Air Quality Contents

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

MODEL	DESCRIPTION	PAGE
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Air Quality Sensor Selection Guide

CO_2 SENSORS

FEATURES/OPTIONS	Wall Mount	Duct Mount	Outdoor/Subzero Mount	Remote Mount
Analog Output	CWL, CWE, CWV pages 26, 32, 36	CDL, CDE pages 26, 32	CHL page 30	
Field-Selectable Output	CWL, CWE pages 26, 32	CDL, CDE pages 26, 32	CHL page 30	CRL page 32
Resistive Temperature Output	CWL, CWE, CWV pages 26, 32, 36	CDL page 26	CHL page 30	
Relay Output	CWL, CWV pages 26, 36	CDL page 26		
Protocol Output (BACnet and Modbus)	CWLP, CWXP page 28			
LCD Display with Humidity and Temperature Options	CWL page 26	CDL page 26	CHL page 30	

CO MONITORS

FEATURES/OPTIONS	Wall Mount	Duct Mount	Remote Monitoring
Selectable Output 4-20mA/0-5 or 0-10VDC	GW page 38	GD page 38	
Monitors up to 4 sensors			GM page 38

SMART SENSING WITH THE BACNET AND MODBUS COMMUNICATING CO_2 SENSOR

CW Protocol

The CW Protocol Series is a line of CO2 sensors with embedded BACnet and Modbus communication protocols, providing a networked connection to the controller, saving installation time and cost, and increasing maintenance efficiency. Instead of the traditional method of wiring each sensor to a controller the CW Protocol allows you to daisy chain the devices on one 3-wire network. The sensors are configurable to multiple baud rates, allowing the data to be transmitted at a speed ideal for most systems.

- Embedded BACnet and Modbus communications protocols.
- Configurable to multiple baud rates
- CO2, humidity, and temperature sensors in one device at one address – provides more information and maximizes system capacity
- Local Feature override capability from the Building Control System
- 5 year recommended calibration interval limits maintenance requirements
- Innovative self-calibration algorithm – maximizes performance
- Field calibratable – convenient installation

Applications

- Controlling ventilation in response to occupancy
- Facilitates compliance with ASHRAE and other air quality standards
- Ideal solution for integration into office buildings, schools, or other systems utilizing BACnet or Modbus control

Deluxe Duct and Wall CO_2 Sensors

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

DESCRIPTION

CDL/CWL carbon dioxide sensors maximize energy savings, while ensuring optimal ventilation. These sensors allow ventilation systems to be controlled by the amount of CO_2 present in a space. The CWL/CDL Series detect fluctuations in CO_2 levels and signal ventilation systems to provide an inlet of fresh air optimal for the space at a given time saving energy and ensuring tenant comfort.

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.

FEATURES

- Microprocessor-based design increases accuracy and reduces installation time
- Non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value...high accuracy measurement
- Innovative self-calibration algorithm...easy to maintain
- 5-year calibration interval (recommended)
- Field-selectable outputs for operation flexibility
- Integrated transducer and probe...eliminates the need to install a separate pick-up tube
- Snap-on faceplate...no screws required, making installation and service easy
- Adjustable duct probe...simplifies installation and airflow monitoring
- CO_2, humidity, and temperature sensing all in one compact device...fewer units to buy and install

AIR QUALITY

SPECIFICATIONS

5 Year Warranty

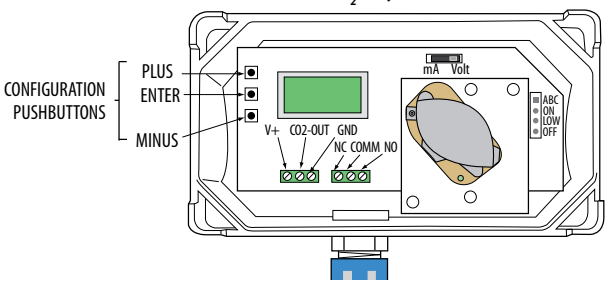
Input Power	20 to 30VDC/24VAC; 100mA max.
Analog Output	4-20mA (clipped & capped)/0-5VDC/0-10VDC (selectable)
Operating Temperature Range	CDL: 0° to 50°C (32° to 122°F) CWL: No humidity option: 0° to 50°C (32° to 122°F); With humidity option: 10° to 35°C (50° to 95°F)
Operating Humidity Range	0 to 95% RH noncondensing
Housing Material	High impact ABS plastic
CO_2 Transmitter:	
Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Output Range	0-2000/5000 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:	
HS Sensor	Fully replaceable, digitally profiled thin-film capacitive (32-bit mathematics) U.S. Patent 5,844,138
Accuracy	±2% from 10 to 80% RH @ 25°C; NIST traceable multi-point calibration
Hysteresis	1.5% typical
Stability	±1% @ 20°C (68°F) annually for two years
Output Range	0-100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25°C (typical)
Temperature Transmitter:	
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 models without setpoint slider option)	1A@30VDC, resistive; 30W max.

RTD/Thermistors in wall packages are not compensated for internal heating of product.
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).
Note: Rough handling and transportation may cause a temporary reduction of CO_2 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.

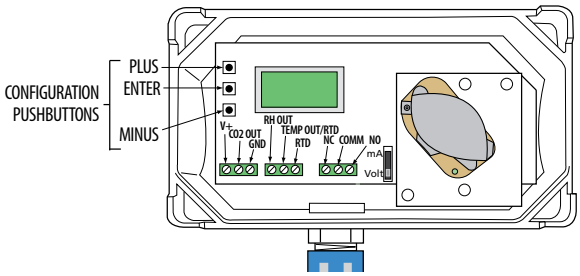
VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAMS

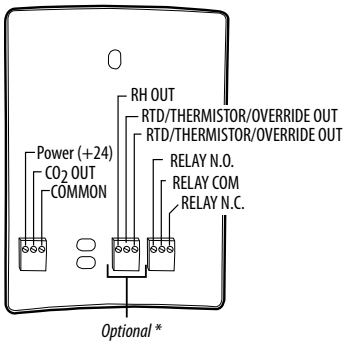
CDL: CO_2 only



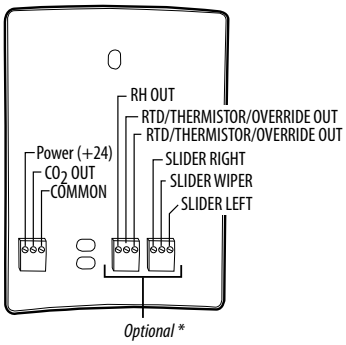
CDL: Temp and/or RH Options



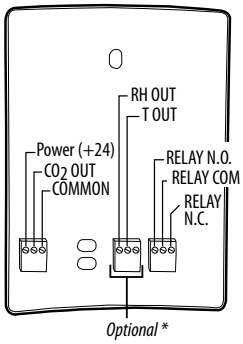
CWL: CO2, RH, Thermistor, Pushbutton Override, and Relay Options



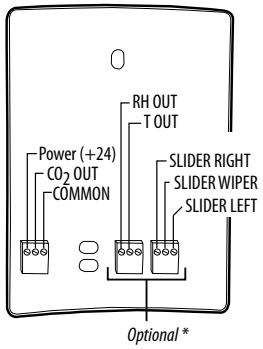
CWL: CO2, RH, Thermistor, Pushbutton Override, and Setpoint Slider Options



CWL: CO2, RH, Temperature Transmitter Options



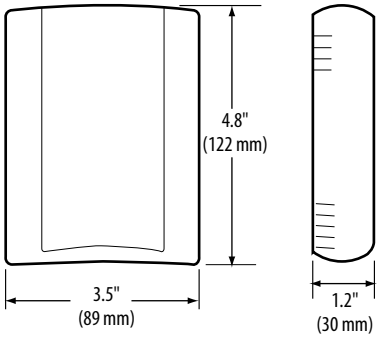
CWL: CO2, RH, Temperature Transmitter, and Setpoint Slider Options



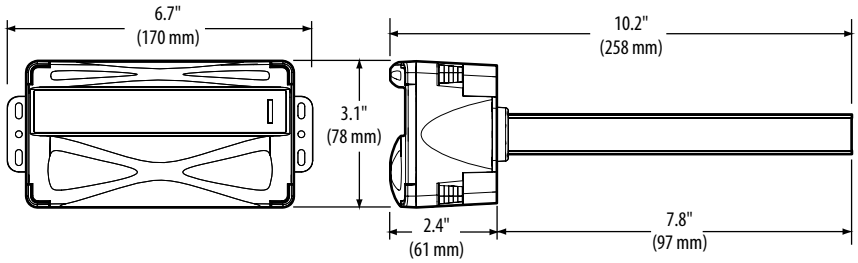
** Note: Connector blocks and headers for optional features are not included with non-option models.*

DIMENSIONAL DRAWINGS

CWL Wall Mount



CDL Duct Mount



ORDERING INFORMATION

CE

Duct Mount

CDLS [RH Option] [Temp] [Sensor Type] [Optional Cal Cert]

RH Option
- **H** = RH2%
- **X** = No RH

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

Sensor Type
- **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
- **Z** = 10k E1, Thermistor

Optional Cal Cert
- **Blank** = None
- **1** = 1 pt Temp Cert
- **2** = 2 pt Temp Cert

Example: CDLS [H] [T] [B] [2]

Wall Mount

CWLS [RH Option] [Temp.] [Sensor Type] [Temp Cal Cert] [Option] [Setpoint Slider Value] [Housing]

RH Option
- **H** = RH 2%
- **X** = No RH

Temp.
- **T** = Temp
- **X** = No *(stop here)*

Sensor Type
- **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
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- **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
- **Z** = 10k E1, Thermistor

Available Options

Temp Cal Cert
- **X** = No
- **1** = 1pt Temp Cert
- **2** = 2pt Temp Cert

Option
- **1** = Push Button Override *
- **2** = Set Point Slider
- **3** = Push Button Override*+Set Point Slider

Setpoint Slider Value
- **-**
- **A** = 1k
- **F** = 10k
- **G** = 20k
- **K** = 50k
- **M** = 100k

Housing
- **Blank** = Cloud white
- **B** = Black

Example: CWLS [H] [T] [C] [2] [2] [A] (Options)

** The Push Button Override feature is not available with temperature transmitter models. Only resistive temperature models qualify for this feature*

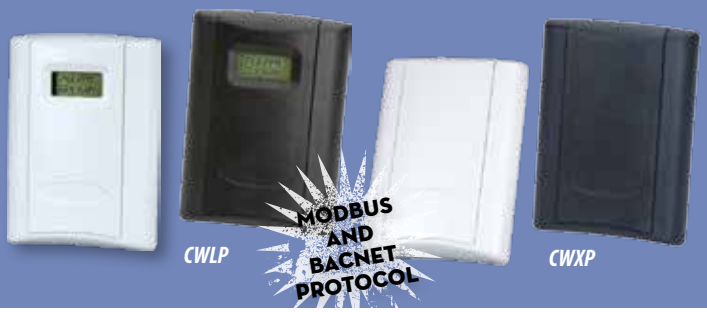
ACCESSORIES

Calibration kits and gases (AA01, AA26, AA27, AA28, AA29)
Handheld air quality testers (1010, 1008, 770)
Replacement covers and housing for wall units (AA52, AA52B, AA55)

AIR QUALITY

Deluxe Wall CO_2 Sensor, Protocol Communication

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



DESCRIPTION

CW Protocol Series is a non-dispersive infrared (NDIR) sensor designed for measuring CO_2 concentration in ventilation systems and indoor living spaces. Its measurement range of 0-5000 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 temperature and optional humidity sensors. An adjustable setpoint relay is provided for direct control and alarm applications, and the setpoint slider and pushbutton override offer additional local input.

