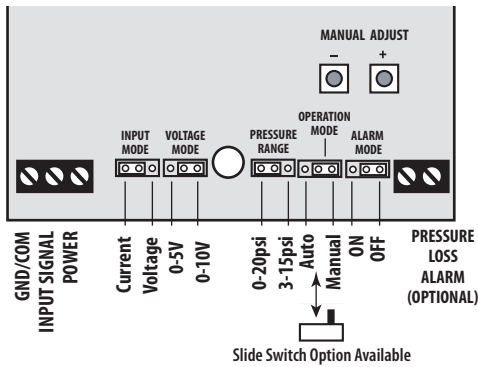
WIRING DIAGRAM



DIMENSIONAL DRAWINGS



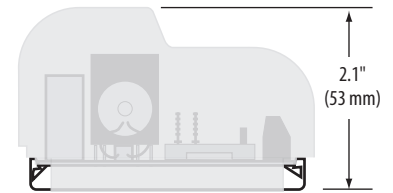
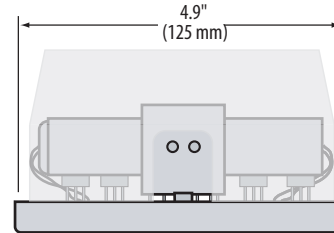
CONFIGURATION



DUST COVER

Dimensional Drawings (Front View)

Side View



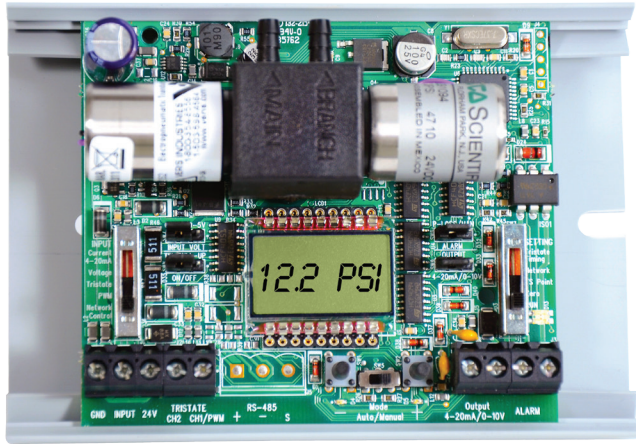
If the dust cover is ordered, the EP2 is mounted to a longer Snaptrack.

ORDERING INFORMATION

	Output	Feedback	Failsafe	US or EU	Option
EP2	1				
	= Selectable 3-15/0-20 psi	0 = None 1 = Pressure Loss Alarm 2 = Manual Mode Alarm	0 = None 1 = Vent on Power Fail	S = Standard C = CE, includes cover plate	Blank = none 1 = Slide Switch/Auto/Manual 2 = EP Cover Plate 3 = Slide Switch/Auto/Manual plus EP cover plate
Example:	EP 2 1 0 0 S 1 Option = Slide Switch Auto Manual Mode				

EP3 SERIES

Micro-Controlled with High-Performance, Low-Power Coil Poppet Valve Technology



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 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, switch-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

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

SCIM	523 in ³ /min @ 45 psi; (8570 cm ³ /min @ 310.3 kPa); 333 in ³ /min @ 20 psi (5457 cm ³ /min @ 137.9 kPa)
Supply Pressure	Min (0.1 psi + user F.S. pressure); Max 45 psig
Control Range	User programmable zero selectable from 0 to 25 psi: Full scale 0 to 25 psi
Pressure Differential	0.1 psig (supply to branch)
Pressure Indication	Electronic, 3-1/2 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



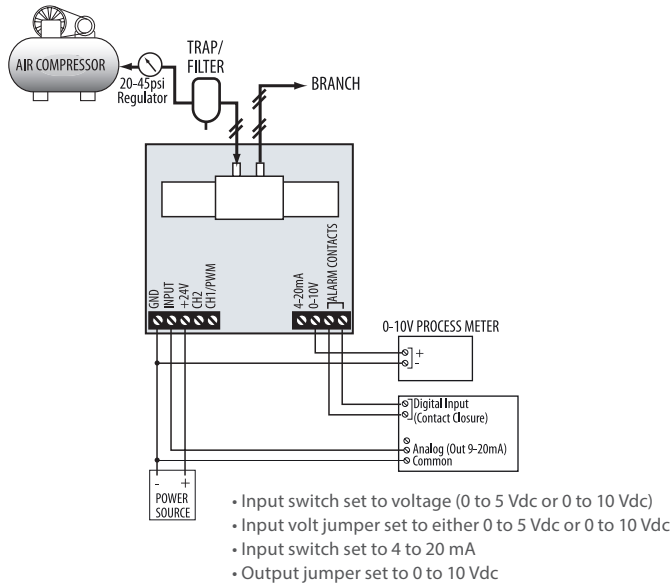
*For shorter tubing runs use the Veris AA45 Pneumatic Capacitor
EMC Conformance: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
EMC Special Note - CE option: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1 specification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

**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

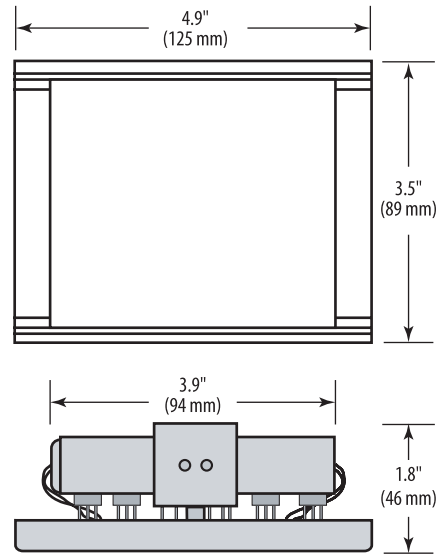


CURRENT/VOLTAGE CONTROL

Wiring Diagrams

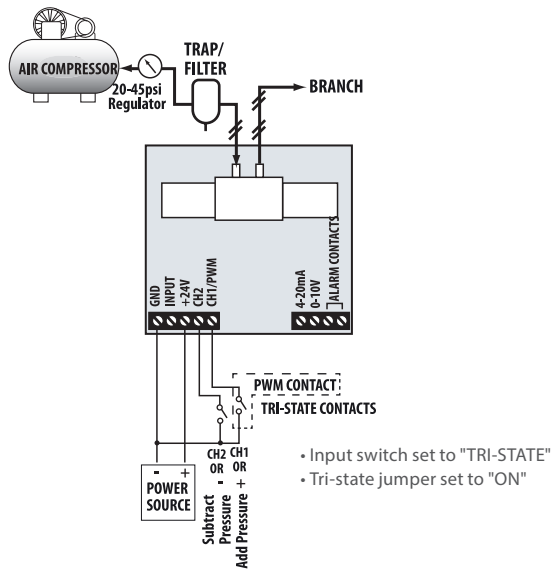


DIMENSIONAL DRAWINGS



TRI-STATE CONTROL

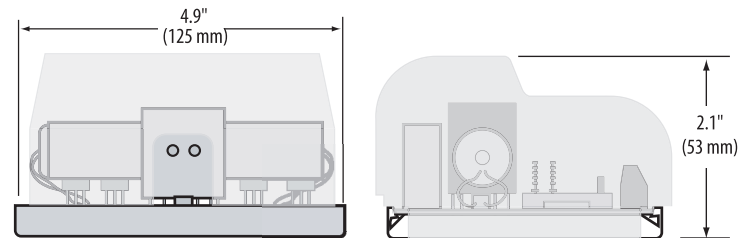
Wiring Diagrams



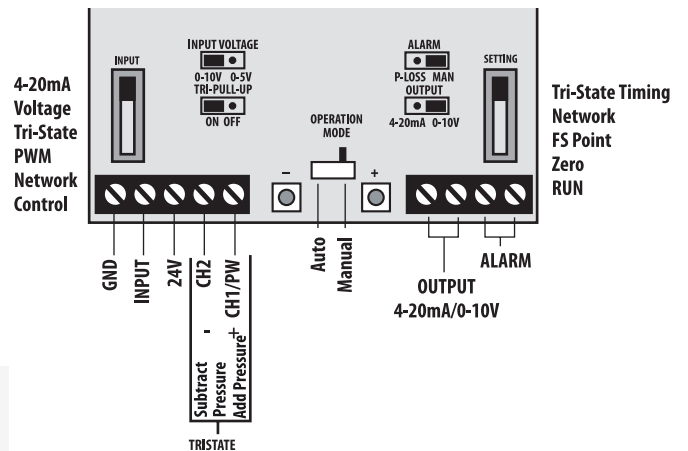
DUST COVER

Dimensional Drawings (Front View)

Side View



CONFIGURATION



ORDERING INFORMATION

Output	Feedback	Failsafe	US or EU	Option
EP3	3			
0 = None 3 = Analog output: 0-10VDC, or 4-20mA, selectable	= Pressure Loss Alarm, or Manual Mode Alarm	0 = None 1 = Vent on Power Fail	S = Standard C = CE, includes cover plate	Blank = None 2 = EP Cover Plate
Example: EP 3 3 3 1 S 2 Option = Cover Plate				

PG SERIES

Rugged Stainless Steel Construction



The durable PG Series pressure transducers are ideal for a wide variety of HVAC/R and industrial applications, such as refrigeration measurement, pneumatic pressure measurement, gas pressure measurement, pump inlet, and outlet fluid pressure. They are even compatible with extreme applications, such as aerospace and motor sports equipment.

SPECIFICATIONS

GENERAL

Supply Voltage	Class 2; 10 to 28 Vdc
Output	0 to 5 (3-wire), 0 to 10 Vdc (3-wire), or 4 to 20 mA (2-wire)
Load Impedance	>100 kΩ
Standard Connection	Cable gland 24" (600 mm) length
Pressure Port	1/4" NPT Male

PERFORMANCE AT 25 °C (77 °F)

Accuracy *	±0.25% BFSL **
Media Compatibility	Fluids & gases compatible with 316L stainless steel
Pressure Cycles	>100 million cycles
Over Pressure	2x F.S. without change in calibration
Burst Pressure	5x rated pressure or 20,000 psi

ENVIRONMENTAL

Shock	100G, 11 msec, 1/2 sine
Vibration	20G peak, 20 to 2400 Hz;
EMI/RFI Protection	Yes
Rating	IP-66
Operating Temp Range	-40 to 85 °C (-40 to 185 °F)
Compensated Temp Range	0 to 55 °C (32 to 130 °F)
Total Error Band Over Temp	<±3% of FS
Humidity	0 to 95% RH non-condensing

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

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



* Accuracy includes nonlinearity and hysteresis.

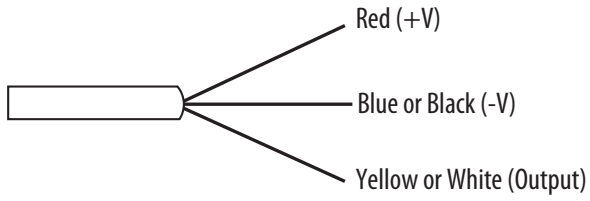
** BFSL = Best fit straight line

***The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details. Deluxe models only.



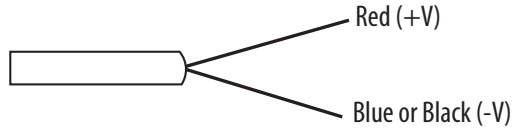
3-WIRE, 0-5 VDC/0-10 VDC

Wire Color Coding

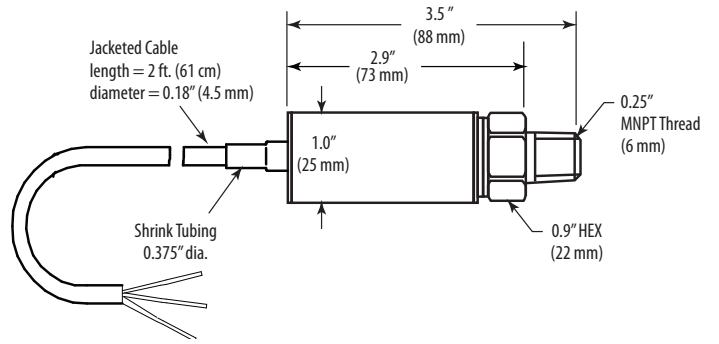


2-WIRE, 4 TO 20 MA

Wire Color Coding



DIMENSIONAL DRAWING



ORDERING INFORMATION

PG	Range	Wetted Material	Output
	<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div> 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	<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; text-align: center; line-height: 20px;">A</div> = 316L stainless steel	<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div> M = 4 to 20 mA V = 0-10 Vdc J = 0-5 Vdc
Call factory for ranges not shown.			
Example:			
PG	07	A	V

PW SERIES

Jumper-Selectable Port Swap Feature



The PW Series wet pressure transducers incorporate microprocessor 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 jumper-selectable port swap feature eliminates costly replumbing when the high and low ports are improperly plumbed, allowing the jumper position to be changed from normal to swap.

SPECIFICATIONS

GENERAL

Input Power	Class 2; 12 to 30 Vdc or 24 Vac nominal, 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; 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
Housing Material	White powder-coated aluminum
Fittings	psig: 1/8" NPT female thread, 17 to 4 PH stainless; barg: 1/8" BSPT female thread, 17 to 4 PH stainless

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)
0 to 3.5 barg (Gauge)	0.35/0.7/1.75/3.5 bard (Differential)
0 to 7.0 barg (Gauge)	0.7/1.4/3.5/7.0 bard (Differential)
0 to 17.0 barg (Gauge)	1.7/3.4/8.5/17.0 bard (Differential)

SENSOR

Accuracy @ 25 °C**	Range A, B, C: ±1% F.S.; Range D: ±2% F.S.***
Long Term Stability	±0.25% per year
Media Compatibility	Media compatible with 17 to 4 PH stainless steel
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range

Jumper-selectable Switch-selectable

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

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

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

High stability

Jumper-controlled electronic surge dampening for high stability

APPLICATIONS

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

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
Product Operating Environment	-10 to 55 °C (14 to 130 °F); 0 to 90% RH non-condensing

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



*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; Minimum input voltage for volt operation: 0 to 5 Vdc output = 12 Vdc; 0 to 10 Vdc output = 15 Vdc.

**Accuracy combines linearity, hysteresis, and repeatability.

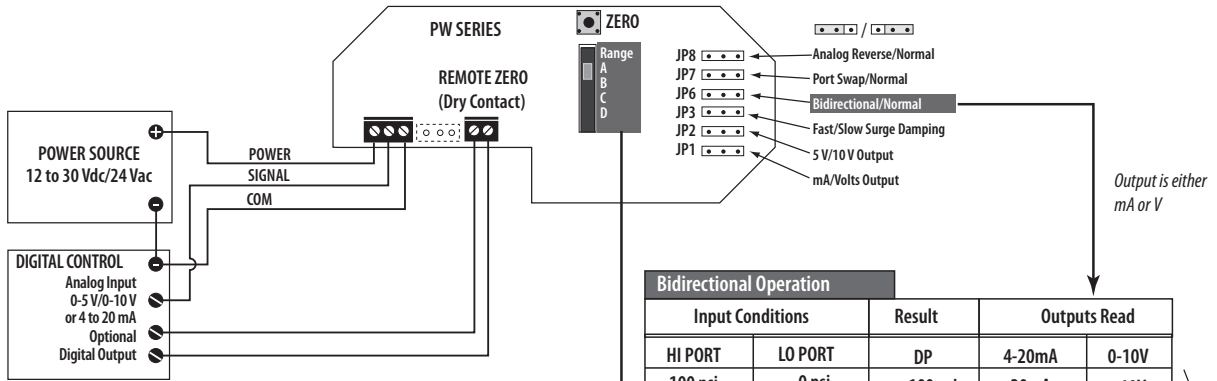
***FS is defined as full span of selected range in bi-directional mode.

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).

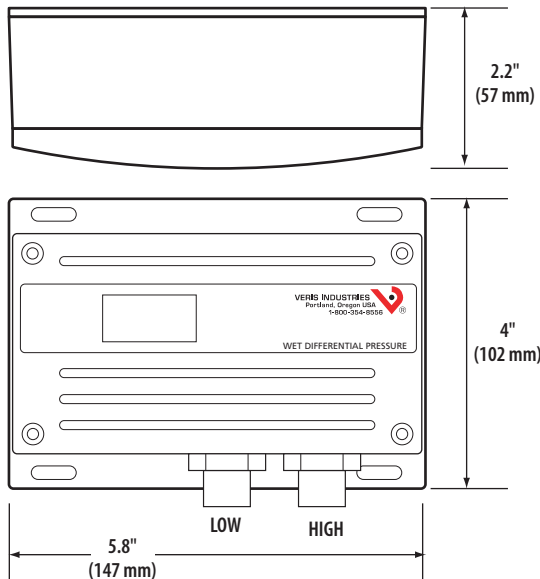
† The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



WIRING DIAGRAM



DIMENSIONAL DRAWING



Bidirectional Operation

Input Conditions		Result	Outputs Read	
HI PORT	LO PORT	DP	4-20mA	0-10V
100 psi	0 psi	+100 psi	20mA	10V
100 psi	50 psi	+50 psi	16mA	7.5V
50 psi	50 psi	0 psi	12mA	5V
50 psi	100 psi	-50 psi	8mA	2.5V
0 psi	100 psi	-100 psi	4mA	0V

e.g. PW-04

17.0 bar	0 bar	+17.0 bar	20mA	10V
17.0 bar	8.5 bar	+8.5 bar	16mA	7.5V
8.5 bar	8.5 bar	0 bar	12mA	5V
8.5 bar	17.0 bar	-8.5 bar	8mA	2.5V
0 bar	17.0 bar	-17.0 bar	4mA	0V

e.g. PW-08

Use the Range switch to select F.S. differential pressure.

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

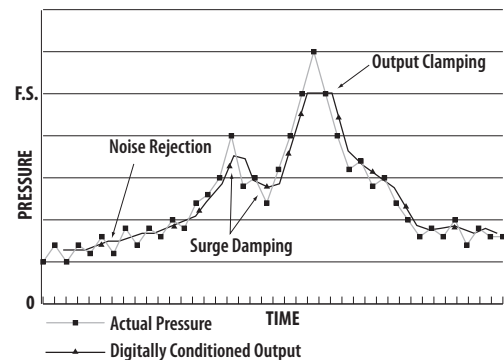
e.g. PW-04

Model	Range (bar)			
	A	B	C	D
PW-06	3.5	1.75	0.7	0.35
PW-07	7.0	3.5	1.4	0.7
PW-08	17.0	8.5	3.4	1.7

e.g. PW-08

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: PW L = LCD Display, X = No Display

NIST: PW N = NIST, X = None

Operational Range*: PW 03 = 0-50 psig, 04 = 0-100 psig, 05 = 0-250 psig, 06 = 0-3.5 barg**, 07 = 0-7.0 barg**, 08 = 0-17 barg**

US or EU: PW S = Standard***, C = CE

Example: PW L X 04 C

* Select operational range according to maximum gauge pressure, NOT differential pressure.

Example: High gauge pressure=90 psig, Select 100 psig model (04).

**Barg models use BSPT threads on sensor fittings

***Not available with barg units



PW2 SERIES

4 to 20 mA, 2-Wire Device



PW2

The 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

SPECIFICATIONS

GENERAL

Input Power	Class 2; 12 to 24 Vdc, loop powered (polarity insensitive)
Maximum Current Draw	29 mA
Output	2-wire transmitter; user selectable 4 to 20 mA (clipped & capped)*
Surge Damping	Electronic; 5-second averaging
Zero Adjust	Pushbutton auto-zero terminals
Housing Material	White powder-coated aluminum

PRESSURE RANGES (SELECTABLE)

0 to 50 psi (0 to 3.45 barg) (Gauge)	0-5/10/25/50 psid (0-0.34/0.69/1.72/3.45 bard) (Differential)
0 to 100 psig (0 to 6.89 barg) (Gauge)	0-10/20/50/100 psid (Differential) (0-0.69/1.38/3.45/6.89 bard) (Differential)
0 to 250 psi (0 to 17.24 bar) (Gauge)	0-25/50/125/250 psid (Differential) (0-1.72/3.45/8.62/17.24 bard) (Differential)

SENSOR

Accuracy @ 25 °C**	Range A, B, C: ±1% F.S.; Range D: ±2% F.S.***
Media Compatibility	Media compatible with 17-4 PH stainless steel
Long Term Stability	±0.25% per year
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range

Jumper selectable Dual sensor

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

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

Temperature Compensated Range	0 to 50 °C (32 to 122 °F); TC Zero <±1.5% of product F.S. per sensor; TC Span <±1.5% of product F.S. per sensor, (2 sensors per unit)
Media Temperature Limits	-20 to 85 °C (-4 to 185 °F); 0 to 90% RH non-condensing
Product Operating Environment	-10 to 55 °C (14 to 130 °F); 0 to 90% RH non-condensing

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

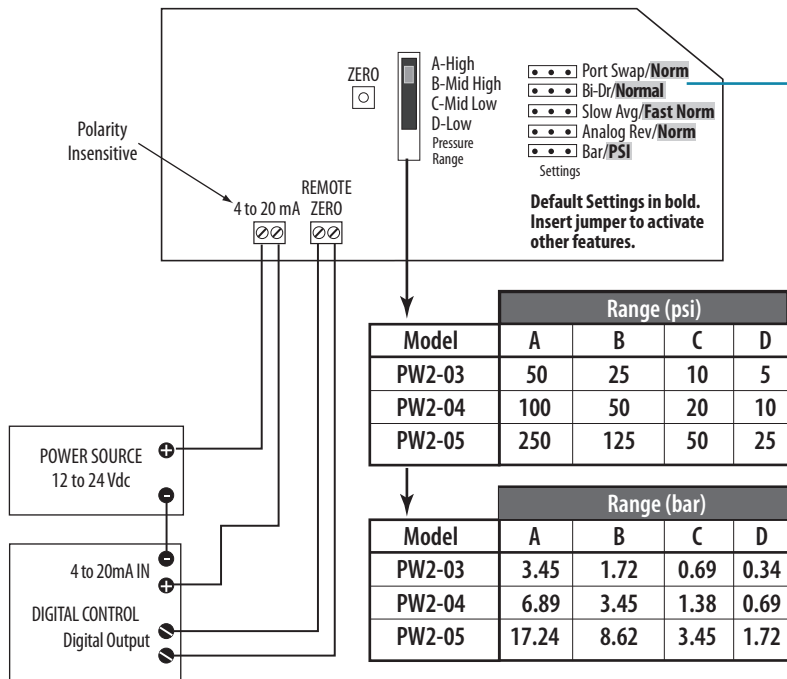


* Minimum input voltage: 250 Ω loop = 12 Vdc; 500 Ω loop = 17 Vdc
 **Accuracy combines linearity, hysteresis, and repeatability.
 ***FS is defined as full span of selected range in bi-directional mode.
 EMC Conformance - CE option: Low voltage directive 2014/35/EU; EMC directive 2014/30/EU.
 EMC Special 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 indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



WIRING DIAGRAM



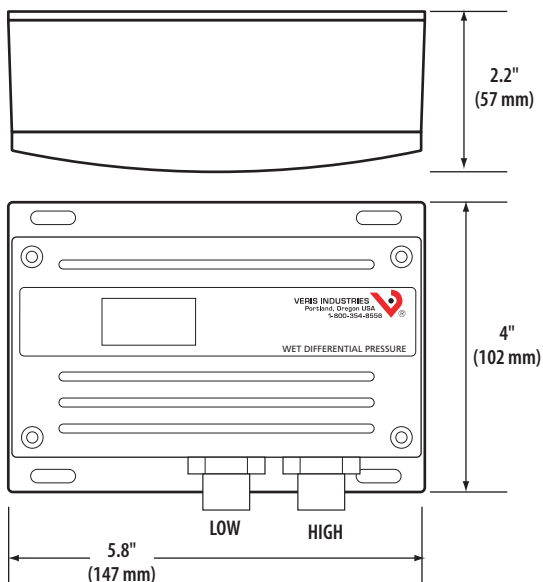
Bidirectional Operation

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

Model	Range (psi)			
	A	B	C	D
PW2-03	50	25	10	5
PW2-04	100	50	20	10
PW2-05	250	125	50	25

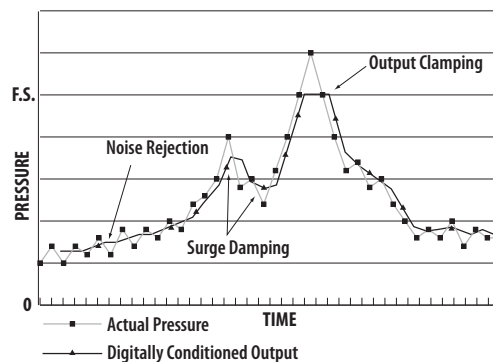
Model	Range (bar)			
	A	B	C	D
PW2-03	3.45	1.72	0.69	0.34
PW2-04	6.89	3.45	1.38	0.69
PW2-05	17.24	8.62	3.45	1.72

DIMENSIONAL DRAWING



MICROPROCESSOR PROVIDES DIGITAL SIGNAL CONDITIONING

- Noise rejection reduces fluctuating readings due to noise or turbulence
- Surge damping prevents false



ORDERING INFORMATION

Local Display NIST Operational Range* US or EU

PW2

L = LCD Display N = NIST 03 = 0 to 50 psig/3.45 barg S = Standard
 X = No Display X = None 04 = 0 to 100 psig/6.89 barg C = CE
 05 = 0 to 250 psig/17.24 barg

Example: PW2 L X 04 C

*Select operational range according to maximum gauge pressure, NOT differential pressure.
 Example: High gauge pressure=90 psig, Select 100 psig model (04).



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

Zero calibration

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

Lower costs

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

Switch-selectable

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

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
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COMPLIANCE INFORMATION

Approvals	RoHS, CE, NEMA4, IP65 at sensor
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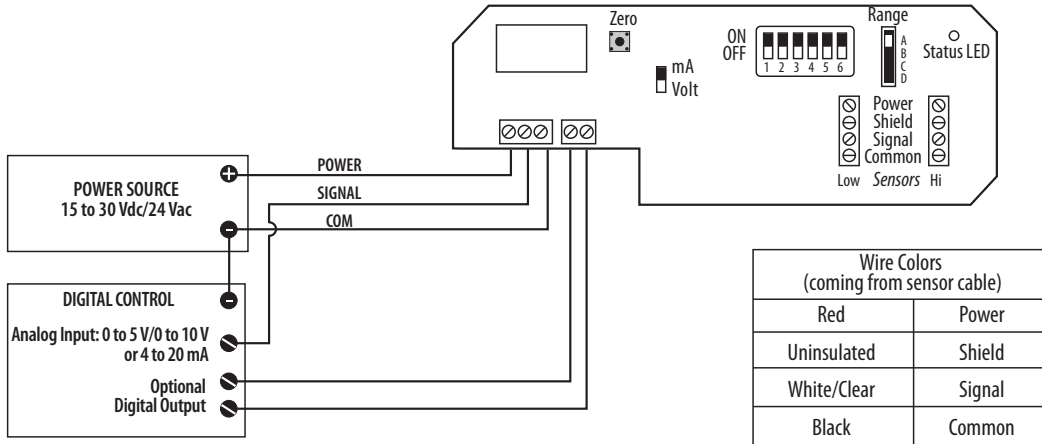
*VFD systems and system wiring generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor or sensor wiring.
**F.S. is defined as full span of selected range.

***Accuracy combines linearity, hysteresis, and repeatability.

† The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



WIRING DIAGRAM



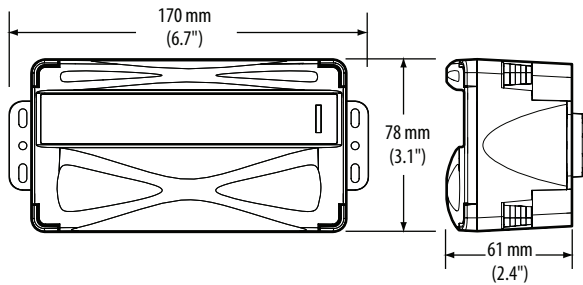
Wire Colors (coming from sensor cable)	
Red	Power
Uninsulated	Shield
White/Clear	Signal
Black	Common

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

DIP Switches		
Num	Function	Off/On ¹
1	Damping	Fast/Slow
2	Test	Operate/Test
3	Mode	Normal/Bidirec.
4	Analog	Normal/Reverse
5	Port	Normal/Swap
6	Voltage Out ²	0 to 10 V/0 to 5 V

1. "Off" position is the default setting for all DIP switches.
2. Ignored in mA mode.

DIMENSIONAL DRAWING



ORDERING INFORMATION

Display	NIST	Operational Range*	Media	Cable Length	Cable
PWR <input type="checkbox"/> L = LCD Display	<input type="checkbox"/> X = None	<input type="checkbox"/> 03 = 0-50 psig 04 = 0-100 psig 05 = 0-250 psig	<input type="checkbox"/> S = Water	<input type="checkbox"/> 006 = 6 ft. (1.8 m) 010 = 10 ft. (3.1 m) 020 = 20 ft. (6.1 m)	<input type="checkbox"/> Blank = Standard** A = Armored***

Example:
PWR LX 03 S 020 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.





TEMPERATURE MONITORING

Veris 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 the Veris reputation for accuracy and reliability, as well as an aesthetically pleasing housing, making them ideal for monitoring temperature in any setting.

MODEL	DESCRIPTION	PAGE
TD/TF/TG/TDDA/TK	Duct Mount Temperature Sensors	183
TO/TOA	Outdoor Temperature Sensors	185
TWxP	Deluxe Wall Mount Temperature Sensors, Protocol Communication	187
TW/TE/TEA	Wall Mount Temperature Sensors	189
TP	Flush Mount Temperature Sensors	191
TC/TS	Ceiling and Recessed Mount Temperature Sensors	193
TI	Immersion Temperature Sensors	195
TB/TRA	Specialty Temperature Sensors	197
TJ	VAV Discharge Temperature Sensors	199
TA	Averaging Temperature Sensors	201

TEMPERATURE SENSOR SELECTION GUIDE

	WALL MOUNT	DUCT MOUNT	CEILING MOUNT	OUTDOOR MOUNT	FLUSH MOUNT	REMOTE	STRAP-ON	IMMERSION	VAV
Analog Transmitter Output	TEA page 189	TDDA page 183							
Resistive Output	TE page 189	TD/TF/TG/TK page 183	TC/TS page 193	TO page 185	TP page 191	TRA page 197	TB page 197	TI page 195	TJ page 199
LCD Display	TW page 189								
Averaging Sensor		TA page 201							
Protocol Communication	TWxP page 187								



Accurately Monitor Temperature in All Settings & Maintain a Comfortable Environment

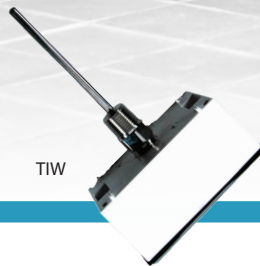


TJ

TC



TIW



TW



TJ VAV Sensor

Install in minutes with plenum rated 2-wire installation (optional quick disconnect).

TC Ceiling Mount Sensor

Recessed press-fit sensor virtually disappears.

Immersion Sensors

Corrosion-resistant stainless steel probe, with choice of service entry body, indoor junction box, or threaded enclosure.

TW Wall Mount Sensors

Easy installation, with local indication of temperature.

Interested in learning more about these innovative products?

Contact a Temperature Monitoring Specialist today: 800.354.8556 or at sales@veris.com



T SERIES

Sensor Housed in Probe, Protects Against Corrosion



Duct mount temperature sensors from Veris are pre-calibrated and housed in sturdy stainless steel probes. The devices are easy to install, durable, and highly accurate.

SPECIFICATIONS

Wiring	22 AWG; 2-wire: RTD/Thermistor, 4 to 20 mA; 3-wire: Linitemp
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TEMPERATURE TRANSMITTER OPTION

Input Power	4 to 20 mA models: Loop powered Class 2, 12 to 30 Vdc only, 30 mA max; 0-5/0-10 V models: Class 2, 12 to 30 Vdc/24 Vac, 50/60 Hz, 15 mA max
Temp. Output	2-wire, loop powered 4 to 20 mA 3-wire, 0-5V/0-10Vdc
Sensor Type	Solid-state, integrated circuit
Transmitter Accuracy	±0.5 °C (±.9 °F) typical*
Ranges	Selectable 0 to 50 °C (32 to 122 °F) or -40 to 50 °C (-40 to 122 °F)

LINITEMP OPTION

Input Power	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) typical; 2.5 °C (4.5 °F) max. at 25 °C (77 °F)**

Cost effective

Cost-effective, high accuracy thermistors or RTDs available with or without a junction box

Durable

Corrosion resistant stainless steel probe design

No calibration

No calibration required

APPLICATIONS

- Duct systems
- Industrial

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
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RESISTIVE OPTION

Operating Temp	-25 to 105 °C (-13 to 221 °F)
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WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



*Room temperature offset documented on each unit.

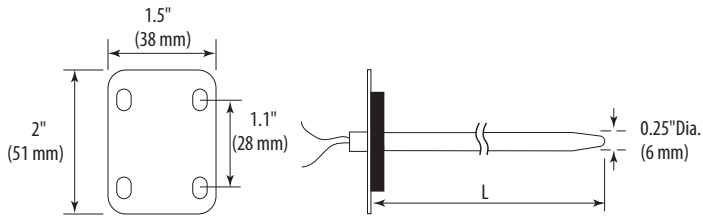
**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

Note: See page 202 for thermistor table.



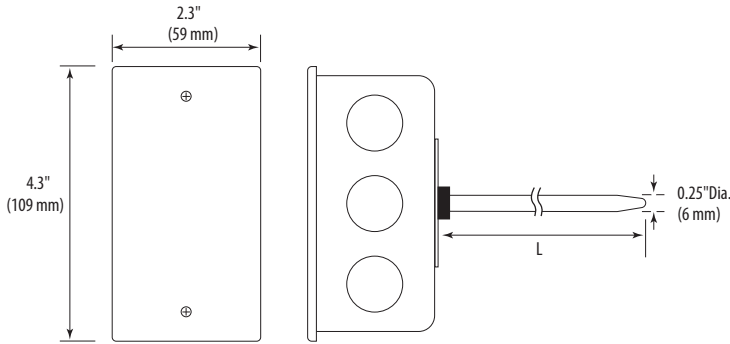
TD

Dimensional Drawing



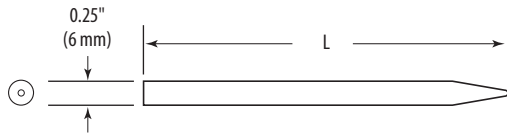
TF

Dimensional Drawing



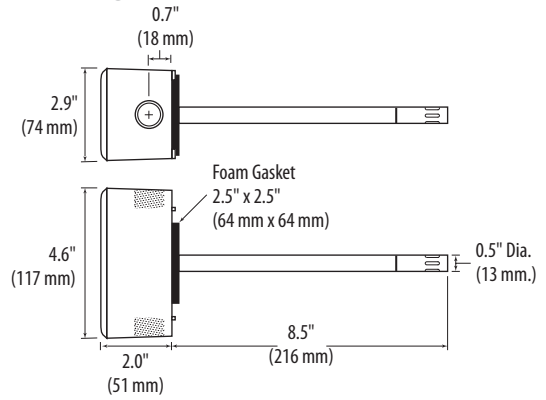
TK

Dimensional Drawing



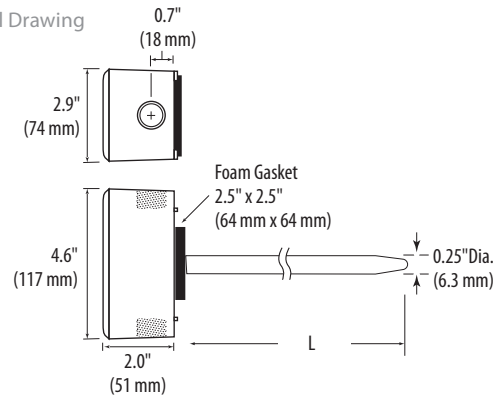
TDDA

Dimensional Drawing



TG

Dimensional Drawing



ORDERING INFORMATION

RTD/Thermistor Models

Enclosure	Immersion Probe Length "L"	Sensor Type	Output	Calibration Certificate
T			RØ	
D = Duct	B = 4" (102mm)*	B = 100R platinum, RTD	= Resistive Output	0 = None
K = Probe only (no mounting hardware)	C = 6" (152mm)	C = 1k platinum, RTD		1 = 1-point cal validation***
F = Duct with mounting box	D = 8" (203mm)	D = 10k T2, Thermistor		2 = 2-point cal validation***
G = Duct with water resistant housing	E = 12" (305mm)**	E = 2.2k, Thermistor		
	F = 18" (457mm)**	F = 3k, Thermistor		
	G = 24" (610mm)**	G = 10k CPC, Thermistor		
	K = 36" (914mm)**	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		

* TK model is 4 1/2" (115 mm)
 ** Not available with TK model
 *** Not available with W and Y high-accuracy thermistors

Examples:
 T D B D RØ 2

Transmitter Models

Output	Range	Cal Certificate
TDDA		
M = 4 to 20mA V = 5/10V	1 = -40 to 50 °C (-40 to 122 °F) 2 = 0 to 50 °C (32 to 122 °F)	0 = None 1 = 1 point Cal validation 2 = 2 point Cal validation

Example:
 TDDA V 2 0



TO SERIES

Sleek Design, Reduces Solar Heating



TO 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
TEMPERATURE TRANSMITTER OPTION	
Input Power	4 to 20 mA version - Loop powered Class 2, 12 to 30 Vdc only, 30 mA max; 0-5/0-10 V versions - 12-30 Vdc/24 Vac, 50/60 Hz, 15 mA max
Temp. Output	2-wire, loop powered Class 2, 4 to 20mA; 3-wire, 0-5 V/0-10 Vdc
Sensor Type	Solid-state, integrated circuit (Transmitter)
Accuracy	±0.5°C (±.9°F) typical
Ranges	0 to 50 °C (32 to 122 °F), -40 to 50 °C (-40 to 122 °F)*
LINITEMP OPTION	
Input Power	5 to 30 Vdc
Output	10mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Calibration Offset	1.5 °C (2.7 °F) typical; 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
RESISTIVE OPTION	
Operating Temp	-25 to 105 °C (-13 to 221 °F)

Sleek design

Reduces solar heating...reliable and accurate

Flexible

Available with transmitter, linitemp, RTDs, or thermistors

APPLICATIONS

- Outdoor reference

WARRANTY

Limited Warranty 5 years

AGENCY APPROVALS

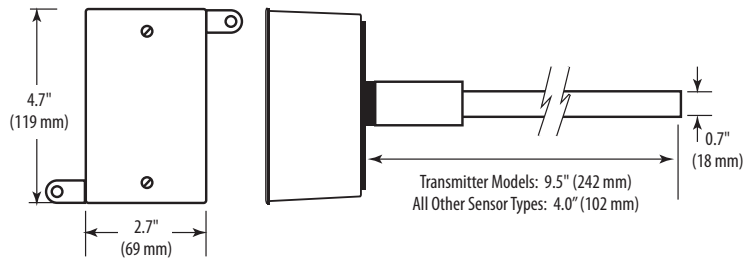


*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

Note: See page 202 for thermistor table.



DIMENSIONAL DRAWING



ORDERING INFORMATION

RTD/Thermistor Models

Sensor Type

TO



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

Output



= Resistive Output

Cal Certificate



0 = None
1 = 1 point Cal validation*
2 = 2 point Cal validation*

Example:

TO C RØ 2

* Not available with W and Y high-accuracy thermistors

Temperature Transmitter Models

Output

TOA



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

Range



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

Calibration Certificate



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

Example:

TOA M 1 0

TW PROTOCOL SERIES

Modbus and BACnet Protocol Communication



The TWLP Series features embedded BACnet and Modbus communication protocols to communicate temperature readings to a building automation system controller. The setpoint slider and pushbutton override options offer additional local input.

SPECIFICATIONS

Input Voltage	Class 2; 12 to 30 Vdc, 24VAC, 50/60Hz, 100 mA max.
Operating Temp	0 to 50 °C (32 to 122 °F)
Housing Material	High impact ABS plastic , UL 94 V0
Protocol	BACnet or Modbus (selectable)
Connection	2-wire RS-485
Data Rate	9600, 19200, 38400, 57600 (Modbus), bps (selectable); 9600, 19200, 38400, 76800 (BACnet), bps (selectable)
Parity	None/Odd/Even (selectable-Modbus); None (BACnet)
Address Range	1 to 127
Setpoint Slider Resolution (Optional)	1% full scale
Override Button (Optional)	Remotely readable and resettable
Sensor Type	Solid-state, integrated circuit
Accuracy	±0.5 °C (±.9 °F) typical
Resolution	0.1 °C (0.2 °F)
Range	10 to 35 °C (50 to 95 °F)
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	



EMC Conformance: Low voltage directive 2006/95/EC and EMC directive 2004/108/EC.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1:2007 specification requirements).

*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

Note: See page 202 for thermistor table.

BACnet and Modbus

Embedded BACnet and Modbus communication protocols... provides ease of integration

Network configuration

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

Multiple baud rates

Configurable to multiple baud rates...ensures network compatibility

Setpoint and override options

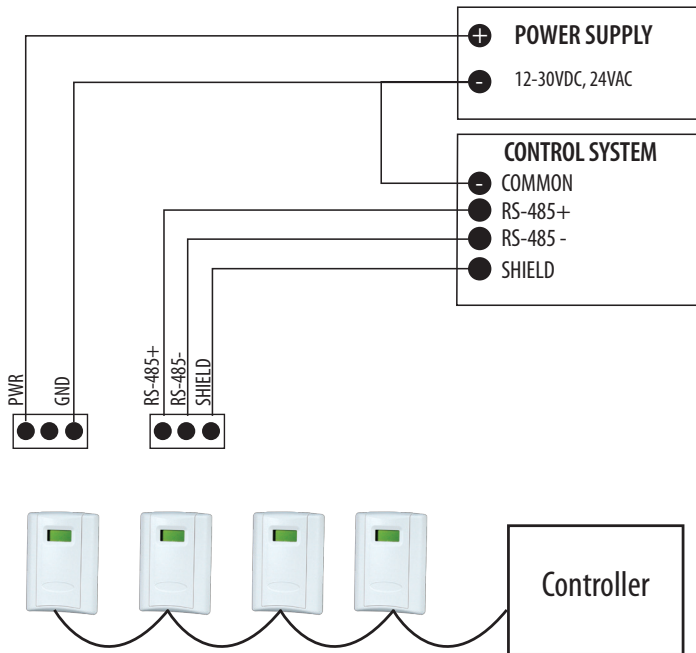
Setpoint and override activation represented in protocol... eliminates costly wiring and inputs

APPLICATIONS

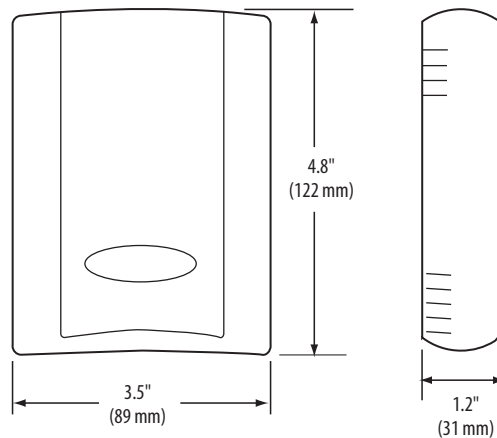
- Temperature control in office buildings and schools with systems utilizing BACnet or Modbus protocol



WIRING DIAGRAM



DIMENSIONAL DRAWING



ORDERING INFORMATION

Local Display	Protocol	Temp. Cal. Cert.	Option	Housing
TW <input type="checkbox"/>	<input type="checkbox"/> P <input type="checkbox"/> X <input type="checkbox"/> X	<input type="checkbox"/> X <input type="checkbox"/> 1 <input type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>
L = LCD X = No display	= Protocol	X = No 1 = 1 pt. cal. cert. 2 = 2 pt. cal. cert.	Blank = None 1 = Pushbutton override 2 = Set point slider 3 = Pushbutton override + set point slider	Blank = Cloud white B = Black

Example:

TW L P X X 1 3

TW & TE SERIES

Wall Mount Temperature Sensors



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

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
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SPECIFICATIONS

TW/TEA Series

INPUT POWER

TW Model	4 to 20mA mode: loop powered Class 2, 12 to 30 Vdc only, 30 mA max.; 0-5/0-10 V mode: Class 2, 12 to 30 Vdc/24 Vac, 50/60 Hz, 15 mA max.
----------	--

Wall mount

Low-profile housing

Quick installation

Reduced downtime for deployment

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

TEA Model	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
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RANGES

TW Model	10 to 35 °C (50 to 95 °F)/0 to 50 °C (32 to 122 °F) jumper-selectable
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)
Temp Output TW Model	2-wire, loop powered 4 to 20 mA or 3-wire, 0-5 V/0 - 10 Vdc
Transmitter Type	Solid-state, integrated circuit
Transmitter Accuracy	±0.5 °C (±.9 °F) typical

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



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

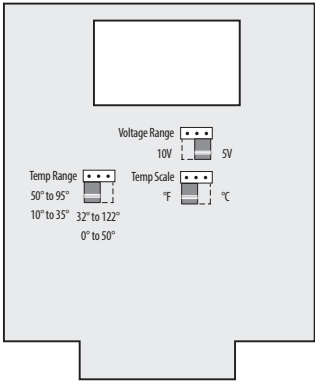
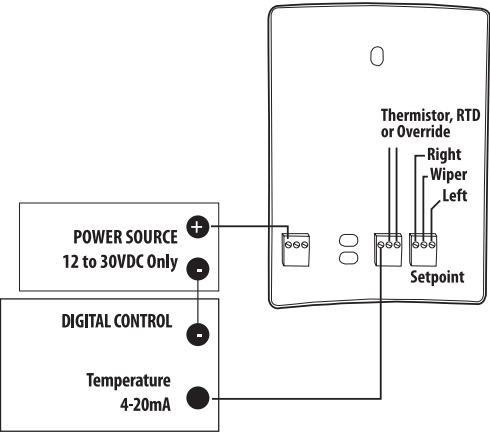
For RTD and thermistor accuracies and ranges, see the thermistor table on page 202.