APPLICATIONS

- Facilitating compliance with ASHRAE and other air quality standards
- Office buildings, schools, or other systems utilizing BACnet or Modbus protocol

FEATURES

- Embedded BACnet and Modbus communication protocols...easy systems integration
- Configurable to multiple baud rates...transfer data at the right speed for the system
- CO_2, humidity, and temperature sensors in one device at one address...provides more information and maximizes system capacity
- Local feature override capability from the building control system...added control and flexibility
- Innovative self-calibration algorithm...maximizes performance
- Field calibratable...minimize downtime
- Available with 2% NIST or 2% standard RH

SPECIFICATIONS

5 Year Warranty

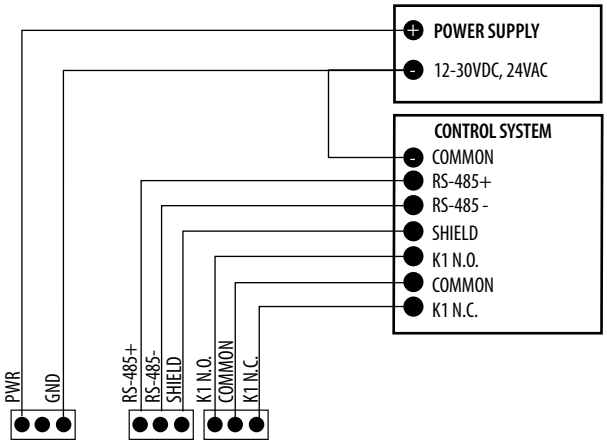
Input Voltage	12 to 30VDC, 24VAC; 100mA max.
Operating Temperature Range	No humidity option: 0° to 50°C (32° to 122°F); With humidity option: 10° to 35°C (50° to 95°F)
Operating Humidity Range	0-95% RH noncondensing
Housing Material	High impact ABS plastic, UL 94 V0
Protocol	BACnet or Modbus (selectable)
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	1-127
CO_2 Transmitter:	
Sensor Type	Non-dispersive infrared (NDIR) diffusion sampling
Measurement Range	0-5000 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 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)
Range	10° to 35°C (50° to 95°F)
Relay Contacts:	
1 Form C (SPDT)	1A@30VDC, resistive; 30W max.
Setpoint Slider Resolution Option	1% full scale
Override Button Option	Remotely readable and resettable

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)
** Measured at NTP*
*** Specified accuracy with 24VDC 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: 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.

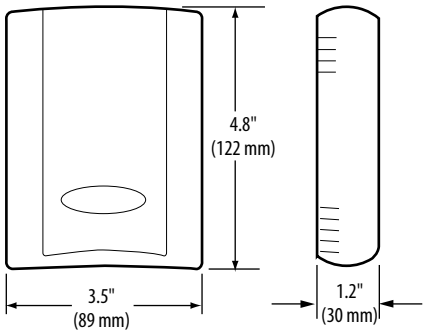
AIR QUALITY

VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAM



DIMENSIONAL DRAWING



AIR QUALITY

ORDERING INFORMATION

CE

Local Display	Protocol	RH Option	Temp. Option	Temp. Cal. Cert.	Option	Housing
CW ☐	P ☐	☐	☐	☐	☐	☐
L = LCD **X** = No Display	= 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.* **3** = 3 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] [ ]

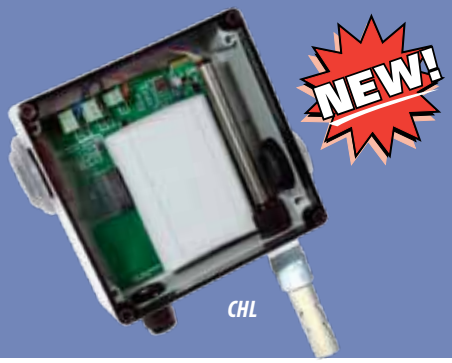
** Only available if temperature option is selected.*

ACCESSORIES

Duct Aspiration Box and Outdoor Aspiration Box (AA35)
Calibration kits and gases (AA01, AA26, AA27, AA28, AA29)
Handheld air quality testers (1010, 1008, 770)
Replacement covers and housing for wall units (AA51, AA51B, AA52, AA52B, AA55)

Deluxe Outdoor and Subzero CO_2 Sensors

Heated Enclosure for Subzero Monitoring



DESCRIPTION

CHX/CHL carbon dioxide sensors are mounted in a heated enclosure for applications in subzero environments. The enclosure is IP65 and NEMA 4 rated, with Gore-Tex® filters on each side to allow air to permeate to the NDIR sensor. The heated housing ensures accuracy at subzero temperatures.

APPLICATIONS

- Controlling ventilation in response to occupancy
- Facilitating compliance with ASHRAE 62.1 standard for air quality
- Outdoor air
- Walk-in freezers and other subzero applications

FEATURES

- Microprocessor-based design increases accuracy and reduces installation time
- IP65 and NEMA 4 rated housing...durable
- Designed for outdoor and subzero use...wide application range
- V or mA output...application flexibility
- Non-dispersive infrared technology (NDIR) repeatable to ±20 ppm ±1% of measured value...high accuracy measurement
- Innovative self-calibration algorithm...easy to maintain
- 5-year calibration interval (recommended)
- CO_2, humidity, and temperature sensing all in one compact device...fewer units to buy and install
- Heater automatically switches on and off to ensure CO_2 accuracy at subzero temperatures

AIR QUALITY

SPECIFICATIONS

5 Year Warranty

Input Power	20 to 30VDC/24VAC; 100mA max. with heater off; 600mA max. with heater on
Analog Output	4-20mA (clipped & capped)/0-5VDC/0-10VDC (selectable)
Operating Temperature Range	-29° to 50°C (-20° to 122°F)
Operating Humidity Range	0 to 95% RH noncondensing
Housing Material	High impact ABS plastic

CO_2 Transmitter:

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

RH Transmitter:

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

Temperature Transmitter:

Sensor Type	Solid-state, integrated circuit
Accuracy	±0.5°C (±1°F) typical
Resolution	0.1°C (0.2°F)
Output Range	-40° to 50°C (-40° to 122°F)

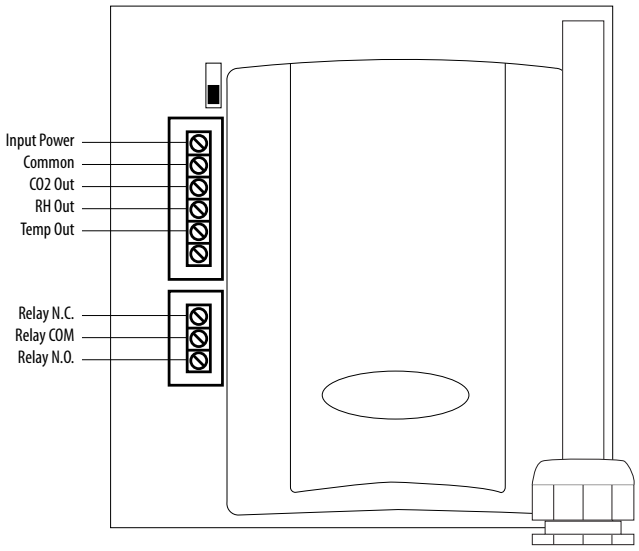
Relay Contacts:

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

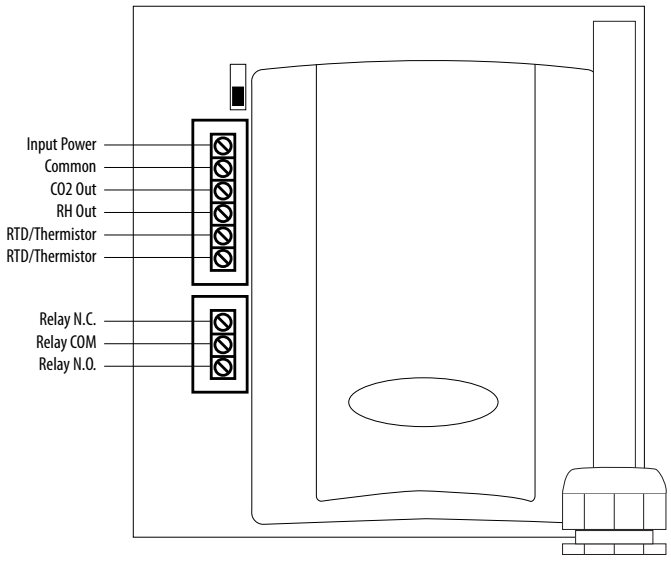
RTD/Thermistors in wall packages are not compensated for internal heating of product.
EMC Conformance: Low voltage directive 2006/95/EC and EMC directive 2004/108/EC.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1:2007 specification requirements).
Note: Rough handling and transportation may cause a temporary reduction of CO_2 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.

APPLICATION/WIRING DIAGRAMS

CO2, RH, Temp. Transmitter

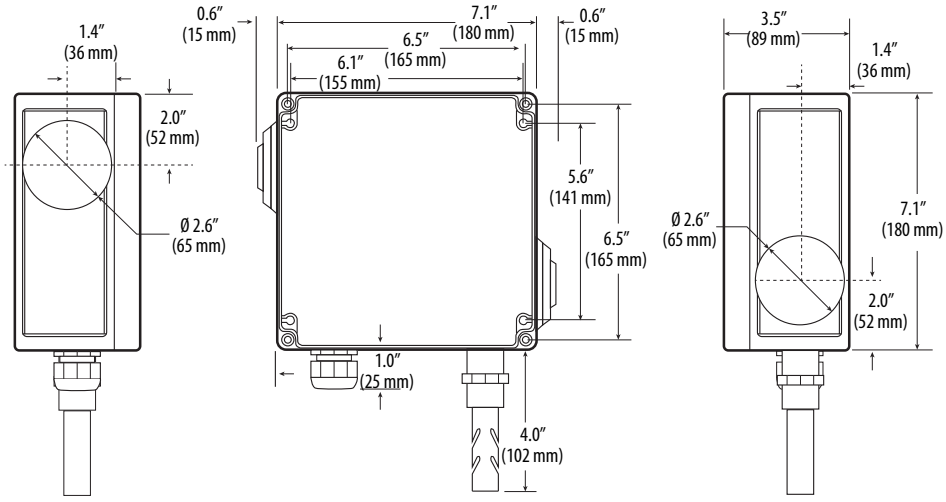


CO2, RH, Thermistor



Power terminals are pre-wired into the board.

DIMENSIONAL DRAWING



ORDERING INFORMATION

CE

CH [ ] [ ] [ ] [ ] [ ] [ ]

Local Display
- **L** = LCD*
- **X** = No display

RH Option
- **2** = RH 2% NIST
- **H** = RH 2%
- **3** = RH 3%
- **5** = RH 5%
- **X** = No RH

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

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

Sensor Type
- **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
- **Z** = 10k E1, Thermistor

Optional Cal Cert
- **Blank** = None
- **1** = 1 pt Temp Cert
- **2** = 2 pt Temp Cert

** LCD displays CO_2 value only*

Example:

CH	L	3	M	T	S	1

ACCESSORIES

Calibration kits and gases (AA01, AA26, AA27, AA28, AA29)
Handheld air quality testers (1010, 1008, 770)
Replacement covers for wall units (AA52, AA52B, AA53, AA53B)
Replacement cloud white wall housing (AA55)

AIR QUALITY

Standard Duct and Wall CO_2 Sensors

Field-Selectable 4-20mA/0-10VDC Output

DESCRIPTION

The **CDE and CWE** are non-dispersive infrared (NDIR) sensors designed for measuring environmental CO_2 concentration in ventilation systems and indoor living spaces. Their measurement range of 0-2000 ppm makes them compliant with ASHRAE and other standards for ventilation control

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

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.

FEATURES

- Microprocessor-based design increases accuracy and reduces installation time
- Non-dispersive infrared technology repeatable to ±20 ppm ±1% of measured value...high accuracy measurements
- Innovative self-calibration algorithm...easy to maintain
- 5-year calibration interval (recommended)
- Low ambient sensitivity
- Output 4-20mA/0-10V for flexible control system interface
- 3-year factory warranty from date of purchase

AIR QUALITY

SPECIFICATIONS

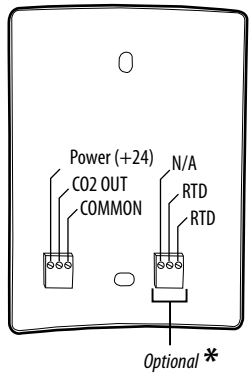
3 Year Warranty

Input Power	20 to 30VDC/24AC; 100mA Maximum
Analog Output	4-20mA (clipped and capped)/0-10VDC (selectable)
Operating Temperature Range	0° to 50°C (32° to 122°F)
Operating Humidity Range	0 to 95% RH noncondensing
Housing Material	High impact ABS plastic
Sensor Type	Non-dispersive infrared, diffusion sampling
Output Range	0-2000 ppm
Accuracy	±30 ppm ±2% of measured value*
Repeatability	±20 ppm ±1% of measured value
Response Time	<60 seconds for 90% step change

RTD/Thermistors in wall housings are not compensated for internal heating of product.
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).
** Measured at NTP*
Note: Rough handling and transportation may cause a temporary reduction of CO_2 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.

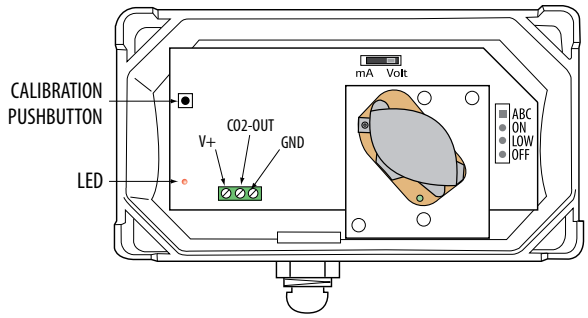
APPLICATION/WIRING DIAGRAMS

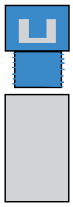
CWE Wall Mount



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

CDE Duct Mount



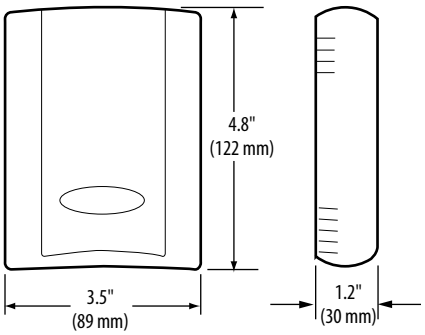


CONDUIT ADAPTER (included)

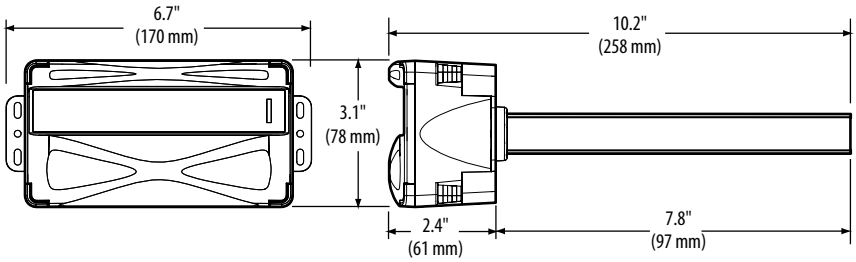
1/2" NPT MALE/FEMALE (included)

DIMENSIONAL DRAWINGS

CWE Wall Mount



CDE Duct Mount



ORDERING INFORMATION CE *all models*

Duct Mount

CDE *(No Options)*

Wall Mount, Temp. Option

Sensor Type **Housing**

CWE [ ] [ ]

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 w/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
SZ = 10k E1, Thermistor

Blank = Cloud white
B = Black

Example:
CWE [SH] [B]

Wall Mount, No Temp. Option

Housing

CWE [ ]

Blank = Cloud white
B = Black

Example:
CWE [B]

ACCESSORIES

Calibration kits and gases (AA01, AA26, AA27, AA28, AA29)
Handheld air quality testers (1010, 1008, 770)
Replacement covers for wall units (AA51, AA51B)
Replacement cloud white wall housing (AA55)

1010

AA01

AA55

AA51/AA51B

AIR QUALITY

Remote Mount CO_2 Sensor, with Field-Selectable Outputs

Suitable For Outside Air Measurement Applications

DESCRIPTION

The **CRLXX** remote mount carbon dioxide sensor is designed for use in HVAC control applications. Inside buildings, people are the major source of CO_2. By controlling fresh air based on CO_2 levels, energy can be saved and tenant comfort improved.

The CRLXX ensures that adequate ventilation is provided, while maximizing energy savings by ventilating at the optimum level.

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

FEATURES

- Microprocessor-based design reduces long-term drift and calibration requirements
- Non-dispersive infrared technology (NDIR) repeatable to ±20 ppm 0-2000 ppm range...high accuracy measurements
- Innovative self-calibration algorithm...reliable accuracy over time
- 5-year calibration interval (recommended)
- Low ambient sensitivity
- Field-selectable 4-20mA/0-5V/0-10V output...system flexibility
- Comes complete with AA50 3 ft long duct pickup and filtered sample tube assembly...easy to install
- LCD display for visibility
- Alarm relay output to trigger HVAC equipment at predetermined level

AIR QUALITY

SPECIFICATIONS

5 Year Warranty

Input Power	20 to 30VDC/24VAC; 100mA maximum
Analog Output	4-20mA (clipped & capped)/0-5VDC/0-10VDC (selectable)
Operating Temperature Range*	0° to 50°C (32° to 122°F)
Operating Humidity Range	0 to 95% RH noncondensing
Housing Material	High impact ABS plastic

CO_2 Transmitter:

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

EMC Conformance: EN 61000-6-3:2001 Class B, EN 61000-6-1:2001, EN 61000-3-2:2000, EN 61000-3-3:2001, EMC Test Methods: CISPR 22:1997 (Amended A1:2000, A2:2002) Class B, IEC 61000-4-2:2002, IEC 61000-4-3:2006, IEC 61000-4-4:2004, IEC 61000-4-5:2001, IEC 61000-4-6:2004, IEC 61000-4-8:2001, IEC 61000-4-11:2004.

EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1:2001 specification requirements).

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

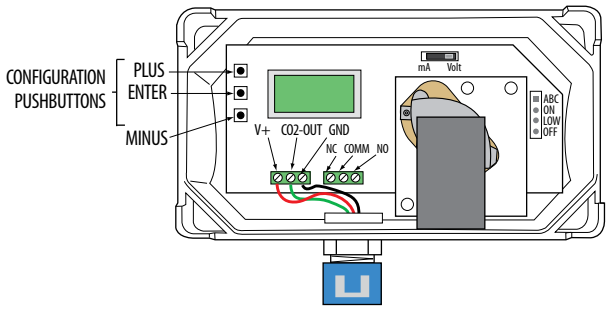
*** Measured at NTP*

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

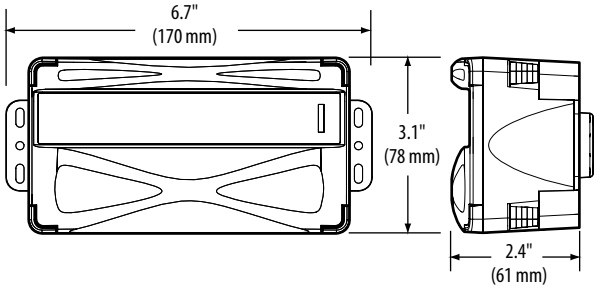
Note: Rough handling and transportation may cause a temporary reduction of CO_2 sensor accuracy. With time, the ABC function will tune the readings back to the correct accuracy range. The default tuning speed is limited to 30 ppm per week.

VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAM



DIMENSIONAL DRAWING



AIR QUALITY

ORDERING INFORMATION

MODEL	DESCRIPTION
CRLSXX	Remote Mount CO_2 Sensor

ACCESSORIES

Remote sample pickup kit (AA50)
Calibration kits and gases (AA01, AA26, AA27, AA28, AA29)
Handheld air quality testers (1010, 1008, 770)

Wall CO2 Sensors, Dual Analog Outputs

Dual Analog Outputs, Switchable 0-3/5/10 Volt/4-20 mA Output

DESCRIPTION

The **CWV Series** is a non-dispersive infrared sensor designed for measuring CO_2 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.

APPLICATIONS

- Controlling HVAC in response to occupancy – save energy by providing ventilation only as required
- Improving tenant comfort
- Schools, museums, airports, commercial buildings, etc.
- OEM applications
- Home automation
- Big-box retail
- Restaurants
- C-Stores
- Bid/Spec market

FEATURES

- Microprocessor-based design reduces long-term drift and calibration requirements
- Non-dispersive infrared technology (NDIR) repeatable to ±30 ppm ± 4.5% of measured value...high accuracy measurements
- Innovative self-calibration algorithm...easy to maintain
- 5-year calibration interval (recommended)
- Low ambient sensitivity
- Improve comfort and facilitate compliance with ASHRAE 62.1 standard for air quality
- Demand control ventilation provides reduction in energy costs...helps with green branding initiatives
- Dual analog outputs...added user convenience
- LED indication for power and error detection...reduces time spent troubleshooting
- Switchable 0-3/5/10V output...increased flexibility
- US & European mounting holes...installation flexibility
- Field calibratable...reduce costly downtime
- 4-20mA and voltage outputs in one unit...greater versatility

AIR QUALITY

SPECIFICATIONS

1 Year Warranty

Input Voltage	20 to 30VDC, 24VAC
Analog Output #1	4-20mA (clipped & capped) or 0-3VDC/0-5VDC/0-10VDC (jumper selectable)
Analog Output #2	4-20mA (clipped & capped) or 0-3VDC/0-5VDC/0-10VDC (jumper selectable)
Sensor Current Draw	200mA Maximum
Operating Humidity Range	0-95% RH noncondensing
Operating Temperature Range	0° to 50°C (32° to 122°F)
Housing Material	High impact ABS plastic

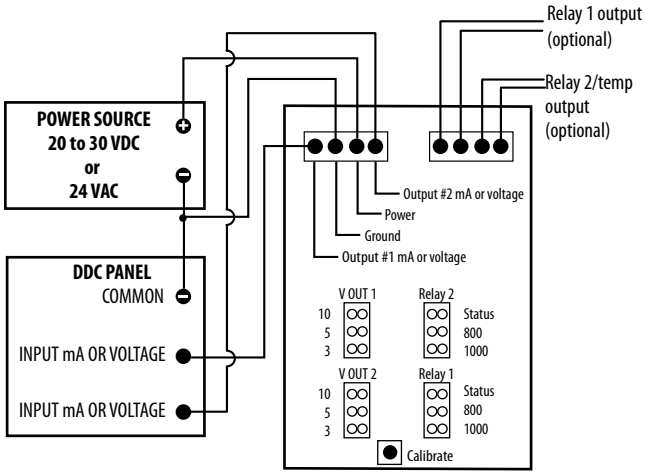
CO_2 Transmitter:

Sensor Type	Non-dispersive infrared (NDIR), diffusion sampling
Measurement Range	0-2000 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
Relay Contacts	1A@30VDC, resistive; 30W max.