*Room temperature offset documented on each unit.

**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

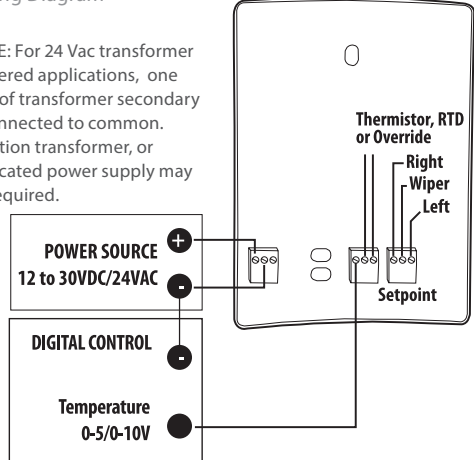


TW (4 TO 20 MA)
Wiring Diagram

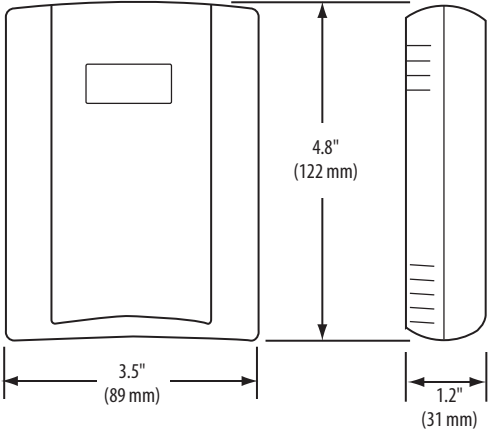


TW (0-5/0-10 V)
Wiring Diagram

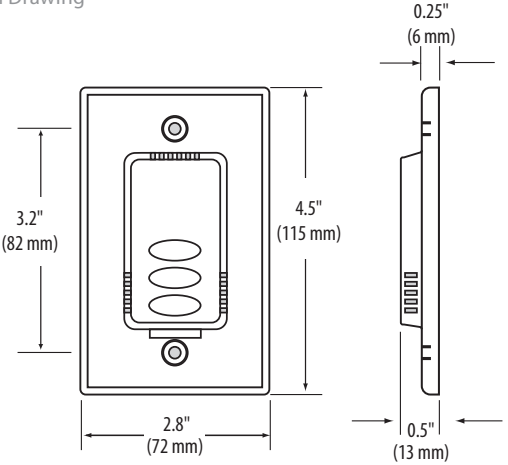
NOTE: For 24 Vac transformer powered applications, one side of transformer secondary is connected to common. Isolation transformer, or dedicated power supply may be required.



TW
Dimensional Drawing



TE/TEA
Dimensional Drawing



ORDERING INFORMATION

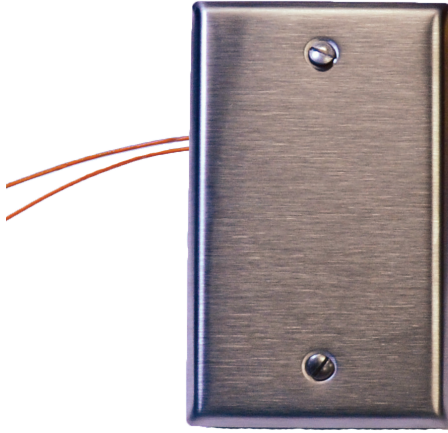
<p>Local Display</p> <p>TW <input type="checkbox"/></p> <p>L = LCD X = No</p>	<p>Sensor Type</p> <p>TW <input type="checkbox"/></p> <p>A = Transmitter selectable outputs</p>	<p>Setpoint/Override</p> <p>TW <input type="checkbox"/></p> <p>0 = None 2 = 1k Setpoint 3 = 10k Setpoint 4 = 1k Setpoint w/override 5 = 10k Setpoint w/override</p>	<p>Cal Certificate</p> <p>TW <input type="checkbox"/></p> <p>0 = None 1 = 1 point Cal validation 2 = 2 point Cal validation</p>	<p>Housing Color</p> <p>TW <input type="checkbox"/></p> <p>None = Cloud White B = Black</p>
<p>Example: TW <input checked="" type="checkbox"/> X <input type="checkbox"/> A <input type="checkbox"/> 0 <input type="checkbox"/> 2</p>				
<p>Local Display</p> <p>TW <input type="checkbox"/></p> <p>L = LCD X = No</p>	<p>Sensor Type</p> <p>TW <input type="checkbox"/></p> <p>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</p>	<p>Setpoint/Override</p> <p>TW <input type="checkbox"/></p> <p>0 = None 1 = Override* 2 = 1k Setpoint 3 = 10k Setpoint 4 = 1k Setpoint w/override* 5 = 10k Setpoint w/override*</p>	<p>Cal Certificate</p> <p>TW <input type="checkbox"/></p> <p>0 = None 1 = 1 point Cal validation 2 = 2 point Cal validation</p>	<p>Housing Color</p> <p>TW <input type="checkbox"/></p> <p>None = Cloud White B = Black</p>
<p>Example: TW <input type="checkbox"/> L <input type="checkbox"/> C <input type="checkbox"/> 0 <input type="checkbox"/> 1</p> <p>*Pushbutton override short circuits RTD/thermistor output. ** Not available with W and Y high-accuracy thermistors.</p>				

<p>Output</p> <p>TEA <input type="checkbox"/></p> <p>M = 4 to 20 mA V = 0-10 Vdc J = 0-5 Vdc</p>	<p>US or EU</p> <p>TEA <input type="checkbox"/></p> <p>S = Standard</p>	<p>Housing Color</p> <p>TEA <input type="checkbox"/></p> <p>None = Cloud White B = Black</p>	<p>Example: TEA <input type="checkbox"/> J <input type="checkbox"/> S</p>
<p>Sensor Type</p> <p>TE <input type="checkbox"/></p> <p>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</p>	<p>Setpoint/Override</p> <p>TE <input type="checkbox"/></p> <p>0 = None 1 = Override* 2 = 1k Setpoint 3 = 10k Setpoint 4 = 1k Setpoint with override* 5 = 10k Setpoint with override*</p>	<p>Cal Certificate</p> <p>TE <input type="checkbox"/></p> <p>0 = None 1 = 1-point cal validation** 2 = 2-point cal validation**</p>	<p>Housing Color</p> <p>TE <input type="checkbox"/></p> <p>None = Cloud white B = Black</p>
<p>Example: TE <input type="checkbox"/> D <input type="checkbox"/> 5 <input type="checkbox"/> 2</p> <p>*Pushbutton override short circuits RTD/thermistor output ** Not available with W and Y high-accuracy thermistors.</p>			



TP SERIES

Durable Device for Temperature Monitoring



TP

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

Wiring	22 AWG; 2-wire: RTD/Thermistor; 3-wire: Linitemp
Housing	Brushed 430 stainless steel
Operating Temperature	-25 to 105 °C (-13 to 221 °F)*

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



* For RTD and thermistor accuracies and ranges, see the thermistor table on page 202.

**The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

Moisture resistant

Potted sensor element

Durable

Stainless steel construction

Easy installation

Mounts to standard duplex wall mount box

Flexible

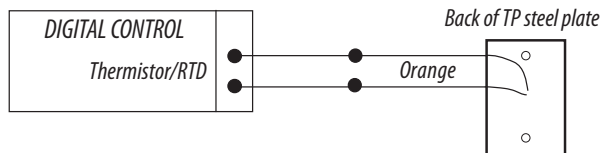
Available with linitemp, RTD, or thermistors...application flexibility

Simple maintenance

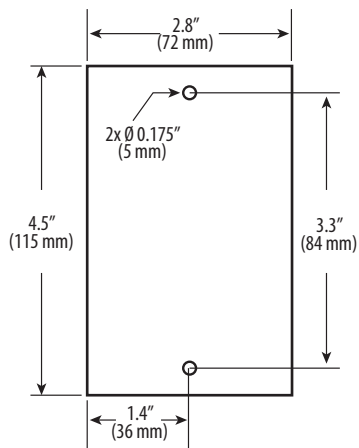
Easy to clean



WIRING DIAGRAM



DIMENSIONAL DRAWING



ORDERING INFORMATION

<p>Sensor Type</p> <p>TP <input type="checkbox"/></p> <p>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 T = 100k, Thermistor U = 20k "D", Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor</p>	<p>Calibration Certificate</p> <p><input type="checkbox"/></p> <p>0 = None 1 = 1-point cal validation* 2 = 2-point cal validation*</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Example:</p> <p>TP <input type="checkbox"/> W <input type="checkbox"/> 5 <input type="checkbox"/> 1</p> </div> <p>* Not available with W and Y high-accuracy thermistors.</p>
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TC & TS SERIES

Low Profile Housing with a Variety of RTD and Thermistor Options



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 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)*

LINITEMP OPTION

Input Power	Class 2; 5 to 30 Vdc
Output	10mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)*
Calibration Offset	1.5° C (2.7 °F) typical; 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

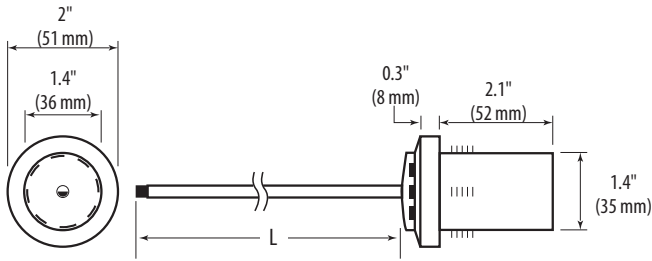
Limited Warranty	5 years
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* For RTD and thermistor accuracies and ranges, see the thermistor table on page 202.

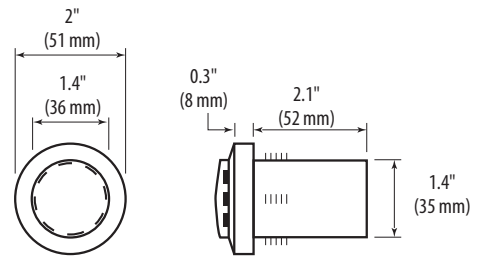
**Room temperature offset documented on each unit.



TC
Dimensional Drawing



TS
Dimensional Drawing

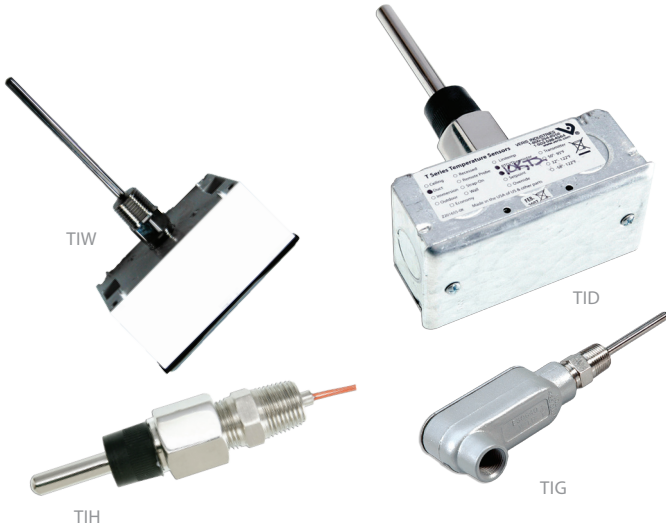


ORDERING INFORMATION

TC			TS		
Probe Length	Sensor Type	Calibration Certificate	Sensor Type	Calibration Certificate	Housing Color
<input type="checkbox"/> B = 4" (102mm) C = 6" (152mm) D = 8" (203mm) E = 12" (305mm) F = 18" (457mm) G = 24" (610mm)	<input type="checkbox"/> 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 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	<input type="checkbox"/> 0 = None 1 = 1-point cal validation* 2 = 2-point cal validation*	<input type="checkbox"/> 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	<input type="checkbox"/> 0 = None 1 = 1-point cal validation* 2 = 2-point cal validation*	<input type="checkbox"/> None = Cloud White B = Black
* Not available with W and Y high-accuracy thermistors.			* Not available with W and Y high-accuracy thermistors.		
Example: TC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			Example: TS <input type="checkbox"/> <input type="checkbox"/>		

TI SERIES

Corrosion Resistant Stainless Steel Probe



These 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; 3-wire: Linitemp
Probe	Stainless steel
Test Pressure	200 psi
Operating Temp	-25 to 105 °C (-13 to 221 °F)
LINITEMP OPTION	
Input Power	Class 2; 5 to 30 Vdc
Output	10mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Calibration Offset	1.5 °C (2.7 °F) typical; 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

*Room temperature offset documented on each unit.

Note: See page 202 for thermistor table.

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

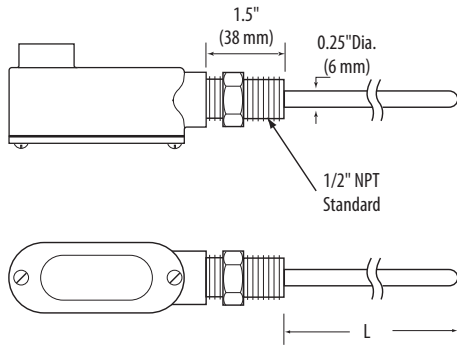
Duct mount, service entry body, threaded, and water resistant to fit your application

APPLICATIONS

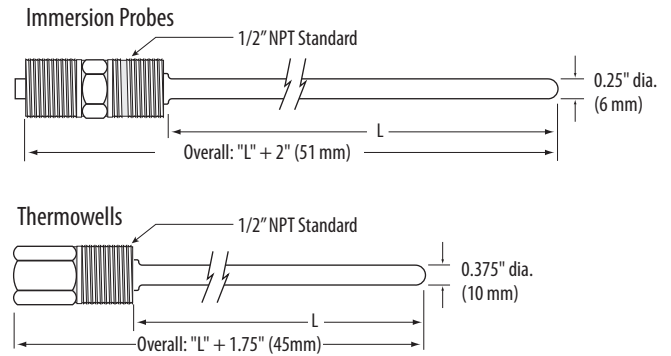
- Tanks
- Pipes
- Chillers



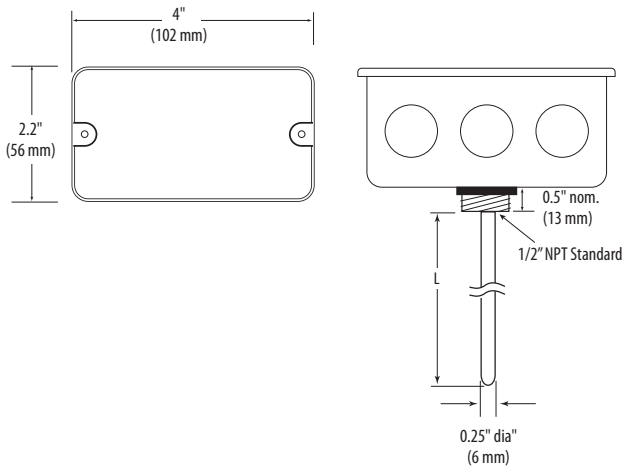
TIG
Dimensional Drawing



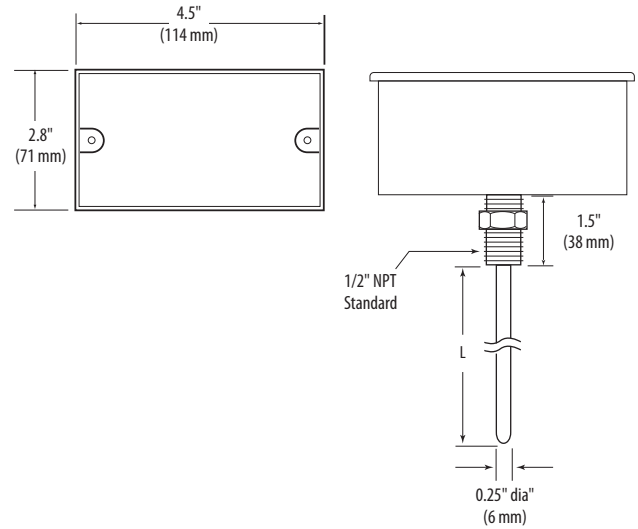
TIH
Dimensional Drawing



TID
Dimensional Drawing



TIW
Dimensional Drawing



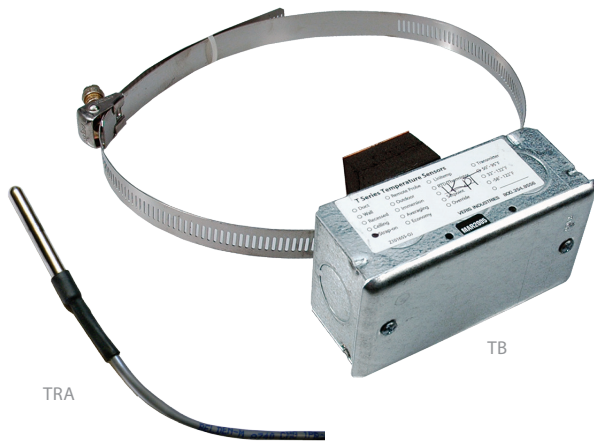
ORDERING INFORMATION

<p>TI</p> <p><input type="checkbox"/> Enclosure</p> <p>D = Duct G = Service Entry Body H = Threaded NPT Only W = Water Resistant Housing</p>	<p><input type="checkbox"/> Immersion Probe Length "L"</p> <p>A = 2 1/2" (64mm) B = 4" (102mm) C = 6" (152mm) D = 8" (203mm) E = 12" (305mm)</p>	<p><input type="checkbox"/> Thermowell</p> <p>0 = None 1 = Add Thermowell</p>	<p><input type="checkbox"/> Sensor Type</p> <p>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</p>	<p>Options</p> <p><input type="checkbox"/> Calibration Certificate</p> <p>0 = None 1 = 1-point cal validation** 2 = 2-point cal validation**</p> <p><input type="checkbox"/> Threads</p> <p>Blank = NPT A = BSPT*</p>												
<p>Thermowell Sizing</p> <table border="0"> <tr> <td>Probe Length</td> <td>Thermowell Length</td> </tr> <tr> <td>A (2 1/2") (64mm)</td> <td>1 1/2" (38mm)</td> </tr> <tr> <td>B (4") (102mm)</td> <td>3" (76mm)</td> </tr> <tr> <td>C (6") (152mm)</td> <td>5" (127mm)</td> </tr> <tr> <td>D (8") (203mm)</td> <td>7" (178mm)</td> </tr> <tr> <td>E (12") (305mm)</td> <td>11" (279mm)</td> </tr> </table>		Probe Length	Thermowell Length	A (2 1/2") (64mm)	1 1/2" (38mm)	B (4") (102mm)	3" (76mm)	C (6") (152mm)	5" (127mm)	D (8") (203mm)	7" (178mm)	E (12") (305mm)	11" (279mm)			
Probe Length	Thermowell Length															
A (2 1/2") (64mm)	1 1/2" (38mm)															
B (4") (102mm)	3" (76mm)															
C (6") (152mm)	5" (127mm)															
D (8") (203mm)	7" (178mm)															
E (12") (305mm)	11" (279mm)															
<p>* BSPT available with thermowell option only. ** Not available with W and Y high-accuracy thermistors.</p>																
<p>Example:</p> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">TI</td> <td style="padding: 2px 5px;">W</td> <td style="padding: 2px 5px;">D</td> <td style="padding: 2px 5px;">0</td> <td style="padding: 2px 5px;">H</td> <td style="padding: 2px 5px;">0</td> </tr> </table>					TI	W	D	0	H	0						
TI	W	D	0	H	0											



TB & TRA SERIES

High Accuracy Specialty Sensors



Secondary measurement

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

Easy installation

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

Long sensor life

Durable stainless steel sensing probe (TRA)

Multiple cable lengths

Multiple cable lengths for application flexibility (TRA)

The TB strap-on sensor uses a clamp to secure the unit to a pipe and a copper sensing plate for fast temperature response. The TB 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 TRA Series stainless steel remote probe is designed for high accuracy in remote temperature sensing applications. The TRA can be used in numerous refrigeration applications or can be mounted on pipes for chilled or heated water temperature sensing. It is easily installed and includes a durable stainless steel sensing probe and a two-wire twisted pair cable with strain relief. Multiple cable lengths are available for added flexibility.

SPECIFICATIONS

TB & TRA Series

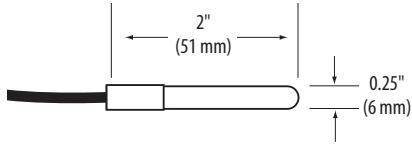
Wiring	22 AWG; 2-wire: RTD/Thermistor
LINITEMP OPTION	
Input Power	Class 2; 5 to 30 Vdc
Output	10mV/°C
Calibration Offset	1.5 °C (2.7 °F) typical; 2.5 °C (4.5 °F) max. at 25 °C (77 °F)*
Offset Over Temperature	1.8 °C (3.24 °F) typical; 3.0 °C (5.4 °F) max. over 0 to 70 °C (32 to 158 °F) range; 2.0 °C (3.6 °F) typical, 3.5 °C (6.3 °F) max. over -25 to 105 °C (-13 to 221 °F) range
Operating Temperature	-25 to 105 °C (-13 to 221 °F)
TB	Probe: -25 to 105 °C (-13 to 221 °F),
TRA	Wiring: -20 to 80 °C (-4 to 176 °F)
WARRANTY	
Limited Warranty	5 years

*Room temperature offset documented on each unit.

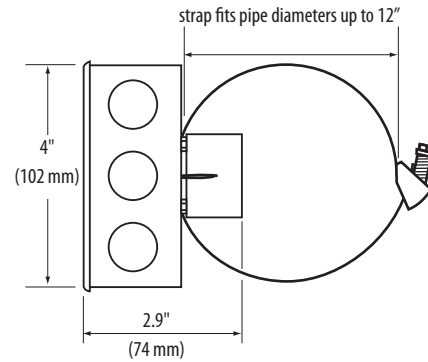
Note: See page 202 for thermistor table.



TRA
Dimensional Drawing



TB
Dimensional Drawing



ORDERING INFORMATION

Strap-on Bracket

	Diameter	Sensor Type	Calibration Certificate
TB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	A = 2 1/2" (6.4 cm) max. D = 8" (20 cm) max. E = 12" (31 cm) max.	B = 100R platinum, RTD C = 1k platinum, RTD D = 10k T2, Thermistor E = 2.2k, Thermistor F = 3k, Thermistor G = 10k CPC, Thermistor H = 10k T3, Thermistor I = 1k Balco (Nickel-iron) RTD J = 10k Dale, Thermistor K = 10k w/11k shunt, Thermistor M = 20k NTC, Thermistor N = 1800 ohm, Thermistor P = 10mV/°C, Linitemp R = 10k US, Thermistor S = 10k 3A221, Thermistor T = 100k, Thermistor U = 20k "D", Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor	0 = None 1 = 1-point cal validation* 2 = 2-point cal validation*
* Not available with W and Y high-accuracy thermistors.			

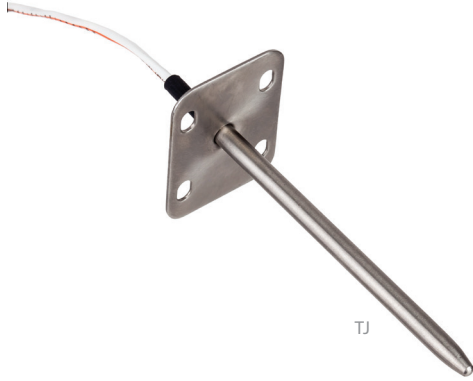
Remote Probe

	Sensor Type	Calibration Certificate	Cable Length																
TRA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
	B = 100R platinum, RTD C = 1k platinum, RTD D = 10k T2, Thermistor E = 2.2k, Thermistor F = 3k, Thermistor G = 10k CPC, Thermistor H = 10k T3, Thermistor I = 1k Balco (Nickel-iron) RTD J = 10k Dale, Thermistor K = 10k w/11k shunt, Thermistor M = 20k NTC, Thermistor N = 1800 ohm, Thermistor P = 10mV/°C, Linitemp R = 10k US, Thermistor S = 10k 3A221, Thermistor T = 100k, Thermistor U = 20k "D", Thermistor W = 10k T2 high accuracy, Thermistor Y = 10k T3 high accuracy, Thermistor	0 = None 1 = 1-point cal validation † 2 = 2-point cal validation †	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)**																
<p>Examples:</p> <table border="1"> <tr> <td>TB</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td>D</td> <td>C</td> <td>2</td> </tr> <tr> <td>TRA</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td>F</td> <td>1</td> <td></td> </tr> </table>				TB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		D	C	2	TRA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		F	1	
TB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
	D	C	2																
TRA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
	F	1																	
<p>*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. † Not available with W and Y high-accuracy thermistors.</p>																			



TJ SERIES

VAV Discharge Air Sensor for Reheat Applications



The 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	-25 to 105 °C (-13 to 221 °F)

LINITEMP OPTION

Input Power	Class 2; 5 to 30 Vdc
Output	10mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Calibration Offset	1.5 °C (2.7 °F) typical; 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
------------------	---------

Increased cable length affects the readings of lower resistance RTDs (100R platinum, RTD).
* Room temperature offset documented on each unit.

Note: See page 202 for thermistor table.

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

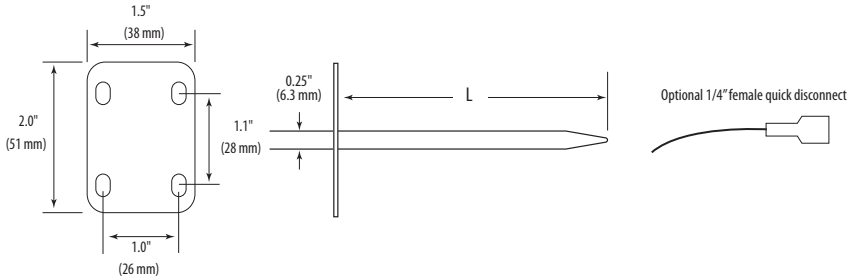
4" or 8" (102 mm or 204 mm) duct probes

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

<p>Probe Length "L"</p> <p>TJ <input type="checkbox"/></p> <p>B = 4" (102mm) D = 8" (204mm)</p>	<p>Sensor Type</p> <p><input type="checkbox"/></p> <p>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</p>	<p>Output</p> <p><input type="checkbox"/> R</p> <p>= Resistive</p>	<p>Cal Certificate</p> <p><input type="checkbox"/></p> <p>0 = None 1 = 1-point cal validation* 2 = 2-point cal validation*</p>	<p>Option</p> <p><input type="checkbox"/></p> <p>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</p>
---	--	--	--	---

Example:

TJ B D R 2 1

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

TA SERIES

High Accuracy Averaging Sensors



TA

The TA 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.

TA 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 for the flexible probe and 12", 18", 24", 30", 36", or 48" (0.3 m, 0.5 m, 0.6 m, 0.8 m, 0.9 m, or 1.2 m) for the rigid probe. This allows you to cover all your averaging applications with one line.

SPECIFICATIONS

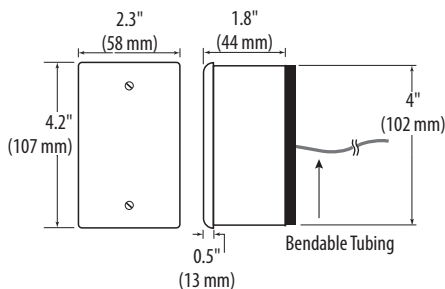
Wiring	22 AWG; 2-wire: RTD/Thermistor
Operating Temp	-25 to 105 °C (-13 to 221 °F)*
LINITEMP OPTION	
Input Power	Class 2; 5 to 30 Vdc
Output	10mV/°C
Operating Temp	-25 to 105 °C (-13 to 221 °F)
Calibration Error	1.5 °C (2.7 °F) typical; 2.5 °C (4.5 °F) max. at 25 °C (77 °F)*
Error over Temp	1.8 °C (3.24 °F) typical; 3.0 °C (5.4 °F) max. over 0 to 70 °C (32 to 158 °F) range; 2.0 °C (3.6 °F) typical, 3.5 °C (6.3 °F) max. over -25 to 105 °C (-13 to 221 °F) range

WARRANTY

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

* Room temperature offset documented on each unit.

DIMENSIONAL DRAWING



APPLICATIONS

- Heat exchangers
- Chillers

ORDERING INFORMATION

	Flexible Probe Length	Sensor Type	Calibration Certificate
TA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	M = 6' (1.8m)* H = 12' (3.6m) J = 24' (7.3m)	B = 100R platinum, RTD C = 1k platinum, RTD D = 10k, T2, Thermistor H = 10k, T3, Thermistor I = 1k Balco (Nickel-iron) RTD J = 10k, Dale, Thermistor M = 20k, NTC N = 1800 ohm, Thermistor P = 10mV/C, Linitemp R = 10k US, Thermistor	0 = None 1 = 1-point cal validation 2 = 2-point cal validation
Example: <input type="checkbox"/> TA <input type="checkbox"/> H <input type="checkbox"/> C <input type="checkbox"/> 2			
* Available with sensor types J, N, P.			



THERMISTOR TABLE

Class	Pt RTD		Balco RTD	THERMISTOR				
	100 Ohm	1000 Ohm	1000 Ohm	10k Type 2	10k Type 3	10k Dale	10k "G" US	20k
Accuracy	±0.3°C	±0.3°C	±1% @70°C	±1.0°C	±0.2°C	±0.2°C	±0.2°C	Consult
	0.00385 curve	0.00385 curve		-50/150°C	0/70°C	-20/70°C	0/70°C	Factory
Temp. Response*	PTC	PTC	PTC	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	10k Type 2	10k Type 3	10k Dale	10k "G" US	20k NTC
-50	-58	80.306	803.06	740.46	692,700	454,910	672,300	441,200	1,267,600
-40	-40	84.271	842.71	773.99	344,700	245,089	337,200	239,700	643,800
-30	-22	88.222	882.22	806.02	180,100	137,307	177,200	135,300	342,000
-20	-4	92.160	921.60	841.00	98,320	79,729	97,130	78,910	189,080
-10	14	96.086	960.86	877.46	55,790	47,843	55,340	47,540	108,380
0	32	100.000	1,000.00	913.66	32,770	29,588	32,660	29,490	64,160
10	50	103.903	1,039.03	952.25	19,930	18,813	19,900	18,780	39,440
20	68	107.794	1,077.94	991.82	12,500	12,272	12,490	12,260	24,920
25	77	109.735	1,097.35	1,013.50	10,000	10,000	10,000	10,000	20,000
30	86	111.673	1,116.73	1,035.18	8,055	8,195	8,056	8,194	16,144
40	104	115.541	1,155.41	1,077.68	5,323	5,593	5,326	5,592	10,696
50	122	119.397	1,193.97	1,120.52	3,599	3,894	3,602	3,893	7,234
60	140	123.242	1,232.42	1,166.13	2,486	2,763	2,489	2,760	4,992
70	158	127.075	1,270.75	1,210.75	1,753	1,994	1,753	1,990	3,512
80	176	130.897	1,308.97	1,254.55	1,258	1,462	1,258	1,458	2,516
90	194	134.707	1,347.07	1,301.17	919	1,088	917	1,084	1,833
100	212	138.506	1,385.06	1,348.38	682	821	679	816.8	1,356
110	230	142.293	1,422.93	1,397.13	513	628	511	623.6	1,016
120	248	146.068	1,460.68	1,447.44	392	486	389	481.8	770
130	266	149.832	1,498.32	1,496.28	303	380	301	376.4	591
Sensor Codes		B	C	I	D	H	J	R	M

To compute Linitemp Temperature
 mV reading/10 - 273.15 = Temperature in °C





OCCUPANCY SENSORS

Veris 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	205
MSB	Wall Switch Occupancy Sensors	207

LIGHTING CONTROL SELECTION GUIDE

CEILING MOUNT	WALL MOUNT
MSC page 205	MSB page 207



Reduce Energy Consumption & Control Energy Waste



MSx Series Occupancy Sensors

**Ceiling and
Wall Mount Options**

Automatic Control

With passive infrared technology.

Large Coverage Area

(2000 sq ft MSC & 1000 sq ft MSB).

Interested in learning more about the MSC & MSB Series occupancy sensors?
Contact an Occupancy Sensor Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on pages 205 & 207

VERIS 
INDUSTRIES



800.354.8556 | +1 503.598.4564 | sales@veris.com | intl@veris.com | www.veris.com

MSC SERIES

Uses the Latest Passive Infrared and Ultrasonic Technologies



MSC Series Occupancy Sensors 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	1 year
------------------	--------

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

Adjustable coverage

Adjustable coverage sensitivity (from 60 to 100%)

Daylight sensing

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

Auxiliary relay

Easily communicates with building control system

Adjustable time delay

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

Tamper resistant cover

Adjustment compartment cover...tamper resistant

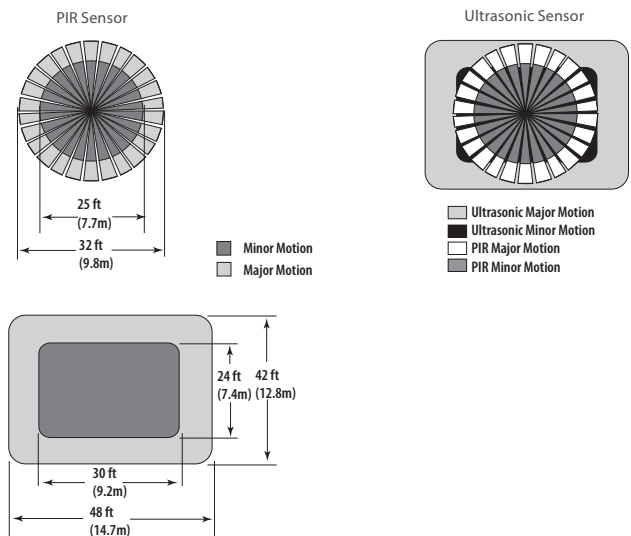
APPLICATIONS

- Lighting control based on occupancy
- Reducing energy usage
- Key component for LEED* certification programs retrofit installations
- MSC1000 – best for conference rooms, classrooms, and other general applications
- MSCD2000 – best for multi-stall bathrooms, large conference rooms, and warehouses
- MSCU2000 – best for lobbies, aisles, and great for multi-stall bathrooms

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

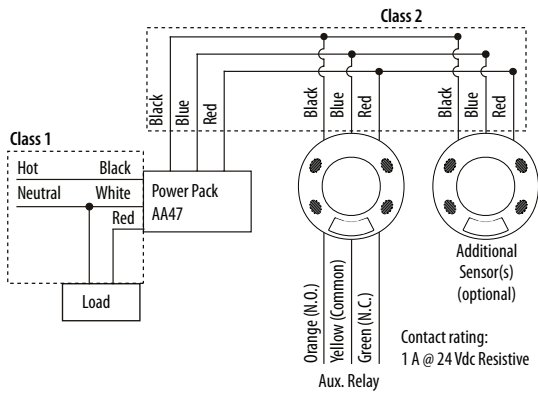
MSC SERIES

Coverage Patterns for 9 ft (2.8 m) Ceiling Height



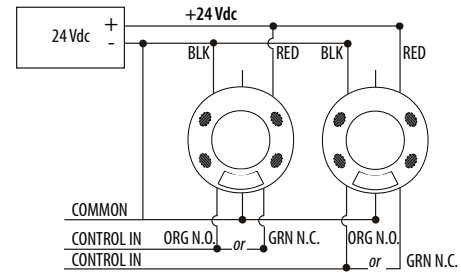
LOCAL LINE-POWER CONTROL MSC

Wiring Diagram



BUILDING CONTROL PANEL

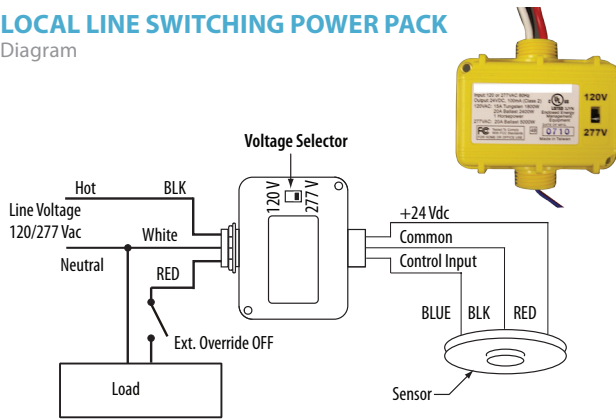
Wiring Diagram



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).

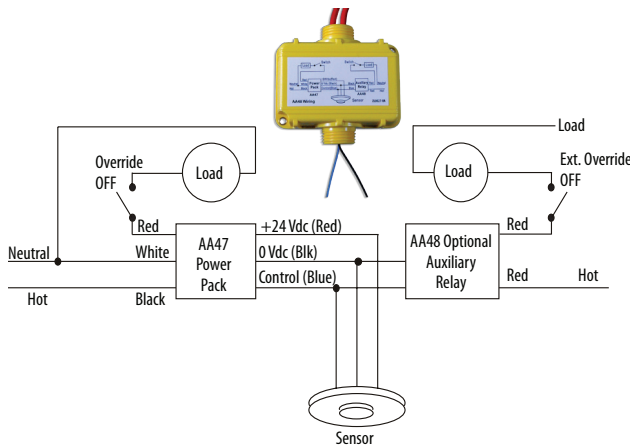
AA47 LOCAL LINE SWITCHING POWER PACK

System Diagram



AA48 AUXILIARY RELAY (OPTIONAL)

System Diagram



ORDERING INFORMATION

Sensing Technology

MSC

U = Ultrasonic
D = PIR + Ultrasonic
P = Passive Infrared (PIR)

Coverage

1000 = 1000 Sq. Ft. (Passive Infrared only)
2000 = 2000 Sq. Ft. (Ultrasonic or Dual technology only)

Example:

MSC D 2000

SPECIFICATIONS

AA47

Storage Temp.	-29 to 65 °C (-20 to 150 °F)
Operating Temp.	0 to 40 °C (32 to 104 °F)
Maximum Humidity	90% RH non-condensing
AC Power Input	120/277 Vac ± 10%, 60 Hz
Output Voltage	24 Vdc
Output Current	100 mA max.
Dimensions	3.2" (81.3 mm) x 3" (76.2 mm) x 1.75" (44.5 mm)

RELAY CONTACTS

Horsepower Rating	1HP@120V
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@120V
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	1 year
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AGENCY APPROVALS



Adjustable

Adjustable time delay

Line powered

No separate supply needed

Bypass button

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

Ballast compatibility

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

180 degrees

180-degree motion detection

Loading

No minimum loading requirement

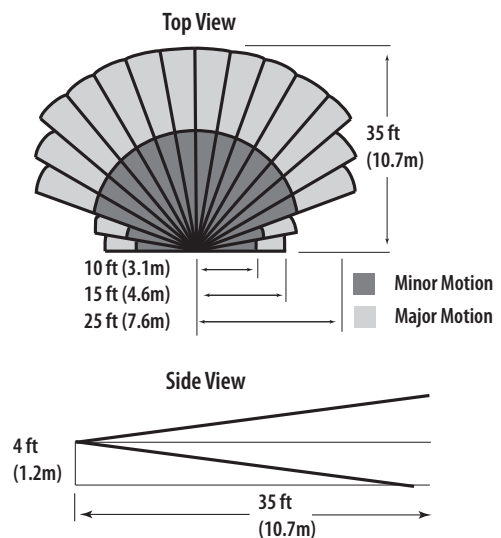
APPLICATIONS

- 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

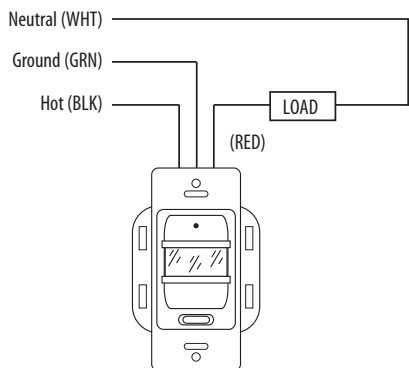
MSB SERIES

Coverage Patterns



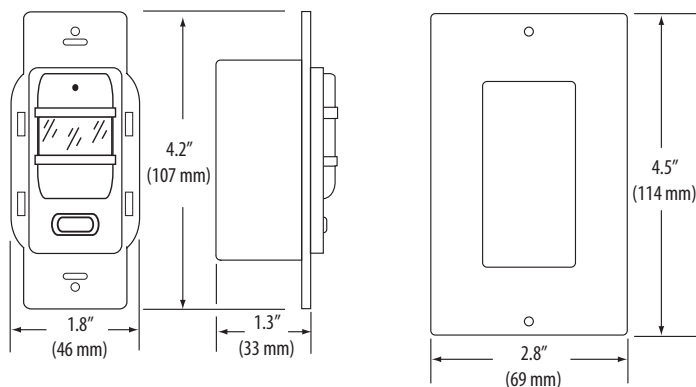
SINGLE-LEVEL LIGHTING

Wiring Diagram



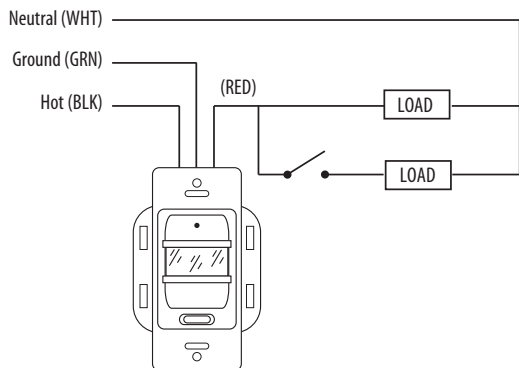
MSB SERIES

Dimensional Drawings



BI-LEVEL LIGHTING

Wiring Diagram



ORDERING INFORMATION

Sensing Technology	Turn On	# of Circuits	Color	
MSB P		1		Example: MSB P A 1 V
= Passive Infrared (PIR)	A = Automatic M = Manual		W = White V = Ivory	



SETPOINT DEVICES

The Veris line of thermostats and humidistats will help you guarantee accurate climate control in buildings with or without a central BAS controller. These devices can be programmed for independent control of dedicated mechanical equipment and can interface with a control system to report status via analog, protocol, or wireless communications.

MODEL	DESCRIPTION	PAGE
VT7200	Zoning Thermostats	211
VT7300	Fancoil Thermostats	213
VT8300	Room Temperature Controller	215
VTR83xx/ VC3xxxxE5000	Fancoil Thermostats, Retrofit Solution	217
VT8600	Room Temperature and Indoor Air Quality Controllers	219
VT7600	Roof Top Unit Thermostats	221
VH7200	Communicating Humidistat Series	223
VWG	Wireless Gateway	225
HT/HWS	Wall Mount Humidity Transmitter, Thermostat Humidistat Functions	227
TWS	Deluxe Temperature Transmitter with Thermostat Functions	229

SETPOINT SELECTION GUIDE

	ROOM CONTROL	ZONE CONTROL	FANCOIL CONTROL	ROOFTOP CONTROL	HEAT PUMP CONTROL
Humidistat	VH *, HT/HWS pages 223, 227		VT8300 * page 215	VT7600 * page 221	
Thermostat	TWS page 229	VT7200 * page 211	VT7300 *, VT8300 * pages 213, 215	VT7600 * page 221	VT7600 * page 221
Wireless	VH * page 223	VT7200 * page 211	VT7300 *, VT8300 * pages 213, 215	VT7600 * page 221	VT7600 * page 221
PIR	VH * page 223	VT7200 * page 211	VT7300 *, VT8300 * pages 213, 215	VT7600 * page 221	VT7600 * page 221
BACnet	VH * page 223	VT7200 * page 211	VT7300 *, VT8300 * pages 213, 215	VT7600 * page 221	VT7600 * page 221
LON	VH * page 223	VT7200 * page 211	VT7300 * page 213	VT7600 * page 221	VT7600 * page 221

* Indicates a series of products.



Accurate, Optimal Climate Control



HT Humidity Transmitter with Thermostat & Humidistat Function

Adjust on the Fly

Adjust to the application with switch-selectable outputs.

Smart Communication

Communicates the actual RH, temperature, and the setpoint selected by the user to the control system, giving greater accuracy and control.

Field Flexibility

Field-replaceable humidity sensor reduces maintenance costs.

Interested in learning more about HT capabilities and applications?

Contact a Setpoint Devices Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 227

VERIS 
INDUSTRIES



VT7200 SERIES

BACnet, Echelon, and Wireless
Models Available



VT7200C5000



VT7200C5500

The VT7200C5x00 Series features a backlit LCD display with dedicated function menu keys for simple operation. Accurate temperature control is achieved using the PI proportional control algorithm. Models have two 3-point floating outputs (can be set for On/Off). In addition, remote room sensing is available. All models contain an auxiliary contact that can be used to control lighting or auxiliary reheat. All devices are also available with Echelon, BACnet MS/TP, or wireless network adapters.

SPECIFICATIONS

Thermostat Power Requirements	19 to 30 Vac; 50 or 60 Hz; 2 VA Class 2
Operating Conditions	0 to 50 °C (32 to 122 °F); 0 to 95% RH non-condensing
Storage Conditions	-30 to 50 °C (-22 to 122 °F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10k NTC thermistor
Resolution	± 0.1 °C (± 0.2 °F)
Control Accuracy Temp.	±0.5 °C (±0.9 °F) @ 21 °C (70 °F) typical, calibrated
Occupied and Unoccupied Setpoint Range Cooling	12 to 38 °C (54 to 100 °F)
Occupied and Unoccupied Setpoint Range Heating	4.5 to 32 °C (40 to 90 °F)
Room and Outdoor Air Temperature Display	-40 to 50 °C (-40 to 122 °F)
Proportional Band for Room Temperature Range Control	Cooling & Heating: 1.8 °C (3.2 °F)
Binary Inputs	Dry contact across terminal BI1, BI2 & UI3 to Scom
Outputs Rating	Triac output: 30 Vac, 1 A max., 3 A in-rush; Analog: 0 to 10 Vdc into 2k Ω resistance min.