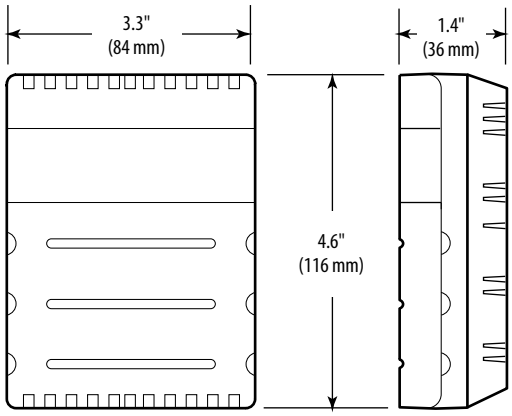
EMC Conformance: Low voltage directive 2006/95/EC and EMC directive 2004/108/EC.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1:2007 specification requirements).

VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAM



DIMENSIONAL DRAWING



AIR QUALITY

ORDERING INFORMATION

CE

CWVS [ ]

Outputs
1 = 0-3/5/10VDC and 4-20mA
2 = Dual 4-20mA
3 = Dual 0-3/5/10VDC

Relay Option
X = None
1 = Relay

Thermistor/2nd Relay option
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
Z = 10k E1, Thermistor
1 = Relay

Warranty
1 = 1 Year
3 = 3 Years
5 = 5 Years

Housing
Blank = White/gray
B = Black

Example:
CWVS [1] [1] [1] [5]

ACCESSORIES

Calibration kits and gases (AA01, AA26, AA27, AA28, AA29)
Handheld air quality testers (1010, 1008, 770)

1010

AA01

Carbon Monoxide Sensors

Easy Control of Ventilation in Parking Garages and Mechanical Areas

DESCRIPTION

G Series carbon monoxide sensors maximize energy savings, while ensuring optimal ventilation in parking garages and other mechanical areas. The sensors allow ventilation systems to be controlled by the amount of CO present in a location. The G Series detects fluctuations in CO levels, and it signals air systems to provide an inlet of fresh air optimal for the space at a given time. In this manner, the ventilation fan does not need to run continuously, saving energy and reducing maintenance costs. Upon alarm, the G Series will alert those in the area with both an audible and a visual alarm.

The G Series devices are equipped with a relay contact that closes when CO level is below 25 ppm and opens when the CO level is above 25 ppm. Sensor removal, power interruption, or cut wires cause the external contactor (normally closed) to open and start the fan. Minimum relay cycle time is 3 minutes to prevent fan short-cycling. Audible Alarm: 85 dB alarm sounds if CO level rises above 100 ppm for 30 minutes.

FEATURES

- Long-life replaceable sensor element
- Microprocessor controlled...excellent stability
- No calibration required...easy maintenance and worry-free operation
- Metal oxide semiconductor (MOS) sensor
- Interface to DDC system, GM panel, or direct fan control...easy integration with existing systems
- Onboard fail-safe 5 Amp alarm relay for direct ventilation fan control...simple operation
- Interface to control system via selectable 4-20mA or 0-5/0-10VDC output... application flexibility
- Audible exposure alarm 100 ppm, 30 minutes per UL 2034...easy troubleshooting

APPLICATIONS

- Controlling parking garage ventilation
- Ensuring OSHA air quality compliance in commercial buildings and factories
- Vehicle bays (ambulance/fire/taxi stations)
- Mechanical rooms
- Sally ports

SPECIFICATIONS (G Series Sensor)

5 Year Warranty

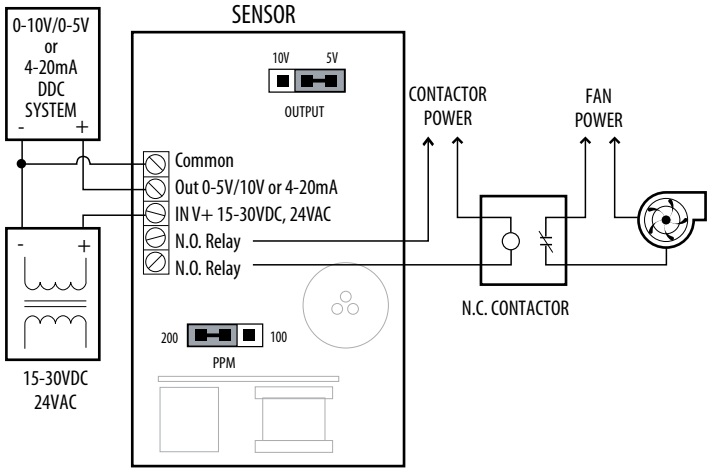
Input Power	12-30VDC/24VAC, 0.3A@12VDC, 0.3A@24VDC
Sensor	Digitally-profiled Metal Oxide Semiconductor (MOS)
Sensor Life	5-10 years typical, replaceable
Detection Range	0 to 200 ppm
Analog Output	3-wire sourcing 4-20mA or user-selectable 0-5V/0-10V (Specify mA or voltage)
Output Scaling	User-selectable 100 ppm F.S. or 200 ppm F.S.
Response Time	2 minutes 30 second sample interval cycle
Relay Output	N.O. Form A (SPST) 8A@30VAC/VDC (use with N.C. contactor)
Relay Setpoint	25 ppm
High Limit Setpoint	100 ppm for 30 minutes
High Limit Alarm	Audible, 85 dB, resets below 100 ppm; (Solid-state contact for -AS version)
High Limit Contact (-AS models)	250 VAC/DC, 120 mA max. Ron 35 Ω
LED Indicators	Normal=Green; Call for ventilation=Red; High-limit alarm=Flashing Red
Operating Environment	-20° to 50°C (-4° to 122°F); 0 to 90% RH non-condensing
Coverage	5000 sq. ft. typical (465 sq. m)
Physical	white powder coat over steel

SPECIFICATIONS (GMxA Monitor)

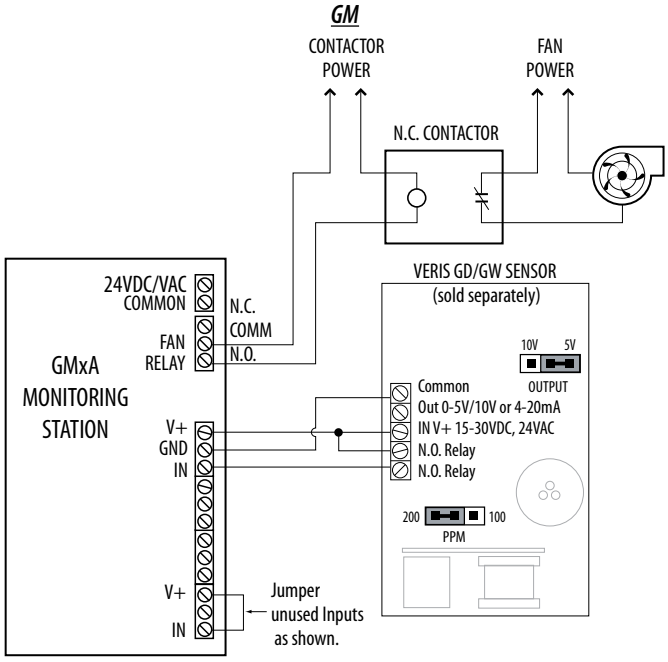
Input Power	24VAC/VDC@0.5A
Inputs	Detect contact closure from sensor relay. Four channels. 24VDC loop
Output	Form C (SPDT) relay. 5A@30VAC
Alarm Indicators	Four, 10 mm red LED indicates alarm status
Power Indicator	Green LED indicates power supply operation
Operating Environment	-20° to 50°C (-4° to 122°F); 0 to 90% RH non-condensing
Physical	NEMA 1, metal enclosure, white

APPLICATION/WIRING DIAGRAMS

GD/GW

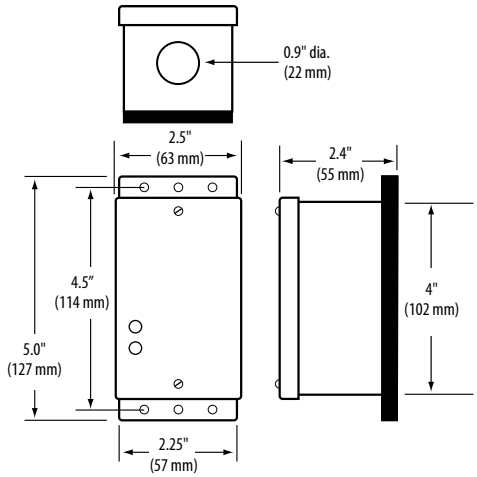


GM

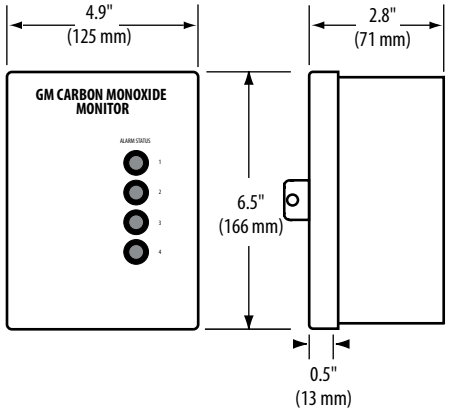


DIMENSIONAL DRAWINGS

GD/GW

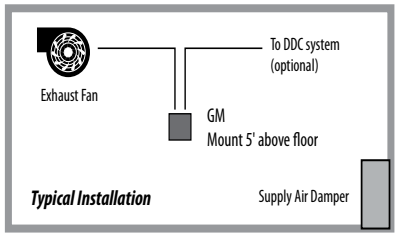


GM



GMxA Monitoring Station

The GMxA monitoring station accepts digital inputs from up to four sensors to provide alarm status indication for each channel, and a Form C (SPDT) fan actuation relay. If any of the sensors detects CO levels above 25 ppm, or if a fault is detected, the corresponding alarm status indicator lights and the fan relay de-energizes (failsafe).



Ventilation control for energy savings and OSHA compliance in parking garages and service bays

ORDERING INFORMATION

Sensor

Enclosure	Output	Auxiliary Alarm Output	US or EU
G [ ]	[ ]	[ ]	[S]
D = Duct mount **W** = Wall mount	**V** = Field-selectable, 0-5/0-10VDC **M** = 4-20mA **R** = Relay only	**A** = Auxiliary Contact **X** = None	= Standard

Example: G W V X S

Monitoring Station

Sensors = GWRXS

GM Gas Monitoring Station [ ] [A]

0 = Station Only
1 = Includes 1 Sensor
2 = Includes 2 Sensors
3 = Includes 3 Sensors
4 = Includes 4 Sensors

Example: GM 4 A

ACCESSORIES

Verification Kits (AA32, AA39)
Replacement sensors (AA09)
Calibration gases (AA37, AA38)
Power Supplies: For a complete product offering check out our PS Series

AA09

AA38

AA32

Current Monitoring Contents

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, eliminating failures caused by the wear and tear of moving parts. Veris offers a full range of analog & digital current sensing devices.

MODEL	DESCRIPTION	PAGE
H300/600/800/800NC/800HV/900	Current Switches: Fixed Trip Point (Status)	44
H308/608/701/708/808/908	Current Switches: Adjustable Trip Point, Standard Output	46
H609/709/709HV/809/909/909HV	Current Switches: Adjustable Trip Point, High Voltage Output	48
H606/706/806/906	Current Switches: Adjustable Trip Point, N.C. Output	50
H11D	Current Switches: Auto Calibration, Automationn Systems, LCD Display	52
H10F	Current Switches: Auto Calibration, Standard Output	54
H614	VFD Current Switch: Auto Calibration	56
H720/904/934	VFD Switches and Current Sensors	58
H730/740/750/930/940/950	Current Switches with Relay: Fixed Trip Point (Status)	60
H735/738/748/758/938/948/958	Current Switches with Relay: Adjustable Trip Point, Standard Output	62
H739/749/939/949/959	Current Switches with Relay: Adjustable Trip Point, High Voltage Output	64
H721HC/721LC/921	Current Transducers: 4-20mA Analog Output	66
H221/221SP/321/321SP/421/421SP	Current Transducers: 4-20mA Analog Output, High Current Monitoring	68
H722LC/722HC/822/822-20/922	Current Transducers: 0-5VDC Analog Output	70
H723LC/723HC/923	Current Transducers: 0-10VDC Analog Output	72
H931/951	Current Transducers with Relay: 4-20mA Analog Output	74
H932/952	Current Transducers with Relay: 0-5VDC Analog Output	76
H971/971SP/H970/EA20 Series	Direct Current Transducers: 4-20mA and 0-5VDC Analog Output	78
EA10 Series	Direct Current String Monitor	80
H40	Field Mount Motor Control Device: Separate Line and Low Voltage	82
H5xx Series	Field Mount Motor Control Device	84
H120/120NC	Field Mount Status Relay	86
H280/280NC	Load Status Switch	88
Accessories		325

Current Sensor Selection Guide

CURRENT STATUS SWITCHES (Digital Output)

** Indicates a series of products.*

APPLICATIONS	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 44	H800* — 200A page 44	H600 — 200A page 44		H900 — 200A page 44
Detect Belt Loss and Mechanical Failure (Adjustable Threshold)	H308 — 50A page 46	H808 — 50A page 46 H806 — 50A page 50 H809 — 50A page 48	H608 — 175A page 46 H606 — 50A page 50 H609 — 50A page 48	H708 — 135A page 46 H706 — 135A page 50 H709* — 135A page 48	H908 - 135A page 46 H906 - 135A page 50 H909* - 135A page 48
Self-Calibrating Switch		H10F — 100A page 54			H11D — 200A page 52
VFD Model - Patented Technology		H614 — 150A page 56			H904 — 135A/20-75Hz page 58
VFD Model - Patented Technology (Onboard Relay)					H934 — 135A/20-75Hz page 58
Veris Exclusive Patented Technology Status and Control (Onboard Pilot Duty Relay)				H730* — 200A page 60 H738* — 135A page 62 H739* — 135A page 64	H930* — 200A page 60 H938* — 135A page 62 H939* — 135A page 64

FLYING LEADS AND JUNCTION BOX MOUNTING

High Voltage/Low Voltage Split			H40* — 16A/2.0HP page 82
Power Duty Status and Control	H120* — to 20A/2HP page 86	H5xx* — to 15A/1.5HP page 84	H40* — 16A/2.0HP page 82
Current and Voltage Monitoring	H280* — 20A/277VAC page 88		

CURRENT TRANSDUCERS (Analog Output)

10A — **MONITOR CURRENT LEVEL** — 2400A

APPLICATIONS					
Load Trending 4-20mA Output		H721LC: 10-40A page 66	H921: 30-120A page 66	H721HC: 50-200A page 66	H221/321/421: 300/800/2400A page 68
Load Trending 0-5V Output	H822*: 10/20A page 70	H722LC: 10-40A page 70	H922*: 30-120A page 70	H722HC: 50-200A page 70	
Load Trending 0-10V Output		H723LC: 10-40A page 72	H923: 20-150A page 72	H723HC: 50-200A page 72	
Load Trending with Relay 4-20mA Output			H931/H951: 30-120A page 74		
Load Trending with Relay 0-5V Output			H932/H952: 30-120A page 76		
DC Current 4-20mA Output		EA10: 0-20A page 80		H970/H971/ EA20: 10-200A page 78	

CURRENT MONITORING

VERIS INDUSTRIES

SELF-LEARNING, SELF-CALIBRATING CURRENT SWITCH WITH LCD DISPLAY

Simplified Installation & Trouble-free Reading of Present Current & Trip Points

H11D

The H11D provides calibration-free status for both under and overcurrent. At initial power-up, the H11D automatically learns the average current on the line with no action needed by the installer. Once a current is learned, the switch monitors for changes in current greater than the selected range.

- Backlit LCD display...view the monitored current (up to 200A)...eliminates the need for expensive handheld meters and offers easy visibility in dark enclosures
- Automatic calibration...reduced errors and installation costs
- Slide-switch selectable trip point limits...application versatility
- Microcontroller based learning technology...automatically learns load upon initial power-up...eliminates labor associated with calibration
- Records and displays the amperage level that trips the alarm...simplifies troubleshooting
- Reset function can be used when unpowered...reduces the possibility of an undesirable arc flash incident
- Monitors current for both under- and over-load in one package

Applications

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

SELF-LEARNING, SELF-CALIBRATING CURRENT SWITCH FOR VFD SYSTEMS

CURRENT MONITORING

H614

The H614 is a microprocessor based, self-learning, self-calibrating current-sensitive switching device designed for use with VFD systems. At initial power-up, the H614 automatically learns the average current on the line with no action required by the installer. Once a current is learned, the switch monitors for changes in current greater than ± 20% of the learned load. When calibrated for a given VFD system, the H614 is tolerant of gradual drifts in frequency due to expected conditions, such as an accumulation of debris in a filter, while still detecting a sudden drop due to a potential abnormal system condition (e.g., belt loss or other mechanical failure)

- Microcontroller based learning technology...automatically learns load upon initial power-up...eliminates labor associated with calibration
- Automatic trip point (1.5 to 150 Amps, 12 to 115 Hz)...detect abnormal events
- Monitors current for both under- and over-load in one package
- Small size fits easily inside small starter enclosures...saves space
- 100% solid state...no moving parts to fail
- Removable mounting bracket for installation flexibility

Applications

VFD SYSTEMS:

- Detecting belt loss, coupling shear, and mechanical failure
- HVAC fan/blower motor failure
- Detecting unauthorized duct access

VERIS INDUSTRIES

Current Switches: Fixed Trip Point

0.15 A TURN-ON! (SELECT MODELS)

Split-Core & Solid-Core On/Off Status Current Switches

DESCRIPTION

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 now have the lowest turn-on current in the industry at a mere 150mA!

APPLICATIONS

- Monitoring status of electrical loads
- Monitoring direct-drive units, exhaust fans, process motors, and other fixed loads
- Verifying lighting run times

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

FEATURES

- More reliable for status than relays across auxiliary contacts
- Ideal for direct-drive units, unit vents, fan coil units, exhaust fans, and other fixed loads
- Great for lighting status–less expensive than 277V relays
- Low 0.15 A turn-on (H300 and H600)...ideal for small exhaust fans (not intended to detect belt loss)
- Removable mounting bracket provides installation flexibility
- Bracket on H900 can be installed in three different configurations...installer convenience
- Split-core H300, H600, and H900 for fast retrofit installation
- Mini solid-core H800 and micro split-core H300 fit in tight enclosures... saves valuable panel space
- 100% solid-state, no moving parts to fail
- Polarity insensitive output
- 5-year warranty

CURRENT MONITORING

SPECIFICATIONS

5 Year Warranty

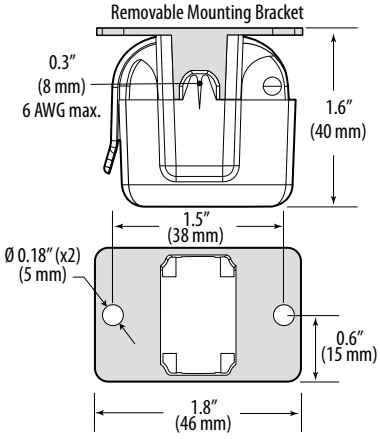
Sensor Power	N.O models: Induced from monitored current; H800NC: 5-30VDC, permanently connected
Insulation Class	600VAC RMS (UL), 300VAC RMS (CE)
Frequency Range	50/60 Hz
Temperature Range	H800, H800NC, H300, H900: -15° to 60°C (5° to 140°F) H600: -15° to 40°C (5° to 104°F) (to 200A); -15° to 60°C (5° to 140°F) (to 150A) H800HV: -40° to 50°C (-40° to 122°F) (to 200A); -40° to 75°C (-40° to 167°F) (to 100A, & 0.25A status output)
Humidity Range	10-90% RH non-condensing
Off State Leakage (H800NC Only)	34µA@5VDC, 200µA@30VDC
On State Voltage Drop (H800NC Only)	1.9VDC (max.) @0.1A
Terminal Block Wire Size	H600, H800, H900: 24-14 AWG (0.2 to 2.1 mm^2); H300: 22-16 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)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-02, CAT III, pollution degree 2, basic insulation