Advanced occupancy functions

Advanced occupancy functions through the network or smart local occupancy sensing

Auxiliary output

Can be used for lighting or reheating

Pre-configured sequences

Pre-configured sequences of operation...one model meets more applications and reduces project delivery cost

APPLICATIONS

- Heating/Cooling valves
- Electric duct heaters
- Changeover sensors

Minimize parameter tampering

Unique local configuration utility

Lockable keypad

Tamper resistant, no need for thermostat guards

Configurable inputs

Three configurable inputs for added functionality

Economizer Analog Output Rating	0 to 10 Vdc into 2k Ω resistance min.
Economizer Analog Output Accuracy	±3% typical
Wire Gauge	18 gauge maximum, 22 gauge recommended
Dimensions	4.94" x 3.38" x 1.13"
Approximate Shipping Weight	0.75 lb (0.34 kg)

WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

UL: 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN, XAPX (US) and XAPX7 (Canada)

FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)

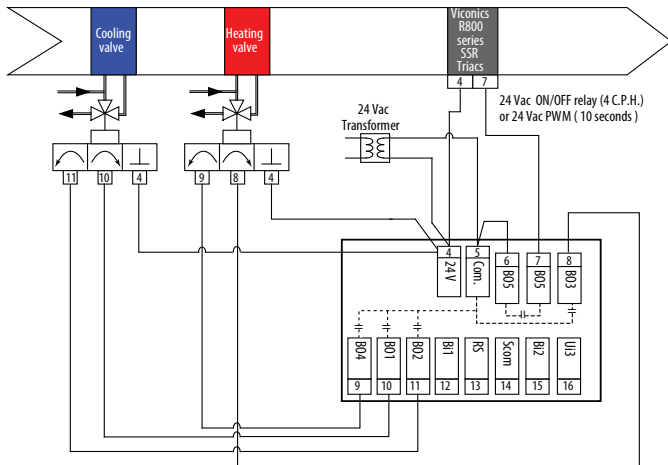
Industry Canada: ICES-003 (Canada)

CE: EMC Directive 2004/108/EC (European Union)



TYPICAL 4-PIPE APPLICATION

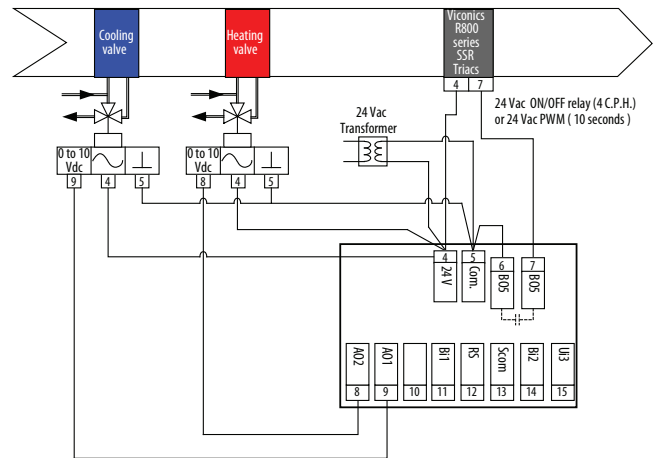
Wiring Examples



* Use for heating and cooling valves and electric duct heaters.

TYPICAL 4-PIPE APPLICATION

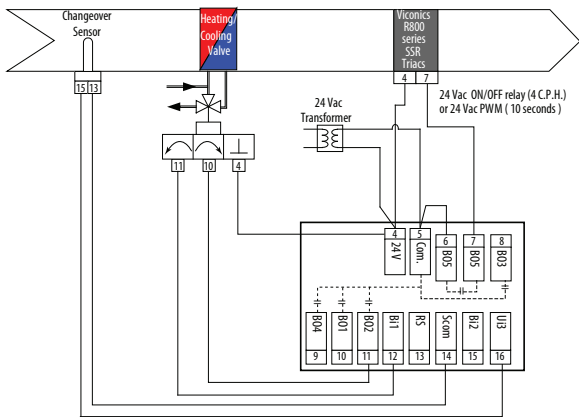
Wiring Examples



* Use for heating and cooling valves and electric duct heaters.

TYPICAL 2-PIPE APPLICATION

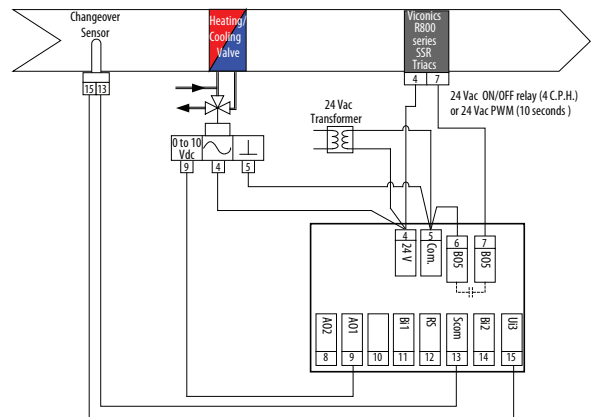
Wiring Examples



* Use for heating and cooling valves, electric duct heaters, and changeover sensors.

TYPICAL 2-PIPE APPLICATION

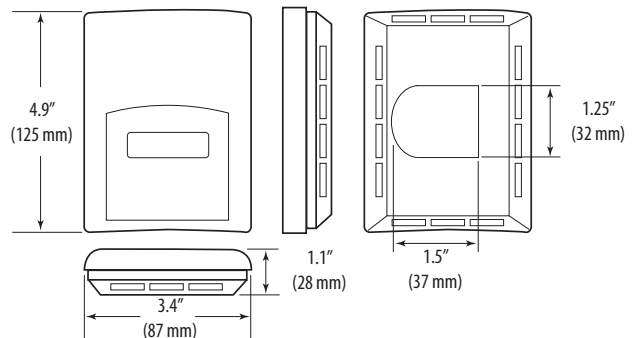
Wiring Examples



ORDERING INFORMATION

MANUF. PART #	ORDER #	DESCRIPTION	COMM.
VT7200C5000	U008-0001	Zone Thermostat with 2 Floating + 1 Digital;	Stand alone
VT7200C5000B	U008-0002	PIR ready	BACnet (MS/TP)
VT7200C5000E	U008-0003	(PIR cover not included)	Echelon
VT7200C5000W	U008-0004		Wireless (Zigbee)
VT7200C5500	U008-0005	Zone Thermostat with 2 Floating + 1 Digital;	Stand alone
VT7200C5500B	U008-0006	PIR factory-equipped	BACnet (MS/TP)
VT7200C5500E	U008-0007		Echelon
VT7200C5500W	U008-0008		Wireless (Zigbee)
VT7200F5000	U008-0009	Zone Thermostat with 2 Analog + 1 Digital;	Stand alone
VT7200F5000B	U008-0010	PIR ready	BACnet (MS/TP)
VT7200F5000E	U008-0011	(PIR cover not included)	Echelon
VT7200F5000W	U008-0012		Wireless (Zigbee)
VT7200F5500	U008-0013	Zone Thermostat with 2 Analog + 1 Digital;	Stand alone
VT7200F5500B	U008-0014	PIR factory-equipped	BACnet (MS/TP)
VT7200F5500E	U008-0015		Echelon
VT7200F5500W	U008-0016		Wireless (Zigbee)

DIMENSIONAL DRAWING



VT7300 SERIES

BACnet, Echelon, and Wireless
Models Available



VT7300C5000



VT7300C5500

The VT7300 PI thermostat family is designed for fancoil control. The product features a backlit LCD display with dedicated function menu buttons for simple operation. Accurate temperature control is achieved with the PI proportional control algorithm, which virtually eliminates temperature offsets associated with traditional, differential-based thermostats. All models can control three, two, or single fan speeds. Three additional inputs are also provided for added functionality. All models feature configurable System and Fan button functions to meet a range of applications and an auxiliary contact that controls lighting or auxiliary reheating. All devices are also available with Echelon or BACnet MS/TP network adapters.

SPECIFICATIONS

Thermostat Power Requirements	19 to 30 Vac; 50 or 60 Hz; 2 VA Class 2
Operating Conditions	0 to 50 °C (32 to 122 °F); 0 to 95% RH non-condensing
Storage Conditions	-30 to 50 °C (-22 to 122 °F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10k NTC thermistor
Resolution	±0.1 °C (± 0.2 °F)
Control Accuracy: Temp Humidity	±0.5 °C (±0.9 °F) @ 21 °C (70 °F) typical, calibrated ±3% from 20 to 70% RH at 21 °C (70 °F)
Occupied and Unoccupied Setpoint Range Cooling	12 to 38 °C (54 to 100 °F)
Occupied and Unoccupied Setpoint Range Heating	4.5 to 32 °C (40 to 90 °F)
Room and Outdoor Air Temperature Display	-40 to 50 °C (-40 to 122 °F)
Proportional Band for Room Temperature Range Control	Cooling & Heating: 1.8 °C (3.2 °F)
Binary Inputs	Dry contact across terminal BI1, BI2 & UI3 to Scom
Outputs Rating	Triac output: 30 Vac, 1 A max., 3 A in-rush; Analog: 0 to 10 Vdc into 2k Ω resistance min.
Economizer Analog Output Rating	0 to 10 Vdc into 2k Ω resistance min.
Economizer Analog Output Accuracy	±3% typical

Available internal humidity sensing

Increased occupant comfort through dehumidification

Configurable sequences

Configurable sequences of operation...single model meets more applications

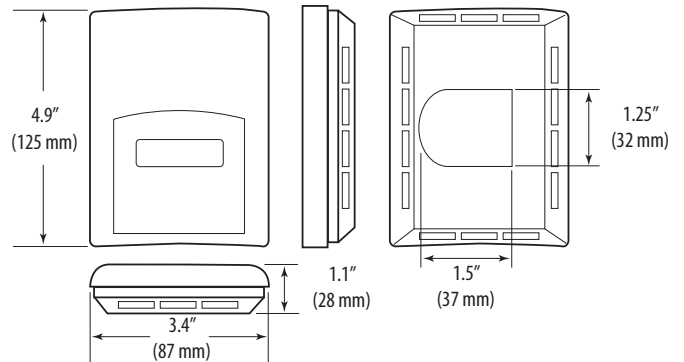
Advanced occupancy functions

Advanced occupancy functions through the network or smart local occupancy sensing

APPLICATIONS

- Three-speed fans
- Heating/cooling valves
- Electric duct heaters
- Changeover sensors

DIMENSIONAL DRAWING



Wire Gauge	18 gauge maximum, 22 gauge recommended
Dimensions	4.94" x 3.38" x 1.13"
Approximate Shipping Weight	0.75 lb (0.34 kg)

WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance.

UL: 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN, XAPX (US) and XAPX7 (Canada)

FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)

Industry Canada: ICES-003 (Canada)

CE: EMC Directive 2004/108/EC (European Union)

Configurable inputs

Three configurable inputs for added functionality

Configurable fan

Configurable fan functions button...meets more applications with a single model

Minimize parameter tampering

Unique local configuration utility



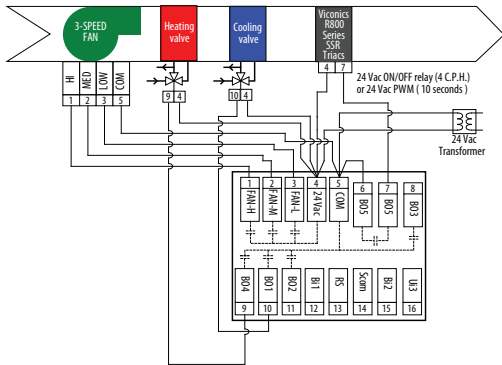
ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7300C5000	U009-0005	Fancoil Commercial 2	Standalone
VT7300C5000B	U009-0006	Floating + 1 Auxiliary;	BACnet (MS/TP)
VT7300C5000E	U009-0007	PIR Ready (PIR cover not included)	Echelon
VT7300C5000W	U009-0008		Wireless (Zigbee)
VT7305C5000	U009-0013	Fancoil Hotel 2 Floating	Standalone
VT7305C5000B	U009-0014	+ 1 Auxiliary;	BACnet (MS/TP)
VT7305C5000E	U009-0015	PIR Ready (PIR cover not included)	Echelon
VT7305C5000W	U009-0016		Wireless (Zigbee)
VT7350C5000	U009-0017	Fancoil Commercial 2	Standalone
VT7350C5000B	U009-0018	Floating + 1 Auxiliary + RH;	BACnet (MS/TP)
VT7350C5000E	U009-0019	PIR Ready (PIR cover not included)	Echelon
VT7350C5000W	U009-0020		Wireless (Zigbee)
VT7355C5000	U009-0021	Fancoil Hotel 2 Floating	Standalone
VT7355C5000B	U009-0022	+ 1 Auxiliary + RH;	BACnet (MS/TP)
VT7355C5000E	U009-0023	PIR Ready (PIR cover not included)	Echelon
VT7355C5000W	U009-0024		Wireless (Zigbee)
VT7300C5500	U009-0033	Fancoil Commercial 2	Standalone
VT7300C5500B	U009-0034	Floating + 1 Auxiliary;	BACnet (MS/TP)
VT7300C5500E	U009-0035	PIR factory equipped	Echelon
VT7300C5500W	U009-0036		Wireless (Zigbee)
VT7305C5500	U009-0037	Fancoil Hotel 2 Floating	Standalone
VT7305C5500B	U009-0038	+ 1 Auxiliary;	BACnet (MS/TP)
VT7305C5500E	U009-0039	PIR factory equipped	Echelon
VT7305C5500W	U009-0040		Wireless (Zigbee)
VT7350C5500	U009-0041	Fancoil Commercial 2	Standalone
VT7350C5500B	U009-0042	Floating + 1 Auxiliary + RH;	BACnet (MS/TP)
VT7350C5500E	U009-0043	PIR factory equipped	Echelon
VT7350C5500W	U009-0044		Wireless (Zigbee)
VT7355C5500	U009-0045	Fancoil Hotel 2 Floating	Standalone
VT7355C5500B	U009-0046	+ 1 Auxiliary + RH;	BACnet (MS/TP)
VT7355C5500E	U009-0047	PIR factory equipped	Echelon
VT7355C5500W	U009-0048		Wireless (Zigbee)

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7300F5000	U009-0049	Fancoil Commercial 2	Standalone
VT7300F5000B	U009-0050	Analog + 1 Auxiliary;	BACnet (MS/TP)
VT7300F5000E	U009-0051	PIR Ready (PIR cover not included)	Echelon
VT7300F5000W	U009-0052		Wireless (Zigbee)
VT7305F5000	U009-0053	Fancoil Hotel 2 Analog +	Standalone
VT7305F5000B	U009-0054	1 Auxiliary;	BACnet (MS/TP)
VT7305F5000E	U009-0055	PIR Ready (PIR cover not included)	Echelon
VT7305F5000W	U009-0056		Wireless (Zigbee)
VT7350F5000	U009-0057	Fancoil Commercial 2	Standalone
VT7350F5000B	U009-0058	Analog + 1 Auxiliary + RH;	BACnet (MS/TP)
VT7350F5000E	U009-0059	PIR Ready (PIR cover not included)	Echelon
VT7350F5000W	U009-0060		Wireless (Zigbee)
VT7355F5000	U009-0061	Fancoil Hotel 2 Analog +	Standalone
VT7355F5000B	U009-0062	1 Auxiliary + RH;	BACnet (MS/TP)
VT7355F5000E	U009-0063	PIR Ready (PIR cover not included)	Echelon
VT7355F5000W	U009-0064		Wireless (Zigbee)
VT7300F5500	U009-0065	Fancoil Commercial 2	Standalone
VT7300F5500B	U009-0066	Analog + 1 Auxiliary;	BACnet (MS/TP)
VT7300F5500E	U009-0067	PIR factory equipped	Echelon
VT7300F5500W	U009-0068		Wireless (Zigbee)
VT7305F5500	U009-0069	Fancoil Hotel 2 Analog +	Standalone
VT7305F5500B	U009-0070	1 Auxiliary;	BACnet (MS/TP)
VT7305F5500E	U009-0071	PIR factory equipped	Echelon
VT7305F5500W	U009-0072		Wireless (Zigbee)
VT7350F5500	U009-0073	Fancoil Commercial 2	Standalone
VT7350F5500B	U009-0074	Analog + 1 Auxiliary + RH;	BACnet (MS/TP)
VT7350F5500E	U009-0075	PIR factory equipped	Echelon
VT7350F5500W	U009-0076		Wireless (Zigbee)
VT7355F5500	U009-0077	Fancoil Hotel 2 Analog +	Standalone
VT7355F5500B	U009-0078	1 Auxiliary + RH;	BACnet (MS/TP)
VT7355F5500E	U009-0079	PIR factory equipped	Echelon
VT7355F5500W	U009-0080		Wireless (Zigbee)

TYPICAL 4-PIPE APPLICATION, ON/OFF OUTPUTS

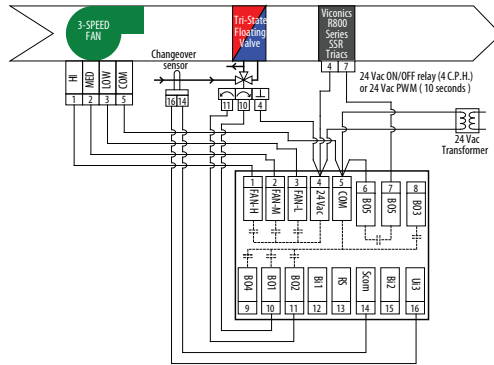
Wiring Examples



* Use for heating and cooling valves, 3-speed fans, and electric duct heaters.

TYPICAL 2-PIPE APPLICATION, FLOATING OUTPUTS

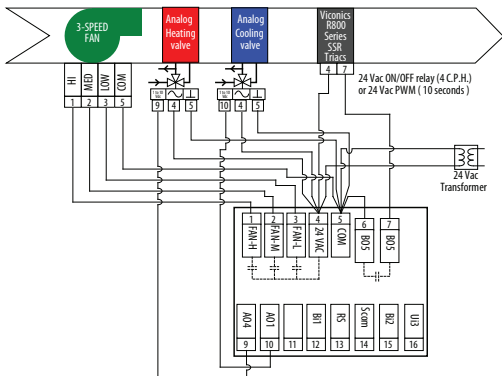
Wiring Examples



* Use for heating and cooling valves, 3-speed fans, and electric duct heaters.

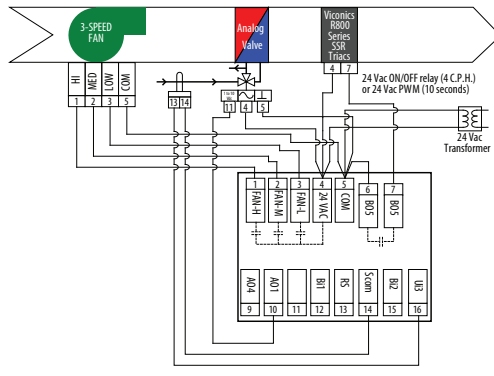
TYPICAL 4-PIPE APPLICATION

Wiring Examples



TYPICAL 2-PIPE APPLICATION

Wiring Examples



VT8300 SERIES

Network Ready, BACnet MS/TP, and Wireless Models Available



Smart energy management has never been easier than with the VT8300 Series Fan Coil Room Controllers. Designed for new construction and retrofit projects, the Room Controllers dramatically decrease project delivery costs by reducing installation, configuration and commissioning time. No complex software or tools are required to customize functionality in order to meet your applications requirements. The Room Controllers provide all the advanced features and monitoring functions required by modern building automation systems in a simple compact enclosure.

The Room Controllers are specifically designed to provide exceptional temperature control of multi-speed Fan Coil units. All models can provide advanced occupancy routines and automatic energy savings during occupied periods without sacrificing occupant comfort. When compared to traditional building automation controllers, the VT8300 series Fan Coil Room Controllers provide unmatched return on investment.

SPECIFICATIONS

Thermostat Power Requirements	7.0 Vdc \pm 10%, 2.4 W min.; 24 Vac \pm 15%; 50/60 Hz; 6 to 100 VA (rating max.)
Operating Conditions	0 to 50 °C (32 to 122 °F); 0 to 95% RH non-condensing
Storage Conditions	-30 to 50 °C (-22 to 122 °F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10k NTC type 2 thermistor
Temp. Sensor Resolution	\pm 0.1 °C (\pm 0.2 °F)
Temp. Control Accuracy	\pm 0.5 °C (\pm 0.9 °F) @ 21 °C (70 °F) typical calibrated
Humidity Sensor and Calibration	Single point calibrated bulk polymer sensor
Humidity Sensor Precision	Reading range from 10 to 90% RH non-condensing 10 to 20% precision is 10%; 20 to 80% precision is 5%; 80 to 90% precision is 10%
Humidity Sensor Stability	<1.0% annual drift (typical)
Dehumidification Setpoint Range	30 to 95% RH
Occupied and Unoccupied Setpoint Range Cooling	12 to 38 °C (54 to 100 °F)

Commercial and hospitality

Suitable for both commercial and hospitality markets and systems

Digital touch screen

Customizable color digital touch screen interface with multi-language support

7-day occupancy scheduling

2 to 4 events

Optional humidity sensor

Humidity sensor with on-board humidification strategy (optional)

Optional cover

Optional occupancy sensor cover

Advanced occupancy functions

For commercial and lodging applications

Occupied and Unoccupied Setpoint Range Heating	5 to 32 °C (40 to 90 °F)
Room and Outdoor Air Temperature Display	-40 to 50 °C (-40 to 122 °F)
Proportional Band for Room Temperature Range Control	Cooling & Heating: 1.8 °C (3.2 °F)
Binary Inputs	Dry contact across terminal BI1, BI2 and UI3 to Scom
Economizer Analog Output Rating	0 to 10 Vdc into 2k Ω resistance min.
Economizer Analog Output Accuracy	\pm 3% typical
Wire Gauge	18 gauge maximum, 22 gauge recommended

WARRANTY

Limited Warranty	18 months
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AGENCY APPROVALS



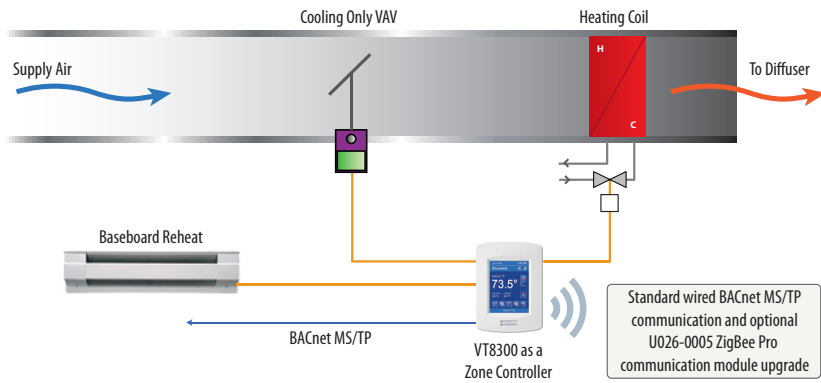
*The CE mark indicates RoHS2 compliance.

UL: 61010-1 (2nd edition); CSA: 61010-1 (3rd edition); IEC: 61010-1 (3rd edition), EN 60950-1: 2006A2: 2013, UL 873, CSA 22.2 No. 24-93; 61326-1:2005; FCC: Part 15, Subpart B; CE: EMC Directive 2004/108/EC (European Union); wireless models: FCC Part 15, Subpart C; R&TTE Directive 1999/5/EC; EN: 301 489-1 V1.9.2, 301 328 V1.8.1; RSS 210

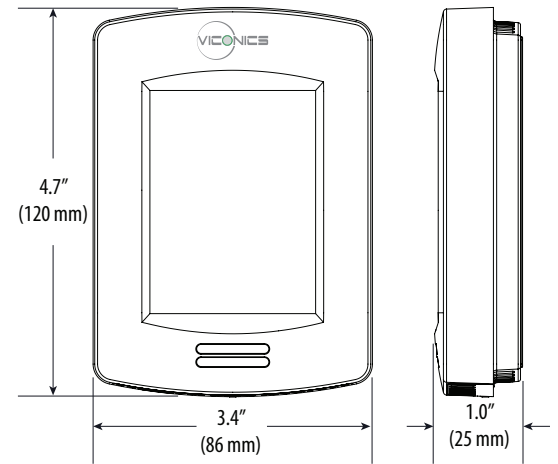


TYPICAL ZONE CONTROLLER APPLICATION

Wiring Examples

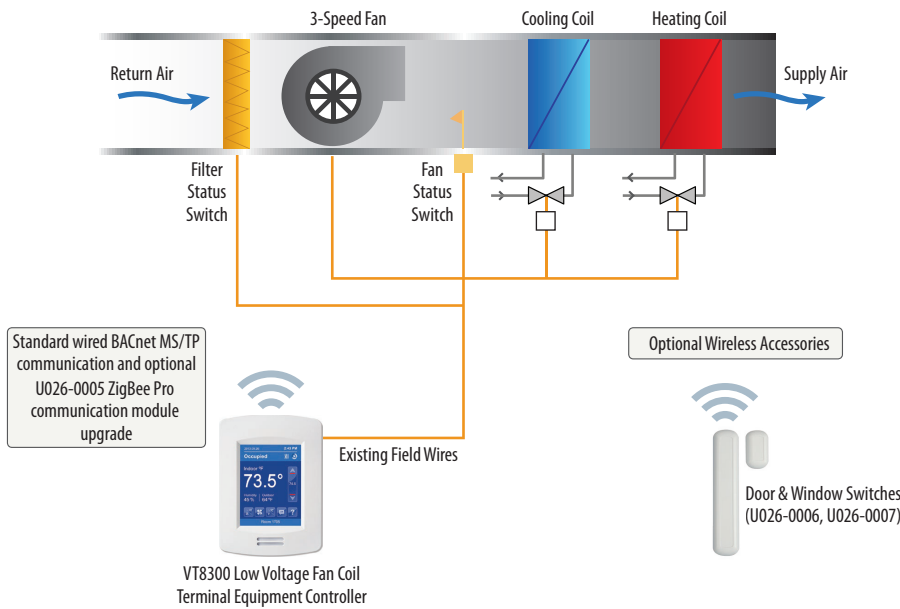


DIMENSIONAL DRAWING



TYPICAL LOW VOLTAGE FAN COIL APPLICATION

Wiring Examples



SELECTABLE COLOR SCHEMES AND LANGUAGES



Dark grey / English HMI



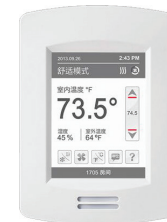
Blue / French HMI



Grey / Spanish HMI



Green / English HMI



White / Chinese HMI

ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION
VT8300U5000B	U026-0001	Fancoil Control, Low Voltage, BACnet
VT8350U5000B	U026-0002	Fancoil Control, Low Voltage, RH, BACnet
VT8300U5500B	U026-0003	Fancoil Control, Low Voltage, PIR, BACnet
VT8350U5500B	U026-0004	Fancoil Control, Low Voltage, RH, PIR, BACnet
VCM8000V5000P	U026-0005	Wireless Communication Card - ZigBee Pro
VWA5000D5000W	U026-0006	Wireless Door Switch Accessory
VWA5000W5000W	U026-0007	Wireless Window Switch Accessory

VTR83X0A5X SERIES/ VC3XXxE5000

Network Ready, BACnet MS/TP,
and Wireless Models Available



VTR83x0A5x



VC3xxxE5000

This two component retrofit option consists of the VTR8300 terminal equipment controller and the VC3000 relay pack. Together, they provide an easy solution for retrofitting fan coil unit thermostats without requiring upgrades to other components such as relays, transformers, controllers, sensors, and network wiring. Existing line voltage wiring between the fan coil unit and temperature controller can be reused, further minimizing overall labor and installation costs.

The VC3000 relay pack features an onboard universal voltage power supply and line-voltage relays that directly drive fractional horsepower fan motors and valves. The VTR8300 controller features a fully digital multi-language touch screen display that can be user customized. The controller's built-in commissioning and configuration utility, its temperature sensor, and the optional humidity and occupancy sensor, provide maximum flexibility. The VTR8300 controller is available in Network Ready, BACnet® MS/TP or wireless ZigBee® networked models.

SPECIFICATIONS

VTR83x0A5x Series/VC3xxxE5000

Thermostat Power Requirements	7 Vdc, 2.4 W min. (from VC3000)
Operating Conditions	0 to 50 °C (32 to 122 °F); 0 to 95% RH non-condensing
Storage Conditions	-30 to 50 °C (-22 to 122 °F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10k NTC type 2 thermistor
Temp. Sensor Resolution	± 0.1 °C (± 0.2 °F)
Temp. Control Accuracy	±0.5 °C (±0.9 °F) @ 21 °C (70 °F) typical calibrated
Humidity Sensor and Calibration	Single point calibrated bulk polymer sensor
Humidity Sensor Precision	Reading range from 10 to 90% RH non-condensing 10 to 20% precision is 10%; 20 to 80% precision is 5%; 80 to 90% precision is 10%

Commercial and hospitality

Suitable for both commercial and hospitality markets and systems (VTR8300 Series)

Extremely compact design

(VC3000 Series)

Digital touch screen

Customizable color digital touch screen interface with multi-language support (VTR8300 Series)

90 to 277 Vac

Line powered from 90 to 277 Vac, 50 to 60 Hz (VC3000 Series)

7-day occupancy scheduling

2 to 4 events (VTR8300 Series)

Wire-leads

Wire-leads for line-voltage connections (VC3000 Series)

Humidity Sensor Stability	<1.0% annual drift (typical)
Dehumidification Setpoint Range	30 to 95% RH
Occupied and Unoccupied Setpoint Range Cooling	12 to 38 °C (54 to 100 °F)
Occupied and Unoccupied Setpoint Range Heating	5 to 32 °C (40 to 90 °F)
Room and Outdoor Air Temperature Display	-40 to 50 °C (-40 to 122 °F)
Proportional Band for Room Temperature Range Control	Cooling & Heating: 1.8 °C (3.2 °F)
Binary Inputs	Dry contact across terminal BI1, BI2 & UI3 to Scom
Economizer Analog Output Rating	0 to 10 Vdc into 2k Ω resistance min.
Economizer Analog Output Accuracy	±3% typical
Wire Gauge	18 gauge maximum, 22 gauge recommended

WARRANTY

Limited Warranty 18 months

AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance.

UL: 61010-1 (2nd edition); CSA: 61010-1 (3rd edition); IEC: 61010-1 (3rd edition), EN 60950-1: 2006A2: 2013, UL 873, CSA 22.2 No. 24-93; 61326-1:2005; FCC: Part 15, Subpart B; CE: EMC Directive 2004/108/EC (European Union); wireless models: FCC Part 15, Subpart C; R&TTE Directive 1999/5/EC; EN: 301 489-1 V1.9.2, 301 328 V1.8.1; RSS 210



WALL CONTROLLERS

Ordering Information

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VTR8300A5000B	U025-0002	Fancoil Terminal Equipment Controller, PIR ready (PIR cover not included)	BACnet
VTR8300A5000P	U025-0003	Fancoil Terminal Equipment Controller, PIR ready (PIR cover not included)	Wireless (Zigbee)
VTR8300A5500B	U025-0005	Fancoil Terminal Equipment Controller, PIR factory equipped	BACnet
VTR8300A5500P	U025-0006	Fancoil Terminal Equipment Controller, PIR factory equipped	Wireless (Zigbee)
VTR8350A5000B	U025-0008	Fancoil Terminal Equipment Controller, PIR ready (PIR cover not included), onboard humidity sensor	BACnet
VTR8350A5000P	U025-0009	Fancoil Terminal Equipment Controller, PIR ready (PIR cover not included), onboard humidity sensor	Wireless (Zigbee)
VTR8350A5500B	U025-0011	Fancoil Terminal Equipment Controller, PIR factory equipped, onboard humidity sensor	BACnet
VTR8350A5500P	U025-0012	Fancoil Terminal Equipment Controller, PIR factory equipped, onboard humidity sensor	Wireless (Zigbee)

RELAY PACKS

Ordering Information

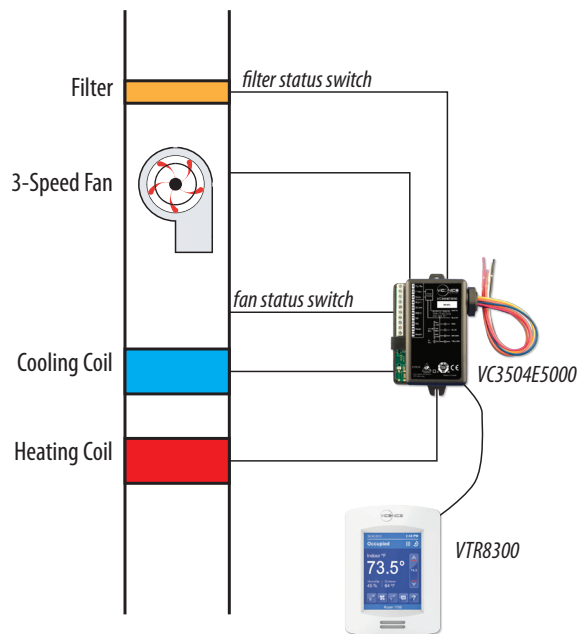
MANUF. PART #	ORDERING #	DESCRIPTION
VC3500E5000	U025-0013	Transformer relay pack, 5 relay fan outputs
VC3504E5000	U025-0014	Transformer relay pack, 5 relay fan outputs and 4 outputs
VC3514E5000	U025-0015	Transformer relay pack, 5 relay fan outputs, smart Vdc OCC output, and 4 inputs
VC3400E5000	U025-0016	Transformer relay pack, 4 relay fan outputs and smart Vdc output
VC3404E5000	U025-0017	Transformer relay pack, 4 relay fan outputs, smart Vdc output, and 4 inputs
VC3300E5000	U025-0018	Transformer relay pack, 3 slave fan outputs

APPLICATIONS

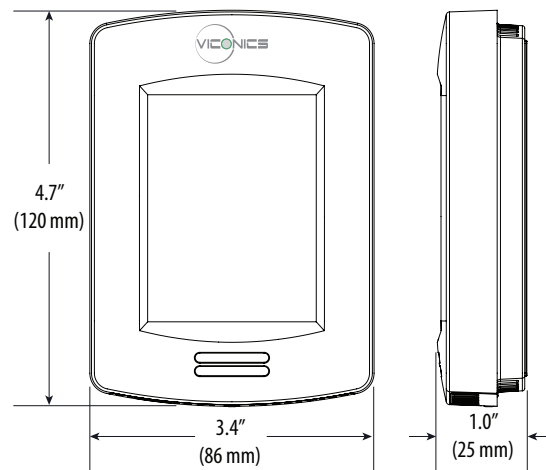
Wall Control and Relay Pack Applications (BACnet models shown, wireless similar)

Application	Outputs/Inputs	Controller Manuf. Part #	Controller Ordering #	Relay Pack Manuf. Part #	Relay Pack Ordering #
2 or 4 pipe, up to 3 speed fan, humidity control	1H/1C with reheat	VTR8350A5000B	U025-0008	VC3500E5000	U025-0013
	1H/1C with 4 inputs and reheat	VTR8350A5000B	U025-0008	VC3504E5000	U025-0014
	1H/1C with 4 inputs, reheat, and occ. output	VTR8350A5000B	U025-0008	VC3514E5000	U025-0015
2 pipe, up to 3 speed fan	1H/1C with pulsed reheat	VTR8300A5000B	U025-0002	VC3500E5000	U025-0013
	1H/1C with 4 inputs and pulsed reheat	VTR8300A5000B	U025-0002	VC3504E5000	U025-0014
2 or 4 pipe, up to 3 speed fan, humidity control	1H/1C with reheat	VTR8350A5000B	U025-0008	VC3500E5000	U025-0013
	1H/1C with 4 inputs and reheat	VTR8350A5000B	U025-0008	VC3504E5000	U025-0014
	1H/1C with 4 inputs, reheat, and occ. output	VTR8350A5000B	U025-0008	VC3514E5000	U025-0015
2 pipe, up to 3 speed fan	1H/1C with pulsed reheat	VTR8300A5000B	U025-0002	VC3500E5000	U025-0013
	1H/1C with 4 inputs and pulsed reheat	VTR8300A5000B	U025-0002	VC3504E5000	U025-0014
Slave fan control only	3 fan outputs	VTR8300A5000B	U025-0002	VC3300E5000	U025-0018

WIRING EXAMPLES



DIMENSIONAL DRAWING



VT8600 SERIES

Network Ready, BACnet MS/TP, and Wireless Models Available



VT8600

Smart energy management has never been easier than with the VT8600 Series Room Temperature and Indoor Air Quality (IAQ) Controller. Designed for new construction and retrofit projects, the temperature and IAC controllers dramatically decrease project delivery costs by reducing installation, configuration and commissioning time. No complex software or tools are required to customize functionality in order to meet your applications requirements. The Room Controllers provide all the advanced features and monitoring functions required by modern building automation systems in a simple compact enclosure.

The Room Controllers are specifically designed to provide exceptional temperature control of multi-speed Fan Coil units. All models can provide advanced occupancy routines and automatic energy savings during occupied periods without sacrificing occupant comfort. When compared to traditional building automation controllers, the VT8300 series Fan Coil Room Controllers provide unmatched return on investment.

SPECIFICATIONS

Thermostat Power Requirements	24 Vac \pm 15%, 50/60 Hz, 6 VA
Operating Conditions	0 to 50 °C (32 to 122 °F); 0 to 95% RH non-condensing
Storage Conditions	-30 to 50 °C (-22 to 122 °F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10k NTC type 2 thermistor
Temp. Sensor Resolution	\pm 0.1 °C (\pm 0.2 °F)
Temp. Control Accuracy	\pm 0.5 °C (\pm 0.9 °F) @ 21 °C (70 °F) typical calibrated
Humidity Sensor and Calibration	Single point calibrated bulk polymer sensor
Humidity Sensor Precision	Reading range from 10 to 90% RH non-condensing 10 to 20% precision is 10%; 20 to 80% precision is 5%; 80 to 90% precision is 10%
Humidity Sensor Stability	<1.0% annual drift (typical)
Dehumidification Setpoint Range	30 to 95% RH
Occupied and Unoccupied Setpoint Range Cooling	12 to 38 °C (54 to 100 °F)

Commercial and hospitality

Suitable for both commercial and hospitality markets and systems

Digital touch screen

Customizable color digital touch screen interface with multi-language support

7-day occupancy scheduling

2 to 4 events

Optional humidity sensor

Optional humidity sensor with onboard humidification strategy

Universal inputs and outputs

Including CO₂ sensor and fresh air station input

Optional cover

Optional occupancy sensor cover

Occupied and Unoccupied Setpoint Range Heating	5 to 32 °C (40 to 90 °F)
Room and Outdoor Air Temperature Display	-40 to 50 °C (-40 to 122 °F)
Proportional Band for Room Temperature Range Control	Cooling & Heating: 1.8 °C (3.2 °F)
Binary Inputs	Dry contact across terminal BI1, BI2 and UI3 to Scom
Economizer Analog Output Rating	0 to 10 Vdc into 2k Ω resistance min.
Economizer Analog Output Accuracy	\pm 3% typical
Wire Gauge	18 gauge maximum, 22 gauge recommended

WARRANTY

Limited Warranty	18 months
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AGENCY APPROVALS



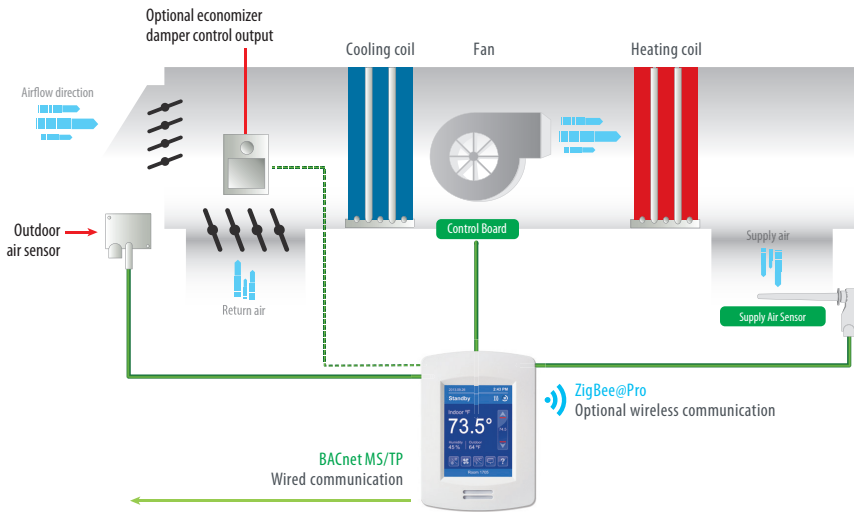
*The CE mark indicates RoHS2 compliance.

UL: 61010-1 (2nd edition); CSA: 61010-1 (3rd edition); IEC: 61010-1 (3rd edition), EN 60950-1: 2006A2: 2013, UL 873, CSA 22.2 No. 24-93; 61326-1:2005; FCC: Part 15, Subpart B; CE: EMC Directive 2004/108/EC (European Union); wireless models: FCC Part 15, Subpart C; R&TTE Directive 1999/5/EC; EN: 301 489-1 V1.9.2, 301 328 V1.8.1; RSS 210

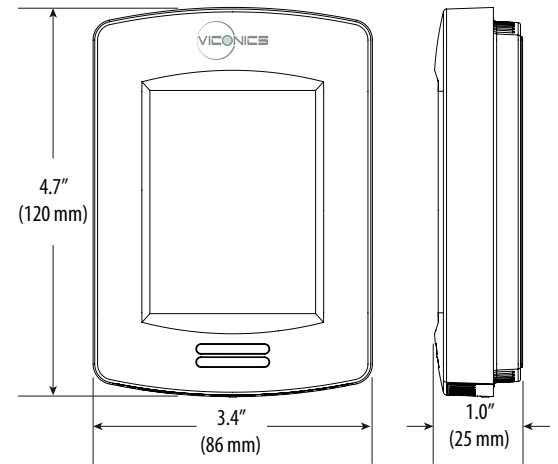


TYPICAL ROOFTOP UNIT APPLICATION

Wiring Examples

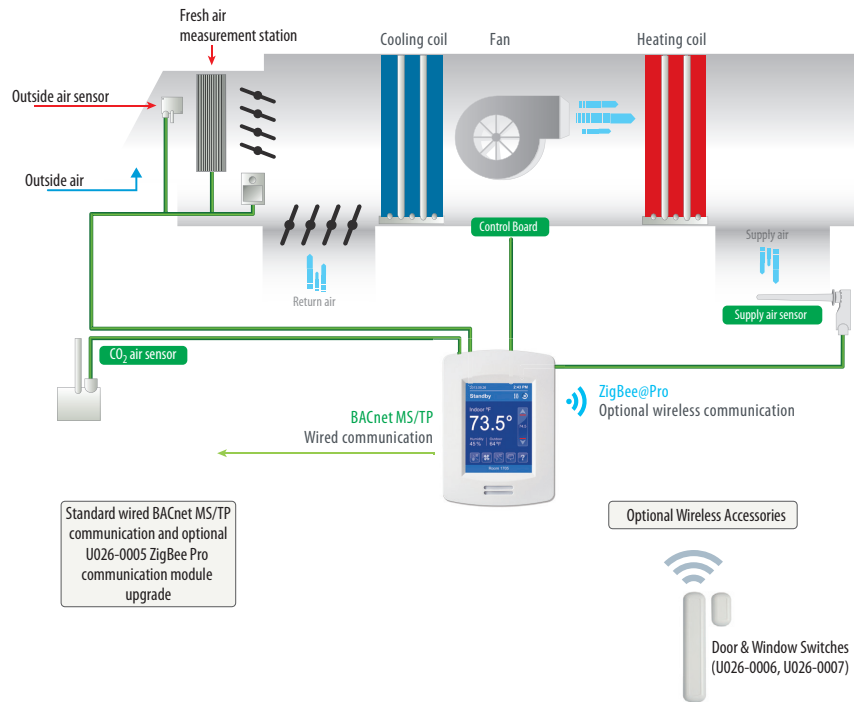


DIMENSIONAL DRAWING



TYPICAL INDOOR AIR QUALITY APPLICATION

Wiring Examples



SELECTABLE COLOR SCHEMES AND LANGUAGES



Dark grey / English HMI



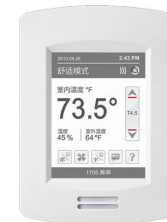
Blue / French HMI



Grey / Spanish HMI



Green / English HMI



White / Chinese HMI

ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION
VT8600U5000B	U028-0001	Fancoil Control, Low Voltage, BACnet
VT8600U5500B	U028-0002	Fancoil Control, Low Voltage, PIR, BACnet
VT8650U5000B	U028-0003	Fancoil Control, Low Voltage, RH, BACnet
VT8650U5500B	U028-0004	Fancoil Control, Low Voltage, RH, PIR, BACnet
VCM8000V5000P	U026-0005	Wireless Communication Card - Zigbee Pro
VWA5000D5000W	U026-0006	Wireless Door Switch Accessory
VWA5000W5000W	U026-0007	Wireless Window Switch Accessory

VT7600 SERIES

BACnet, Echelon, and Wireless
Models Available



VT7600A5000

The VT7600 Series PI thermostat family provides single stage and multi-stage control of heating/cooling equipment, including rooftop and self-contained units. The product features an intuitive, menu-driven, back-lit LCD display that walks users through the simple programming procedure, making installation extremely simple.

All models contain two user-controlled digital inputs that monitor filter status, change the occupancy status, and/or provide general purpose service indication. Some models offer up to three remote sensor inputs. All models contain a discharge air sensor input and SPST auxiliary switch, which can be used to control lighting or disable the economizer function. All devices are available with Echelon, BACnet, or wireless adapters.

SPECIFICATIONS

Thermostat Power Requirements	19 to 30 Vac; 50 or 60 Hz; 2 VA Class 2
Operating Conditions	0 to 50 °C (32 to 122 °F); 0 to 95% RH non-condensing
Storage Conditions	-30 to 50 °C (-22 to 122 °F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10k NTC thermistor
Resolution	± 0.1 °C (± 0.2 °F)
Control Accuracy	Temp: ±0.5 °C (±0.9 °F) @ 21 °C (70 °F) typical calibrated
Occupied and Unoccupied Setpoint Range Cooling	12 to 37.5 °C (54 to 100 °F)
Occupied and Unoccupied Setpoint Range Heating	4.5 to 32 °C (40 to 90 °F)
Room and Outdoor Air Temperature Display	-40 to 50 °C (-40 to 122 °F)
Proportional Band for Room Temperature Range Control	Cooling & Heating: 1.8 °C (3.2 °F)

PI time proportioning

PI time proportioning algorithm for increased comfort, accuracy, and energy savings

Local configuration

Unique local configuration utility minimizes parameter tampering

Two digital inputs

Two digital inputs for added functionality

Tamper resistant, no need for thermostat guards

Smart fan

Saves energy during night mode

Freeze protection

Limits costly freeze damage

APPLICATIONS

- Single-speed fans
- Outdoor air temperature sensor
- Supply air temperature sensor
- Differential pressure switch sensor

Binary Inputs	BI2 and UI3 to Scm
Output Rating	30 Vac, 1 A max., 3 A in-rush
Economizer Analog Output Rating	0 to 10 Vdc into 2k Ω resistance min.
Economizer Analog Output Accuracy	±3% typical
Wire Gauge	18 gauge maximum, 22 gauge recommended
Dimensions	4.94" x 3.38" x 1.13" (12.5 x 86 x 30 mm)
Approximate Shipping Weight	0.75 lb (0.34 kg)

WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance.

UL: 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN, XAPX (US) and XAPX7 (Canada)

FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)

Industry Canada: ICES-003 (Canada)

CE: EMC Directive 2004/108/EMC (European Union).

C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

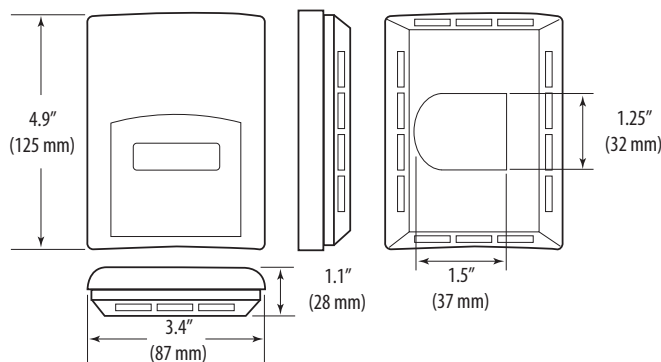


ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7600A5000	U010-0001	1H/1C thermostat, non-programmable; PIR Ready (PIR cover not included)	Standalone
VT7600A5000B	U010-0002		BACnet (MS/TP)
VT7600A5000E	U010-0003		Echelon
VT7600A5000W	U010-0004		Wireless (Zigbee)
VT7600B5000	U010-0005	2H/2C thermostat, non-programmable; PIR Ready (PIR cover not included)	Standalone
VT7600B5000B	U010-0006		BACnet (MS/TP)
VT7600B5000E	U010-0007		Echelon
VT7600B5000W	U010-0008		Wireless (Zigbee)
VT7652A5000	U010-0009	1H/1C thermostat, programmable; PIR Ready (PIR cover not included)	Standalone
VT7652A5000B	U010-0010		BACnet (MS/TP)
VT7652A5000E	U010-0011		Echelon
VT7652A5000W	U010-0012		Wireless (Zigbee)
VT7652B5000	U010-0013	2H/2C thermostat, programmable; PIR Ready (PIR cover not included)	Standalone
VT7652B5000B	U010-0014		BACnet (MS/TP)
VT7652B5000E	U010-0015		Echelon
VT7652B5000W	U010-0016		Wireless (Zigbee)
VT7600A5500	U010-0017	1H/1C thermostat, non-programmable; PIR factory equipped	Standalone
VT7600A5500B	U010-0018		BACnet (MS/TP)
VT7600A5500E	U010-0019		Echelon
VT7600A5500W	U010-0020		Wireless (Zigbee)
VT7600B5500	U010-0021	2H/2C thermostat, non-programmable; PIR factory equipped	Standalone
VT7600B5500B	U010-0022		BACnet (MS/TP)
VT7600B5500E	U010-0023		Echelon
VT7600B5500W	U010-0024		Wireless (Zigbee)
VT7652A5500	U010-0025	1H/1C thermostat, programmable; PIR factory equipped	Standalone
VT7652A5500B	U010-0026		BACnet (MS/TP)
VT7652A5500E	U010-0027		Echelon
VT7652A5500W	U010-0028		Wireless (Zigbee)
VT7652B5500	U010-0029	2H/2C thermostat, programmable; PIR factory equipped	Standalone
VT7652B5500B	U010-0030		BACnet (MS/TP)
VT7652B5500E	U010-0031		Echelon
VT7652B5500W	U010-0032		Wireless (Zigbee)
VT7605B5000	U010-0049	2H/2C + economizer thermostat, non-programmable; PIR Ready (PIR cover not included)	Standalone
VT7605B5000B	U010-0050		BACnet (MS/TP)
VT7605B5000E	U010-0051		Echelon
VT7605B5000W	U010-0052		Wireless (Zigbee)
VT7656B5000	U010-0053	2H/2C + economizer thermostat, programmable; PIR Ready (PIR cover not included)	Standalone
VT7656B5000B	U010-0054		BACnet (MS/TP)
VT7656B5000E	U010-0055		Echelon
VT7656B5000W	U010-0056		Wireless (Zigbee)

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7605B5500	U010-0057	2H/2C + economizer thermostat, non-programmable; PIR factory equipped	Standalone
VT7605B5500B	U010-0058		BACnet (MS/TP)
VT7605B5500E	U010-0059		Echelon
VT7605B5500W	U010-0060		Wireless (Zigbee)
VT7656B5500	U010-0061	2H/2C + economizer thermostat, programmable; PIR factory equipped	Standalone
VT7656B5500B	U010-0062		BACnet (MS/TP)
VT7656B5500E	U010-0063		Echelon
VT7656B5500W	U010-0064		Wireless (Zigbee)
VT7607B5000	U010-0033	2H/2C + humidity, non-programmable; PIR ready (PIR cover not included)	Standalone
VT7607B5000B	U010-0034		BACnet (MS/TP)
VT7607B5000E	U010-0035		Echelon
VT7607B5000W	U010-0036		Wireless (Zigbee)
VT7657B5000	U010-0037	2H/2C + humidity, non-programmable; PIR ready (PIR cover not included)	Standalone
VT7657B5000B	U010-0038		BACnet (MS/TP)
VT7657B5000E	U010-0039		Echelon
VT7657B5000W	U010-0040		Wireless (Zigbee)
VT7607B5500	U010-0041	2H/2C + humidity, non-programmable; PIR factory equipped	Standalone
VT7607B5500B	U010-0042		BACnet (MS/TP)
VT7607B5500E	U010-0043		Echelon
VT7607B5500W	U010-0044		Wireless (Zigbee)
VT7657B5500	U010-0045	2H/2C + humidity, programmable; PIR factory equipped	Standalone
VT7657B5500B	U010-0046		BACnet (MS/TP)
VT7657B5500E	U010-0047		Echelon
VT7657B5500W	U010-0048		Wireless (Zigbee)
VT7600H5000	U010-0065	3H/2C heat pump thermostat, non-programmable; PIR ready (PIR cover not included)	Standalone
VT7600H5000B	U010-0066		BACnet (MS/TP)
VT7600H5000E	U010-0067		Echelon
VT7600H5000W	U010-0068		Wireless (Zigbee)
VT7652H5000	U010-0069	3H/2C heat pump thermostat, programmable; PIR ready (PIR cover not included)	Standalone
VT7652H5000B	U010-0070		BACnet (MS/TP)
VT7652H5000E	U010-0071		Echelon
VT7652H5000W	U010-0072		Wireless (Zigbee)
VT7600H5500	U010-0073	3H/2C heat pump thermostat, non-programmable; PIR factory equipped	Standalone
VT7600H5500B	U010-0074		BACnet (MS/TP)
VT7600H5500E	U010-0075		Echelon
VT7600H5500W	U010-0076		Wireless (Zigbee)
VT7652H5500	U010-0077	3H/2C heat pump thermostat, programmable; PIR factory equipped	Standalone
VT7652H5500B	U010-0078		BACnet (MS/TP)
VT7652H5500E	U010-0079		Echelon
VT7652H5500W	U010-0080		Wireless (Zigbee)

DIMENSIONAL DRAWING



VH7200 SERIES

BACnet, Echelon, and Wireless Models Available



VH7200A1000

The VH7200 humidity controller family features a complete embedded humidity control solution with an intuitive backlit LCD display that walks the installer through the configuration steps, making the process extremely simple. Accurate relative humidity control is achieved via the product's unique PI time proportional control algorithm, which virtually eliminates humidity offset associated with traditional, differential-based humidity controllers.

All models contain a user-controlled binary input, which monitors an electrode humidifier canister service status or may be used as a general purpose service indicator. Models are available with more advanced features such as discharge humidity, proportional high limit, and indoor humidity setpoint reset based upon outdoor air temperature.

SPECIFICATIONS

Humidistat Power Requirements	19 to 30 Vac; 50 or 60 Hz; 2 VA (RC & C) Class 2
Operating Conditions	0 to 50 °C (32 to 122 °F); 0 to 95% RH non-condensing
Storage Conditions	-30 to 50 °C (-22 to 122 °F); 0 to 95% RH non-condensing
Resolution: Temp Humidity	±0.1 °C (±0.2 °F) ±0.1%
Control Accuracy Humidity	±3% RH from 20 to 70% RH at 21 °C (70 °F)
Humidification Setpoint Range	10 to 90% RH
Dehumidification Setpoint Range	15 to 95% RH
Outdoor Air Temp Range	-40 to 50 °C (-40 to 122 °F)

PI time proportioning

PI time proportioning algorithm for increased comfort, accuracy, and energy savings

Binary input

Binary input for added functionality

Local configuration

Unique local configuration utility...minimizes parameter tampering

Lockable keypad

Tamper resistant, no need for thermostat guards

EEPROM memory

No loss of program

Optional remote humidity sensors

Increased flexibility and functionality

APPLICATIONS

- Humidifier
- Dehumidifier/air exchanger
- Humidity high limit sensor
- Outdoor air temperature sensor
- Airflow switch

Binary Inputs	Relay dry contact only across Scom and DI1 terminals
Contact Output Rating	Each relay output: 30 Vac, 1A max.; 30 Vac, 3 A in-rush
Analog Output Rating	0 to 10 Vdc into 2k Ω resistance min.
Wire Gauge	18 gauge maximum, 22 gauge recommended
Dimensions	4.94" x 3.38" x 1.13" (12.5 x 86 x 30 mm)
Approximate Shipping Weight	0.75 lb (0.34 kg)

WARRANTY

Limited Warranty	2 years
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance.

UL: 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN , XAPX (US) and XAPX7 (Canada)

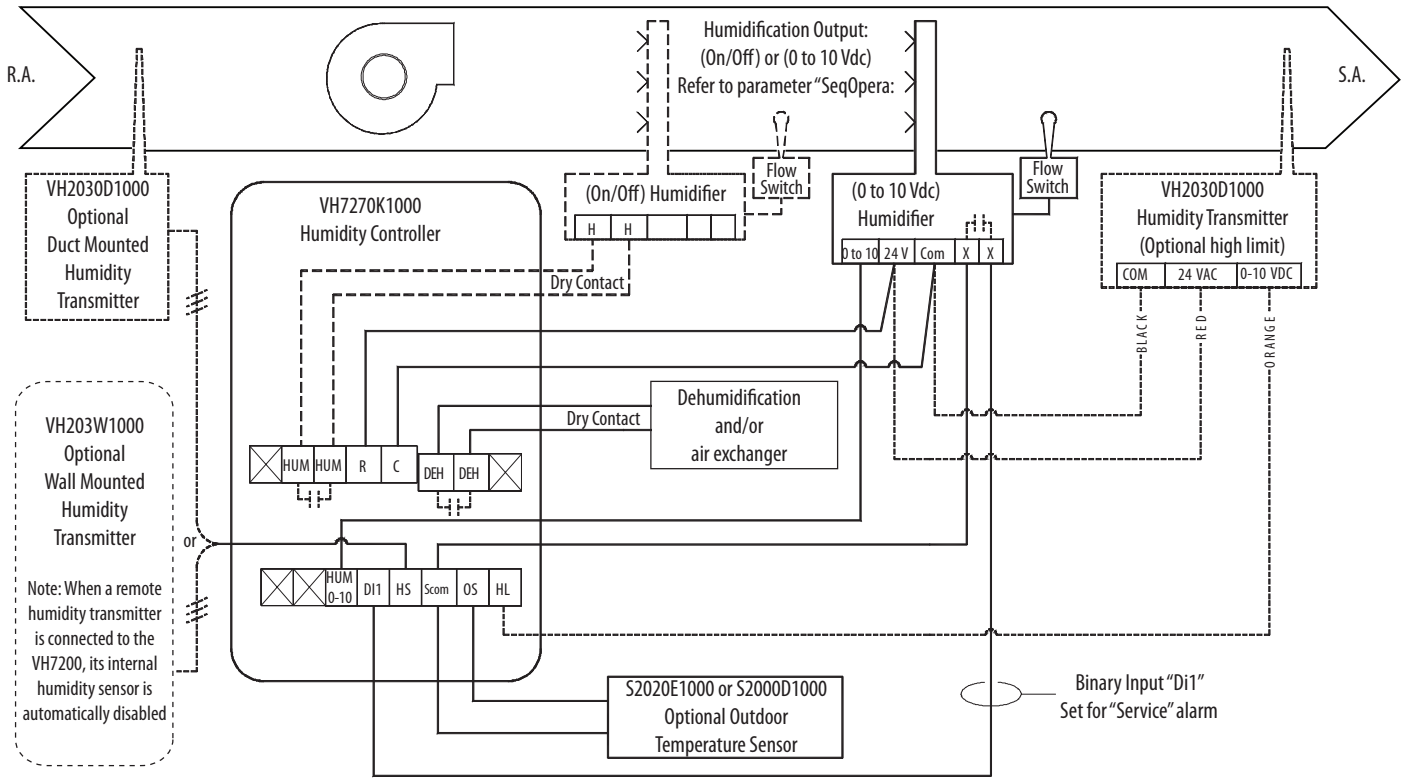
FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)

Industry Canada: ICES-003 (Canada)

CE: EMC Directive 2004/108/EC (European Union)



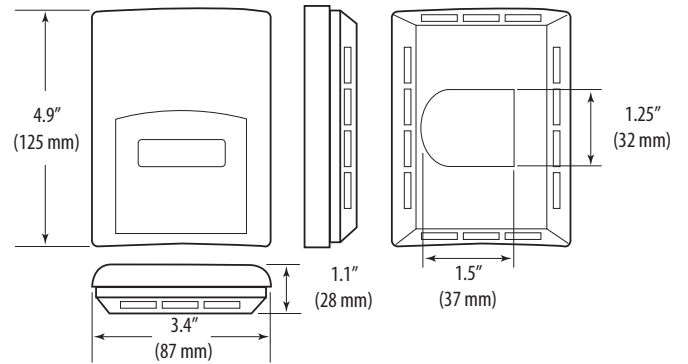
WIRING EXAMPLE



ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VH7200A1000	U007-0001	On/Off Hum.;	Standalone
VH7200A1000B	U007-0002	On/Off Dehum.;	BACnet (MS/TP)
VH7200A1000W	U007-0004	Outdoor Reset	Wireless (Zigbee)
VH7270F1000	U007-0005	0 to 10 V Hum.;	Standalone
VH7270F1000B	U007-0006	On/Off Dehum.;	BACnet (MS/TP)
VH7270F1000E	U007-0007	Prop HL, Outdoor Reset	Echelon
VH7270F1000W	U007-0008		Wireless (Zigbee)
VH7270K1000	U007-0009	0 to 10 V Hum.;	Standalone
VH7270K1000B	U007-0010	On/Off Hum.;	BACnet (MS/TP)
VH7270K1000E	U007-0011	On/Off Dehum.;	Echelon
VH7270K1000W	U007-0012	Prop HL; Outdoor Reset	Wireless (Zigbee)

DIMENSIONAL DRAWING



VWG SERIES

Wireless Gateway with BACnet Protocol



VWG-50-5000

The VWG Series Wireless Gateway and related wireless thermostats are targeted for retrofit applications where the addition of communication wiring within the building space is prohibitive.

The Gateway and Communicating Thermostats with wireless field bus encourages the use of existing wiring used by existing electronic thermostat type controls.

The VWG-50-5000, when used in conjunction with the VTxxxxXxxxxW Series wireless thermostats, offers simple BACnet IP, or BACnet MS/TP objects to integrate over standard building automation systems using familiar integration toolsets. Up to 50 thermostats are supported by a single gateway.

SPECIFICATIONS

Platform	PowerPC 405EP 250 MHz processor, 64 MB SDRAM and 64 MB serial flash, 128 kB static RAM, battery backup (5 min. typical; shutdown begins within 10 sec.); Real-time clock: 3-month backup max. via battery
Operating System	QNX RTOS; IBM J9 JVM Java Virtual Machine; NiagaraAX
Communications	2 Ethernet ports - 10/100 Mbps (RJ-45 connectors); 1 RS-232 port (9-pin D-shell connector); 1 RS-485 non-isolated port (3 screw connector on baseboard)
Power Supply	VWG-PS-AC 120 Vac to 15 Vdc with cord
Chassis Construction	Plastic, DIN rail or screw mounted; Cooling: internal air convection

ENVIRONMENT

Operating Temp Range	0 to 50 °C (32 to 122 °F)
Storage Temperature Range	0 to 60 °C (32 to 140 °F)

Supports up to 50 thermostats

Supports up to 50 thermostats per gateway, satisfying most project requirements

Auto-discovery

Auto-discovery of network nodes...simple setup and operation reduces installation costs

Wireless

Wireless network interface eliminates the need for communication wiring

Fully redundant

Thermostat operates separately from network connection... fully redundant automation with minimal downtime

Relative Humidity Range	5 to 95% non-condensing
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WARRANTY

Limited Warranty	2 years
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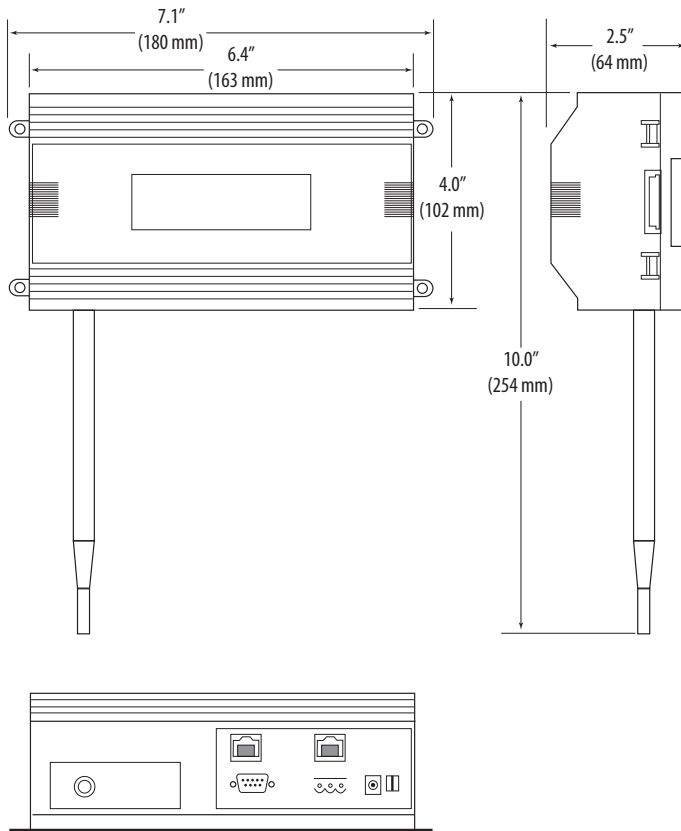
AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance.



DIMENSIONAL DRAWING



ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION
VWG-RA-1000	U011-0004	Wireless Gateway - Remote antenna
VWG-WA-1000	U011-0005	Wireless Gateway - Replacement whip antenna (supplied with gateway)
VWG-PSEU-AC120-1000	U011-0007	Power Supply for Wireless Gateway - 24 Vac to 15 Vdc European plug mount adapter power supply
VWG-PSNA-AC120-1000	U011-0008	Power Supply for Wireless Gateway - 120 Vac to 15 Vdc North American plug mount adapter power supply
VWG-BB-1000	U011-0009	Wireless Gateway - Replacement battery for backup (supplied with gateway)
VWG-50-5000	U011-0011	Wireless Gateway - BACnet MS/TP and IP

HT/HWS SERIES

Independent RH, Temp, and Analog Setpoint Outputs



All HT/HWS Series institutional grade relative humidity transmitters are designed to meet the rigorous needs of pharmaceutical labs, hospitals, science labs, and other settings that call for precise environmental control. Internal jumpers control access to a feature that allows adjustment of the calibration offsets. The devices can also be made tamper resistant using a jumper to disable keypad programming functions. HT/HWS models are calibrated with NIST traceable calibration equipment.

Analog Output Transmitter

Analog output models feature a keypad to make adjusting humidity and temperature setpoint values easy. They transmit the setpoint values back to a control system by means of dual outputs. A slide-switch allows easy selection of output type, either 4 to 20 mA or 0 to 5 V/0 to 10 Vdc signals. Dual outputs enable effortless control of both humidity and temperature in a single, compact sensor.

Setpoint Relay Transmitter

The HT Series setpoint relay models also offer thermostat or humidistat functionality. Two separate relays can be configured to control heating and cooling when in thermostat mode, or humidifying and de-humidifying when in humidistat mode.

HWS models offer the same precise humidity measurement and control as the HT, but without the temperature and thermostat features.

SPECIFICATIONS

Input Power	Class 2; 15 to 30 Vdc or 24 Vac 50/60Hz, 100 mA max.
Outputs, Analog	Switch-selectable 4 to 20 mA, or 0 to 10 V/0 to 5 Vdc (switch affects both outputs)
Outputs, Relay (Relay models only)	2 Form C (SPDT), 1A 30VDC, resistive, 30 W max.
RH Sensor	Digitally profiled thin-film capacitive (32-bit mathematics) U.S. Patent 5,844,138*
Accuracy at 25 °C from 10 to 80% RH** (Multi-point calibration NIST traceable)	±2%, 3%, or 5% models; ±1% at 20 to 50% RH on HTA models ±1% at 12 to 40% RH on HTR models in mA output mode; ±1% at 30% RH on HTR models in voltage output mode

Flexibility

Independent heat/cool (TWS relay) or analog setpoint outputs (TWS analog) provide application flexibility

LCD display

LCD for local display of readings and setup values

Offset function

Offset function adjusts calibration intervals for both RH and T (HT models)

Switch-selectable

Switch-selectable 4 to 20 mA or 0 to 5/0 to 10 Vdc analog outputs

Multi-point calibration

Multi-point calibration to 1% RH, traceable to NIST

Saves time

Replaceable RH sensor element supports field calibration offset

APPLICATIONS

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

Reset Rate***	24 hours
Stability	±1% @ 20 °C (68 °F) annually, for two years
Hysteresis	RH: 1.5% (typical), Temp: 1 to 10 °F in 1 °F increments
Linearity	Included in accuracy spec.
Operating Humidity Range	0 to 100% RH non-condensing
Temperature Coefficient	±0.1%RH/°C above or below 25 °C (typical)
Operating Temperature Range	10 to 35 °C (50 to 95 °F)
Temperature Accuracy	±1.0 °C (±1.8 °F)
Physical	UL 94V-0 fire retardant ABS
Scaling	RH: 0 to 100%; Temp: 10 to 35 °C (50 to 95 °F) or 0 to 50 °C (32 to 122 °F) menu selectable
Calibration Offset	RH: Adjustable ±10% in 0.1% increments; Temp: Adjustable ±10° in 0.1° increments
Setpoint Range	RH: 10 to 80% in 1% increments; Temp: minimum to full scale in 1 °F increments

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



* The HS sensing element has a 1-year warranty. The element is not included in the 5-year product warranty.

** Specified accuracy with 24 Vdc supplied power with rising humidity.

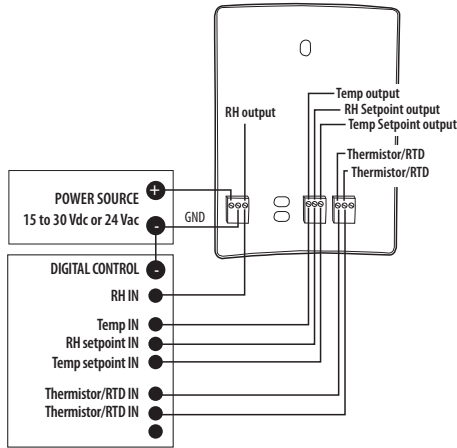
***Reset rate is time required to recover to 50% RH after exposure to 90% RH for 24 hours. One side of transformer secondary is connected to a signal common, so an isolation transformer or dedicated power supply may be required.

RTD/thermistors in wall packages are not compensated for internal heating of product.*The ****CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



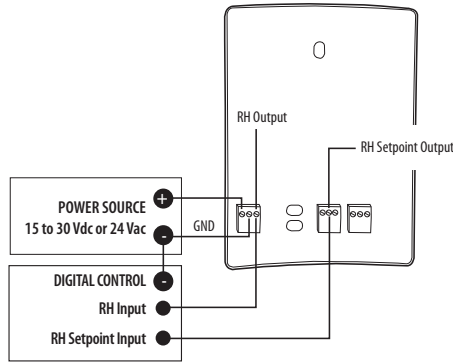
HT ANALOG OPTION

Wiring Examples



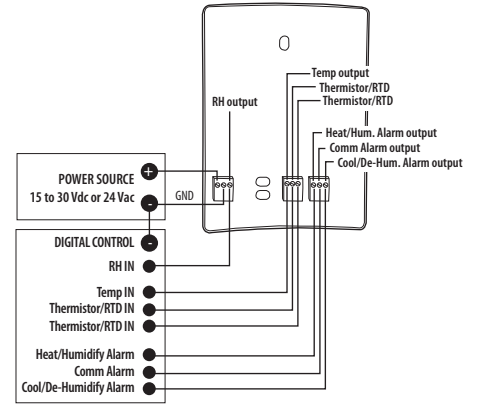
HWS ANALOG OPTION

Wiring Examples



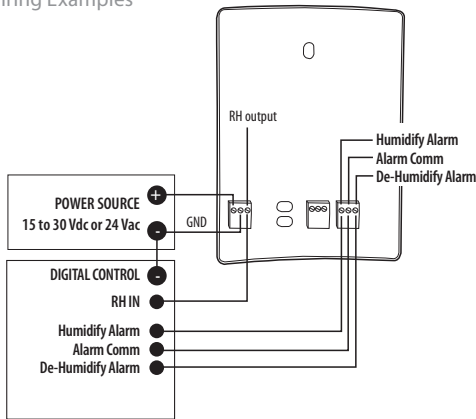
HT RELAY OPTION

Wiring Examples

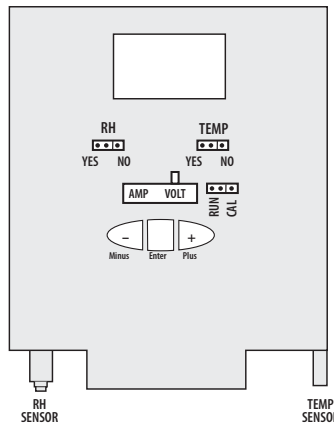


HWS RELAY OPTION

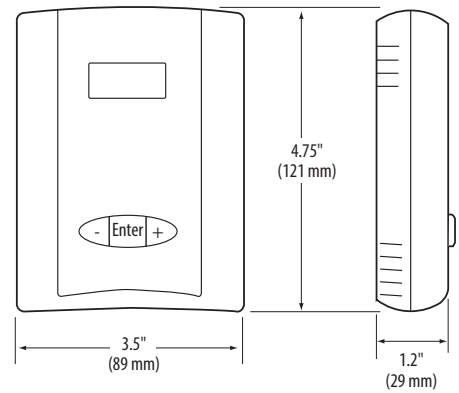
Wiring Examples



CONFIGURATION



DIMENSIONAL DRAWING



ORDERING INFORMATION

RH/T Combination Device

Accuracy	NIST	Setpoint	Temp Cal Certificate	Option
HT			S	
1 = 1%	N = NIST	A = Analog	0 = None	B = 100R Platinum, RTD
2 = 2%	(1 & 2% only)	R = Relay	1 = 1 point Cal Cert*	C = 1k Platinum, RTD
3 = 3%	X = No		2 = 2 point Cal Cert*	D = 10k T2, Thermistor
5 = 5%	(2, 3, 5% only)			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
				T = 100k, Thermistor
				U = 20k "D", Thermistor
				W = 10k T2 high accuracy, Thermistor
				Y = 10k T3 high accuracy, Thermistor

RH Only Device

Accuracy	NIST	Setpoint	Option
HWS			S
1 = 1%	N = NIST	A = Analog	= CE
2 = 2%	(1 & 2% only)	R = Relay	
3 = 3%	X = No		
5 = 5%	(2, 3, 5% only)		

Example:



HT Series devices contain both humidity and temperature transmitter outputs. Optional RTDs and thermistors are available.

*Not available in W or Y high accuracy thermistors.

Example:



TWS SERIES

Independent RH, Temp, and Analog Setpoint Outputs



All TWS Series institutional grade temperature transmitters are field-programmable and designed to satisfy the demanding requirements of pharmaceutical labs, hospitals, science labs, and other exacting applications. Internal jumpers control access to a feature which allows field adjustment of calibration offsets. Tampering can be discouraged by setting a jumper to disable keypad program functions.

Analog Output

Analog output models feature a keypad to make adjusting temperature setpoint values easy. They are unique in reporting the setpoint values back to a control system by means of 4 to 20 mA or 0 to 5V/0 to 10 Vdc (output selected by slide-switch) signals.

Setpoint Relay

The TWS Series setpoint relay models measure temperature and offer thermostat functionality. Two separate relays can be configured to control heat/cool in thermostat mode.

SPECIFICATIONS

Input Power	Class 2; 15 to 30 Vdc or 24 Vac 50/60Hz, 100 mA max.
Outputs, Analog	Switch-selectable 4 to 20 mA (clipped and capped)/0 to 10 V/0 to 5 Vdc (switch affects all outputs)
Outputs, Relay (Relay Models Only)	2 Form C (SPDT), 1 A 30 Vdc, resistive, 30 W max.
Physical	UL 94V-0 fire retardant ABS

TEMPERATURE

Accuracy	±0.5 °C (±1 °F)
Scaling	10 to 35 °C (50 to 95 °F) or 0 to 50 °C (32 to 122 °F), menu selectable
Calibration Offset	Adjustable ±10° in 0.1° (C or F) increments
Setpoint Range	Minimum to full scale in 1° (C or F) increments
Hysteresis (Deadband)	1 to 10 °F in 1 °F increments

Flexibility

Independent heat/cool (TWS relay) or analog setpoint outputs (TWS analog) provide application flexibility

LCD display

LCD for local display of readings and setup values...easy visibility under any lighting conditions

Offset function

Offset function adjusts calibration offsets for temperature

Switch-selectable

Switch-selectable 4 to 20 mA or 0 to 5V/0 to 10 Vdc analog outputs

Semiconductor

Semiconductor temperature sensor can be field-calibrated

APPLICATIONS

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

WARRANTY

Limited Warranty 5 years

AGENCY APPROVALS

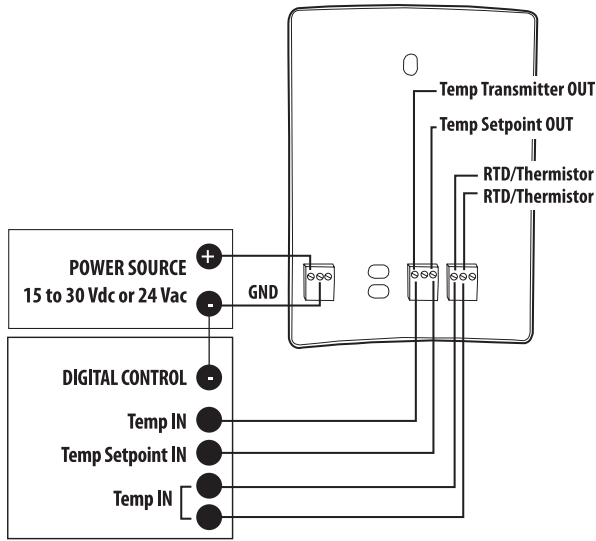


*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

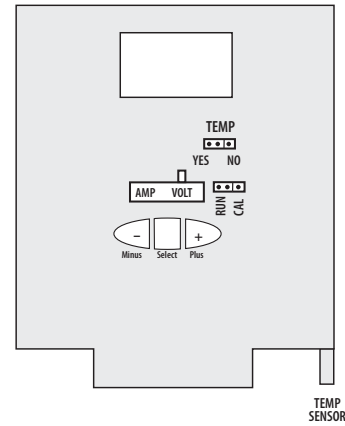


ANALOG MODELS

Wiring Diagrams

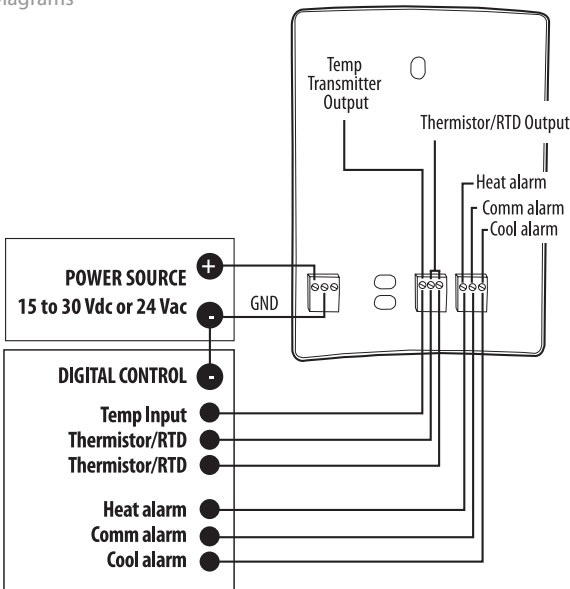


CONFIGURATION

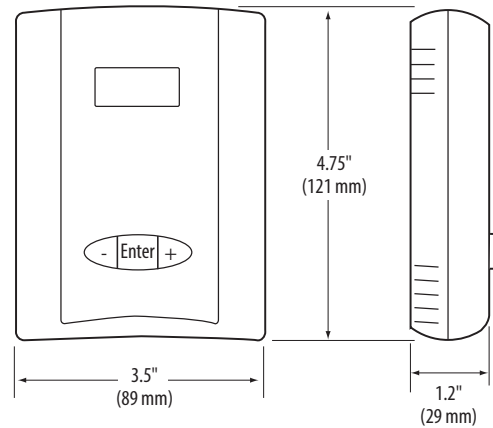


RELAY MODELS

Wiring Diagrams



DIMENSIONAL DRAWING



ORDERING INFORMATION

Setpoint	Cal Certificate	Option
TWS <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A = Analog R = Relay	S = CE (standard) 0 = None 1 = 1 point Cal Validation* 2 = 2 point Cal Validation*	Blank = None 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 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

Example:

TWS

TWS

TWS models include standard temperature transmitter outputs. Optional RTDs and thermistors are available as shown for TWSA models.

*Not available in W or Y high accuracy thermistors.



ACCESSORIES SELECTION GUIDE: AIR QUALITY/ GAS DETECTION

Product	Description	C Series	CW Protocol	CDE & CWE	CRLSXX	CWV	GWN	GWNP
CO₂ 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				•			
AA51	Replacement Cloud White Non-LCD Cover		•	•				
AA51B	Replacement Black Non-LCD Cover		•	•				
AA52	Replacement Cloud White LCD Cover	•	•					
AA52B	Replacement Black LCD Cover	•	•					
AA55	Replacement Cloud White Housing, Cover Not Included.	•	•	•				
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						•	•
AG01	CO Sensor						•	•
AG01E	CO Sensor						•	•
AGAE	Metal Wall Mount Enclosure for GWNxx Gas Platform						•	
AGPE	Metal Wall Mount Enclosure for GWNPxx Gas Platform							•
NO₂ Monitoring								
AG02	NO ₂ Sensor						•	•
AGAE	Metal Wall Mount Enclosure for GWNxx Gas Platform						•	
AGPE	Metal Wall Mount Enclosure for GWNPxx Gas Platform							•





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



AA35
Duct Aspiration Box



AA36
CO₂ Outdoor Aspirator Box



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



AA50
Remote Sample Pickup Kit



AA51/AA51B
Replacement Covers for Wall Units



AA52/AA52B
Replacement Covers for Wall Units



AA55
Replacement Cloud White Housing. Cover Not Included.



AG01
CO Sensor



AG01E
CO Sensor



AG02
NO₂ Sensor



AGAE, AGPE
Metal Wall Mount Enclosure for GWNxx & GWNpxx Gas Platforms

ACCESSORIES SELECTION GUIDE: PRESSURE MONITORING

Product	Description	PH	PX	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		•					
AA23	Steel Bracket			•	•			
AA43	Dust Cover			•	•			
AA45	Pneumatic Capacitor			•	•			
AA49	Triac Adaptor				•			
AA56	Wall Plate Remote Pickup		•					
AA62	Replacement Cloud White LCD cover		•					
AA63	Replacement Cloud White N on-LCD cover		•					
WET PRESSURE								
AA11	Brass Snubber, 1/8" NPT					•	•	
AA12	Stainless Steel Snubber, 1/8" NPT					•	•	
AA13	Pigtail Steam Siphon	•				•	•	•
AA14A	Bypass Valve Assembly Bracket					•	•	
AA16A	Bypass Valve Assembly Bracket					•	•	
AA68	1/4" Ball Valve							•
AA69	Brass Snubber, 1/4" NPT	•						•
AA70	Stainless Steel Snubber, 1/4" NPT	•						•
AA72	1/2" EMT Conduit Connector							•



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)



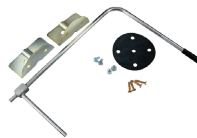
AA12/AA70
Stainless Steel Snubber, 1/8" NPT (AA12)
Stainless Steel Snubber, 1/4" NPT (AA70)



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"



AA23
Steel Bracket



AA43
Dust Cover



AA45
Pneumatic Capacitor



AA49
Triac Adapter



AA56
Wall Plate Remote Pickup



AA62
Replacement Cloud White LCD Cover



AA63
Replacement Cloud White Non-LCD Cover



AA68
Brass Snubber, 1/4" NPT



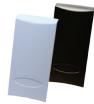
AA72
1/2" EMT Conduit Connector

ACCESSORIES SELECTION GUIDE: HUMIDITY MONITORING

Product	Description	HD & HO	HW	HW PROTOCOL	HN & HP
AA42	Water Guard, Humidity Sensor Protection Shield	•			
AA51	Replacement Cloud White Non-LCD Cover		•	•	
AA51B	Replacement Black Non-LCD Cover		•	•	
AA52	Replacement Cloud White LCD Cover		•	•	
AA52B	Replacement Black LCD Cover		•	•	
AA55	Replacement Cloud White Housing		•		
HS	Replacement Humidity Element	•	•	•	•



AA42
Water Guard, Humidity Sensor Protection Shield



AA51/AA51B
Replacement Covers



AA52/AA52B
Replacement Covers



AA55
Replacement Cloud White Housing



HS
Replacement Humidity Element

ACCESSORIES: FLOW MONITORING



B220
Remote cable assembly



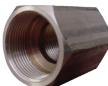
B30XX
Series Monitor



TIH
Immersion probe temperature sensor



TRA
Probe temperature sensor



U001-0050 (1027)
Hot tap adapter tool: 1" machine to 1" NPT



U001-0071 (HTT)
Hot tap insertion/removal tool



U001-0149 (40134-0002)
Programming cable with CD for Badger, USB connection (PC)

ACCESSORIES: TEMPERATURE MONITORING



AA04
Remote Display (specify range) — use with 4 to 20 mA products



AA10XXXX
Temperature Range Converter, Resistive to 4-20 mA



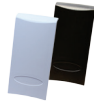
AA22, AA24, AA25, AA33
Thermowells



AA47
Motion Sensor Local Load Power Pack



AA48
Motion Sensor Local Load Auxiliary Power Pack



AA51/AA51B
Replacement Covers for Wall Units



AA52/AA52B
Replacement Covers for Wall Units



AA55
Replacement Housing for Wall Units

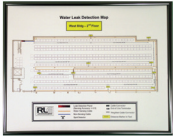


AA64
Klipet Mounting Clip



U006-0061
Leader cable kit for SC-C and SC-H cables (connects from leak panel to SC-C or SC-H cable)

ACCESSORIES: LEAK DETECTION



U006-0004
Framed reference map



U006-0024
Cross connector
(1 cable input to 3 outputs)



U006-0025
Weighted connector cable, 50'



U006-0026
Replacement cable end terminators



U006-0028
Cable connector kit



U006-0029
SC cable tester*



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
Power supply for LD300



U006-0039
Cable extractor tool



U006-0040
Cable pin crimp tool



U006-0041
Cable stripper tool

ACCESSORIES: SETPOINT DEVICES



HS
Replacement humidity element



AA53
Replacement cover



AA55
Replacement housing



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)	243
H308/608/701/708/808/908	Current Switches: Adjustable Trip Point, Standard Output	245
H609/709/709HV/809/909/909HV	Current Switches: Adjustable Trip Point, High Voltage Output	247
H606/706/806/906	Current Switches: Adjustable Trip Point, N.C. Output	249
H11D	Current Switches: Auto Calibration, Automation Systems, LCD Display	251
H10F	Current Switches: Auto Calibration, Standard Output	253
H614	VFD Current Switch: Auto Calibration	255
H720/904/934	VFD Switches and Current Sensors	257
H6ECM05	ECM-Optimized Current Switch	259
H730/740/750/930/940/950	Current Switches with Relay: Fixed Trip Point (Status)	261
H735/738/748/758/938/948/958	Current Switches with Relay: Adjustable Trip Point, Standard Output	263
H739/749/939/949/959	Current Switches with Relay: Adjustable Trip Point, High Voltage Output	265
H721HC/721LC/921	Current Transducers: 4 to 20 mA Analog Output	267
H221/221SP/321/321SP/421/421SP	Current Transducers: 4 to 20 mA Analog Output, High Current Monitoring	269
H722LC/722HC/822/822-20/922	Current Transducers: 0 to 5 Vdc Analog Output	271
H723LC/723HC/923	Current Transducers: 0 to 10 Vdc Analog Output	273
H931	Current Transducers with Relay: 4 to 20 mA Analog Output	275
H932/952	Current Transducers with Relay: 0 to 5 Vdc Analog Output	277
H971/971SP/EA20 Series	Direct Current Transducers: 4 to 20 mA and 0 to 5 Vdc Analog Output	279
H5xx Series	Field Mount Motor Control Device	281
H120/120NC	Field Mount Status Relay	283



CURRENT SENSOR SELECTION GUIDE

CURRENT STATUS SWITCHES (DIGITAL OUTPUT)

	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 243	H800* — 200A page 243	H600 — 200A page 243		H900 — 200A page 243
Detect Belt Loss and Mechanical Failure (Adjustable Threshold)	H308 — 50A page 245	H808 — 50A page 245 H806 — 50A page 249 H809 — 50A page 247	H608 — 175A page 245 H606 — 50A page 249 H609 — 50A page 247	H708 — 135A page 245 H706 — 135A page 249 H709* — 135A page 247	H908 - 135A page 245 H906 - 135A page 249 H909* - 135A page 247
Self-Calibrating Switch			H10F — 100A page 253		H11D — 200A page 251
VFD Model - Patented Technology			H614 — 150A page 255		H904 — 135A/20-75Hz page 257
VFD Model - Patented Technology (Onboard Relay)					H934 — 135A/20-75Hz page 257
Veris Exclusive Patented Technology Status & Control (Onboard Pilot Duty Relay)				H730* — 200A page 261 H738* — 135A page 263 H739* — 135A page 265	H930* — 200A page 261 H938* — 135A page 263 H939* — 135A page 265

FLYING LEADS AND JUNCTION BOX MOUNTING

High Voltage/Low Voltage Split		
Power Duty Status and Control	H120* — to 20A/2HP page 283	H5xx* — to 15A/1.5HP page 281

* Indicates a series of products.