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

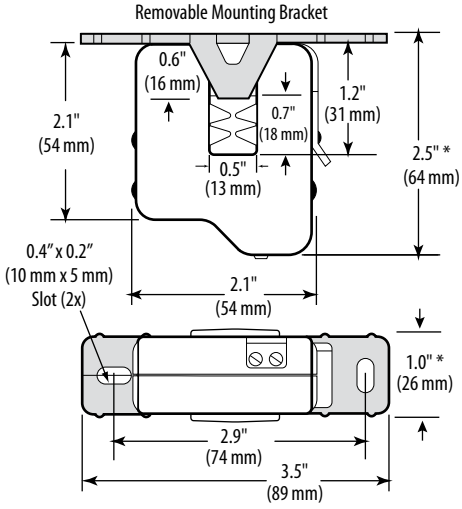
VERIS INDUSTRIES™

DIMENSIONAL DRAWINGS

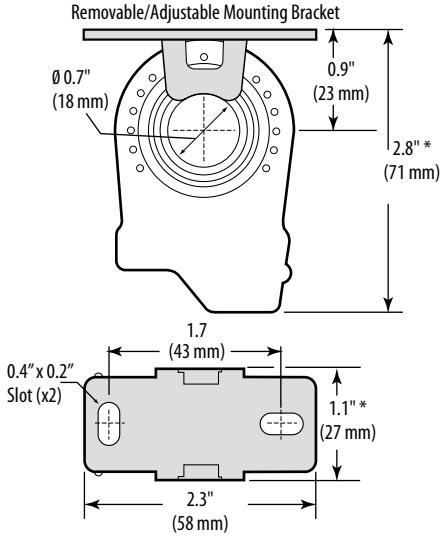
H300



H600

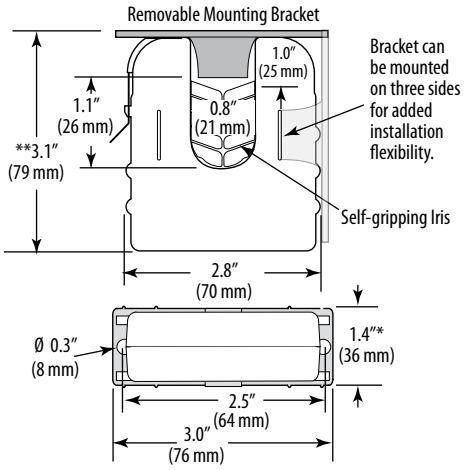


H800, H800HV, H800NC



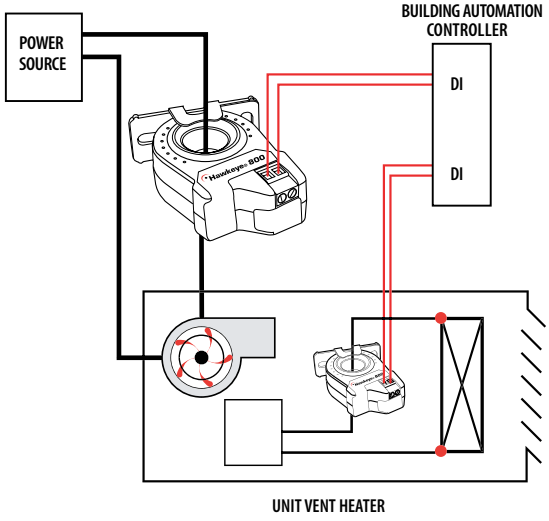
** Terminal block may extend up to 1/8" over the height dimensions shown.*

H900



APPLICATION/WIRING DIAGRAM

Unit Vent Heater Control



ORDERING INFORMATION

E150462

MODEL	AMPERAGE RANGE	STATUS OUTPUT (max.)	TRIP POINT	HOUSING	UL	CE	RoHS
H300	0.15 - 60A	N.O. 1.0A@30VAC/DC	0.15A or less	Split-core	●	● [2]	●
H600	0.15 - 200A	N.O. 1.0A@30VAC/DC	0.15A or less	Split-core	● [1]	●	●
H800	0.25 -200A	N.O. 1.0A@30VAC/DC	0.25A or less	Solid-core	● [1]	●	●
H800NC	0.5 - 200A	N.C. 0.1A@30VDC	0.5A or less	Solid-core	● [1]		●
H800HV	0.75 - 200A	N.O. 0.5A@250VAC/DC	0.75A or less	Solid-core	● [3]		
H900	1.5 - 200A	N.O. 1.0A@30VAC/DC	1.5A or less	Split-core	●	●	

[1] *Listed for use on 75°C insulated conductors.*
[2] *Product provides functional insulation only.*
[3] *Listed for use on 90°C insulated conductors.*

ACCESSORIES

DIN Rail Clip Set (AH01 for H6xx, H8xx, H9xx; AH27 for H3xx)
DIN Rail (AV01) and DIN Stop Clip (AV02)

Current Switches: Adjustable Trip Point

Detect Belt Loss, Coupling Shear, And Mechanical Failure

DESCRIPTION

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 loads from 1/5 to 100 HP.

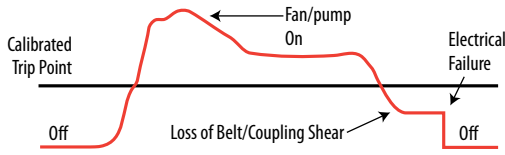
APPLICATIONS

- Detecting belt loss, coupling shear, and mechanical failure
- Verifying lighting circuit and other electrical service run times
- Monitoring status of industrial process equipment
- Monitoring status of critical motors (compressor, fuel, etc.)

FEATURES

- High performance devices in split- and solid-core housings
- Adjustable trip point...precise current trip point setting
- Minimum trip point as low as 0.5A (H608)...eliminates the need for multiple wraps of the conductor through the sensor even on loads as small as 1/5 HP
- Small size...fits easily inside small enclosures
- Self-gripping iris on the split-core housing for easy installation
- Status LEDs available for easy setup and local indication
- Bracket on H908 can be installed in three different configurations...installation flexibility in tight spaces
- 1 Amp status output...increased application flexibility
- All devices are 100% solid state for high reliability and polarity insensitive for trouble-free installation, with a 5-year warranty

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.

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

SPECIFICATIONS

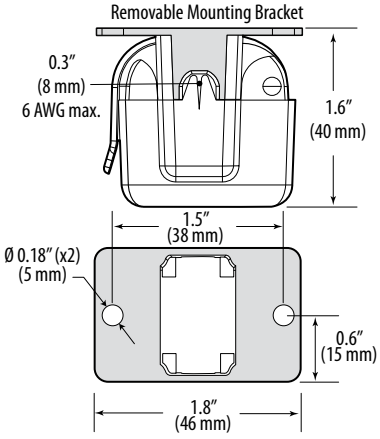
5 Year Warranty

Sensor Power	Induced from monitored conductor
Insulation Class	600VAC RMS (UL), 300VAC RMS (CE)
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH, non-condensing
Hysteresis	10% (typical)
Terminal Block Wire Size	H608, H701, H708, H808, H908: 24-14 AWG (0.2 to 2.1 mm^2); H308: 22-16 AWG (0.3 to 1.3 mm^2)
Terminal Block Torque	H608, H701, H708, H808, H908: 3.5 to 4.4 in-lbs (0.4 to 0.5 N-m); H308: 7 in-lbs (0.8 N-m)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-02, CAT III, pollution degree 2, basic insulation

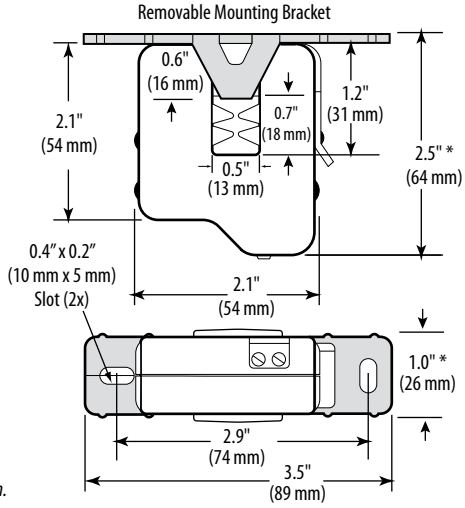
Do not use the LED status indicators as evidence of applied voltage.

DIMENSIONAL DRAWINGS

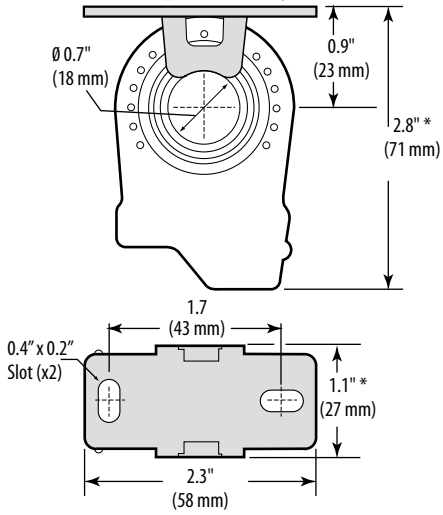
H308



H608

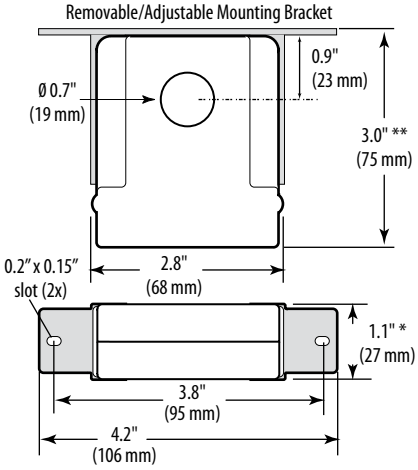


H808

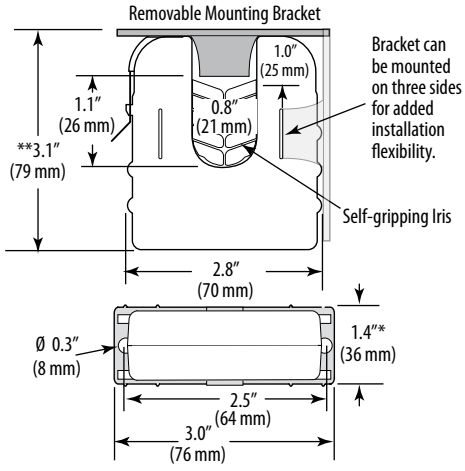


** Terminal block may extend up to 1/8" over the height dimensions shown.*

H708/701

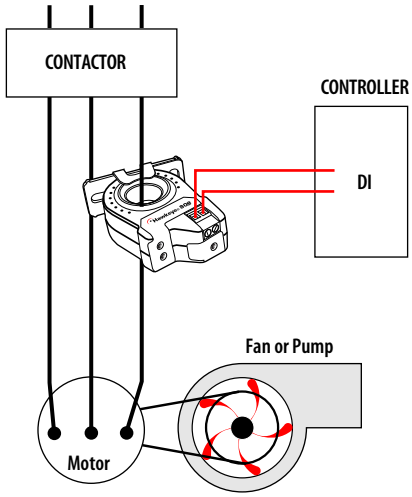


H908



APPLICATION/WIRING DIAGRAM

Monitoring Fan /Pump Motors for Positive Proof of Flow



CURRENT MONITORING

ORDERING INFORMATION

CE c UL us LISTED E150462 RoHS Compliant

MODEL	AMPERAGE RANGE	STATUS OUTPUT (max.)	MIN. TRIP POINT	HOUSING	STATUS LED	UL	CE	RoHS
H308	0.75 - 50A	N.O. 1.0A@30VAC/DC	0.75A or less	Split-Core	●	●	● [2]	●
H608	0.5 - 175A		0.5A or less	Split-Core	●	● [1]	●	●
H701	1 - 135A		1.0A or less	Solid-Core		●	●	
H708	1 - 135A		1.0A or less	Solid-Core	●	●	●	
H808	0.75 - 50A		0.75A or less	Solid-Core	●	●	●	●
H908	2.5 - 135A		2.5A or less	Split-Core	●	●	●	●

[1] Listed for use on 75°C insulated conductors.
[2] Product provides functional insulation only.