CURRENT TRANSDUCERS (Analog Output)

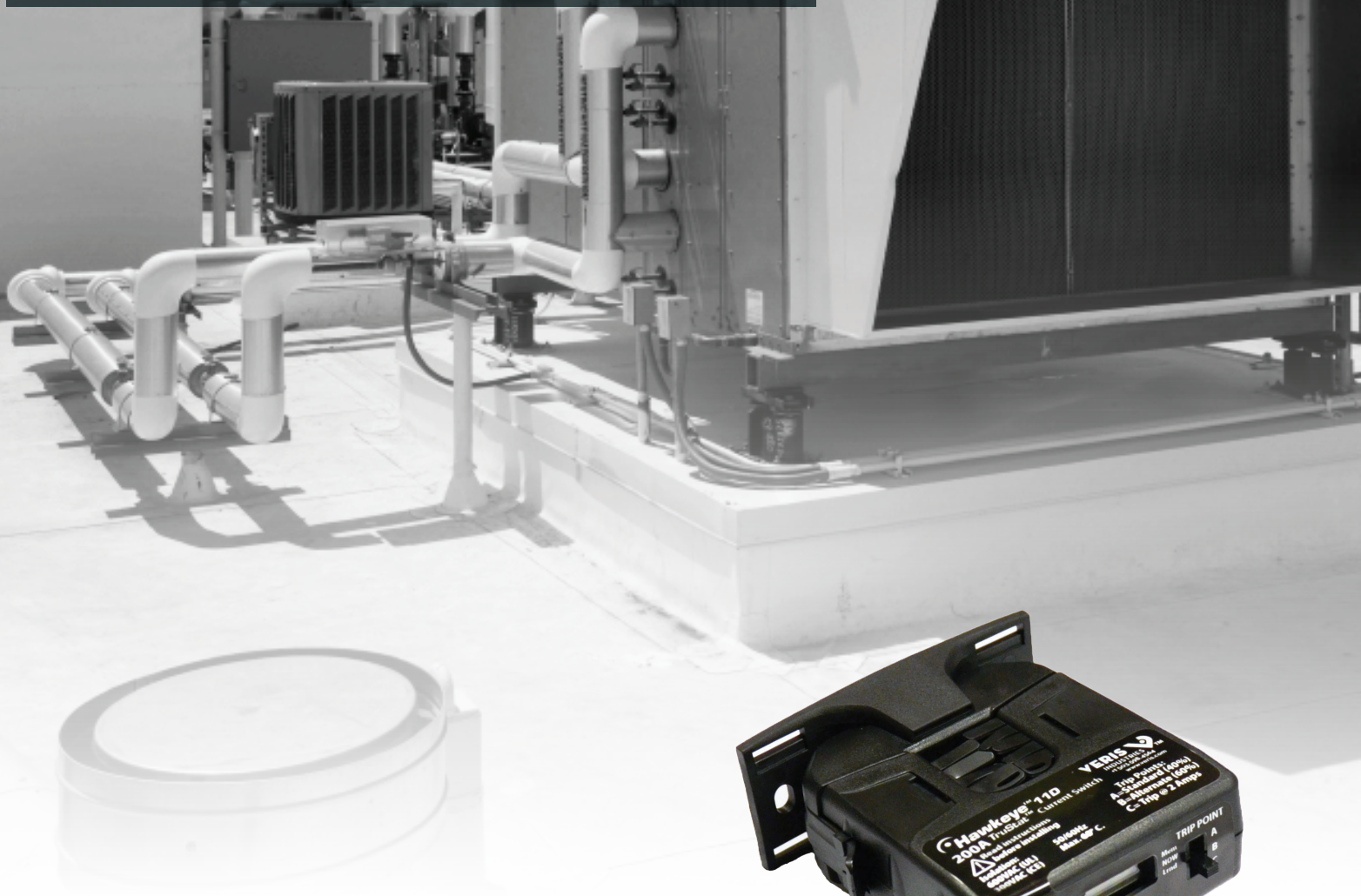


Load Trending 4-20mA Output		H721LC: 10-40A page 267	H921: 30-120A page 267	H721HC: 50-200A page 267	H221/321/421: 300/800/2400A page 269
Load Trending 0-5V Output	H822*: 10/20A page 271	H722LC: 10-40A page 271	H922*: 30-120A page 271	H722HC: 50-200A page 271	
Load Trending 0-10V Output		H723LC: 10-40A page 273	H923: 20-150A page 273	H723HC: 50-200A page 273	
Load Trending with Relay 4-20mA Output			H931: 30-120A page 275		
Load Trending with Relay 0-5V Output			H932/H952: 30-120A page 277		
DC Current 4-20mA Output				H971/EA20: 10-200A page 279	

* Indicates a series of products.



Adaptable, Viewable, and Cost Competitive



H11D Current Switch

Eliminate Guesswork

View real-time amperage in the conductor, and know the exact trip current limits.

Adjust to an Application on the Fly

Slide-switch selectable normal, wide range, and on/off trip points.

Exceptional Labor Savings

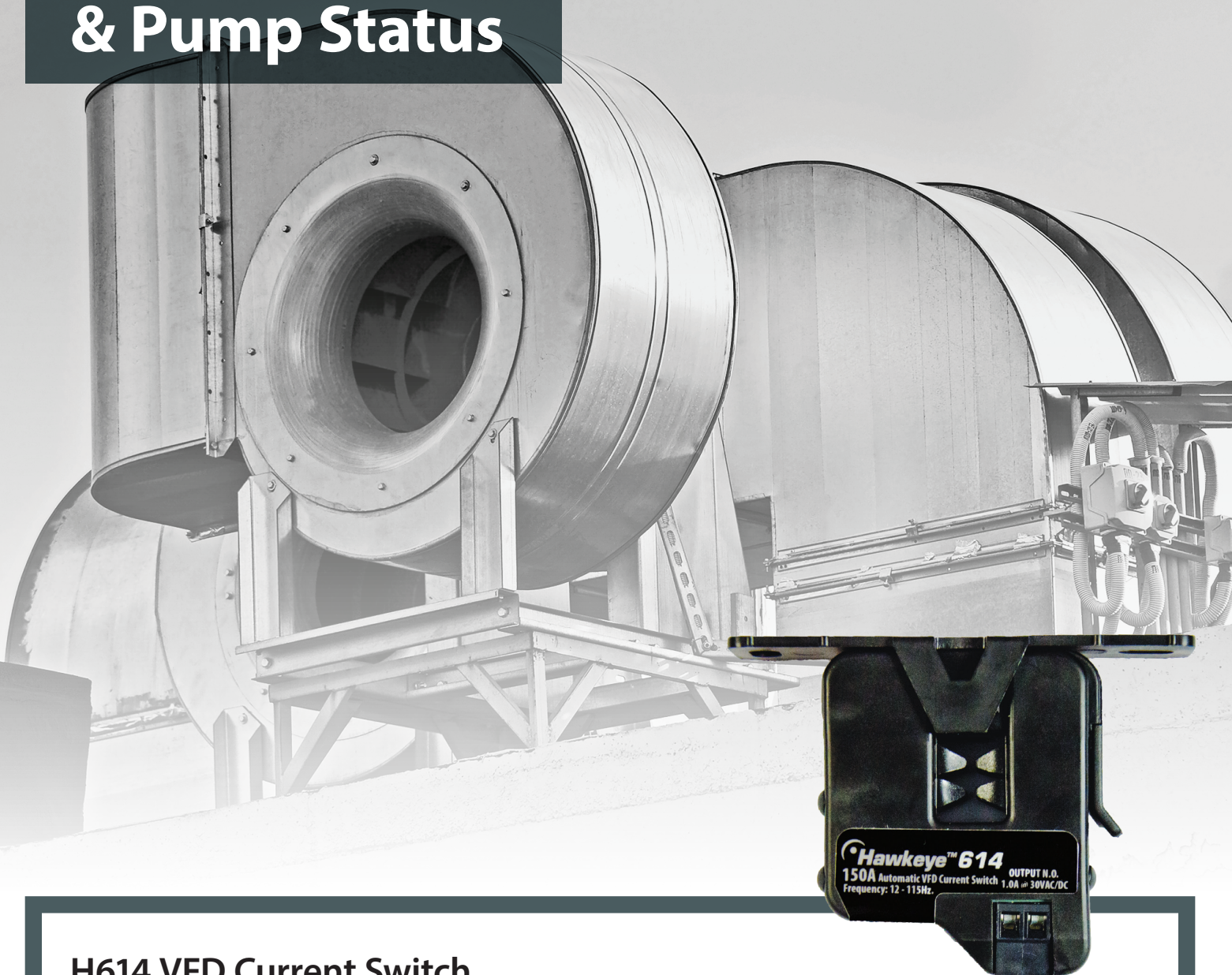
Self-calibrating, self-learning: snap on and complete.

Interested in learning more about the innovative H11D design?

Contact a Current Monitoring Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on 251



Ultimate VFD Fan & Pump Status



H614 VFD Current Switch

Greater Intelligence

Industry's most reliable self-learning, self-calibrating current switch

Increased Knowledge

Up to 40 trip points are spanned across 12-115 Hz, providing the industry's largest monitoring range.

Simplified Installation

Auto configures up to 40 trip points for fault detection on VFD fan/pump motors.

Interested in learning more about the innovative H614 design?

Contact a Current Monitoring Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 255

VERIS 
INDUSTRIES



HX00 SERIES

On/Off Status Current Switches



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

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 0.5 A (H608)...avoids the need for multiple wraps of the conductor through the sensor even on loads as small as 1/5 HP

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

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

Terminal Block Wire Size	
H600, H800, H900	24 to 14 AWG (0.2 to 2.1 mm ²);
H300	22 to 16 AWG (0.3 to 1.3 mm ²)
Terminal Block Torque	
H600, H800, H900	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m);
H300	7 in-lbs (0.8 N-m)

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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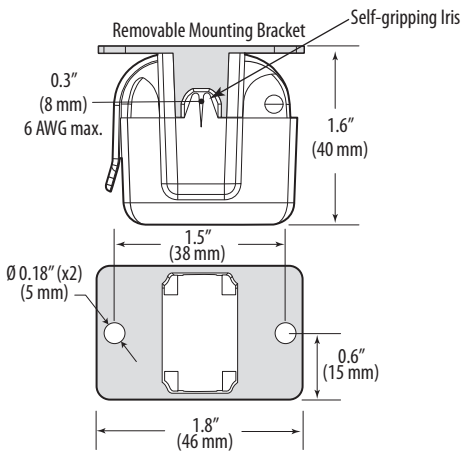
*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

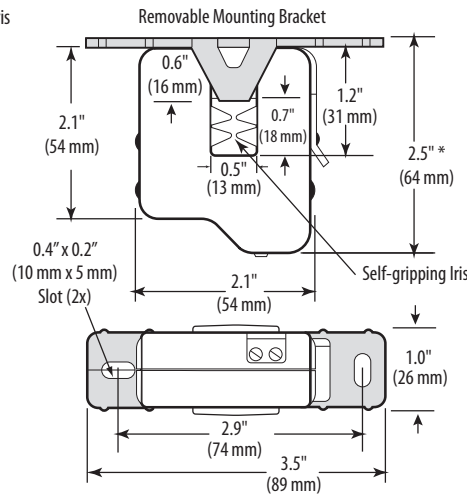
(a) VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.



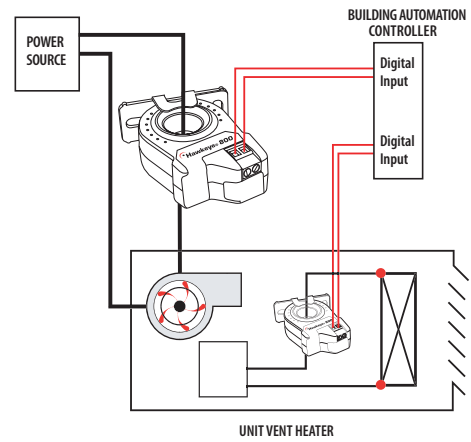
H300
Dimensional Drawing



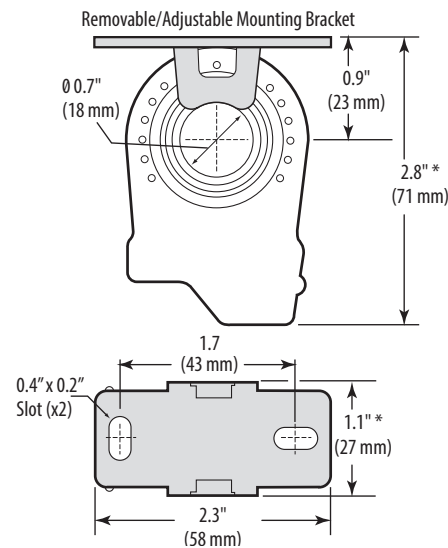
H600
Dimensional Drawing



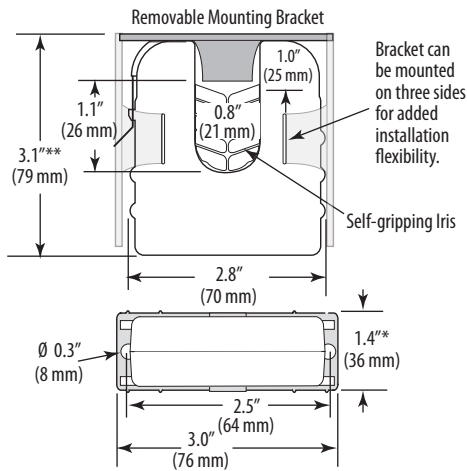
UNIT VENT HEATER CONTROL
Wiring Diagram



H800, H800HV, H800NC
Dimensional Drawing



H900
Dimensional Drawing



Bracket can be mounted on three sides for added installation flexibility.

* 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	•	•	

- Listed for use on 75°C insulated conductors.
- Product provides functional insulation only.
- Listed for use on 90°C insulated conductors.



HX08 SERIES & H701

Detect Belt Loss, Coupling Shear, and Mechanical Failure



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

Hx08 Series & H701

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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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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

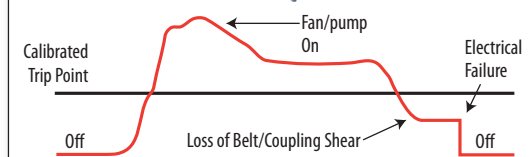
Status LEDs

Status LEDs available for easy setup and local indication

APPLICATIONS

- Detecting belt loss, coupling shear, and mechanical failure
- Monitoring status of industrial process equipment
- Verifying lighting circuit and other electrical service run times
- 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.

*The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

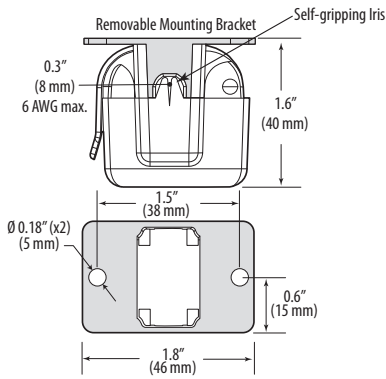
Notes: Do not use the LED status indicators as evidence of applied voltage.

If using this switch in an application that includes an electronically commutated motor (ECM), see Veris Application Note VN61, at www.veris.com.

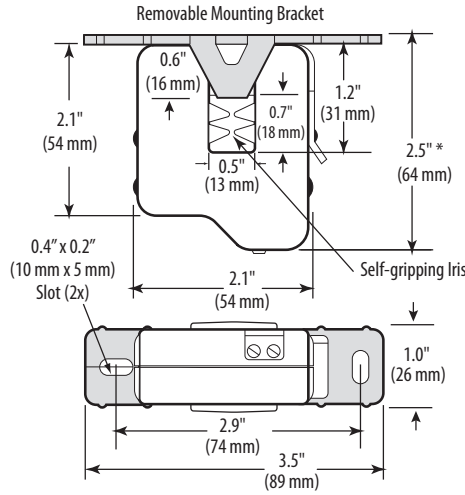
VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.



H308
Dimensional Drawing

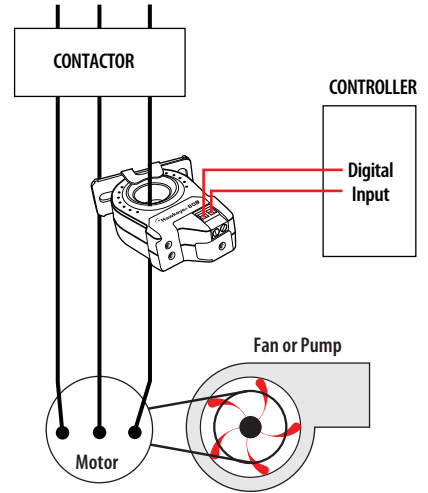


H608
Dimensional Drawing

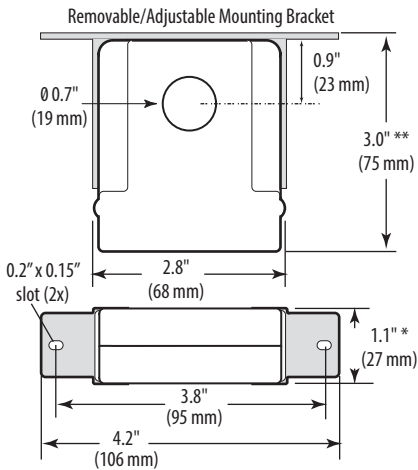


MONITORING FAN /PUMP MOTORS FOR POSITIVE PROOF OF FLOW

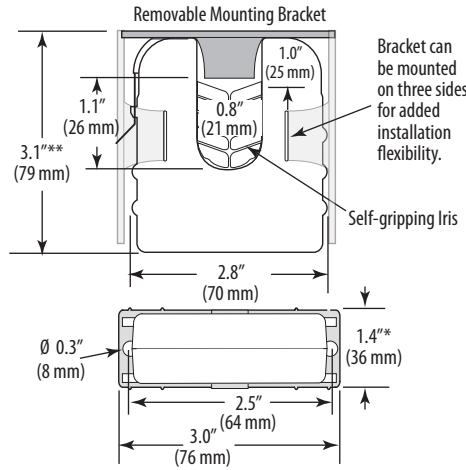
Wiring Diagram



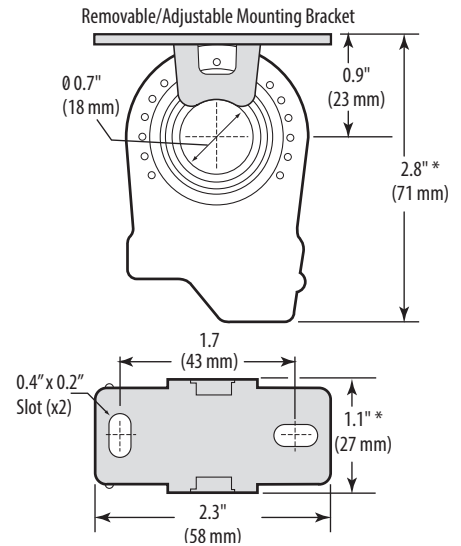
H708/701
Dimensional Drawing



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



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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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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

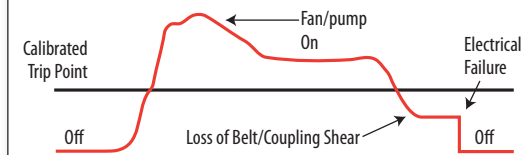
Status LEDs

For easy setup and local indication

Flexibility

Bracket on H909 can be installed in three different configurations

DETECTS BELT LOSS/COUPLING SHEAR!



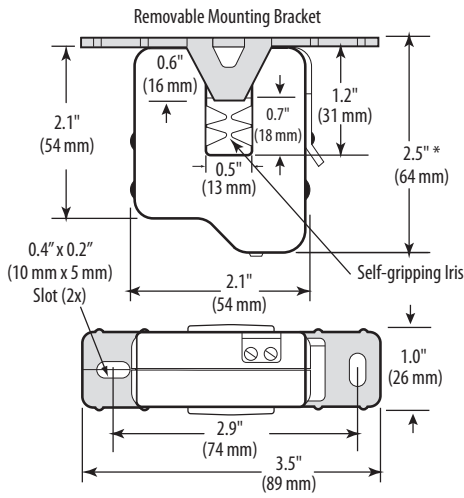
Now you can easily detect when drive belts slip, break, or pump couplings shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

1. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

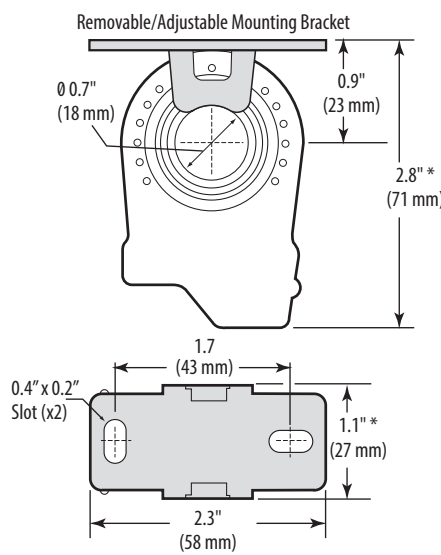
Note: Do not use the LED status indicators as evidence of applied voltage. If using this switch in an application that includes an electronically commutated motor (ECM), see Veris Application Note VN61, at www.veris.com.



H609
Dimensional Drawing

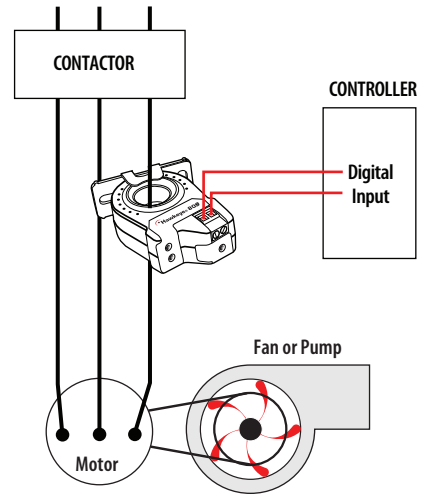


H809
Dimensional Drawing

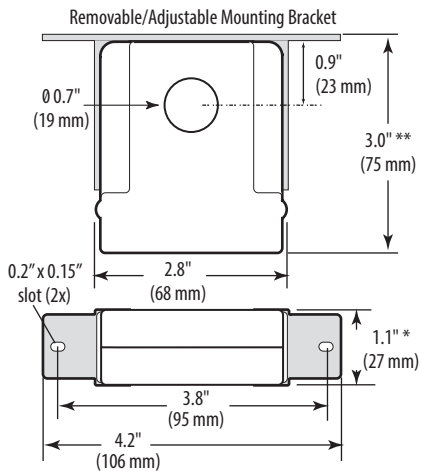


MONITORING FAN /PUMP MOTORS FOR POSITIVE PROOF OF FLOW

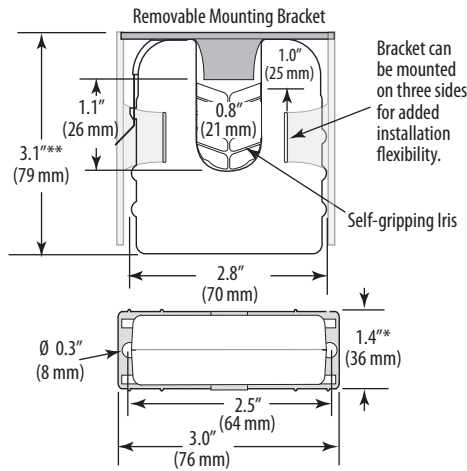
Wiring Diagram



H709/H709HV
Dimensional Drawing



H909/H909HV
Dimensional Drawing



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

ORDERING INFORMATION

MODEL	AMPERAGE RANGE @ 50/60 HZ ONLY	STATUS OUTPUT (MAX.)	MIN. TRIP POINT	STATUS LED	HOUSING	UL	CE	LEAD FREE
H609	1.25 to 50 A	N.O. 0.2 A @ 120 Vac/dc	1.25 A or less	•	Split-core	• ¹		•
H709	1 to 135 A	N.O. 0.2 A @ 120 Vac/dc	1.0 A or less	•	Solid-core	•		
H709HV	1 to 135 A	N.O. 1.0 A @ 250 Vac	1.0 A or less		Solid-core		•	
H809	0.75 to 50 A	N.O. 0.2A @ 120 Vac/dc	0.75 A or less	•	Solid-core	• ¹		•
H909	2.5 to 135 A	N.O. 0.2 A @ 120 Vac/dc	2.5 A or less	•	Split-core	•		
H909HV	2.5 to 135 A	N.O. 1.0A @ 250 Vac	2.5 A or less		Split-core		•	

1. Listed for use on 75°C insulated conductors.



HX06 SERIES

Detect Belt Loss, Coupling Shear, and Mechanical Failure



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 ¹)
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Hysteresis	10% Typical
Off State Leakage	34 µA @ 5 Vdc, 200 µA @ 30 Vdc
On State Voltage Drop	1.9 Vdc max@ 0.1 A
Terminal Block Wire Size	H300: 22 to 16 AWG (0.3 to 1.3 mm ²) Others: 24 to 14 AWG (0.2 to 2.1 mm ²)
Terminal Block Torque	H300: 7 in-lbs (0.8 N-m) Others: 3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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Adjustable trip point

Versatility with four available amperage ranges

No tubing needed

Easier to install than differential pressure switches

100% solid-state

No moving parts to fail

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)

Status LEDs

Output status LEDs for fast set up

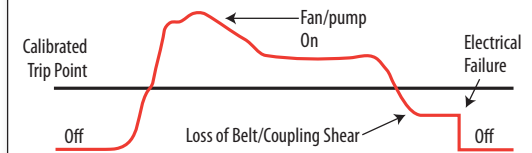
Easy placement

Adjustable mounting bracket on the solid-core housing

Self-gripping iris

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

DETECTS BELT LOSS/COUPLING SHEAR!



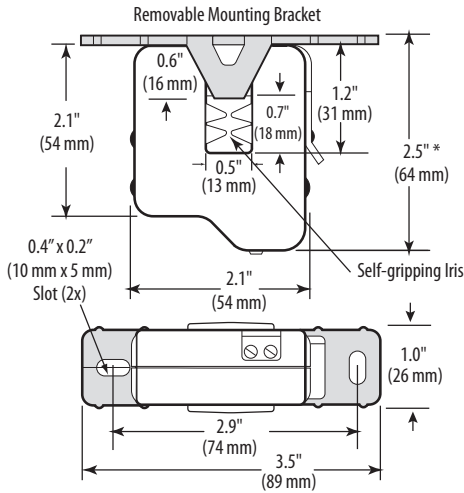
Now you can easily detect when drive belts slip, break, or pump couplings shear. In fact, a typical HVAC motor that loses its load has a reduction of current draw of up to 50%. That's why our sensors are the industry standard for status.

1. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

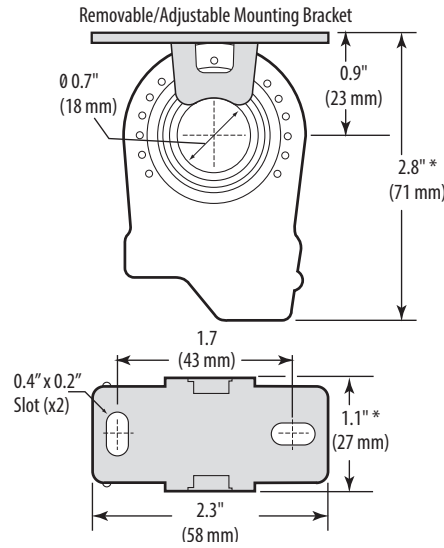
Note: Do not use the LED status indicators as evidence of applied voltage. (a) VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.



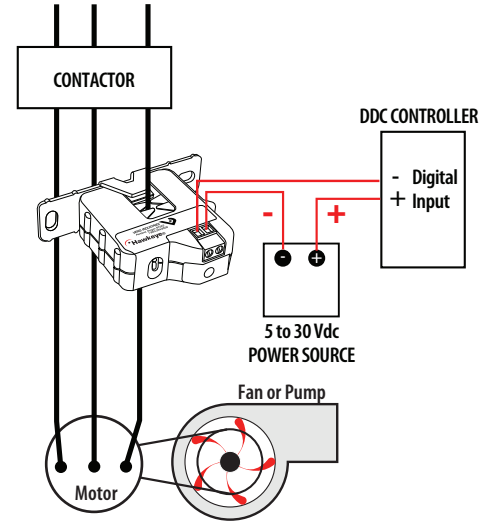
H606
Dimensional Drawing



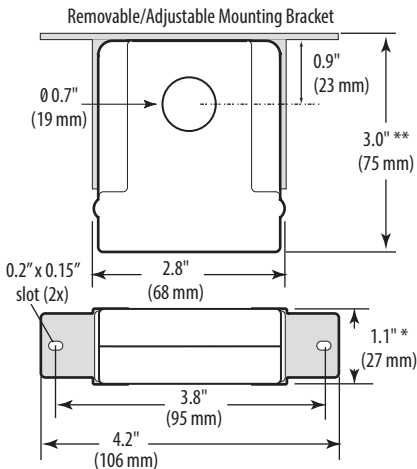
H806
Dimensional Drawing



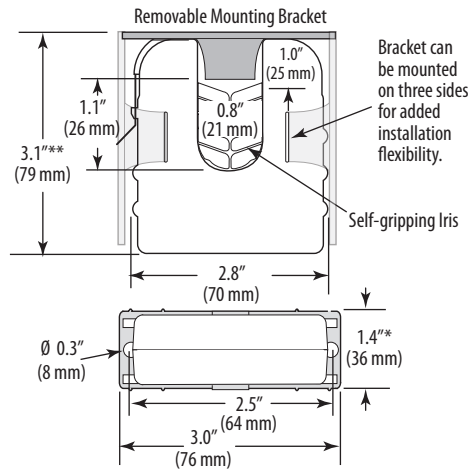
MONITORING FAN/PUMP MOTORS FOR POSITIVE PROOF OF FLOW (H606 & H806)
Wiring Diagram



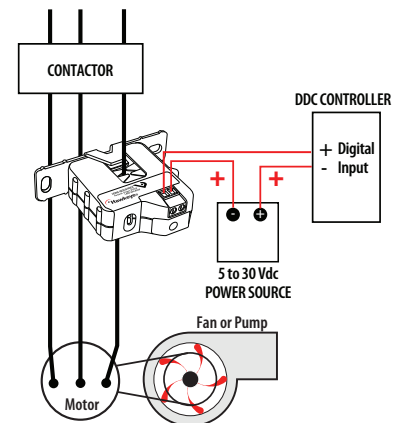
H706
Dimensional Drawing



H906
Dimensional Drawing



MONITORING FAN/PUMP MOTORS FOR POSITIVE PROOF OF FLOW (H706 & H906)
Wiring Diagram



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

ORDERING INFORMATION

MODEL	AMPERAGE RANGE	STATUS OUTPUT (MAX.)	MIN. TRIP POINT	HOUSING	STATUS LED	UL	CE
H606	1.25 to 50 A	N.C. 0.1 A @ 30 Vdc	1.25 A or less	Split-Core	•	• ¹	•
H706	1 to 135 A		1.0 A or less	Solid-Core	•	•	•
H806	0.75 to 50 A		0.75 A or less	Solid-Core	•	•	•
H906	2.5 to 135 A		2.5 A or less	Split-Core	•	•	•

1. Listed for use on 75°C insulated conductors.

H11D

LCD Display



H11D



The 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
Alarm-to-Normal Output Delay	30 sec. nominal

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

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

APPLICATIONS

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

Insulation Class	600 Vac RMS (UL); 300 Vac RMS (CE ³)
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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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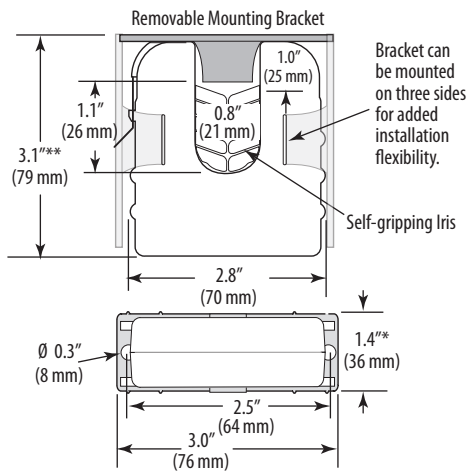
1. Trip point switch positions A and B are not for use in applications where the current will fluctuate by more than 40% (A) or 60% (B) of the nominal current. If the current will fluctuate by more than 60%, use the H11D for on/off status (position C) only.
2. The upper trip limit alarm resets when the 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.
3. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

Do not use the LCD as evidence of applied voltage.

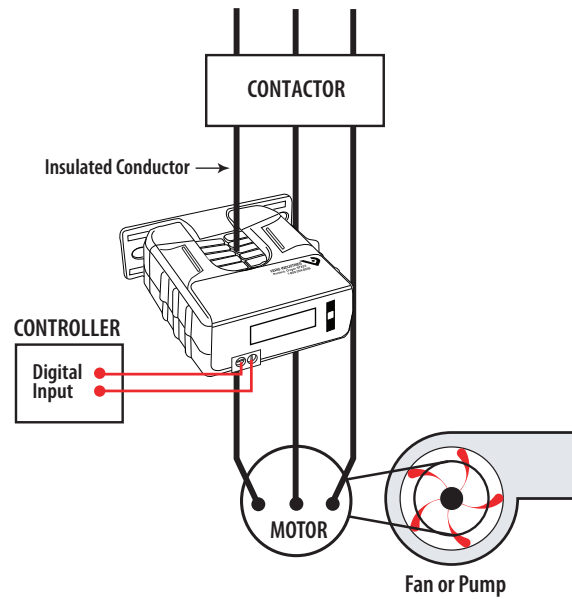


DIMENSIONAL DRAWING

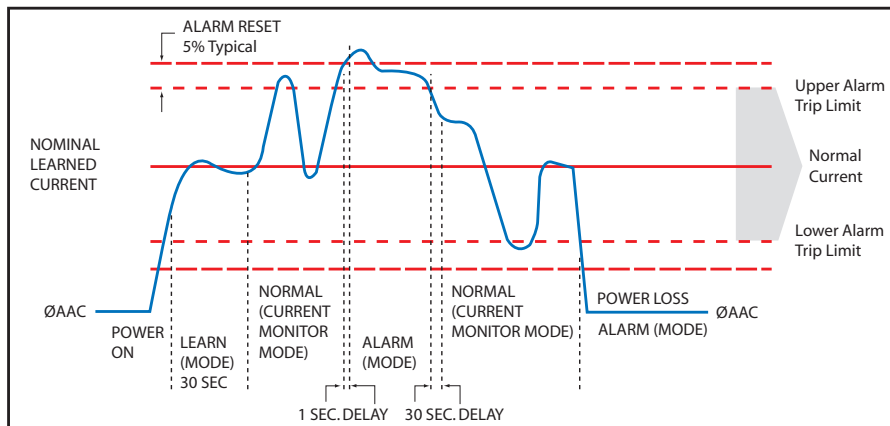


* Terminal block may extend up to 1/8" over the height dimensions shown.

WIRING DIAGRAM



FUNCTIONAL DRAWING



ORDERING INFORMATION

MODEL	AMPERAGE RANGE ¹	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.

H10F

Automatically Learns at Initial Power-Up



H10F
Hawkeye™

The Hawkeye TruStat H10F is a microprocessor based, self-learning, self-calibrating current switch. It provides calibration-free status, for both under-current and over-current conditions. At initial power-up, the H10F 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.

SPECIFICATIONS

Sensor Power	Induced from monitored conductor
Isolation	600 Vac RMS (UL); 300 Vac RMS (CE ¹)
Temperature Range	-15 to 60 °C (5 to 140 °F)
Humidity Range	10 to 90% RH non-condensing
Frequency Range	50/60 Hz
Trip Point Calibration Learn Period	30 sec. learn period
Normal-to-Alarm Status Output Delay	1 second max.
Alarm-to-Normal Status Output Delay	30 sec. nominal ²
Status Output	$\pm 20\%$ of learned current to trigger alarm; $\pm 15\%$ of learned current to release alarm (see graph)
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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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Adjustable trip point

Automatic adjustable trip point (3.5 to 100 A)...precise control of current trip point

Reduced costs

Automatic calibration...reduced errors and installation costs

100% solid state

No moving parts to fail

Flexibility

Removable mounting bracket for installation flexibility

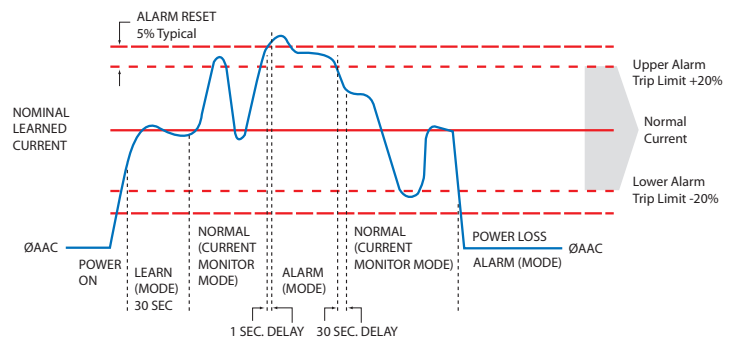
Microcontroller based learning technology

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

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)

PRODUCT FUNCTIONS

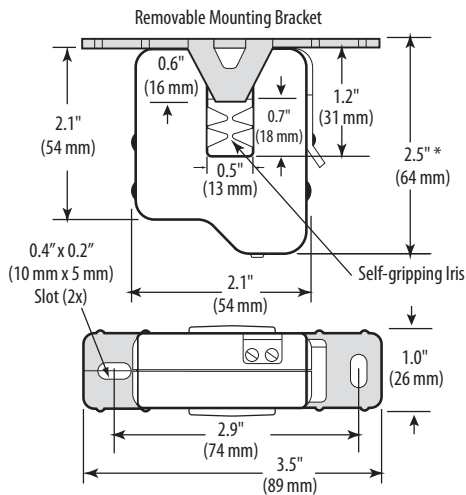


- The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.
- If current switch experiences a momentary loss of power, 30 second delay may or may not apply.

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



DIMENSIONAL DRAWING



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

HOW IT WORKS

The compact split-core H10F current switch monitors a learned load current to detect power loss and electrical overload. The push-button initiated LEARN MODE allows resetting of the monitored current when the load changes due to system alterations.

Learn Mode

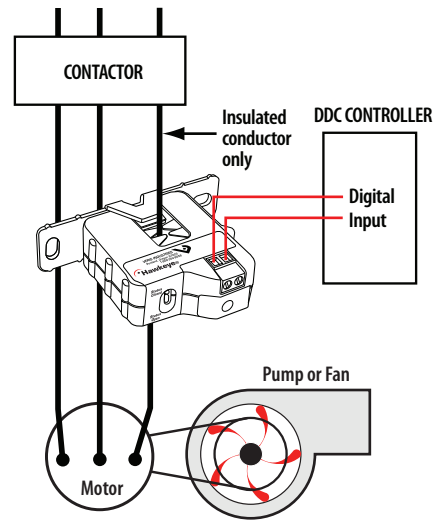
- Unit automatically enters LEARN MODE upon initial power-up
- Auto-calibration is achieved by averaging the load current for 30 seconds
- During this stage, green and red LEDs alternately blink on/off
- STATUS OUTPUT contacts are closed
- LEARN MODE may be initiated manually

Normal Mode

- Initiated after the 30-second learning period, or immediately upon power-up if sensor has already learned a load
- The red LED is off, and the green LED is blinking
- STATUS OUTPUT contacts are closed

MONITORING FAN/PUMP MOTORS FOR POSITIVE PROOF OF FLOW (H11D)

Wiring Diagram



Alarm Mode

- The ALARM state signals low current, high current, or power loss conditions
- Initiated within 1 second when any load current excursion exceeds a nominal $\pm 20\%$
- ALARM will persist until the load current returns to within a nominal $\pm 15\%$ of the learned current value, or when power is restored to normal
- The 5% ALARM-to-NORMAL MODE reentry margin prevents alarm signal oscillations. This feature is enhanced by a 30 second delay, to insure true nominal load current conditions when returning to NORMAL MODE from an ALARM state
- The green LED is off, and the red LED blinks
- STATUS OUTPUT contacts are open

OPERATING MODES	STATUS LEDs		STATUS OUTPUT
	GREEN	RED	
LEARN (30 secs)	Alternating Blink On/Off		Contacts Closed
NORMAL	Blink	Off	Contacts Closed
ALARM*	Off	Blink	Contacts Open

* 1 sec maximum after detection.

ORDERING INFORMATION

MODEL	AMPERAGE RANGE	STATUS OUTPUT	NOMINAL TRIP POINT TARGET RANGE ¹	NOMINAL ALARM RESET RANGE ¹	HOUSING	STATUS LED	UL	CE
H10F	3.5 to 100 A	N.O.1.0 A @ 30 Vac/ dc	$\pm 20\%$	$\pm 15\%$	Split-core	•	• ²	•

1. For best performance, monitor 5 A or more current. At currents less than 5A, these ranges are approximate. 2. Listed for use on 75°C insulated conductors.



H614

Automatically Learns At Initial Power-Up



H614



The 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 ⁴)
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
- 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)

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
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AGENCY APPROVALS

Agency Approvals	UL508 open device, CE: EN61010-1, CAT III, Pollution Degree 2
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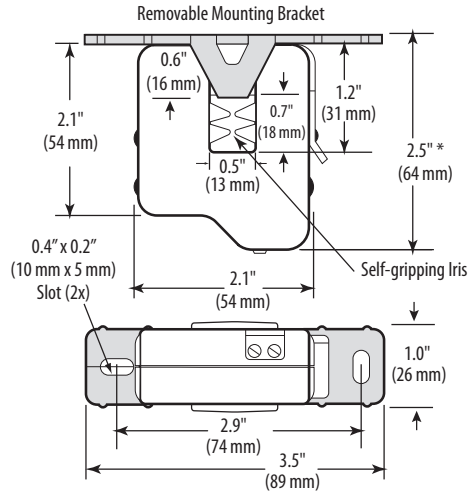
1. VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.
2. The H614 is not intended for use in applications where the current is expected to fluctuate by more than 20% due to acceptable causes other than VFD driven changes.
3. If the H614 experiences a momentary loss of power, the Alarm-to-Normal output delay may exceed 1 sec.
4. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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.

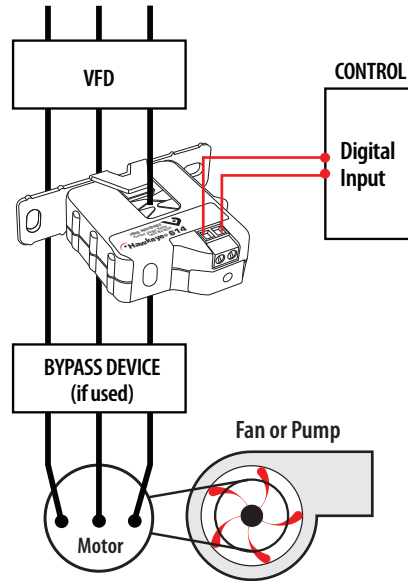


DIMENSIONAL DRAWING



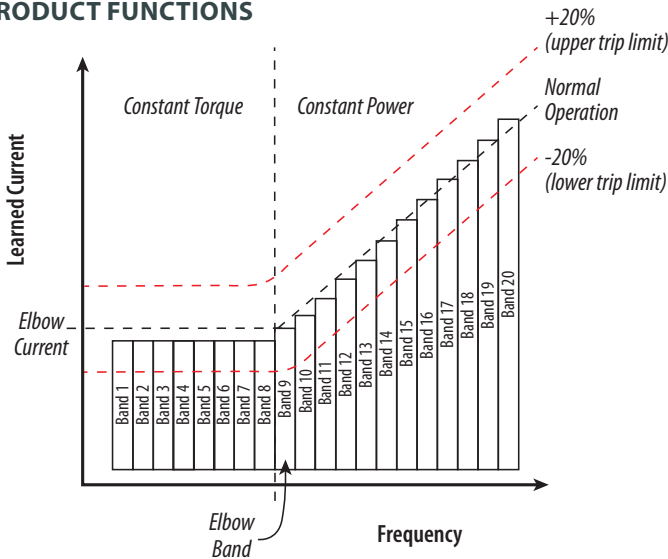
* Terminal block may extend up to 1/8" over the height dimensions shown.

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



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.

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.

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.

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



H720, H904 & H934

Variable Frequency Drive Monitoring and Control

Also see H614.



U.S. Patent No. 5,705,989

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)

Automatically compensates

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

Nuisance reduction

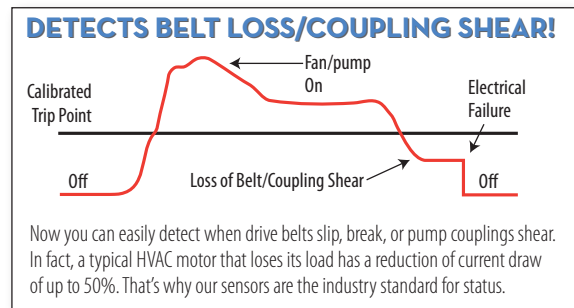
Provides a secondary setpoint option of 50% of the originally measured current (H901/934)

Rapid troubleshooting

LED indicates normal and alarm conditions (H901/934)

APPLICATIONS

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



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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing CAT III, Pollution Degree 2, basic insulation
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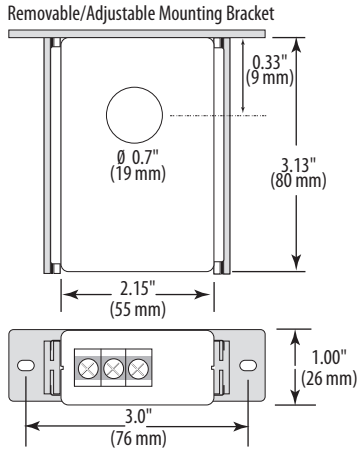


Note: Do not use the LED status indicators as evidence of applied voltage.

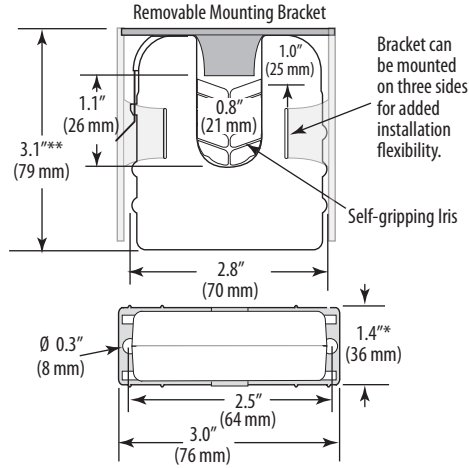
1. VFD systems generate fields that can disrupt electrical devices. Ensure that these fields are minimized and are not affecting the sensor.



H720
Dimensional Drawing



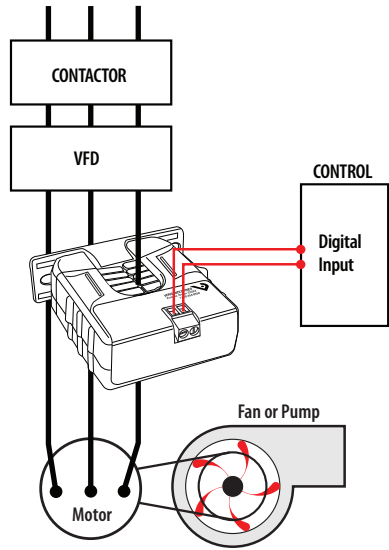
H904/934
Dimensional Drawing



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

MONITORING FAN /PUMP MOTORS FOR POSITIVE PROOF OF FLOW

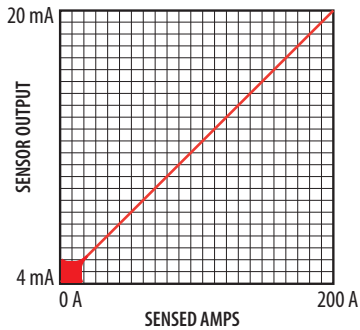
Wiring Diagram



Note: The H904 is not intended for use in staged pump or variable inlet vane applications.