ACCESSORIES

DIN Rail Clip Set (AH01 for H6xx, H8xx, H9xx; AH27 for H3xx)
DIN Rail (AV01) and DIN Stop Clip (AV02)

Current Switches: Adjustable Trip Point, High Voltage Output

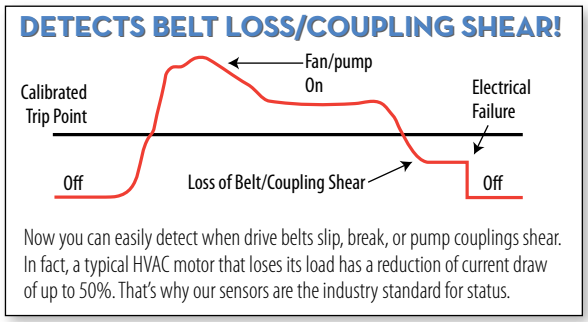
Detect Belt Loss, Coupling Shear, And Mechanical Failure

DESCRIPTION

Hawkeye x09 Series are high performance current switches, ideal for line voltage loads. The devices are powered by the current being monitored.

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.)



FEATURES

- The H809 has a low (0.75 A) minimum setpoint...eliminates the need for multiple wraps of the conductor through the sensor even on loads as small as 1/5 HP
- H609 and H809 are small in size to fit easily inside small starter enclosures
- Removable mounting bracket optimizes field versatility
- Bracket on H909 can be installed in three different configurations... added flexibility
- Status LEDs for easy setup and local indication
- Adjustable trip point...precise current trip point setting
- Detect belt loss and mechanical failure...ideal for fan/pump status monitoring
- Easier to install than differential pressure switches...eliminates long wiring runs
- 100% solid state...no moving parts to fail
- 5-year warranty

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

CURRENT MONITORING

SPECIFICATIONS

5 Year Warranty

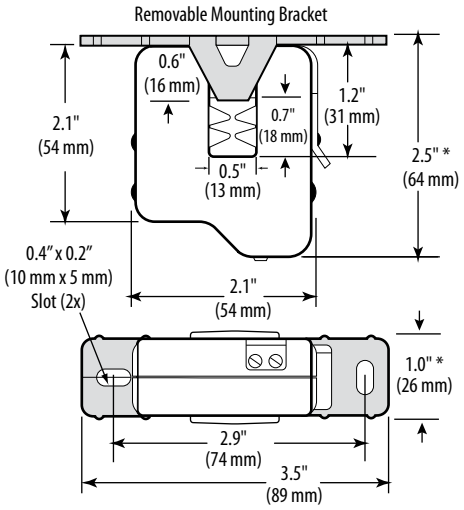
Sensor Power	Induced from monitored conductor
Insulation Class	600VAC RMS
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Hysteresis	10% (typical)
Terminal Block Wire Size	24-14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-02, CAT III, pollution degree 2, basic insulation

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

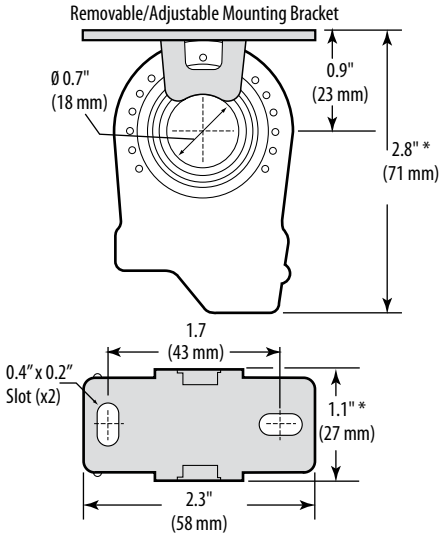
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

H609

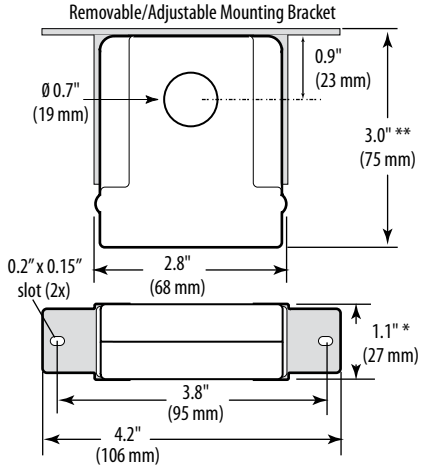


H809

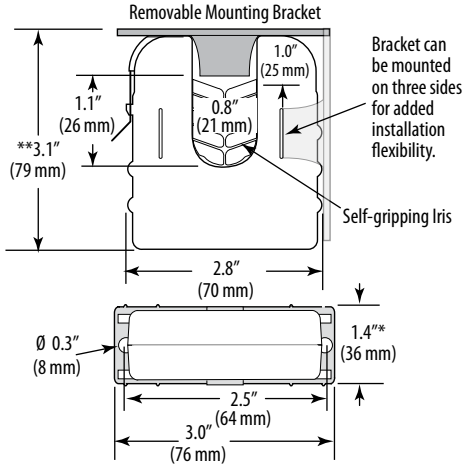


* *Terminal block may extend up to 1/8" over the height dimensions shown.*

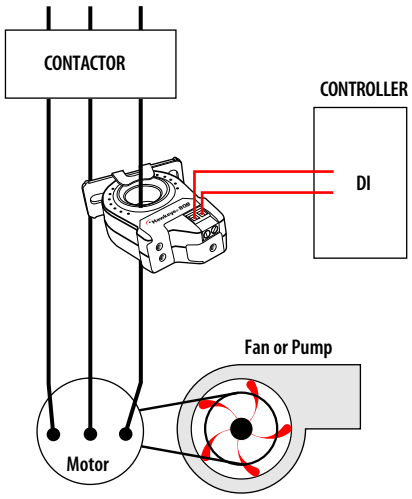
H709/H709HV



H909/H909HV



APPLICATION/ WIRING DIAGRAM



ORDERING INFORMATION

CE

c UL us LISTED E150462

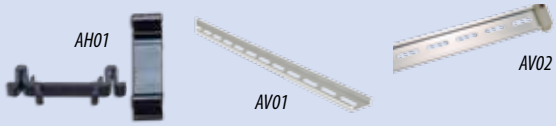
RoHS Compliant

MODEL	AMPERAGE RANGE	STATUS OUTPUT (max.)	MIN. TRIP POINT	STATUS LED	HOUSING	UL	CE	RoHS
H609	1.25 - 50A	N.O. 0.2A@120VAC/DC	1.25A or less	●	Split-core	●[1]		●
H709	1 - 135A	N.O. 0.2A@120VAC/DC	1.0A or less	●	Solid-core	●		
H709HV	1 - 135A	N.O. 1.0A@250VAC	1.0A or less		Solid-core		●	
H809	0.75 - 50A	N.O. 0.2A@120VAC/DC	0.75A or less	●	Solid-core	●[1]		●
H909	2.5 - 135A	N.O. 0.2A@120VAC/DC	2.5A or less	●	Split-core	●		
H909HV	2.5 - 135A	N.O. 1.0A@250VAC	2.5A or less		Split-core		●	

[1] *Listed for use on 75°C insulated conductors.*

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



CURRENT MONITORING

Current Switches: Adjustable Trip Point, N.C. Output

Detect Belt Loss, Coupling Shear, And Mechanical Failure

DESCRIPTION

Hawkeye x06 Series solid- and split-core current switches provide accurate, reliable, and maintenance-free fan and pump status indication.

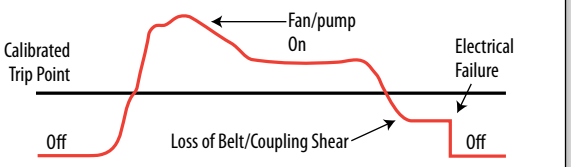
APPLICATIONS

- 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)

FEATURES

- Adjustable trip point...4 amperage range options for versatility
- Easier to install than differential pressure switches...no tubing needed
- 100% solid-state, no moving parts to fail
- Output status LEDs for fast setup
- Adjustable mounting bracket on the solid-core housing...easy placement
- Self-gripping iris on the split-core housing for easy installation
- Bracket on H906 can be installed in three different configurations...added flexibility
- 5-year warranty

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.

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

CURRENT MONITORING

SPECIFICATIONS

5 Year Warranty

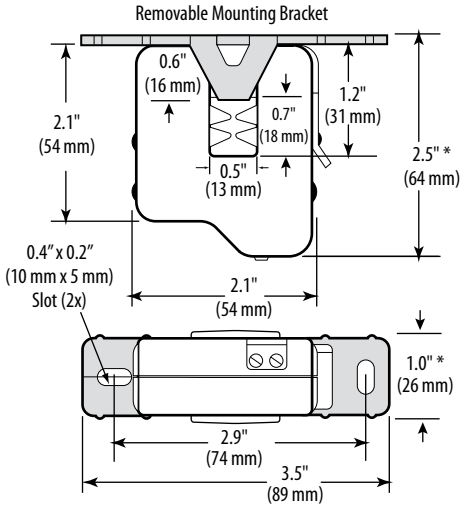
Sensor Power	5-30VDC
Insulation Class	600VAC RMS (UL), 300VAC RMS (CE)
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Hysteresis	10% Typical
Off State Leakage	34µA@5VDC, 200µA@30VDC
On State Voltage Drop	1.9VDC max@0.1A
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-02, CAT III, pollution degree 2, basic insulation

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

VERIS INDUSTRIES

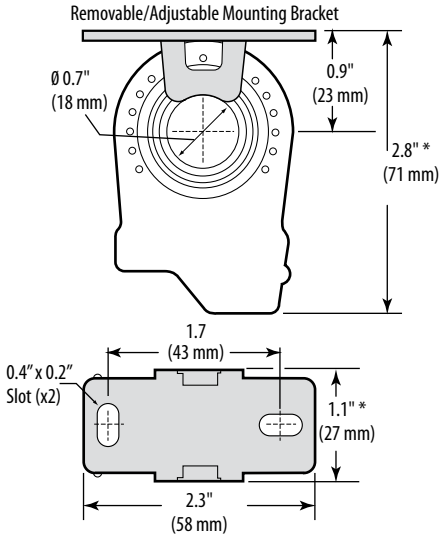
DIMENSIONAL DRAWINGS

H606

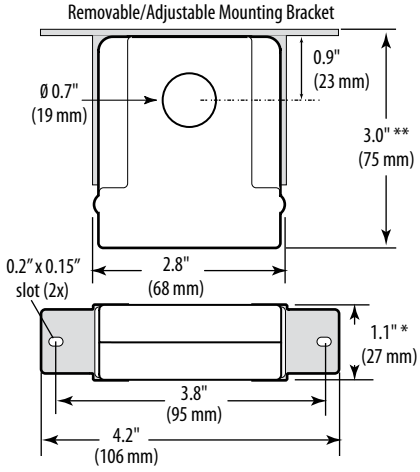


* *Terminal block may extend up to 1/8" over the height dimensions shown.*

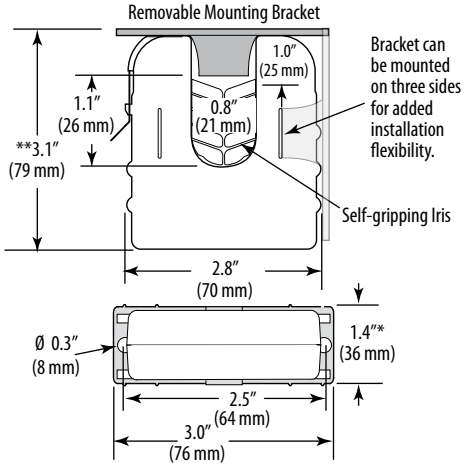
H806



H706

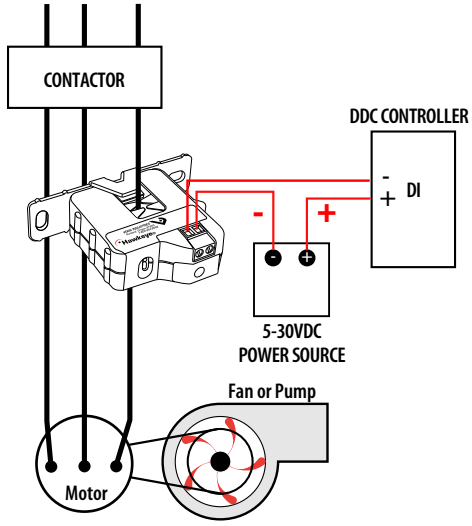


H906



APPLICATION/ WIRING DIAGRAM

Monitoring Fan /Pump Motors for Positive Proof of Flow



CURRENT MONITORING

ORDERING INFORMATION

CE cULus LISTED E150462 RoHS Compliant

MODEL	AMPERAGE RANGE	STATUS OUTPUT (max.)	MIN. TRIP POINT	HOUSING	STATUS LED	UL	CE	RoHS
H606	1.25 - 50A	N.C. 0.1A@30VDC	1.25A or less	Split-Core	●	●[1]	●	●
H706	1-135A		1.0A or less	Solid-Core	●	●	●	
H806	0.75 - 50A		0.75A or less	Solid-Core	●	●	●	●
H906	2.5-135A		2.5A or less	Split-Core	●	●	●	

[1] *Listed for use on 75°C insulated conductors.*

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)

Current Switch: Auto Calibration, Automation Systems

LCD Display

DESCRIPTION

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.