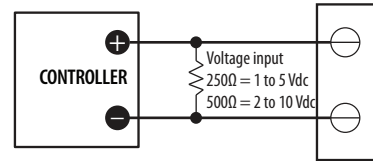
EXAMPLE LINEAR OUTPUT (H720)

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



H6ECM05



The 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

High performance device, split-core housing

Precise

Precise current trip point setting

Small size

Fits easily inside small enclosures

Self-gripping iris

Self-gripping iris for easy installation

Status LEDs

Status LEDs for easy setup and local indication

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
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AGENCY APPROVALS

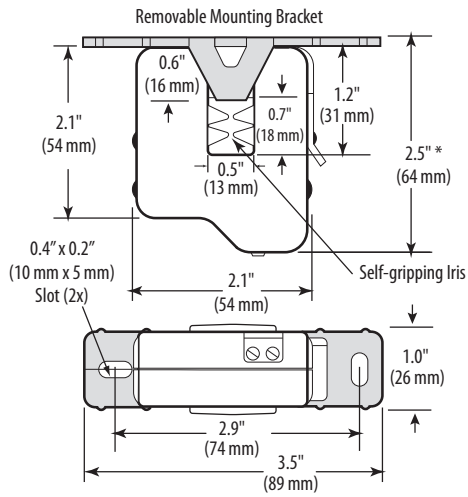
Agency Approvals	UL508 open device listing
Installation Category	CAT III, Pollution Degree 2



Notes: For applications requiring double or reinforced insulation, please contact the factory. The product design provides basic insulation only. Do not use the LED indicators as evidence of applied voltage.

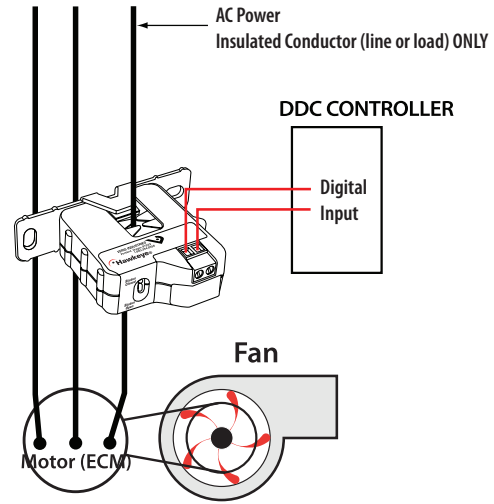


DIMENSIONAL DRAWING



* 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



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation
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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

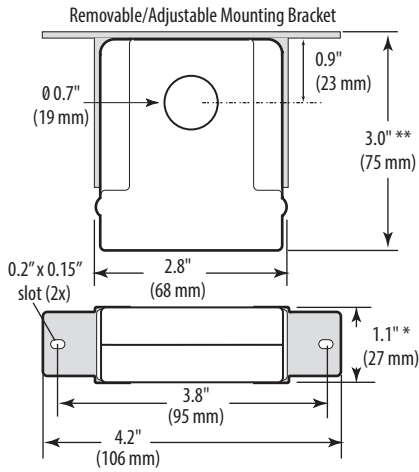
Inductive 3.5 A @ 250 Vac, 30 Vdc

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

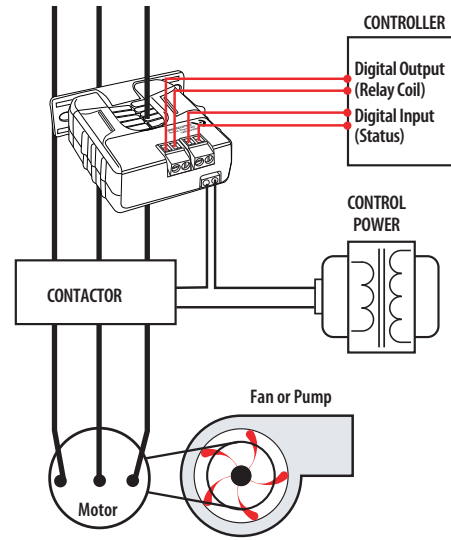


H730/740/750
Dimensional Drawing

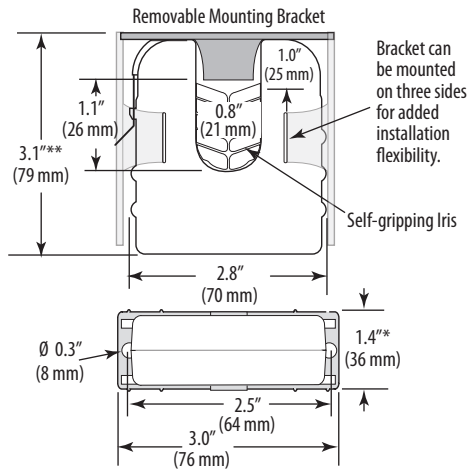


* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

START/STOP MONITORING OF FAN/PUMP MOTORS
Wiring Diagram

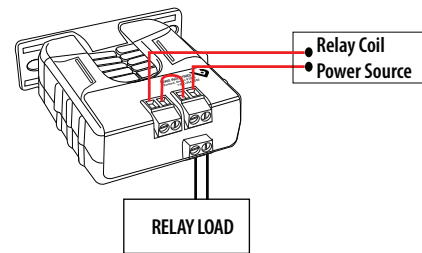


H930/940/950
Dimensional Drawing



* 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



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation
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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

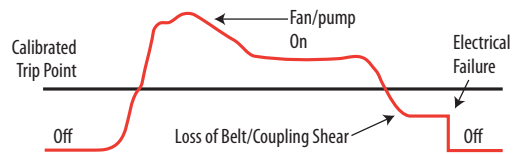
Added flexibility

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	

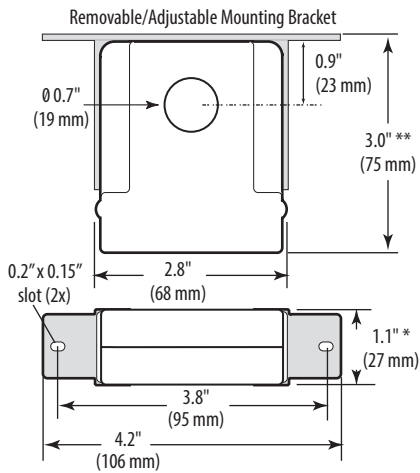
TYPICAL COIL PERFORMANCE

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

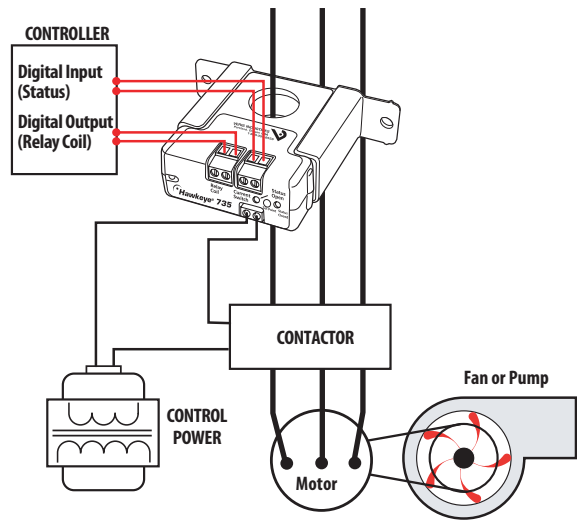
Dimensional Drawing



* 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.

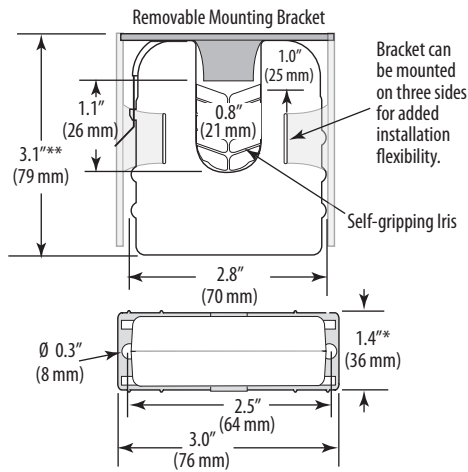
START/STOP MONITORING OF FAN /PUMP MOTORS

Wiring Diagram



H938/948/958

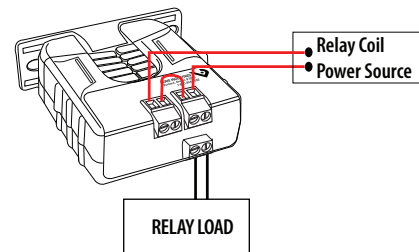
Dimensional Drawing



* 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	0.1 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		1.0 A @ 30 Vac/dc	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



H939



H739



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
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AGENCY APPROVALS

Limited Warranty	5 years
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Do not use the LED status indicators as evidence of applied voltage.

Combined relay & status

Combines command relay and fan/pump status sensor in a single, easy-to-install unit

No tubing

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

Polarity insensitive

Polarity insensitive status outputs...fast and easy installation

Detect belt loss

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

Easy setup

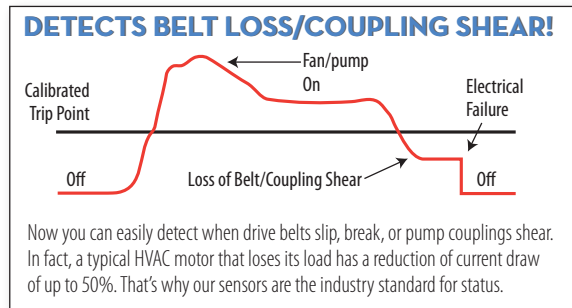
Relay and status LEDs

Added flexibility

Bracket on H939, H949, and H959 can be installed in three different configurations

APPLICATIONS

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



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	

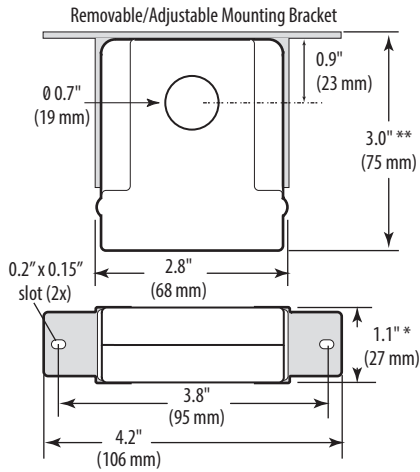
Typical Coil Performance

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

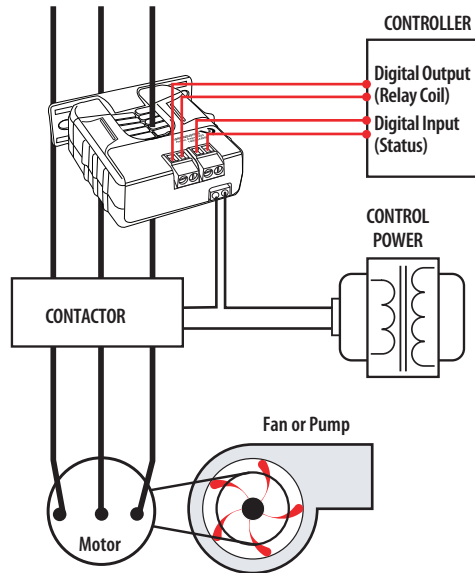
Dimensional Drawing



* 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.

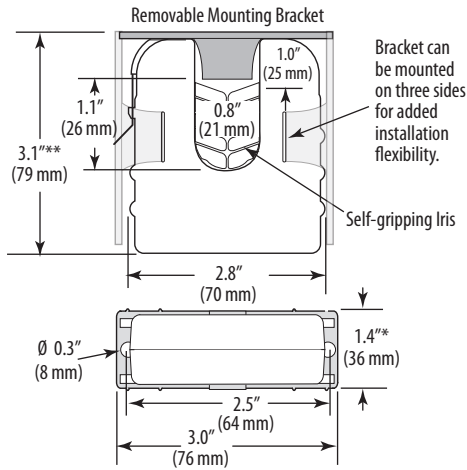
START/STOP MONITORING OF FAN /PUMP MOTORS

Wiring Diagram



H939/H949/H959

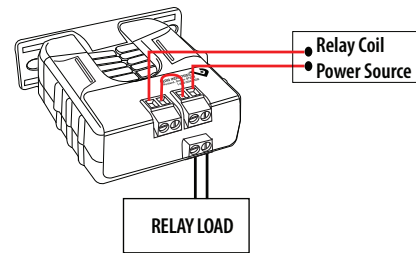
Dimensional Drawing



* 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	•	•	•
				SPDT	12 Vdc nom.	Split-core	•	•	•



H721XC SERIES & H921

Load Trending with 4 to 20 mA Output



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 ¹)
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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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1. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

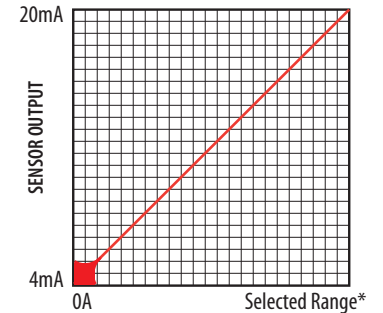
Removable mounting bracket for installation flexibility

APPLICATIONS

- Load trending
- Motor control
- Fan/pump status

EXAMPLE LINEAR OUTPUT

Scale software as shown

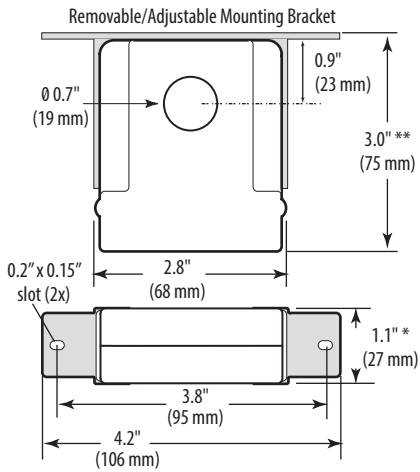


SENSED AMPS

*Factory calibrated ranges selected with the amperage range switch

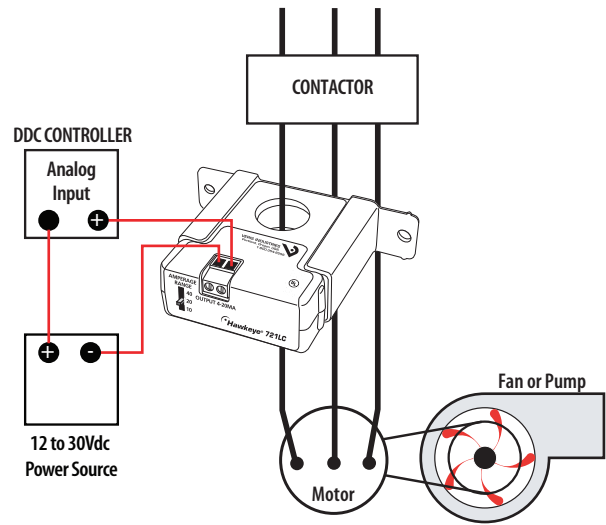


H721LC/H721HC
Dimensional Drawing



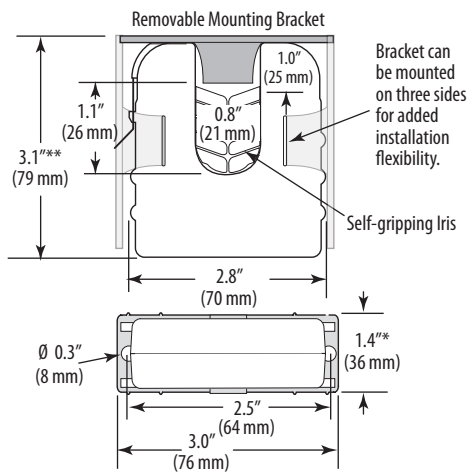
* Terminal block may extend up to 1/8" over the height dimensions shown.
** Slide switch may extend up to 1/4" over the height dimensions shown.

MONITORING FAN /PUMP MOTORS FOR POSITIVE PROOF OF FLOW
Wiring Diagram

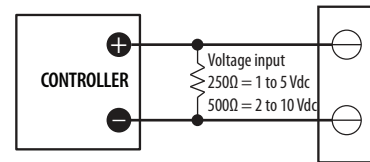


Voltage Output

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.



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



H321



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 ¹)
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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing, CE: EN61010-1, (H221, H321 only)CAT III, Pollution Degree 2, basic insulation
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1. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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

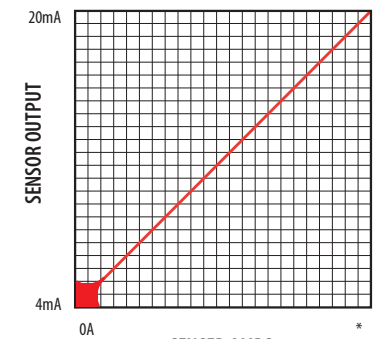
Hx21 models offer zero and span adjustments for field flexibility

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

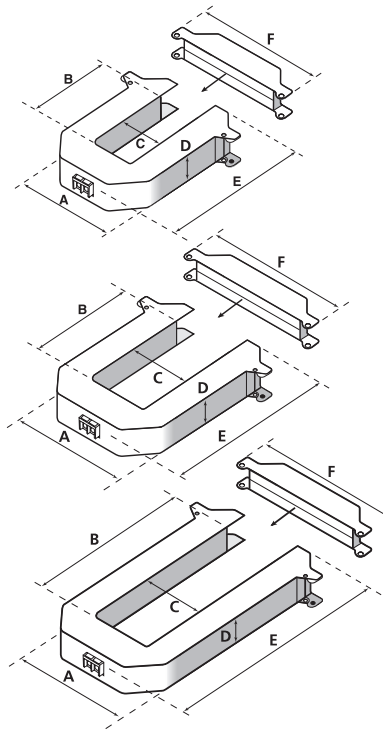


*Adjusted with Span Potentiometer for Hx21 models;
Factory-set per customer specification for Hx21SP models

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



DIMENSIONAL DRAWING



H221

- A = 3.7" (94 mm)
- B = 1.6" (40 mm)
- C = 1.4" (35 mm)
- D = 1.1" (29 mm)
- E = 4.2" (106 mm)
- F = 4.7" (120 mm)

H321

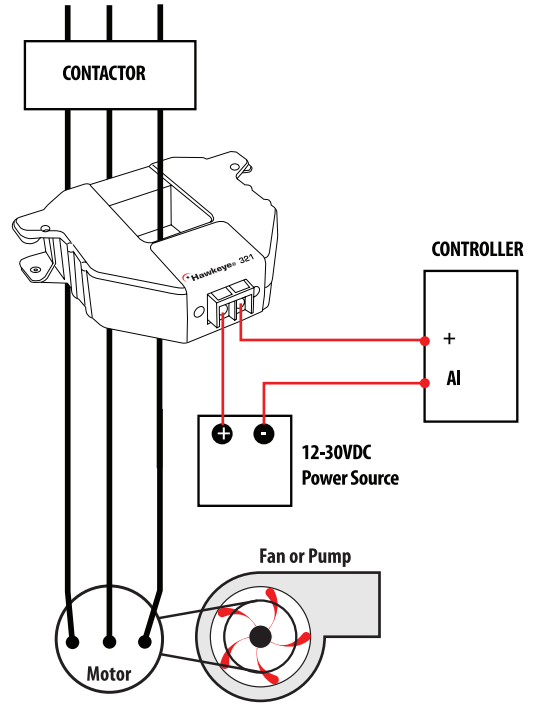
- A = 4.9" (124 mm)
- B = 2.9" (75 mm)
- C = 2.5" (63 mm)
- D = 1.2" (29 mm)
- E = 5.5" (140 mm)
- F = 6.0" (151 mm)

H421

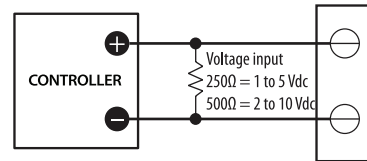
- A = 4.9" (124 mm)
- B = 5.5" (141 mm)
- C = 2.5" (65 mm)
- D = 1.1" (29 mm)
- E = 8.1" (206 mm)
- F = 6.0" (151 mm)

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				1	•	
H321				1	•	
H321SP				1	•	
H421						•
H421SP						•

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



H722 LC

H922

H822

H622-xx



The 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 ¹)
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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing; CE: EN61010-1, CAT III, Pollution Degree 2, basic insulation
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1. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.

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)

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

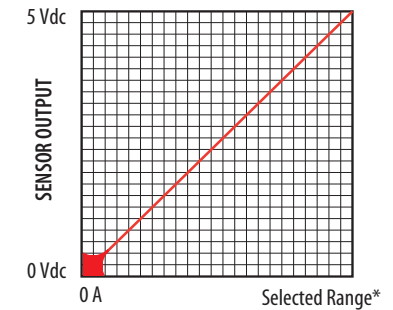
No jumpers on unit...reduces installation error

APPLICATIONS

- Load trending
- Motor control
- Positive proof of flow

EXAMPLE LINEAR OUTPUT

Scale software as shown

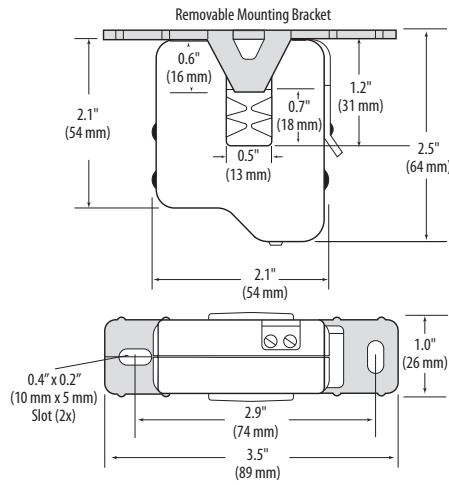


*Factory calibrated ranges selected with the amperage range switch



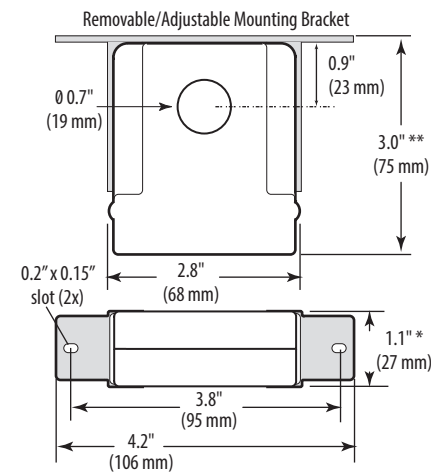
H622-XX

Dimensional Drawing



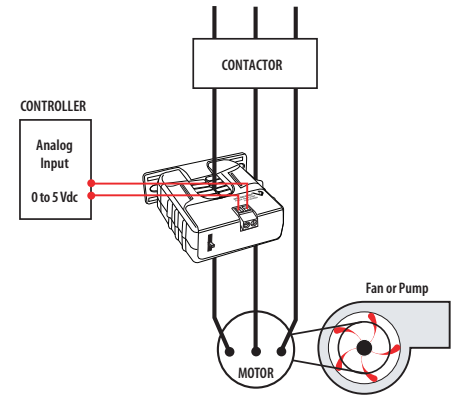
H722LC/H722HC

Dimensional Drawing



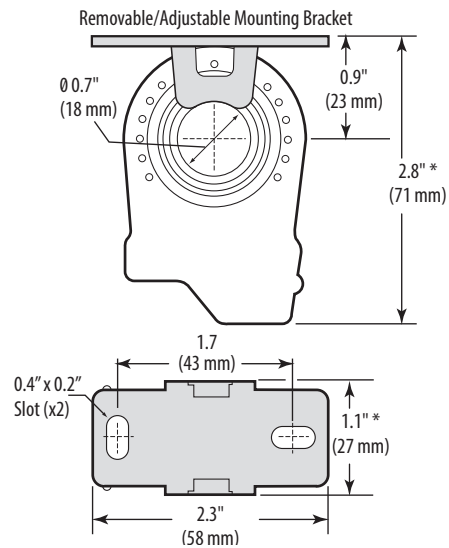
MONITORING FAN /PUMP MOTORS FOR POSITIVE PROOF OF FLOW

Wiring Diagram



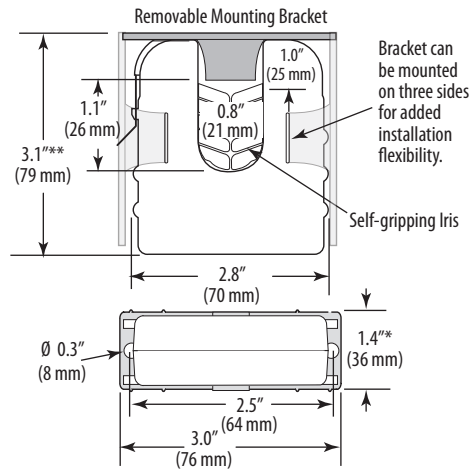
H822/H822-20

Dimensional Drawing



H922

Dimensional Drawing



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

ORDERING INFORMATION

MODEL	AMPERAGE RANGE	SENSOR OUTPUT	HOUSING	UL	CE	LEAD FREE
H622-10	0 to 10 A	0 to 5 Vdc	Split-core	•	•	
H622-20	0 to 20 A		Split-core	•	•	
H722LC	0 to 10/20/40 A		Solid-core	•	•	
H722HC	0 to 50/100/200 A		Solid-core	•	•	
H822	0 to 10 A		Solid-core	•		•
H822-20	0 to 20 A		Solid-core	•		•
H922	0 to 30/60/120 A		Split-core	• ¹	•	
H922030A	0 to 30 A		Split-core		•	
H922060A	0 to 60 A		Split-core		•	
H922120A	0 to 120 A		Split-core		•	

1. Listed for use on 75°C insulated conductors.



HX23 SERIES

Load Trending with 0 to 10 Vdc Output



H923



H723



H623-xx



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing (H623-xx only); CE ¹ : EN61010-1, CAT III, Pollution Degree 2, basic insulation
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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

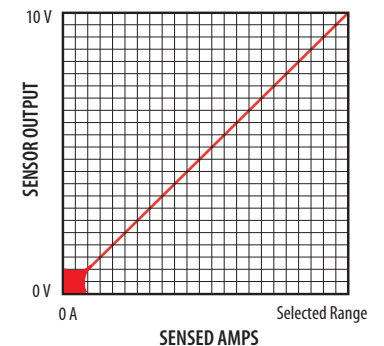
Factory calibrated ranges for high resolution and installation ease

Field-selectable ranges

Some models available with field-selectable ranges

EXAMPLE LINEAR OUTPUT

Scale software as shown

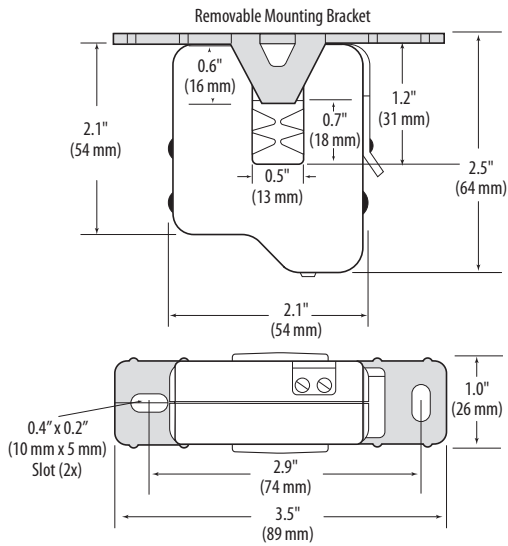


1. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.



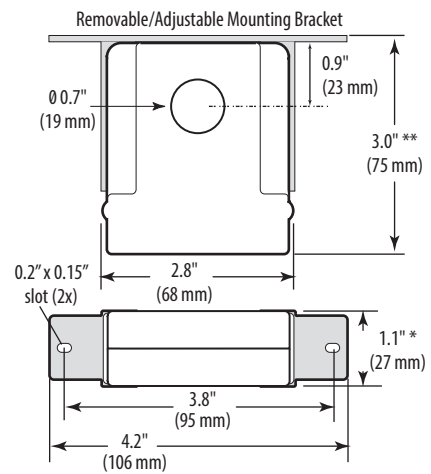
H623-XX

Dimensional Drawing



H723LC/H723HC

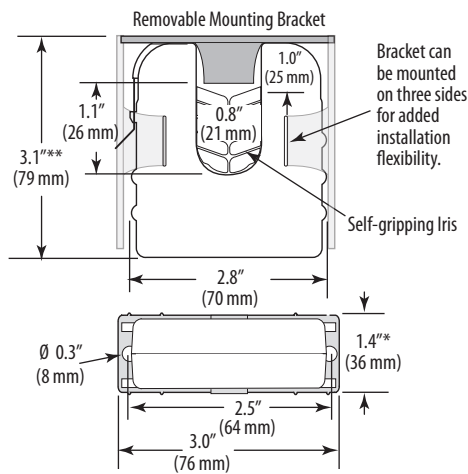
Dimensional Drawing



* 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

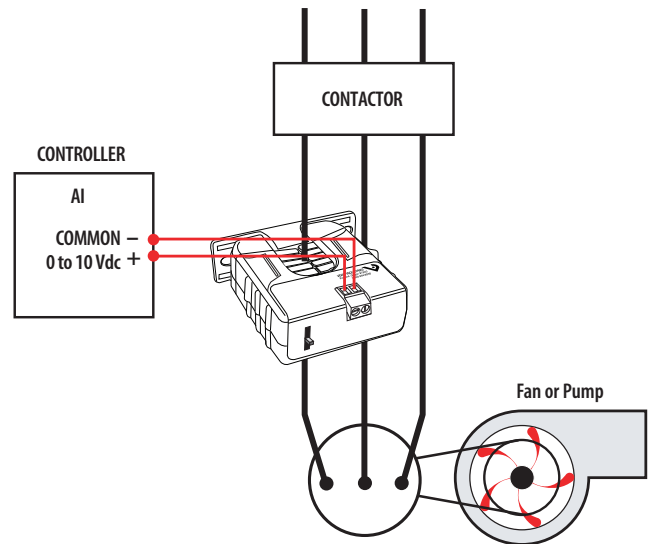
Dimensional Drawing



* 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



H931



The 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 mm ²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation
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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

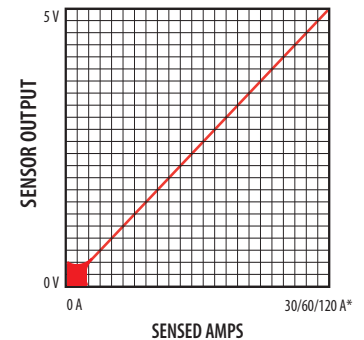
Selectable factory calibrated ranges up to 120 A for increased flexibility and resolution

APPLICATIONS

- Load trending
- Motor control
- Positive proof of flow

EXAMPLE LINEAR OUTPUT

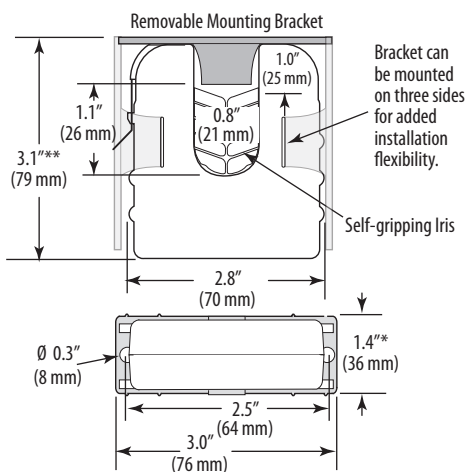
Scale software as shown



*Factory calibrated ranges selected with the amperage range switch



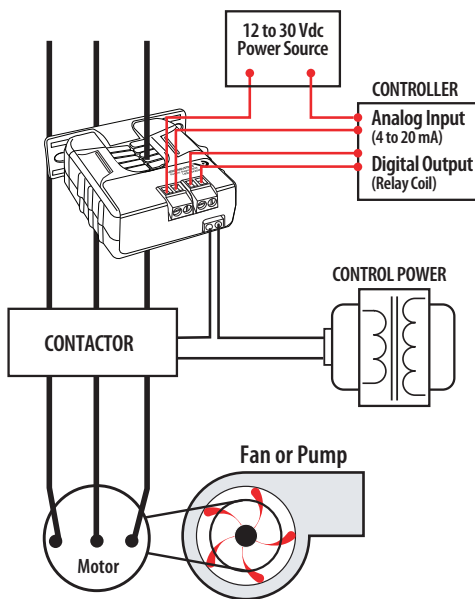
DIMENSIONAL DRAWING



* 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 & 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



H932



The 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 mm ²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS

Agency Approvals	UL 508 open device listing, CAT III, Pollution Degree 2, basic insulation
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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

Reduces installation

One device to install for start/stop and status

Saves time

Reduces the number of installed components...saves time and space

No external power

No external power required for current sensor

Retrofit

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

Increased flexibility

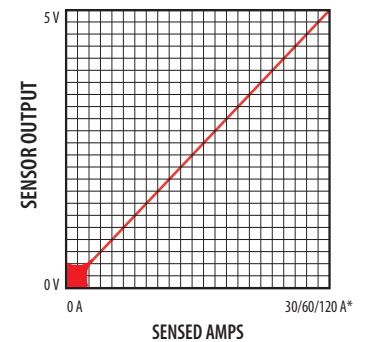
Selectable factory calibrated ranges up to 120 A for increased flexibility and resolution

APPLICATIONS

- Load trending
- Motor control
- Fan/pump status

EXAMPLE LINEAR OUTPUT

Scale software as shown

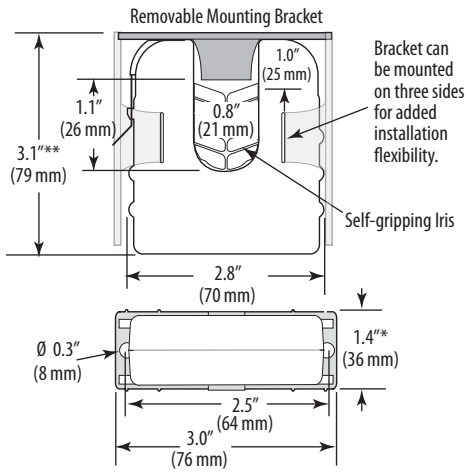


*Factory calibrated ranges selected with the amperage range switch



H932/H952

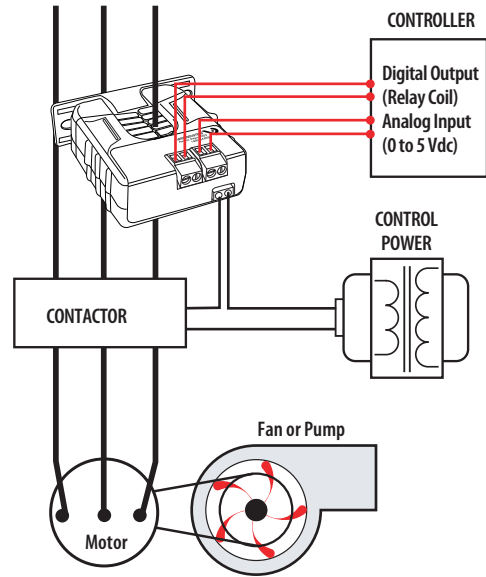
Dimensional Drawing



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

TRENDING & CONTROLLING MOTOR LOADS WITH THE HAWKEYE 932

Wiring Diagram



RELAY CONTACT RATINGS (N.O.)

Resistive	5 A @ 250 Vac, 30 Vdc
	5 A @ 30 Vac, 30 Vdc
Inductive	2 A @ 250 Vac, 30 Vdc
	2 A @ 30 Vac, 30 Vdc

TYPICAL COIL PERFORMANCE

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

ORDERING INFORMATION

MODEL	AMPERAGE RANGE	SENSOR OUTPUT	RELAY TYPE	RELAY COIL	HOUSING	UL
H932	0 to 30/60/120 A	0 to 5 Vdc	SPST, N.O.	24 Vac/dc	Split-core	•
H952				12 Vdc		•

H971 & EA20 SERIES

DC Applications



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) ³ ; 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) ⁵
Accuracy at Ranges Above 100 A	±0.5% full scale (combined linearity, hysteresis, and repeatability) ⁵
Withstand Current	25,000 ADC

WARRANTY

Limited Warranty	5 years
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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
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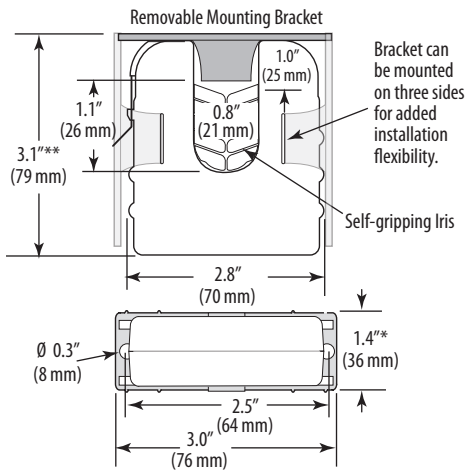
Note: Do not use the LED status indicators as evidence of applied voltage.

1. For currents over 120A, supply voltage must be at least 15V.
2. For H971, at zero monitored current: 35mA max.; at 200A monitored current: 55mA to 100mA depending on supply voltage and current polarity.
3. Unless factory set per customer specifications (H971SP only).
4. The CE mark indicates RoHS2 compliance. Please refer to the CE Declaration of Conformity for additional details.
5. For single conductor through product (no wraps).



H932/H952

Dimensional Drawing

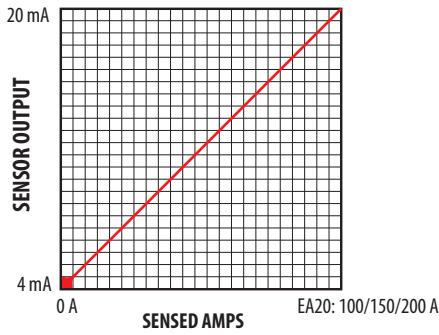


* Terminal block may extend up to 1/8" over the height dimensions shown.

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

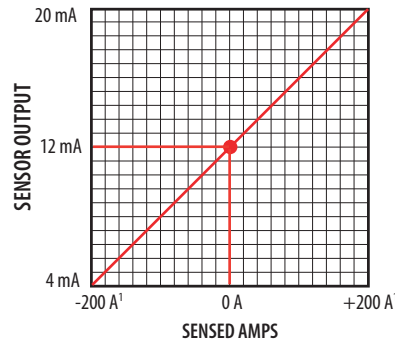
EA20 LINEAR OUTPUT

Scale software as shown



H971 BIDIRECTIONAL OUTPUT

Scale software as shown

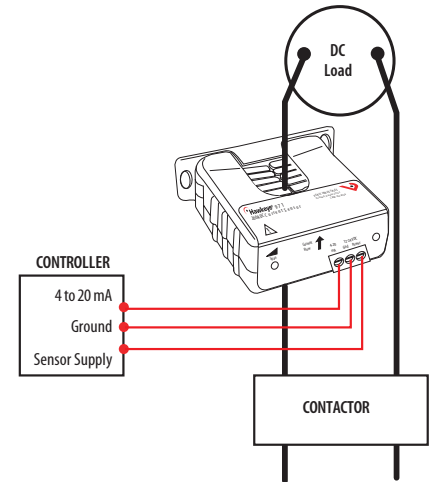


1. Field Adjustable from ±20 A to ±200 A

(not applicable to customer-specified factory scaled models)

H971/EA20

Wiring Diagram



ORDERING INFORMATION

MODEL	PULSE RESET TECHNOLOGY	AMPERAGE RANGE (DC)	SENSOR OUTPUT	HOUSING	STATUS LED	UL	CE	ROHS
Hawkeye Series								
H971	•	0 to 200 A	Bidirectional 4 to 20 mA	Split-core	•	•	•	•
H971SP	•	0 to 200 A1	Bidirectional 4 to 20 mA	Split-core	•	•	•	•
EA Series								
EA20BB010	•	0 to 100 A	Unidirectional 4 to 20 mA	Split-core	•	• ²	•	•
EA20BB015	•	0 to 150A	Unidirectional 4 to 20 mA	Split-core	•	• ²	•	•
EA20BB020	•	0 to 200A	Unidirectional 4 to 20 mA	Split-core	•	• ²	•	•

1. Range set in factory per customer specified value from 0 to ±20 A through 0 to ±199 A.

2. UL Recognized.

H5XX SERIES

Combination Switching Relay,
Current Status Switch, and HOA Switch*



The 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 mm ²)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
WARRANTY	
Limited Warranty	5 years
AGENCY APPROVALS	
Agency Approvals	UL 508 closed type device listing, CAT III, Pollution Degree 2, basic insulation

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

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

SPST

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

Gang box mounting

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

Up to 1 HP

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

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	
	2 1.5 HP @ 277 Vac	
SPST (HOA) Models		
Resistive	15 A @ 250 Vac	
Motor	1 HP @ 120 Vac	

TYPICAL COIL PERFORMANCE

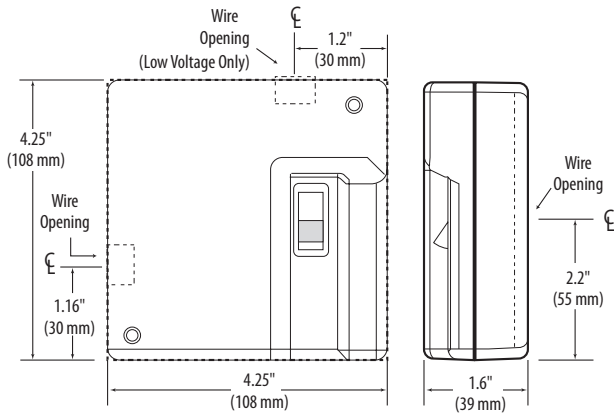
Voltage	AC	DC
	24 V	36 mA



*Some models

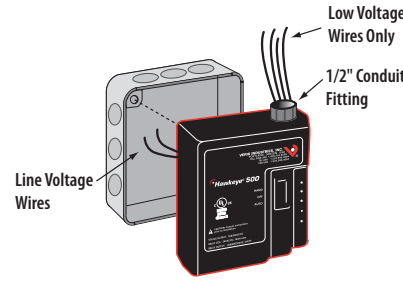


DIMENSIONAL DRAWING



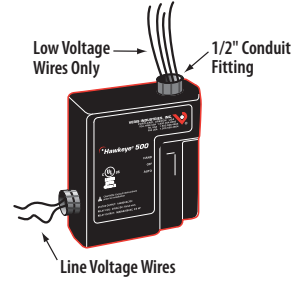
MOUNTS DIRECTLY ON 4-GANG JUNCTION BOX

Mounting Options

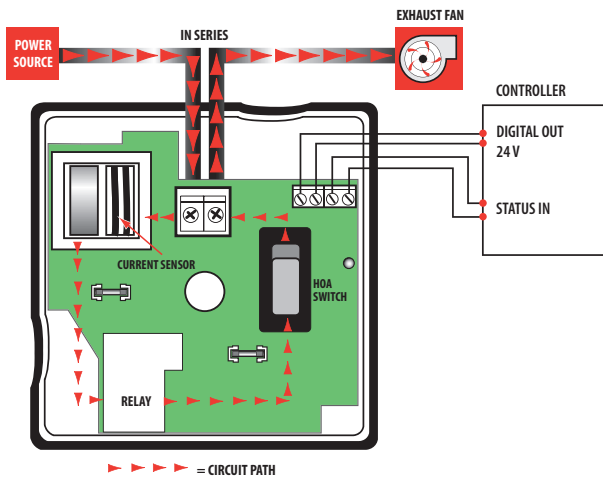


MOUNTS DIRECTLY ON WALL OR PANEL

Mounting Options

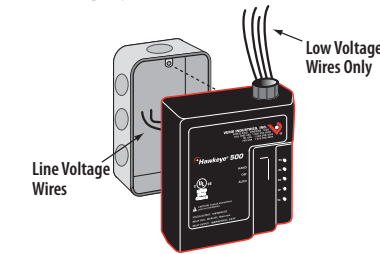


WIRING DIAGRAM

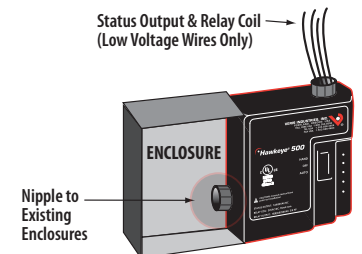


MOUNTS DIRECTLY ON 2-GANG JUNCTION BOX

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



The 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.)
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
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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

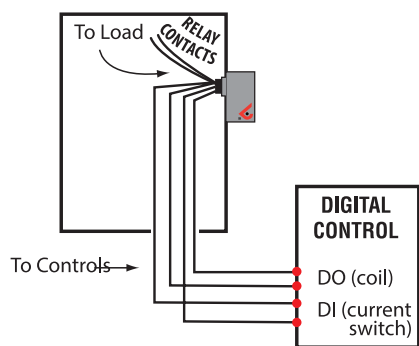
APPLICATIONS

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



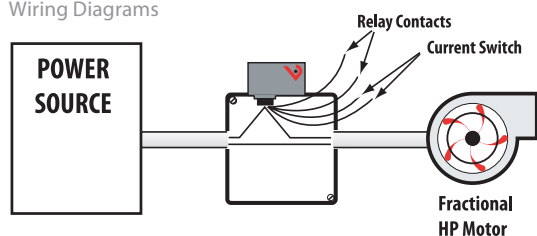
NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagrams

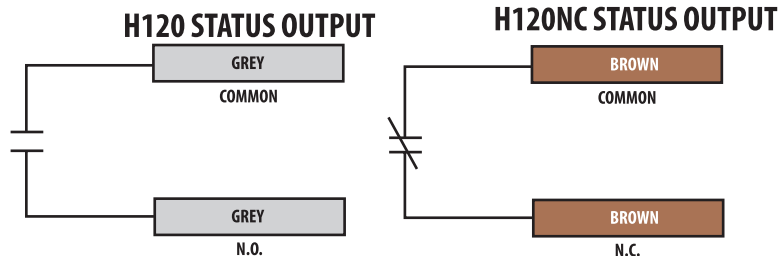
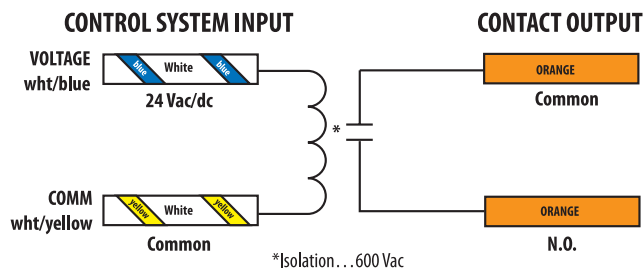


NIPPLE MOUNT TO 4X ELECTRICAL BOX

Wiring Diagrams



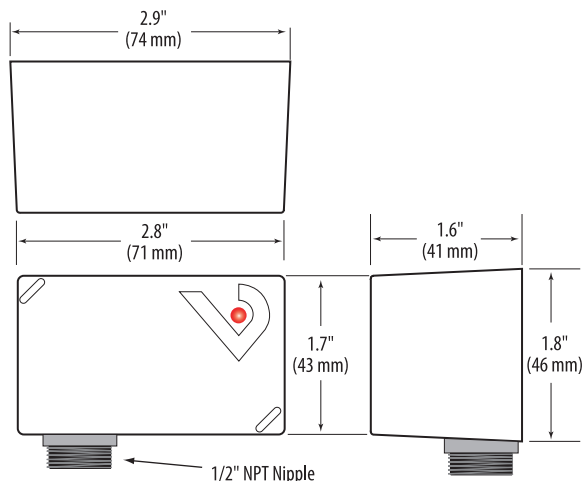
WIRE COLOR CODES



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



RELAYS

Veris offers a complete line of relays for motor control, relay logic, and other automation system applications. Nipple mount, SNAPTRACK™ mount, DIN mount and other options are all available.

MODEL	DESCRIPTION	PAGE
V100/200 Series	10 A SPDT Enclosed Relay 10 A@277 Vac, 28 Vdc	289
V101/102/103 and V201	10 A SPST Enclosed Relay with HOA Switch 10 A@250 Vac or 277 Vac	291
V300/400	10 A DPDT Enclosed Relay 10 A@277 Vac, 30 Vdc	293
V120/V220	20 A SPDT Enclosed Relay 20 A@277 Vac, 28 Vdc	295
V121/122/123 and V221/222/223	20 A SPST Enclosed Relay with HOA Switch 20 A@240 Vac, 8 A@28 Vdc	297
V320/V420	20 A DPDT Enclosed Relay 20 A@277 Vac, 28 Vdc	299
V321/V421	20 A DPST Enclosed Relay with HOA Switch 20 A@240 Vac or 8 A@240 Vdc	301
V645	10 A SPDT Enclosed Mini Command Relay 10 A@250 Vac N.O., 7 A@250 Vac N.C.	303
VMD1B	Socket SPDT Relays	305
VMD2B	Socket DPDT Relays	307
VMD3B	Socket 3PDT Relays	309
VMD4B	Socket 4PDT Relays	311
VS861 Series	Solid State Relays	313
VTD2P-F50/VTD1P-UNI/VTD2P-UNI	Time Delay Relays	315



RELAY SELECTION GUIDE

RELAYS AND SOCKETS

	NIPPLE MOUNT	SOCKET MOUNT	DIN MOUNT
SPDT 10A	V100*/V200* page 289	VMB1B-S* (3A) page 305	V645, VMB1B-S* (3A) pages page 303, page 305
SPDT 20A	V120/V220 page 295	VMD1B-C*/VMD1B-F* page 305	VMD1B-C*/VMD1B-F* page 305
DPDT 10A	V300/V400 page 293	VMD2B-S* page 307	VMD2B-S* page 307
DPDT 20A	V320/V420 page 299	VMD2B-C*/VMD2B-F* page 307	VMD2B-C*/VMD2B-F* page 307
3PDT 15A		VMD3B-C*/VMD3B-F* page 309	VMD3B-C*/VMD3B-F* page 309
4PDT 15A		VMD4B-C*/VMD4BF* page 311	VMD4B-C*/VMD4BF* page 311
Time Delay 12A		VTD2P-F50 page 315	VTD1P-UNI/VTD2P-UNI page 315
Solid State 8A			VS861* page 313

* Indicates a series of products.

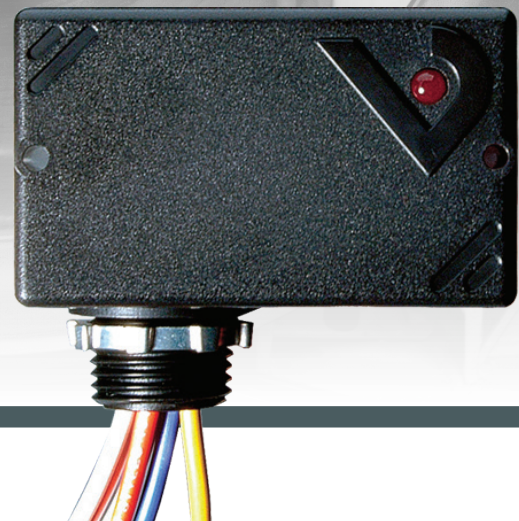
RELAYS WITH HOA SWITCH

	NO HOA MONITORING	RESISTIVE HOA MONITORING	DIGITAL HOA MONITORING
SPST 10A	V101*/V201* page 291	V102 page 291	V103 page 291
SPST 20A	V121/V221 page 297	V122/V222 page 297	V123/V223 page 297
DPST 20A	V321/V421 page 299		

* Indicates a series of products.



Reduce Costs with Quick & Easy Mounting



Victory Enclosed Relays

Saves Debug Time

Local control and troubleshooting with HOA switch.

Saves Labor

Exceptional labor savings.

Quick Mounting

With nipple mount feature for common electrical box enclosures.

Interested in learning more about the Victory relay products?
Contact a Relay Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on page 289

VERIS 
INDUSTRIES



800.354.8556 | +1 503.598.4564 | sales@veris.com | intl@veris.com

Save Time & Costs with Simplified Installation & Maintenance



DIN Mount Socket Relays

Manually Override

Relay with override lever, providing control at the relay.

Test Button

Push to test button, activate relay to commission job.

Contact Flag

For easy troubleshooting with visual confirmation, eliminates guesswork and saves time.

Hold-Down Clip

Available with marking surface for tidy installation.

Interested in learning more about the DIN Mount Socket relay products?

Contact a Relay Specialist today: 800.354.8556 or at sales@veris.com

See Product Specifications on page 305



800.354.8556

| +1 503.598.4564

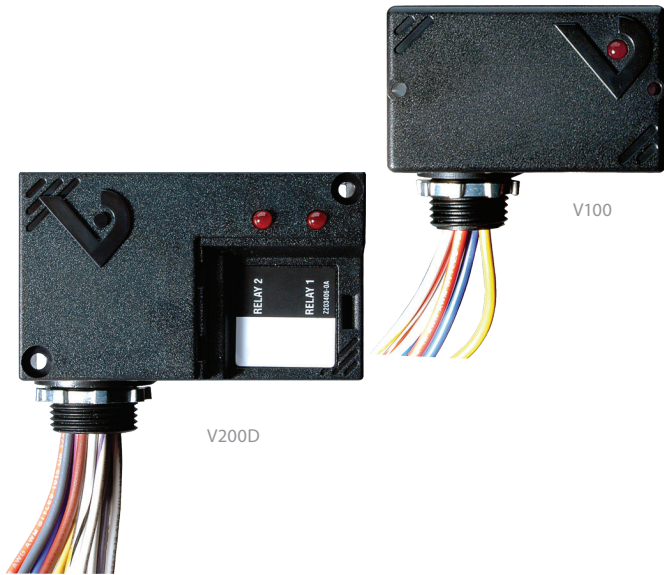
| sales@veris.com

| intl@veris.com

| www.veris.com

VICTORY 100 & 200 SERIES

Great for External Mount Applications



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
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AGENCY APPROVALS

Agency Approvals	UL 508
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Sleek enclosure

Reduces the need for panel space

UL508 Listed

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

Nipple mount

Victory Series products can be mounted to any electrical enclosure, easing installation

Eliminate conduit

Run low voltage instead of line voltage...eliminates conduit in some applications

Flexible wire

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

APPLICATIONS

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

TYPICAL COIL PERFORMANCE

Pull in Voltage	AC	DC
10 to 30 V	8	9
120 V	78	
208 to 277 V	154	
Drop Out Voltage		
10 to 30 V	2	3
120 V	18	
208 to 277 V	36	
Voltage	Coil Current	
	AC	DC
10 V	25 mA	14 mA
12 V	25 mA	14 mA
24 V	31 mA	16 mA
30 V	39 mA	18 mA
120 V	22 mA	
208 V	19 mA	
277 V	25A	

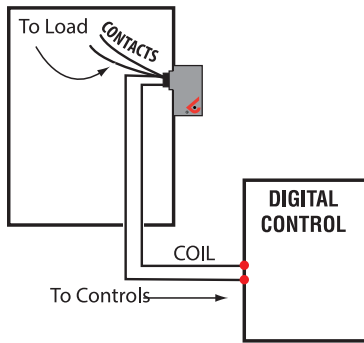
CONTACT RATINGS

Resistive	10 A @ 277 Vac, 28 Vdc
Motor	120 Vac, 1/3 HP N.O. & 1/6 HP N.C. 240 Vac, 1/3 HP N.O. & 1/6 HP N.C. 277 Vac, 1/4 HP N.O. * 1/8 HP N.C.
Pilot Duty	277 Vac (1.7 A), 480 VA N.O.
Ballast	277 Vac, 1.7 A
Tugsten	120 Vac, TV3 N.O. TV2 N.C.
Gold Flash	yes



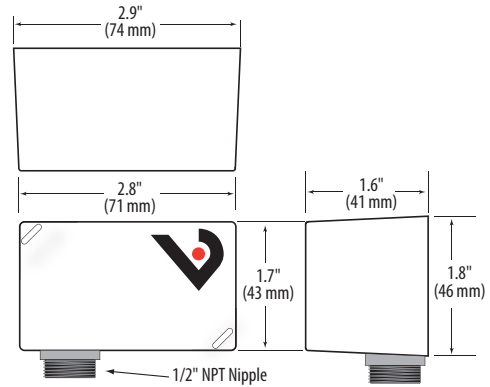
NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagram



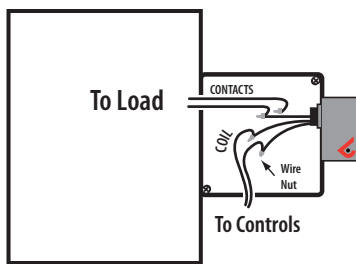
V100/V100DC/V200

Dimensional Drawing



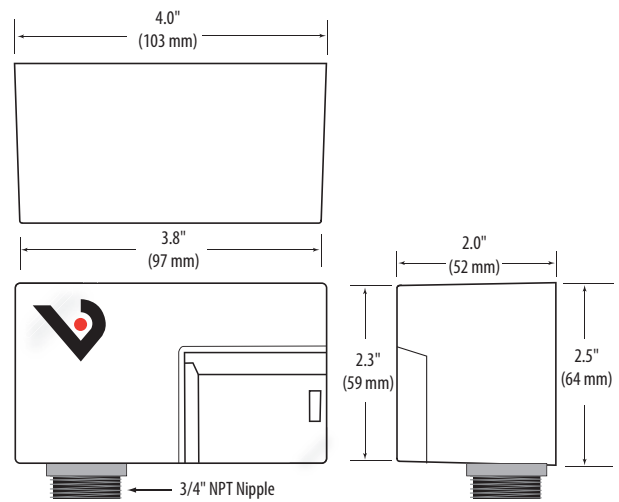
NIPPLE MOUNT TO ANY 2X OR 4X ELECTRICAL BOX

Wiring Diagram



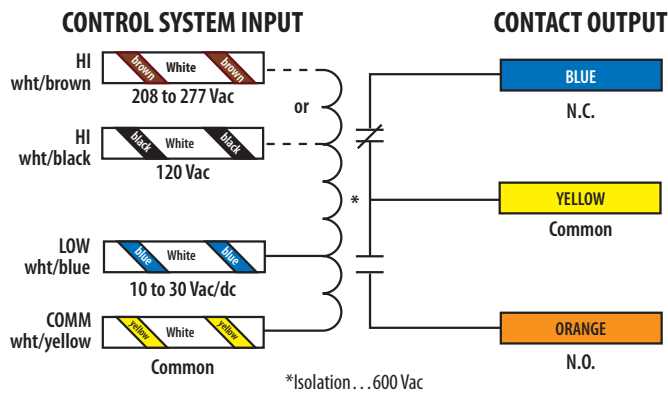
V100D/V200D

Dimensional Drawing



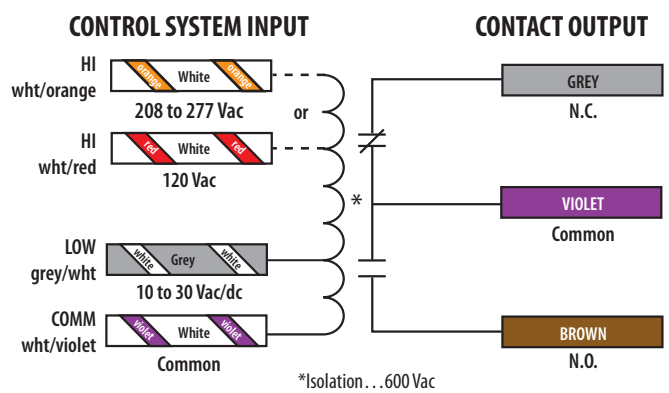
PRIMARY

Wire Color Codes



RELAY 2 ON V100D AND V200D ONLY

Wire Color Codes



ORDERING INFORMATION

MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V100*	SPDT	10 to 30 Vac/dc, 120 Vac	10 A	•	•
V100D	2x SPDT	10 to 30 Vac/dc, 120 Vac		•	•
V100DC	SPDT	10 to 30 Vdc		•	•
V200	SPDT	10 to 30 Vac/dc, 208 to 277 Vac		•	•
V200D	2x SPDT	10 to 30 Vac/dc, 208 to 277 Vac		•	•

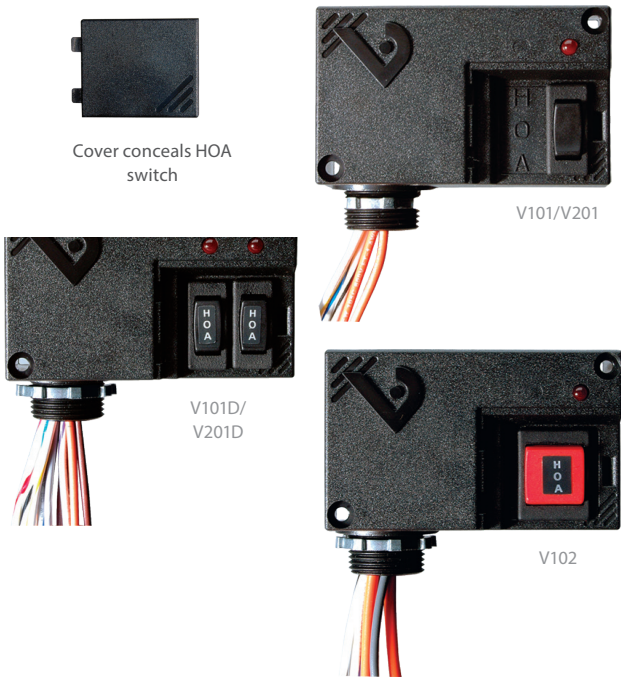
Note: Some units are Plenum rated per UL 1995. For details, see White Paper VWP01, *UL 1995 and Plenum Ratings*, at www.veris.com.

*U.S. origin version available.



VICTORY 101, 102 & 103 SERIES

Relays with HOA Switches for Local Control



Cover conceals HOA switch

V101/V201

V101D/V201D

V102

With a concealed HOA switch for local control and troubleshooting, the 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
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WARRANTY

Limited Warranty	5 years
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Nipple mount

Can be mounted to any electrical enclosure, easing installation

Flexible wire

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

Protective cover

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

UL508 Listed

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

Sleek enclosure

Reduces the need for panel space

Switch position monitors

Allows the control system to notify personnel when a load is inadvertently left ON or OFF (V102 and V103 models)

APPLICATIONS

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

TYPICAL COIL PERFORMANCE		
Pull in Voltage	AC	DC
10 to 30 V	8	9
120 V	78	
208 to 277 V	154	
Drop Out Voltage		
10 to 30 V	2	3
120 V	18	
208 to 277 V	36	
Voltage	Coil Current	
	AC	DC
10 V	25 mA	14 mA
24 V	31 mA	16 mA
30 V	39 mA	18 mA
120 V	22 mA	
208 V	19 mA	
277 V	25A	

CONTACT RATINGS	
V101, V201, V101D*, V201D*	
Resistive	10 A @ 250 Vac
Motor	1/3 HP @ 120Vac
Gold Flash	Yes
V101, V201, V101D*, V201D*	
Resistive	10 A @ 277 Vac
Motor	1/3 HP @ 240 Vac
Gold Flash	Yes

*each relay

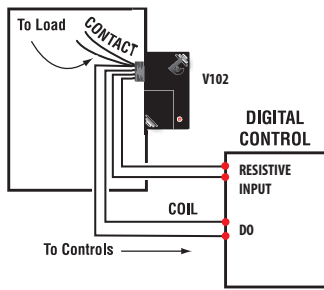
AGENCY APPROVALS

Agency Approvals	UL 508
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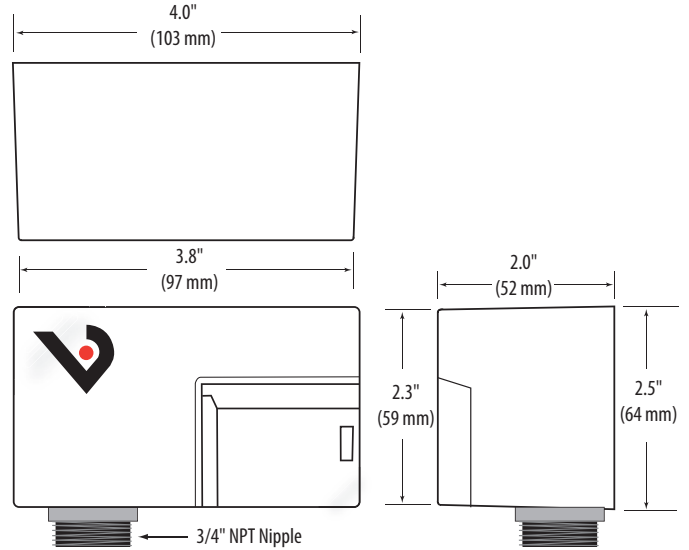


NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagram

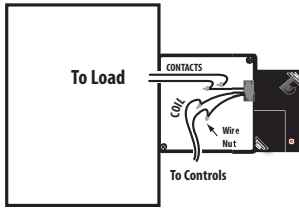


DIMENSIONAL DRAWING



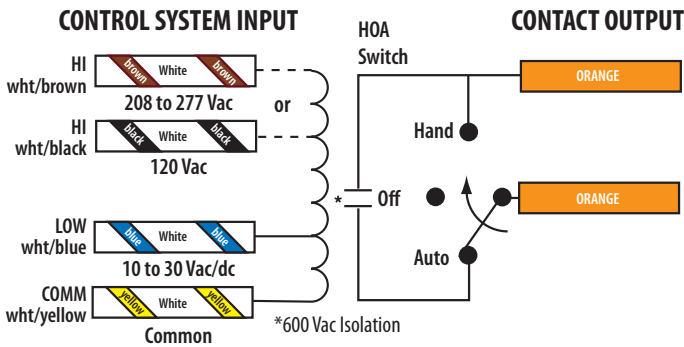
NIPPLE MOUNT TO ANY 2X OR 4X ELECTRICAL BOX

Wiring Diagram



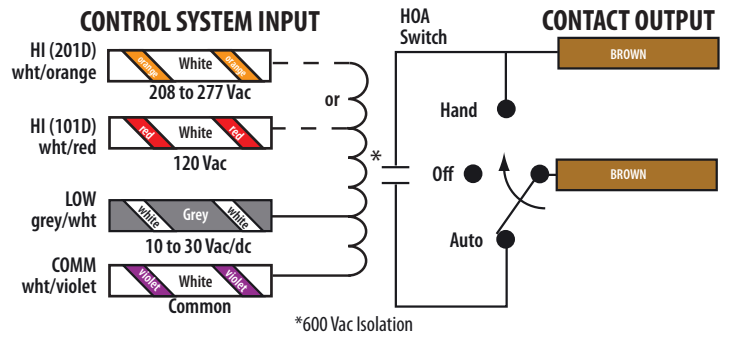
PRIMARY

Wire Color Codes



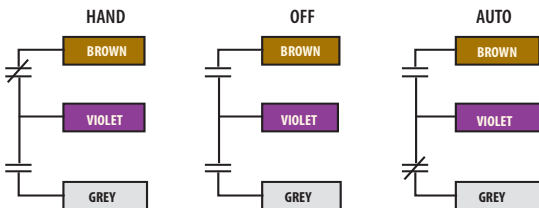
RELAY #2 FOR V101D/V201D ONLY

Wire Color Codes



V103 DIGITAL HOA POSITION MONITOR

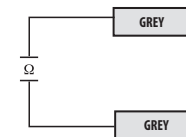
Wire Color Codes



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: Cable Faults:
 HAND ~ 1.4 kΩ OPEN = Infinite Ω
 OFF ~ 6.2 kΩ SHORT ~ 0 Ω
 AUTO ~ 3.4 kΩ



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



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508
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Nipple mount

Can be mounted to any electrical enclosure, easing installation

Flexible wire

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

Sleek enclosure

Reduces the need for panel space

UL508 Listed

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

APPLICATIONS

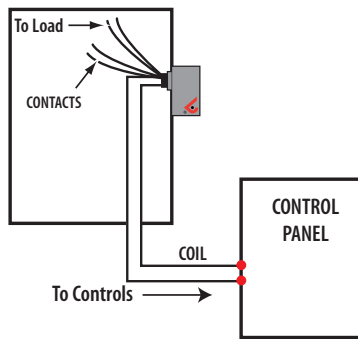
- Command contactors
- Control motors
- Isolation
- Device interlocking
- Relay logic
- Sense voltages for alarm conditions

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

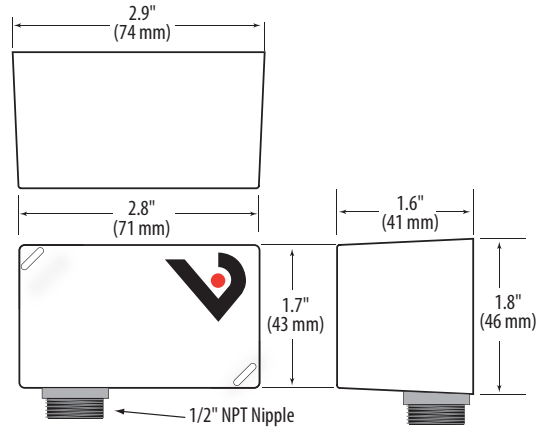


NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagram

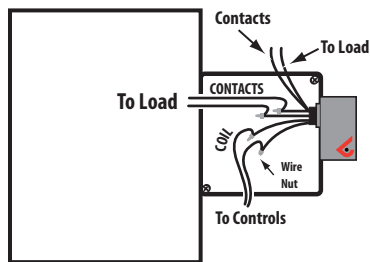


DIMENSIONAL DRAWING

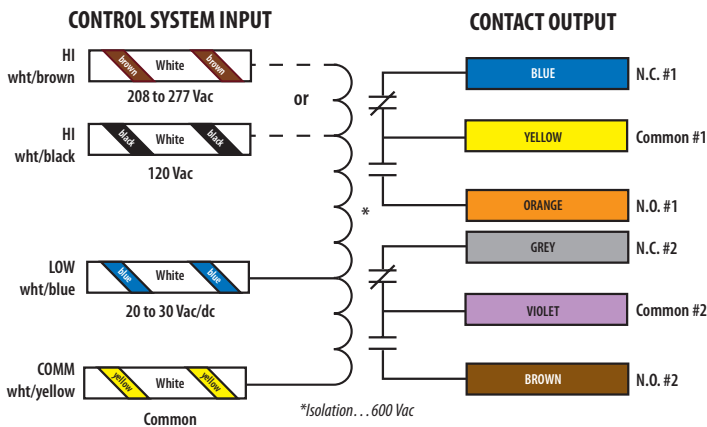


NIPPLE MOUNT TO ANY 2X OR 4X ELECTRICAL BOX

Wiring Diagram



WIRE COLOR CODES



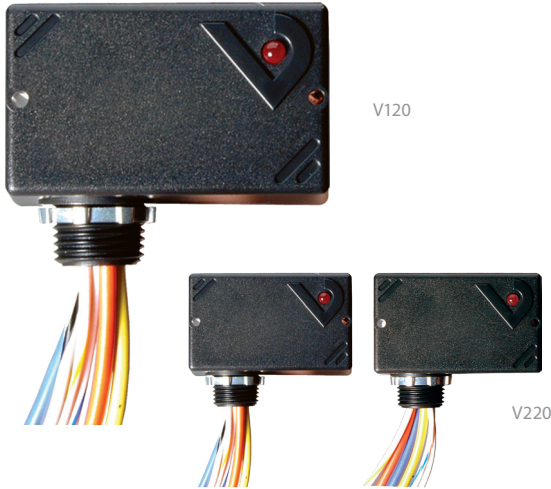
ORDERING INFORMATION

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		•	•

Note: Some units are Plenum rated per UL 1995. For details, see White Paper VWP01, UL 1995 and Plenum Ratings, at www.veris.com.

VICTORY 120 & 220

Great for External Mount Applications



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508
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Nipple mount

Can be mounted to any electrical enclosure, easing installation

Flexible wire

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

HP ratings

Ideal for control of fractional HP motors

UL508 Listed

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

Sleek enclosure

Reduces the need for panel space

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	

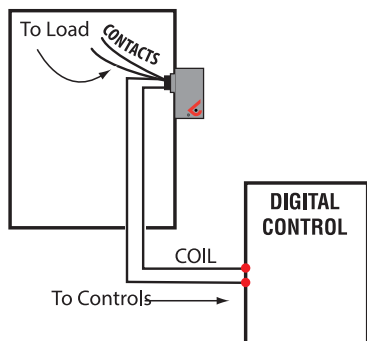
CONTACT RATINGS

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.

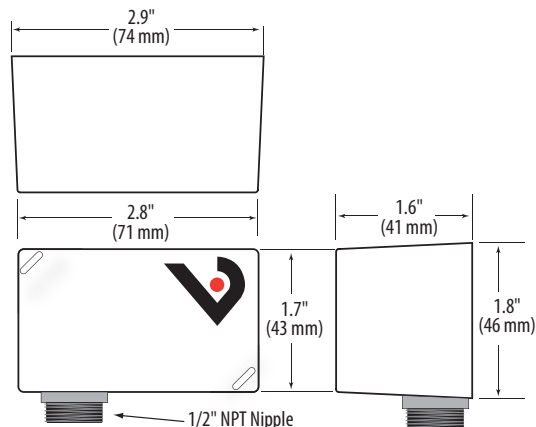


NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagram

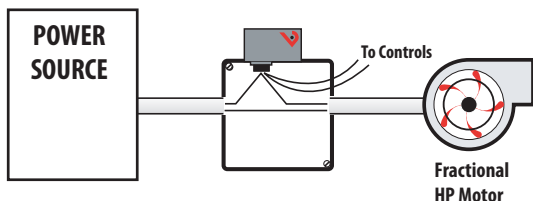


DIMENSIONAL DRAWING

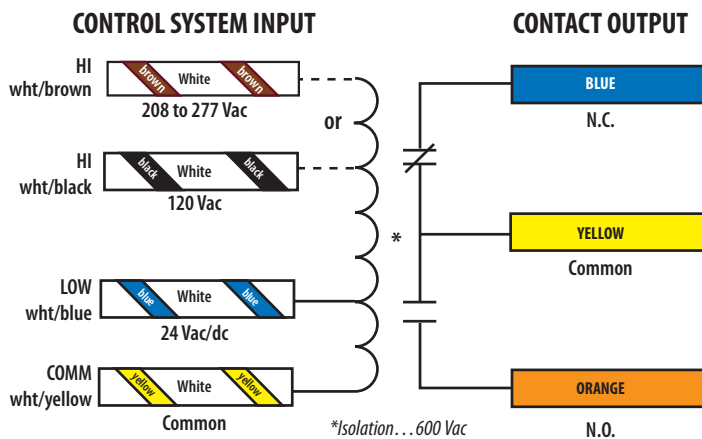


NIPPLE MOUNT TO A 4X ELECTRICAL BOX

Wiring Diagram



WIRE COLOR CODES



ORDERING INFORMATION

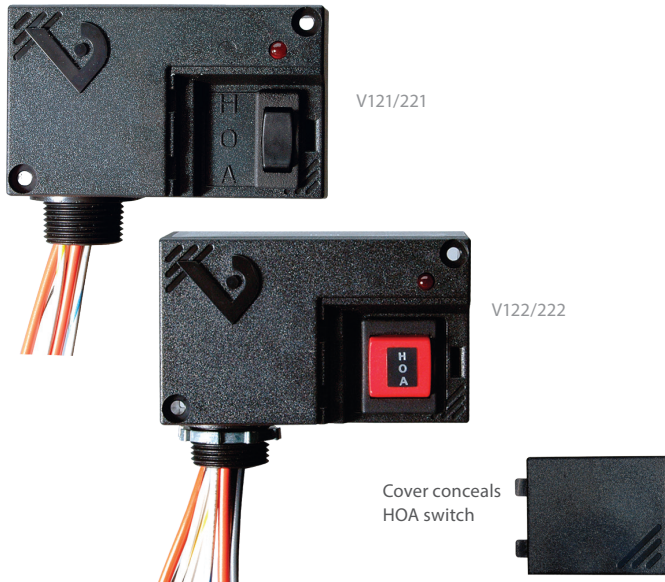
MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V120	SPDT	24 Vac/dc, 120 Vac	20 A	•	•
V220		24 Vac/dc, 208 to 277 Vac		•	•

Note: Some units are Plenum rated per UL 1995. For details, see White Paper VWP01, UL 1995 and Plenum Ratings, at www.veris.com.



VICTORY 121, 122, & 123 SERIES

HOA Switch Provides Local Control



The 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/V222 and V123/V223 are equipped with a monitored HOA. The V122/V222 provides a two-wire resistive output and the V123/V223 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
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WARRANTY

Limited Warranty	5 years
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Protective cover

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

Nipple mount

Allows the V121 Series to be mounted to any electrical enclosure easing installation

Switch position monitors

Allows the control system to notify personnel when a load is inadvertently left ON or OFF (V122/V222 & V123/V223 models)

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

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, V222, V223	
Resistive	20 A @ 240 Vac
	8 a @ 28 Vdc
	14 A @ 14 Vdc
Motor	1 HP @ 250 Vac

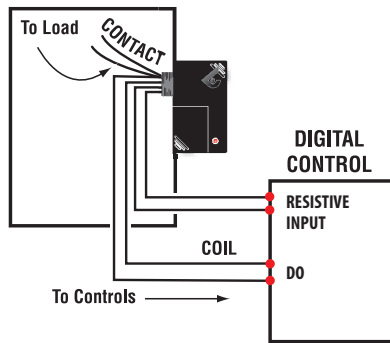
AGENCY APPROVALS

Agency Approvals	UL 508
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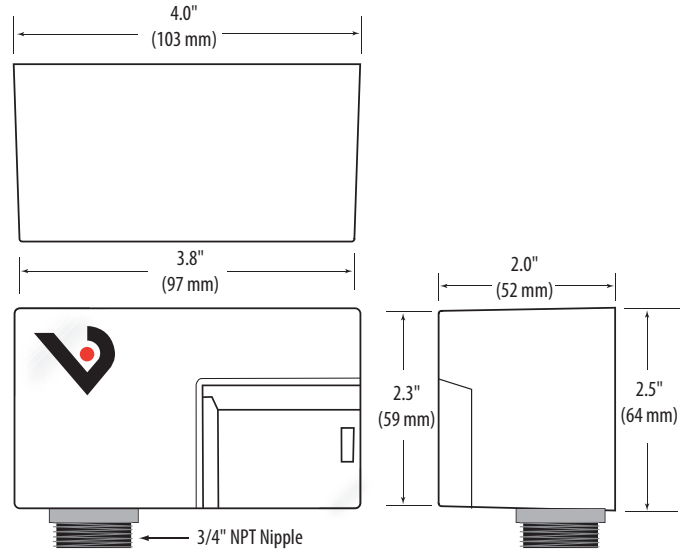


NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagram

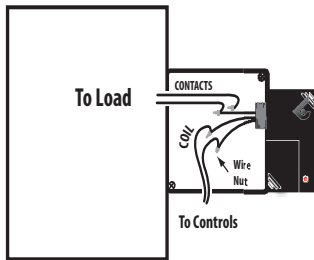


DIMENSIONAL DRAWING

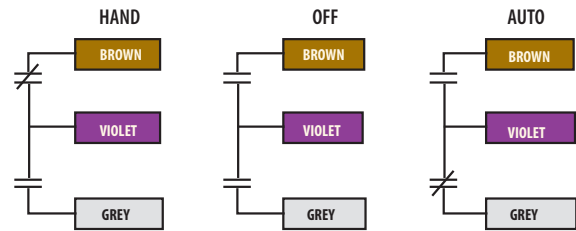


NIPPLE MOUNT TO ANY 2X OR 4X ELECTRICAL BOX

Wiring Diagram



V123/V223 DIGITAL HOA POSITION MONITOR

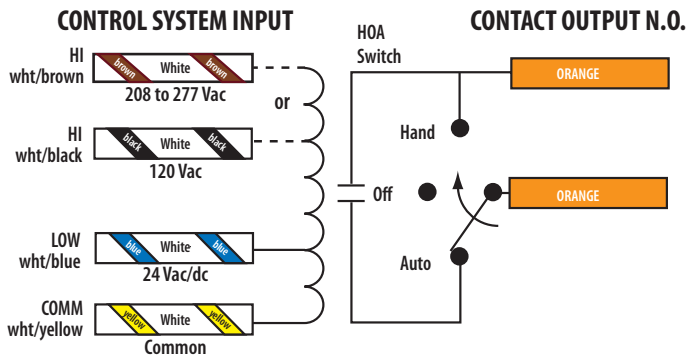


Switch Positions:

HAND = Brown wire closed to Common
OFF = Both wires open to Common

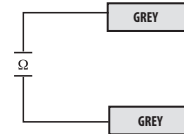
AUTO = Grey wire closed to Common
VIOLET = Common

WIRE COLOR CODES



V122/V222 RESISTIVE HOA POSITION MONITOR

Switch Positions: Cable Faults:
HAND ~ 1.4 k Ω OPEN = Infinite Ω
OFF ~ 6.2 k Ω SHORT ~ 0 Ω
AUTO ~ 3.4 k Ω



ORDERING INFORMATION

MODEL	RELAY	COIL	AMPERAGE RATING	HOA	HOA MONITOR	RELAY POWER LED	UL
V121	SPST, N.O.	24 Vac/dc, 120 Vac	20 A	•	None	•	•
V122		24 Vac/dc, 120 Vac		•	Resistive	•	•
V123		24 Vac/dc, 120 Vac		•	Digital	•	•
V221		24 Vac/dc, 208 to 277 Vac		•	None	•	•
V222		24 Vac/dc, 208 to 277 Vac		•	Resistive	•	•
V223		24 Vac/dc, 208 to 277 Vac		•	Digital	•	•

Note: Some units are Plenum rated per UL 1995. For details, see White Paper VWP01, *UL 1995 and Plenum Ratings*, at www.veris.com.



VICTORY 320 & 420

DPDT Relays Provide Versatility



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508
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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	

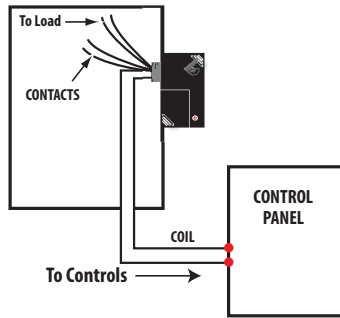
CONTACT RATINGS

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.

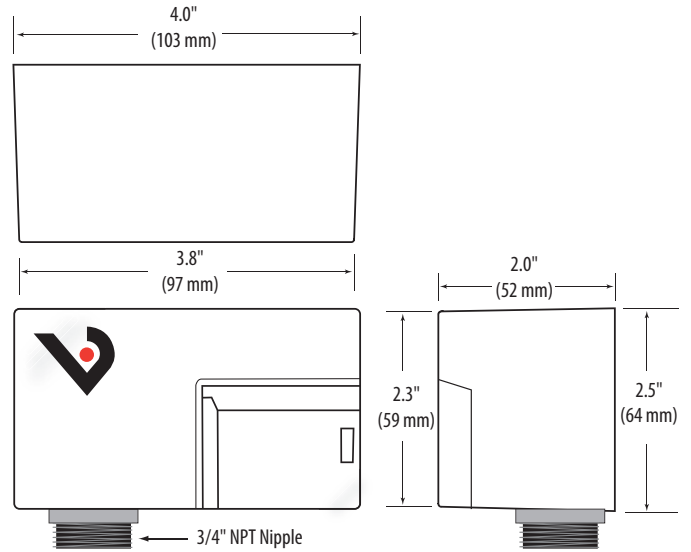


NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagram

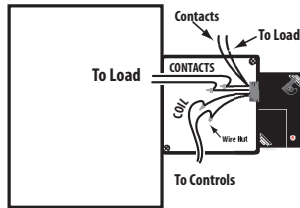


DIMENSIONAL DRAWING

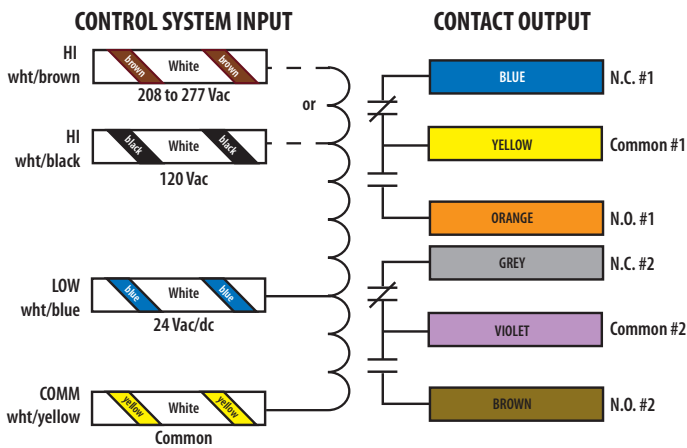


NIPPLE MOUNT TO ANY 2X OR 4X ELECTRICAL BOX

Wiring Diagram



WIRE COLOR CODES



ORDERING INFORMATION

MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V320	DPDT	24 Vac/dc, 120 Vac	20 A	•	•
V420		24 Vac/dc, 208 to 277 Vac		•	•

Note: Some units are Plenum rated per UL 1995. For details, see White Paper VWP01, UL 1995 and Plenum Ratings, at www.veris.com.

VICTORY 321 & 421

HOA Switch Provides Local Control



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508
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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

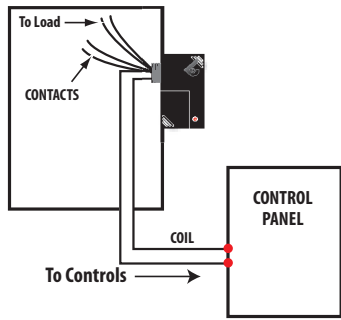
TYPICAL COIL PERFORMANCE		
Voltage	Coil Current	
	AC	DC
24 V	120 mA	64 mA
120 V	84 mA	
277 V	102 mA	

CONTACT RATINGS	
Resistive	20 A @ 240 Vac
	8 A @ 28 Vac
	14 A @ 14 Vac
Motor	120 Vac, 1 HP

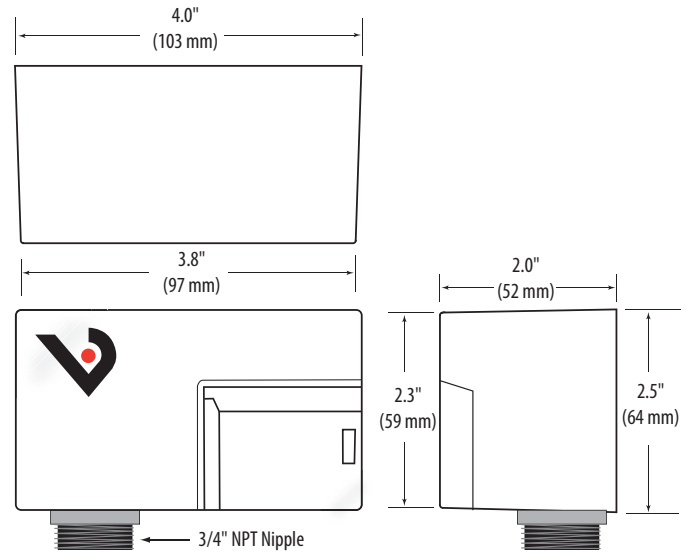


NIPPLE MOUNT DIRECTLY TO A PANEL

Wiring Diagram

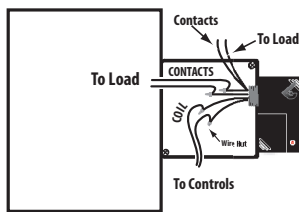


DIMENSIONAL DRAWING

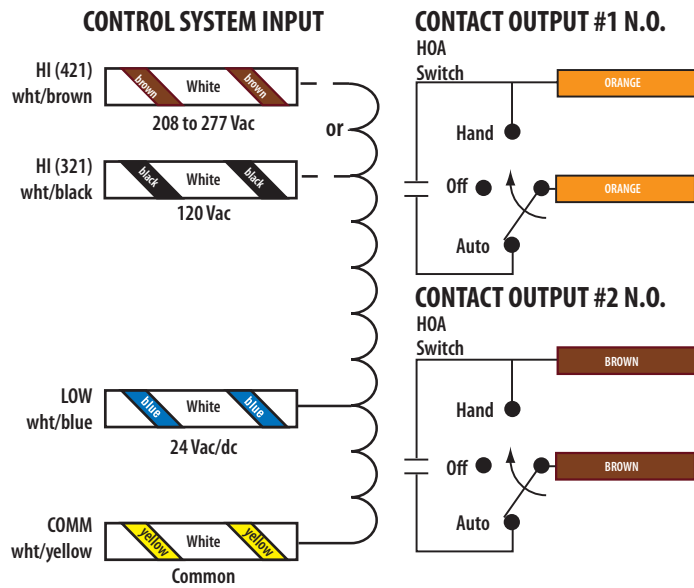


NIPPLE MOUNT TO ANY 2X OR 4X ELECTRICAL BOX

Wiring Diagram



WIRE COLOR CODES



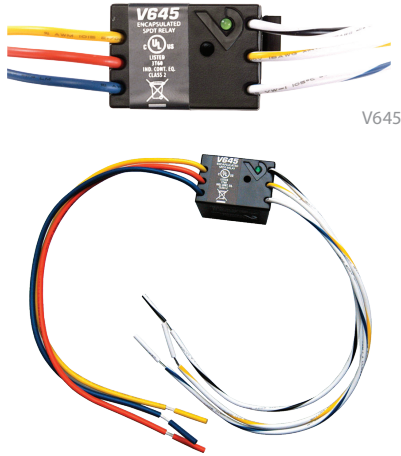
ORDERING INFORMATION

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		•	•	•

Note: Some units are Plenum rated per UL 1995. For details, see White Paper VWP01, *UL 1995 and Plenum Ratings*, at www.veris.com.

VICTORY 645

10 A Relay in a Small Package for Tight Spaces



The 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
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AGENCY APPROVALS

Agency Approvals	UL 508
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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

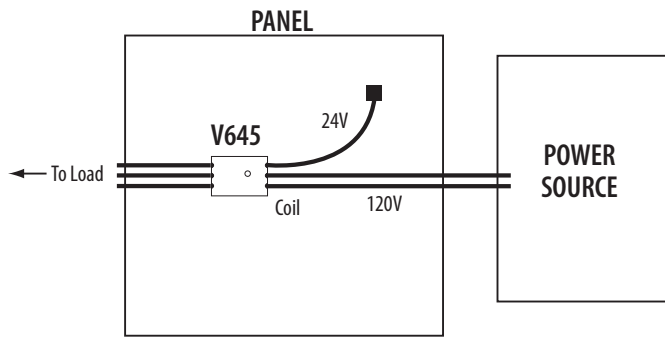
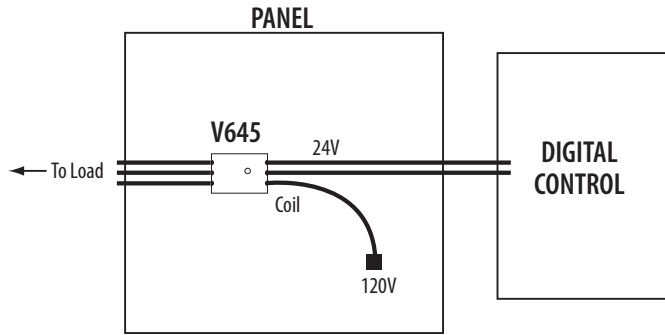
Voltage	Coil Current	
	AC	DC
24 to 30 V	32 mA	13 mA
120 V	17 mA	

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.

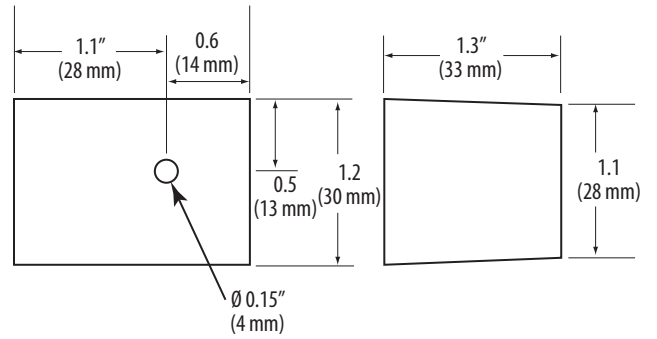


WIRING DIAGRAMS

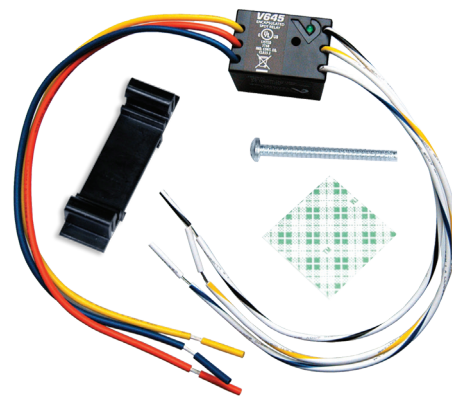


* Wire is capped on unused option.

DIMENSIONAL DRAWING

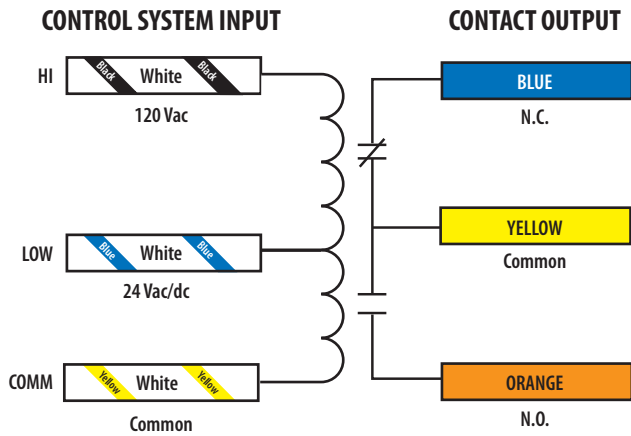


MOUNTING METHOD



The V645 comes with a DIN rail clip, screw, and foam tape for a variety of mounting methods.

WIRE COLOR CODES

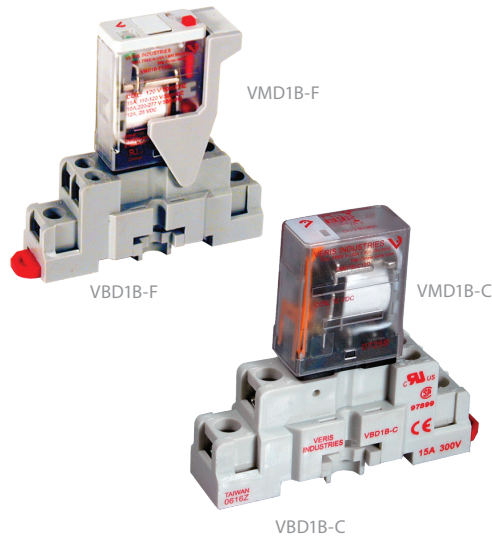


ORDERING INFORMATION

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



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

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.

TYPICAL COIL PERFORMANCE

Power Consumption	
AC Coils	0.9 VA
DC Coils	0.7 VA

CONTACT RATINGS

Standard (F & C Series)	
Resistive	15 A @ 120 Vac
	15 A @ 277 Vac
	15 A @ 28 Vdc
Motor	1/3 @ 120 Vac
	3/4 @ 277 Vac
Pilot Duty	B300

SPECIFICATIONS

Operating Temp. Range	-40 to 55 °C (-40 to 131 °F)
Coil Operating Range	85% to 110% of rated voltage
Coil Drop-out Voltage Threshold	15% of rated voltage
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Operating Time	20 msec typical
Dielectric Strength	1500 Vac RMS

WARRANTY

Limited Warranty	5 years
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance. Note: These relays are UL Listed when used with Veris sockets.

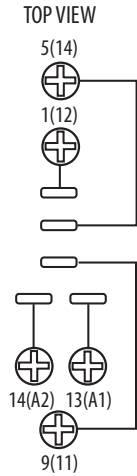


VBD1B SOCKET

Wiring Diagram

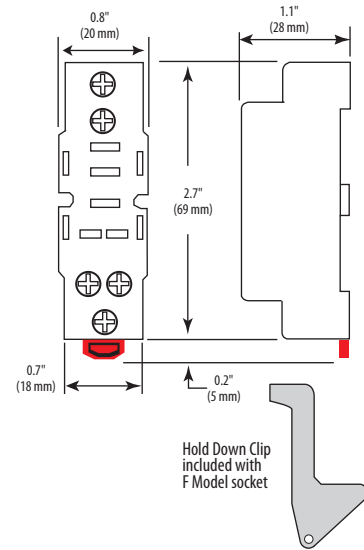
Function	NEMA (IEC) Terminal
Coil (+)*	14 (A2)
Coil (-)*	13 (A1)
COMM	9 (11)
N.O.	5 (14)
N.C.	1 (12)

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



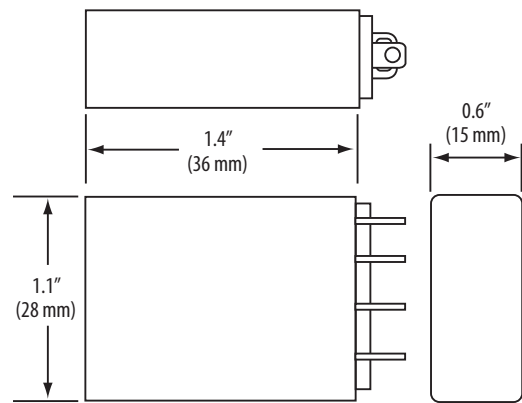
VMD1B SOCKET

Dimensional Drawing



VMD1B RELAYS

Dimensional Drawing



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	•	•	•
VMD1B-F240A		15 A	240 Vac	100 mA@5 Vdc	•	•	•

SOCKET ORDERING INFORMATION

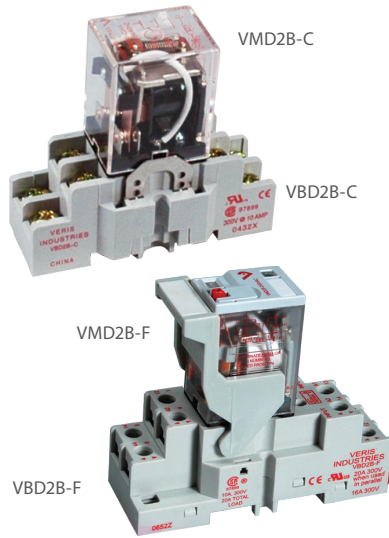
MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD1B-C	15 A	300 V	•		•	•
VBD1B-F			•	•	•	•

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



VMD2B-C & VMD2B-F SERIES

Socket Relays in a Wide Range of Coil Voltages



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
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance. Note: These relays are UL Listed when used with Veris sockets.

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)

TYPICAL COIL PERFORMANCE

	Power Consumption
AC Coils	1.2 VA
DC Coils	0.9 W

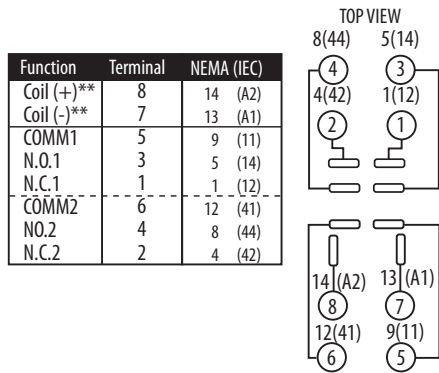
CONTACT RATINGS

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



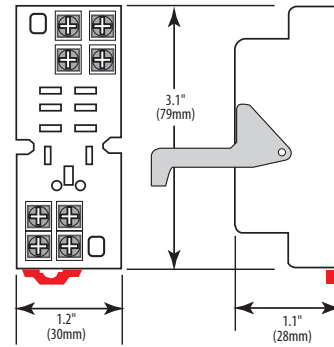
VBD2B SOCKET

Wiring Diagram



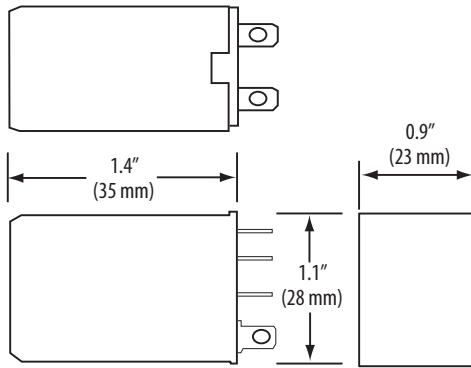
VBD2B-F SOCKET

Dimensional Drawing



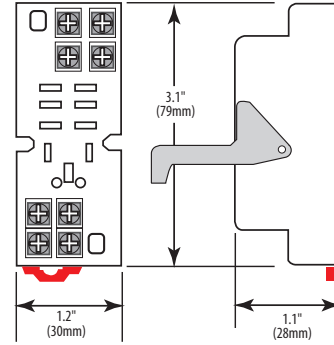
VMD2B RELAY

Wiring Diagram



VBD2B-F SOCKET

Dimensional Drawing



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

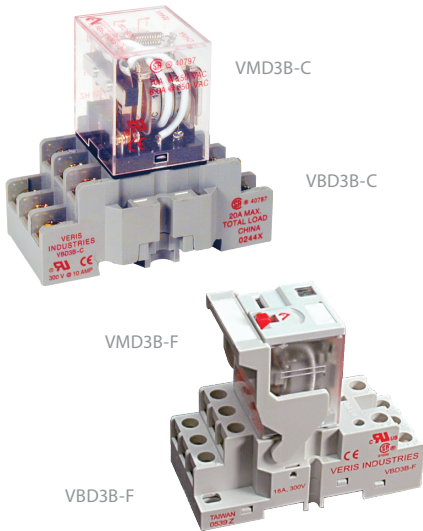
MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD2B-F	20 A	300 V	•	•	•	•

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



VMD3B & VMD3B-C SERIES

Socket Relays with a Wide Range of Features and Coil Voltages



The VMD3B 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
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance. Note: These relays are UL Listed when used with Veris sockets.

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)

TYPICAL COIL PERFORMANCE

Power Consumption	
AC Coils	1.2 VA
DC Coils	1.4 W

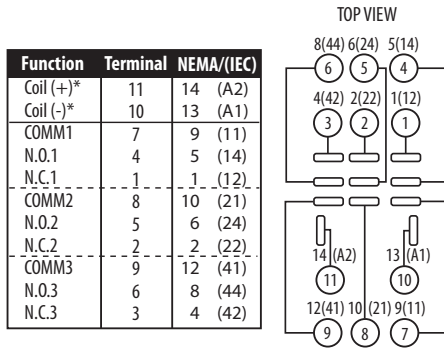
CONTACT RATINGS

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

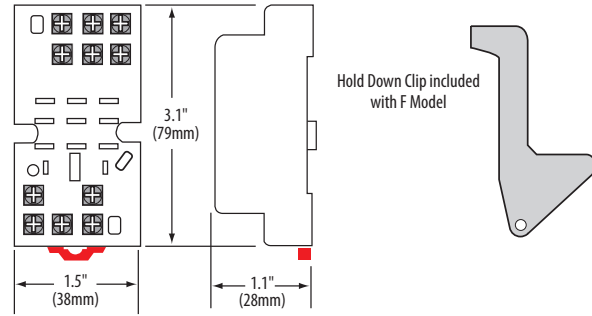
Wiring Diagram



*Observe polarity for relays with DC coil voltages only

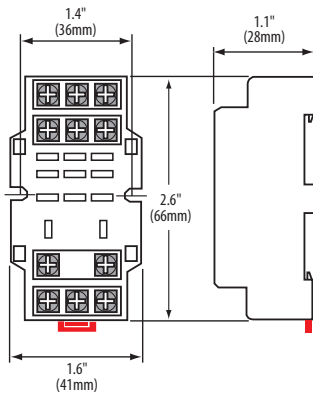
VBD3B-F SOCKET

Wiring Diagram



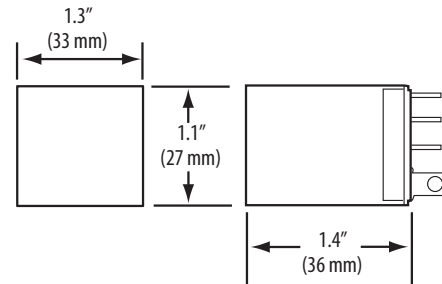
VBD3B-C SOCKET

Wiring Diagram



VMD3B RELAY

Wiring Diagram



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			•	•	•

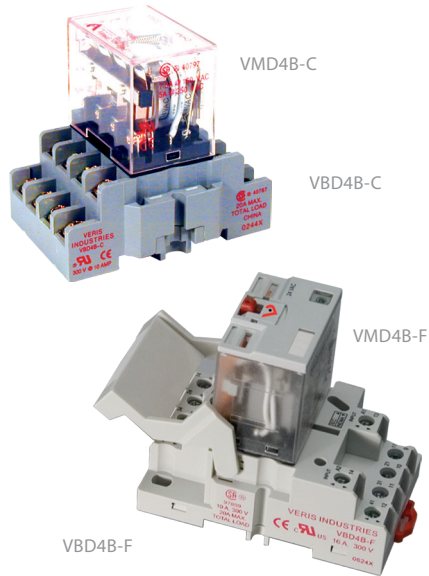
SOCKET ORDERING INFORMATION

MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD3B-F	16 A	300 V	•	•	•	•

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

VMD4B & VMD4B-C SERIES

Socket Relays with a Wide Range of Features and Coil Voltages



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
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AGENCY APPROVALS



*The CE mark indicates RoHS2 compliance. Note: These relays are UL Listed when used with Veris sockets.

Color-coded pushbuttons

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

2-way mounting

Side or DIN rail mounting system...retrofits existing panel mounting and 35 mm DIN rail

Override lever

When activated, locks pushbutton and contacts in the powered position (-F Series only)

ID tag

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

Flag indicator

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

LED status lamp

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

TYPICAL COIL PERFORMANCE

Power Consumption	
AC Coils	1.5 VA
DC Coils	1.5 W

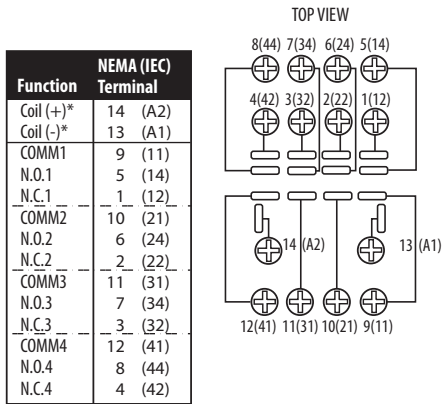
CONTACT RATINGS

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

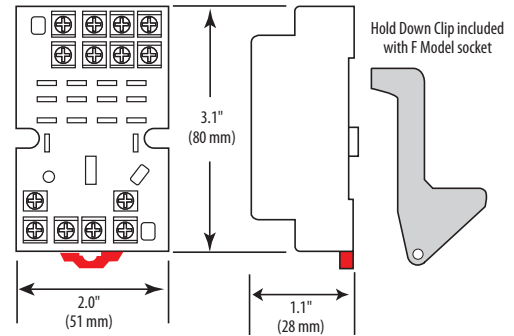
Wiring Diagram



*Observe polarity for relays with DC coil voltages only

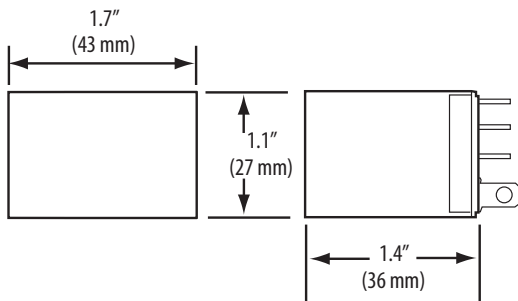
VBD4B-F SOCKET

Dimensional Drawing



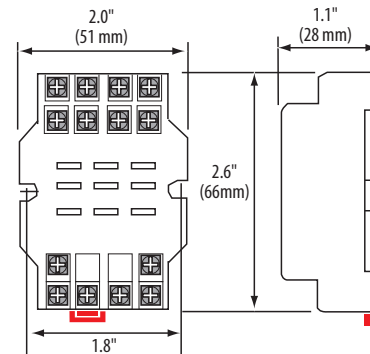
VMD4B RELAY

Dimensional Drawing



VBD4B-F SOCKET

Dimensional Drawing



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

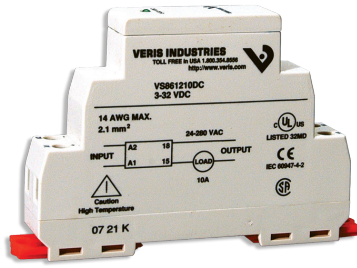
MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD4B-C	10 A	300 V			•	•
VBD4B-F	16 A		•	•	•	•

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



VS861 SERIES

Higher Reliability than Electromagnetic Relays



VS861210DC

The DIN-Mountable 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
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No moving parts

No moving parts to wear or fail

EMI

Reduced EMI

Contacts

No contact bounce or arcing contacts

Long life

Longer life than electromechanical relays

Superior performance

Fast response time and high frequency of on/off cycling

APPLICATIONS

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

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
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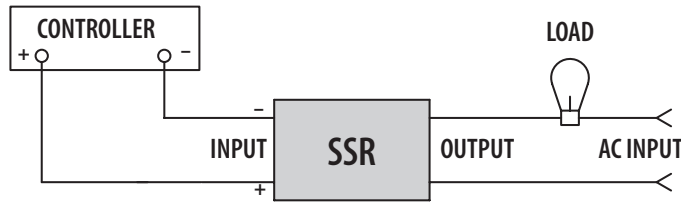
AGENCY APPROVALS



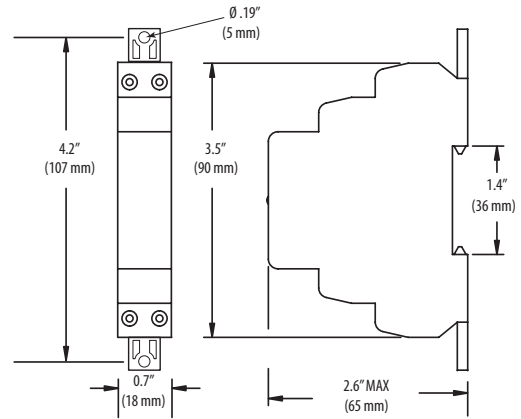
*The CE mark indicates RoHS2 compliance.



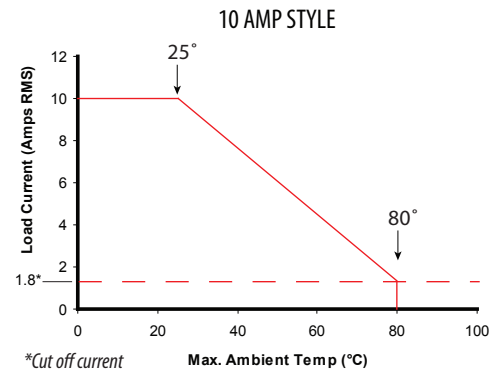
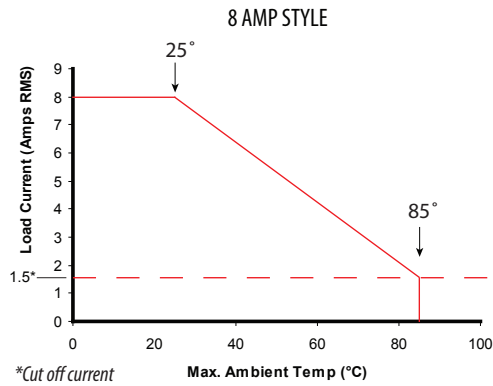
WIRING DIAGRAM



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



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

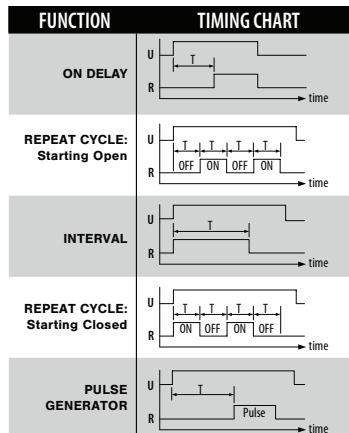
Limited Warranty	5 years
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AGENCY APPROVALS

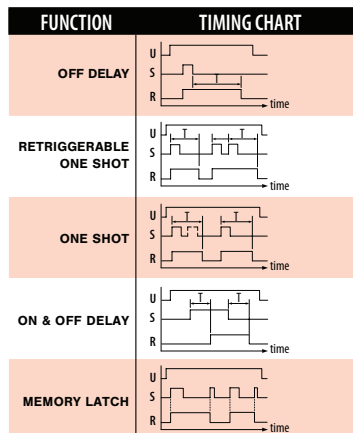


*The CE mark indicates RoHS2 compliance.

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

Solid state relays

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

Housing options

Two different housings provide multiple mounting options

TYPICAL COIL PERFORMANCE

	Power Consumption
AC Coils	1.5 VA
DC Coils	2 w

CONTACT RATINGS

(VTD2P-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

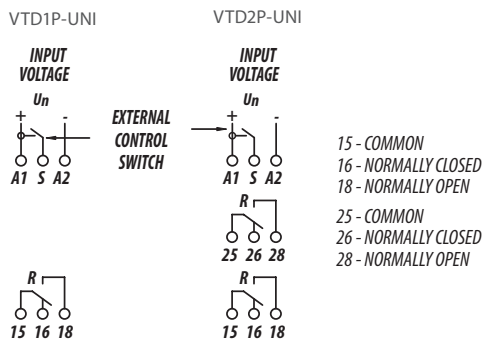
TIMING CHARACTERISTICS

	VTD2P-F50	VTD1P-UNI, VTD2P-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



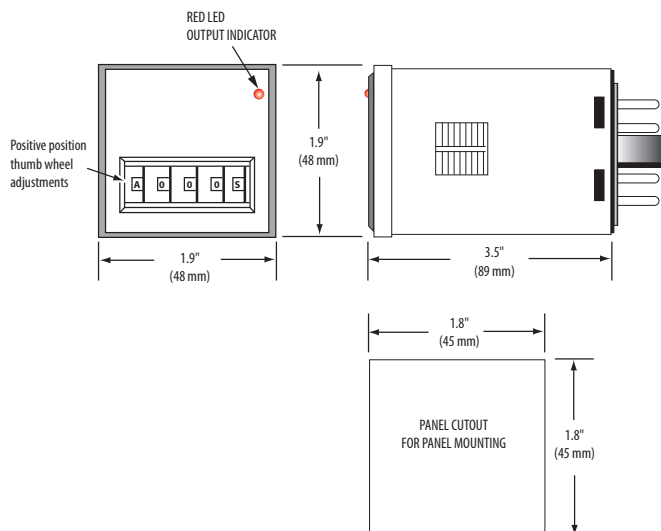
VTD1P-UNI/VTD2P-UNI

Dimensional Drawing



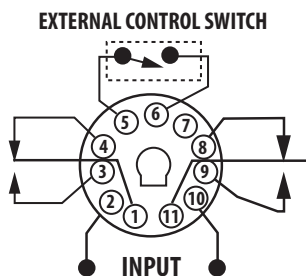
VTD2P-F50

Dimensional Drawing



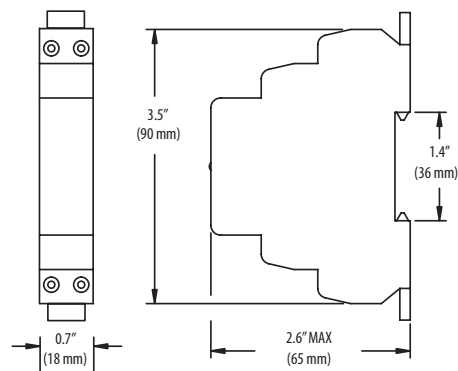
VTD2P-F50

Wiring Diagram



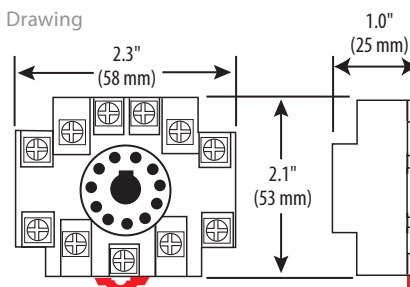
VTD1P-UNI/VTD2P-UNI

Dimensional Drawing



VBD3P-C

Dimensional Drawing



RELAY ORDERING INFORMATION

MODEL	RELAY STYLE	NO. 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.





POWER SOURCES

Veris provides a wide range of AC or DC output power supplies. Veris 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. Veris 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 100 Watts in capacity.

MODEL	DESCRIPTION	PAGE
PS	Power Supplies	319
X	Control Transformers	321

POWER SOURCES SELECTION GUIDE

DC Power Supply	PS* page 319
Control Transformers	X* page 321

* Indicates a series of products



A Convenient Source of AC Control Power for HVAC Control and Building Automation Applications



X Series Control Transformers

Flexibility You Want

Multiple hub/foot mounting and voltage options available.

Certification You Need

UL Listings for all models.

Right Product for the Job

Current limiting options available.

Interested in learning more about the X and PS Series products?

Contact a Power Sources Specialist today: 800.354.8556 or at sales@veris.com
See Product Specifications on pages 319 & 321



PS SERIES

PS Series Switching Power Supplies



PS Series

Capable of supplying up to 100 Watts
(AV01 DIN Rail not included)

Up to 100 W

High efficiency switching power supply capable of supplying up to 100 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 (except 100 W versions)

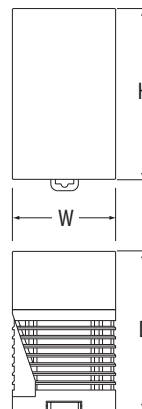
High efficiency

Won't generate excessive heat in control panel

SPECIFICATIONS

Input Voltage (except PSxx-100W)	100 to 240 Vac (85 to 264 Vac), 50/60Hz (47 to 63 Hz); 110 to 340 Vdc (105 to 370 Vdc)
Input Voltage (PSxx-100W)	100 to 120/200 to 240 Vac, Jumper Selectable 50/60 Hz (47 to 63 Hz); 240 to 370 Vdc
Input Current (Typical @100 Vac)	
7.5 W	0.17 A
15 W	0.30 A
30 W	0.68 A
50 W	1.15 A
100 W	2.5 A
Internal Fuse Ratings	
7.5/15 W	2 A
30/50 W	3.15 A
100 W	4 A
Inrush Current	50 A max. (cold start at 200 V)
Regulation	Line: 0.4%; Load 1.5%; (+ Ambient Temp. effect 0.05%)
Ripple	2% p-p
Leakage Current (No Load)	0.75 mA max. (60 Hz. measured in conformance with VDE, UL, CSA)
Output Current (12 V Models)	
7.5 W	0.6 A
15 W	1.2 A
30 W	2.5 A
Output Current (24 V Models)	
7.5 W	0.3 A
15 W	0.6 A
30 W	1.3 A
100 W	4.2 A

DIMENSIONAL DRAWING



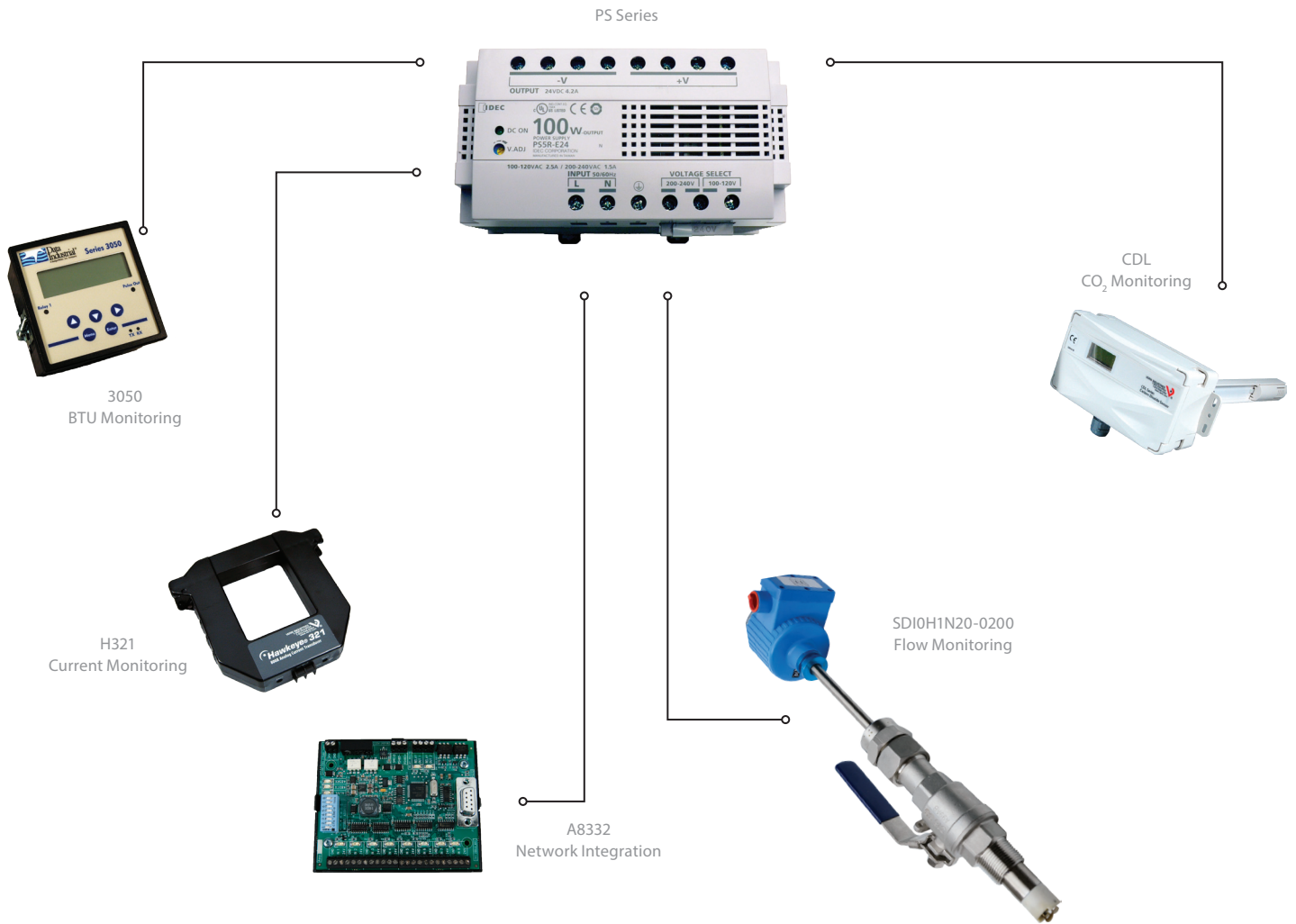
	H	W	D	WEIGHT (APPROX.)
7.5 W	3.0" (77 mm)	1.8" (46 mm)	2.8" (70 mm)	150 g
15 W	3.0" (77 mm)	1.8" (46 mm)	3.8" (97 mm)	170 g
30 W	3.0" (77 mm)	3.6" (92 mm)	3.8" (97 mm)	360 g
50 W	3.0" (77 mm)	3.6" (92 mm)	3.8" (97 mm)	390 g
100 W	3.0" (77 mm)	5.7" (145 mm)	3.8" (97 mm)	600 g

Operating Temperature (Mounted DIN Rail on Wall, Grilles Vertical)	-10 to 60 °C (14 to 140 °F) derate to 80% below 0 °C, derate to 50% above 50 °C
Operating Humidity	20 to 90% RH non-condensing
Storage Temperature	-30 to 85 °C (-22 to 185 °F)
Terminals	Spring-up, finger-safe (when tightened); captive M3.5 screws Phillips/flat heads

AGENCY APPROVALS



SUPPLYING POWER FOR ALL YOUR DC NEEDS



Approximate number of products that can be powered by a PS24:

	CDL (100 MA)	PX 2-WIRE (20 MA)	PX 3-WIRE (30 MA)	PW (125 MA)	HW (15 MA)	HW (30 MA)	SDI (20 MA)	A8332 (200 MA)	H321 (30 MA)	3050 (280 MA)
7.5 W	3	15	10	2	20	10	15	1	10	1
15 W	6	31	20	5	41	20	30	3	20	2
30 W	12	62	41	10	83	41	60	6	41	4
50 W	20	104	69	16	138	69	101	10	69	7
100 W	41	208	138	33	277	138	203	20	138	14

ORDERING INFORMATION

Output Watts

PS - W

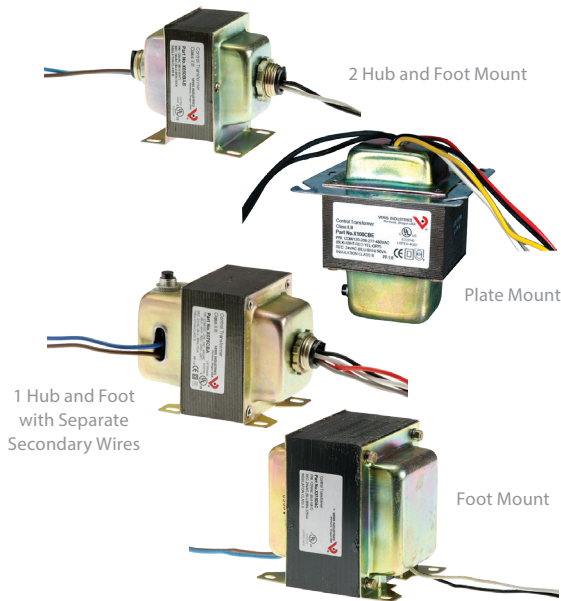
12 = 12 Vdc
24 = 24 Vdc

7.5 = 7.5 Watts
15 = 15 Watts
30 = 30 Watts
50* = 50 Watts
100* = 100 Watts
120* = 120 Watts
240* = 240 Watts

Example:
PS 12 - 7.5 W

*Available in 24 V only.

X SERIES



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 Veris 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.
 **The CE mark indicates RoHS2 compliance.

UL Listings

UL Listings for all models simplify panel building requirements

One-stop shopping

Save time by ordering along with other Veris products

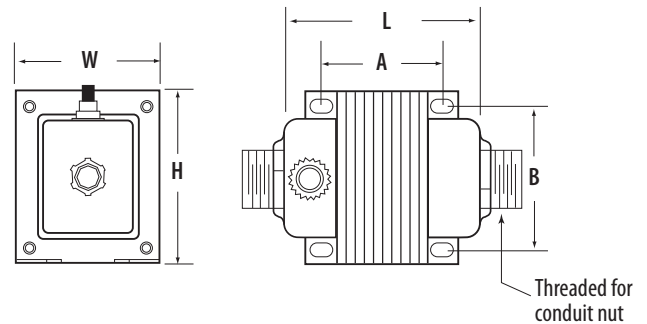
Threaded hub options

Threaded hub options maximize installation flexibility

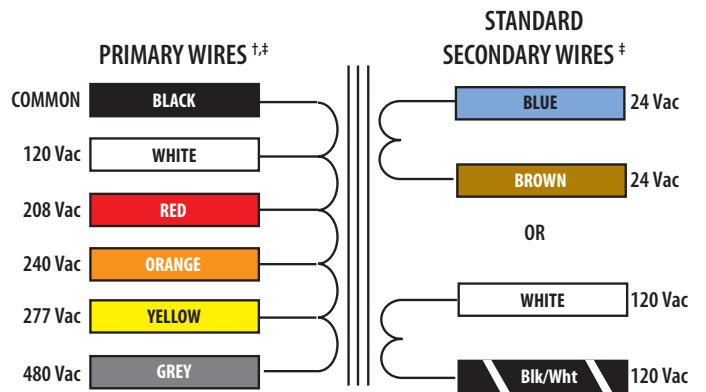
APPLICATIONS

- Controller power
- Powering sensors
- Driving relays and other digital I/O circuits

DIMENSIONAL DRAWING



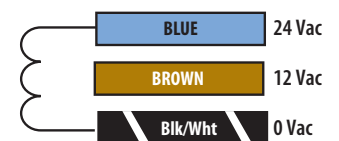
WIRE COLORS



† Primary of 24 V isolation transformers = Red/Red

‡ Colors refer to the transformer wiring, not the external circuit.

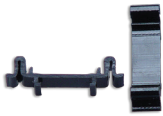
CENTER TAP SECONDARY WIRES †



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	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
PS	Universal Power Supply														•					

1. For H6xx, H8xx, H9xx.
2. For H3xx.



AH01
DIN Rail Clip Set



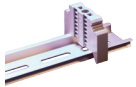
AH06
CT Mounting Brackets



AH27
DIN Rail Clip Set



AV01
35 mm DIN Rail - 1 Meter Length



AV02
DIN Rail Stop Clip



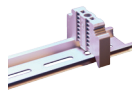
PS
Universal Power Supply

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			•	•	•	•
AV03	2.75" SNAPTRACK, 12" Length	•	•				
AV04	4.0" SNAPTRACK, 12" Length	•	•				
AV05	2.75" SNAPTRACK, 2" Length	•	•				
AV06	4.0" SNAPTRACK, 2" Length	•	•				



AV01
35 mm DIN Rail - 1 Meter Length



AV02
DIN Rail Stop Clip



AV03/AV04 (2.75")
2.75" SNAPTRACK, 12" Length
4.0" SNAPTRACK, 12" Length



AV05 (2.75")
2.75" SNAPTRACK, 2" Length



AV06 (4.0")
4.0" SNAPTRACK, 2" Length

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QUALITY IN SERVICE

OVERNIGHT DELIVERY

Place your order by 3:00 PST (6:00 EST)* and it's on your dock, ready to install, the next day! Veris products are also available from local stocking distributors (consult factory for nearest distributor).

*available on most products

VALUE ENGINEERING

Our engineering staff maintains stringent USA quality control and focus on performance. We design all of our products for fast installation and long, long life.

APPLICATIONS ASSISTANCE

Veris has full-time technical support available to help specify sensor and transducers solutions. Our recommendations save you time and money.

CUSTOM & OEM MANUFACTURING

Veris will custom build products reducing your total installed cost. From pre-setting trip-points and span adjustments, to fully integrating transducers into your system or product, Veris delivers.

FIVE-YEAR WARRANTY

Our simple limited warranty says it all. We offer this because of our ability to design and manufacture solid products.

LIBERAL CREDIT

Veris offers a liberal, same day \$500 line of credit to qualified contractors. We build relationships on trust and keeping commitments.

By purchasing products from Veris Industries, LLC. (referred to as, "Veris," "us," "we," and "our"), whether through our website www.veris.com (the "Website") or otherwise (e.g., placing an order via telephone, facsimile, mail, or electronic transmission), you, on behalf of yourself and any entity you represent, if applicable (referred to as "you" or "Purchaser"), acknowledge that (1) all of the following terms and conditions ("Sales Terms") apply to every purchase; (2) these Sales Terms supersede any conflicting terms in any other purchase order, acknowledgement, agreement, or document, unless you and Veris have negotiated a separate master sales agreement that has been signed by both Veris and Purchaser; (3) these Sales Terms form a legally-binding agreement between you and Veris; and (4) if acting on behalf of an entity, you must have, and you represent and warrant that you have, full authority to bind your entity to these Sales Terms.

Please read these Sales Terms carefully.

EFFECTIVENESS OF SALE & DELIVERY

Title transfers to Purchaser upon delivery to carrier. Purchaser bears all risk and transportation costs in accordance with INCOTERMS 2010, EXW. Packaging will be designed by Veris with the intent of protecting the product during shipment. Delivery dates are estimated only. In no event will Veris be liable for any damages of any kind, direct or indirect, in the event of delay of delivery.

CANCELLATION POLICY

If your order is for standard products shipped from stock at quantities less than LOQ (Large Order Quantity), you can cancel your order at any time prior to shipment without charge. Upon receipt of a purchase order, Veris will proceed to facilitate the manufacture and shipment of that order. In doing so, investment of materials and labor is made in the order. Therefore, if you cancel an order that exceeds the LOQ or is customized to your specifications, cancellation of that order can result in a loss to Veris. Therefore, by placing an order for quantities in excess of LOQ or for custom-made products, you are making a commitment to pay Veris for any investments of labor and materials that are made to fulfill that order (LOQ's available upon request). If you cancel such an order prior to shipment, with respect to any unfinished goods, Veris will bill for labor and material costs already incurred; with respect to finished goods, we will ship those products and bill for the originally agreed upon purchase price plus shipping.

After shipment, cancellation is no longer available; instead, please refer to the returns policy listed below in the Returns section of these Sales Terms.

LIMITED WARRANTY FOR MOST PRODUCTS

Subject to the conditions and restrictions described below, Veris warrants to Purchaser that any product sold by Veris, except for products described in "Products Sold Without Warranty" below, shall be free from material defects in design, materials, or manufacturing for the period shown on the current datasheet for that product or, if the current datasheet does not specify a warranty period, for a warranty period of 5 years, in each case beginning from the delivery date; provided, however, that the warranty shall not extend to ordinary wear and tear, or to normally replaceable components (e.g., batteries and humidity sensor elements).

During the warranty period, Veris may at our sole discretion, repair, replace, or refund the purchase price (less depreciation) of any product deemed by us to have a defect, with no charge to Purchaser for any warranty repair or replacement. Purchaser will pay costs of shipping related to repair and replacement of any defective product. THIS WARRANTY IS PURCHASER'S EXCLUSIVE REMEDY FOR ALL CLAIMS AGAINST VERIS.

This warranty shall remain in full force and effect for the warranty period, provided that all of the product: (1) was installed, operated, and maintained properly, under normal use conditions, and in accordance with the product instructions; (2) has not been abused or misused; and (3) has not been repaired, altered, or modified outside of Veris's authorized facilities. This warranty shall become null and void in the event any of the foregoing conditions is not satisfied. This warranty provides specific legal rights that may be varied by local laws.

Veris is providing this warranty in lieu of all other express or implied warranties, including any warranty of merchantability or fitness for a particular purpose. There are no other warranties or representations, statutory or otherwise, express or implied, or arising by usage or trade, or otherwise, except the limited warranties set forth herein or in the documentation or data sheet for a product.

To the extent of any inconsistency between the terms of this limited warranty and any special, extended, or optional warranty or service program purchased with the product (e.g., the optional warranty periods available for the CWVS series products), the terms of such special, extended, or optional warranty or service program will control.

PRODUCTS SOLD WITHOUT WARRANTY

All products that are marked "as is," "with all faults," no warranty," or with similar language are sold with no representations, warranties, or indemnities of any kind, statutory or otherwise, express or implied, or arising by trade. Without limiting the generality of the foregoing, such products are sold without any warranty of merchantability, fitness for a particular purpose, or non-infringement.

LIMITATIONS OF LIABILITY

Veris shall not be liable for any consequential, incidental, indirect, exemplary, special, punitive, or multiple damages arising in any way from the website or the products, even if Veris has been advised of the possibility of such damages. Veris's total liability for all claims shall be limited to the price paid for its product. The limitation of Veris's liability is applicable to any and all claims or theories of recovery asserted by purchaser, including, without limitation, breach of contract, breach of warranty, expressed or implied, strict liability in tort or negligence, or in the event that you claim, allege, or otherwise assert that any loss or damage is attributable to the negligence of Veris.

RETURNS

Valid returns are accepted with a Returned Material Authorization (RMA) number assigned by Veris. To request an RMA, please contact Customer Service at 1-800-354-8556 toll-free in the USA and Canada, or +1 503-598-4564. All returns and warranty claims must be delivered to Veris, attention customer service with the assigned RMA number visible on the package. Standard products in unopened condition (except evaluation orders) can be returned to stock subject to a charge of 15% for up to 90 days from original shipment. Items that have been opened, or held for 90 to 180 days after the date of shipment, may be accepted for return subject to a 30% restocking charge. Items may not be returned after 180 days from the date of shipment. Products returned for credit must be in saleable condition. If the product has been modified, damaged, or installed, or is otherwise not in saleable condition, the product is not returnable. Products that have been customized in any way for Purchaser's specifications (including those having electrical modifications or private labeling) and products that are marked "FINAL SALE," "NOT RETURNABLE," or with a similar statement may only be returned for warranty service (if such products have a warranty).

PAYMENT

Unless different payment terms are agreed to in a written instrument executed by both Veris and Purchaser, payment terms for all purchases are 2%-10%/NET 30 days for delivery to the US or Canada, net 30 days to all other destinations. OneSource Rewards points cannot be applied to open invoices, or to any shipping costs. Purchaser agrees to pay finance charges of 18% per annum on any past due amount. Purchaser further agrees to pay any court costs, collections fees or attorney fees if legal action must be taken on any unpaid balance.

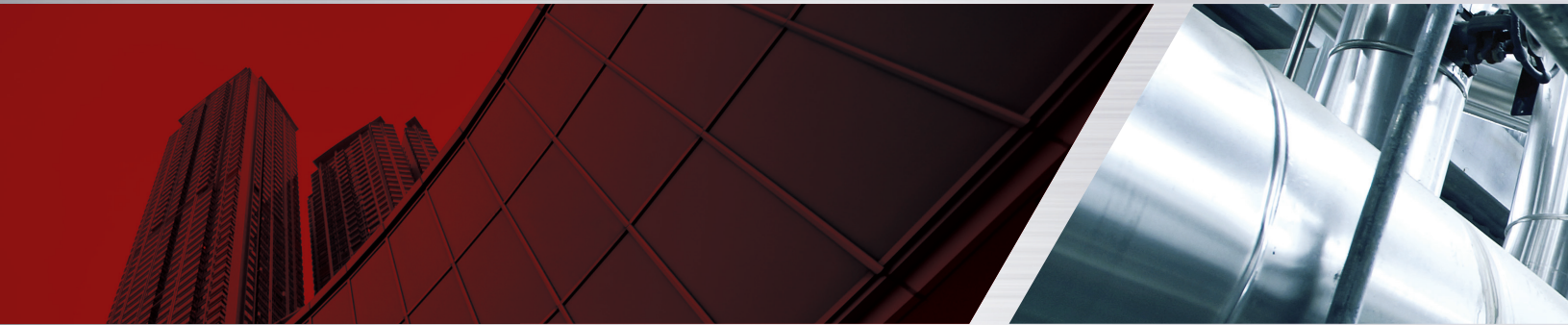
PRODUCT APPLICATION LIMITATION

Veris's products are not designed for life or safety applications. Veris products are not intended for use in critical applications such as nuclear facilities, human implantable devices, life support or safety. Veris is not liable, in whole or in part, for any claims or damages arising from such uses.

MODIFICATION

We reserve the right to revise these Sales Terms at any time. We will post any new or revised Sales Terms here, and you should review these Sales Terms before you place a product order. You can determine if these Sales Terms have been revised since your last product order by referring to the effective date or last updated date at the top of these Sales Terms. The Sales Terms in effect at the time of your product order shall apply to such order.

For complete terms and conditions, visit www.veris.com



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Bid With Expertise

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