APPLICATIONS

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

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

FEATURES

- Backlit LCD display...view the monitored current (up to 200A)...eliminates the need for expensive handheld meters and offers easy visibility in dark enclosures
- Automatic calibration...reduced errors and installation costs
- Slide-switch selectable trip point limits...application versatility
- Microcontroller based learning technology...automatically learns load upon initial power-up...eliminates labor associated with calibration
- Records and displays the amperage level that trips the alarm...simplifies troubleshooting
- Reset function can be used when unpowered...reduces the possibility of an undesirable arc flash incident
- Monitors current for both under- and over-load in one package
- 100% solid state...no moving parts to fail
- Small size fits easily inside small starter enclosures...saves space
- Self-gripping iris for easy installation
- Bracket can be installed in three different configurations...added flexibility
- 5-year warranty

SPECIFICATIONS

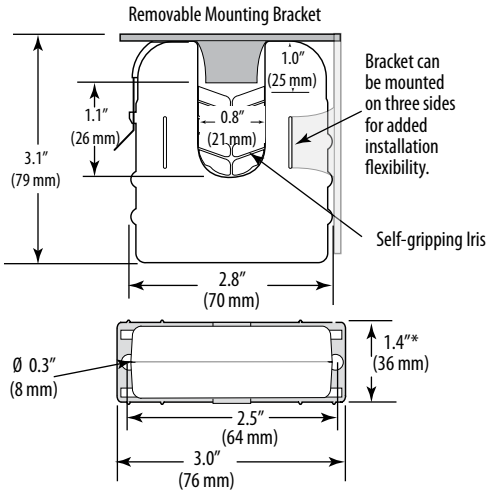
5 Year Warranty

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	10-90% RH non-condensing
LCD Backlight	Off at low currents; illuminates when monitored current exceeds 4.5A; flashes during an alarm state while current remains above 4.5A
On-State Resistance	≤1.0 Ω
Off-State Resistance	≥1.0 MΩ
Setpoint Target Range, Switch Setting A*	±40% of learned nominal current; max. learned current of 142A to enable an upper trip limit at or below 200A
Setpoint Target Range, Switch Setting B*	±60% of learned nominal current;max. learned current of 125A to enable an upper trip limit at or below 200A
Switch Setting C*	On/Off Status; contacts are closed while amperage is above 2.5A
Alarm Reset Range	±5% of learned nominal current **
Setpoint Calibration Learn Period	30 sec.; self-learning, pushbutton reset
Normal-to-Alarm Output Delay	1 sec. maximum
Alarm-to-Normal Output Delay	30 sec. nominal
Insulation Class	600VAC RMS (UL); 300VAC RMS (CE)
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL508 open device, CE: EN61010-1:2001-02, CAT III, pollution degree 2

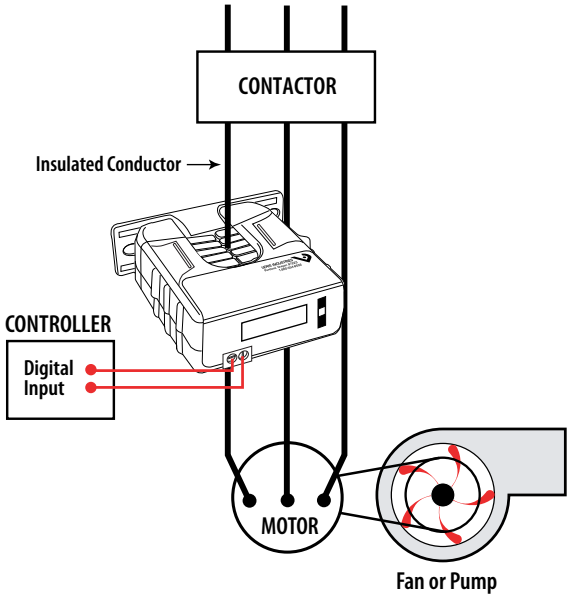
** Trip point switch positions A and B are not for use in applications where the current will fluctuate by more than 40% (A) or 60% (B) of the nominal current. If the current will fluctuate by more than 60%, use the H11D for on/off status (position C) only.*
*** The upper trip limit alarm resets when the current drops by 5% of the learned nominal current limit. The lower trip limit alarm resets when the current rises by 5% of learned nominal current limit.*
Specification Note: For CE compliance, conductor shall be insulated according to IEC 61010-1:2001.
The product design provides for basic insulation only.
Do not use the LCD as evidence of applied voltage.

CURRENT MONITORING

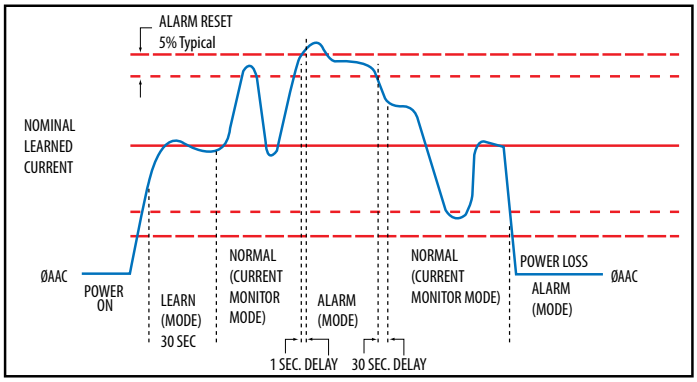
DIMENSIONAL DRAWING



APPLICATION/WIRING DIAGRAM



FUNCTIONAL ILLUSTRATION



ORDERING INFORMATION

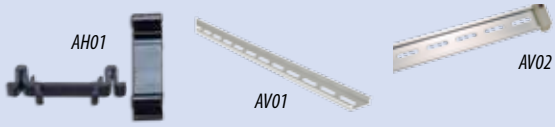
MODEL	AMPERAGE RANGE [1]	STATUS OUTPUT	NOMINAL TRIP POINT TARGET RANGE	HOUSING	STATUS LED	UL	CE
H11D	2.5 - 200A @ 60 Hz 3.0 - 200A @ 50 Hz	N.O. 1.0A@30VAC/DC	±40%, ±60%, or on/off (user selectable)	Split-core	●	● [2]	●

[1] *To enable the upper trip limit alarm, the max. learned current for switch setting "A" is 142A, and the max. learned current for switch setting "B" is 125A. 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.*

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



Current Switch: Auto Calibration, Process Control

Automatically Learns At Initial Power-Up

Hawkeye® TruStat™

DESCRIPTION

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 ±20% of the learned load.

APPLICATIONS

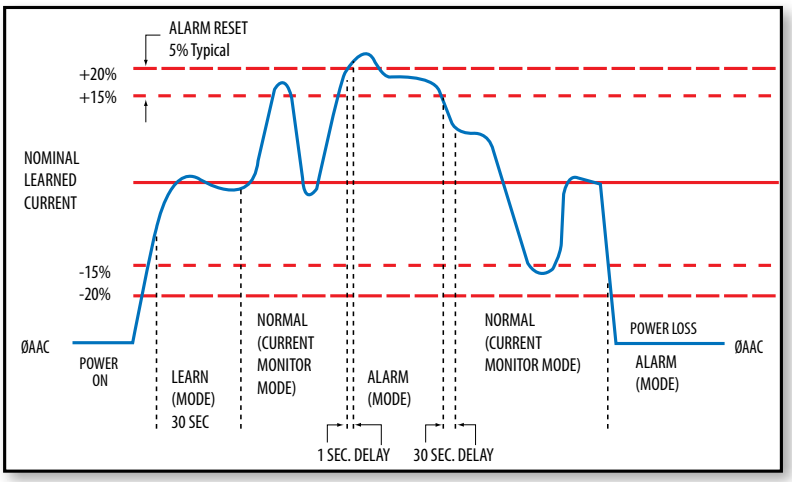
- Verifying lighting circuit and other electrical service run times
- Monitoring status of industrial process equipment
- Monitoring status of critical motors (compressor, fuel, etc.)

FEATURES

- Automatic adjustable trip point (3.5-100A)...precise control of current trip point
- 100% solid state...no moving parts to fail
- Removable mounting bracket for installation flexibility
- 5-year warranty
- Automatic calibration...reduced errors and installation costs
- Microcontroller based learning technology...automatically learns load upon initial power-up...eliminates labor associated with calibration
- Monitors current for both under- and over-load in one package
- Small size fits easily inside small starter enclosures...saves space

CURRENT MONITORING

PRODUCT FUNCTIONS



CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

SPECIFICATIONS

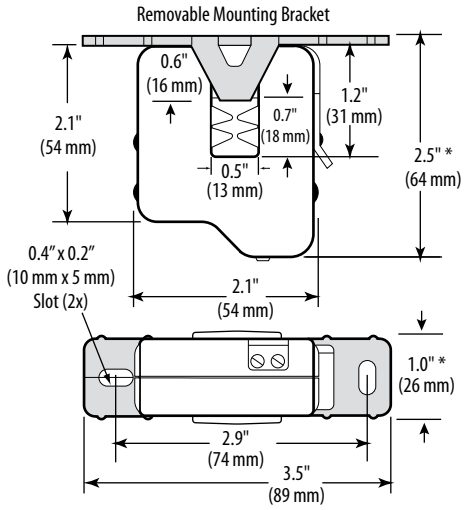
5 Year Warranty

Sensor Power	Induced from monitored conductor
Isolation	600VAC RMS (UL); 300VAC RMS (CE)
Temperature Range	-15° to 60° C (5° to 140°F)
Humidity Range	10-90% 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 seconds nominal*
Status Output	±20% of learned current to trigger alarm; ±15% of learned current to release alarm (see graph)
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-02, CAT III, pollution degree 2, basic insulation

**If current switch experiences a momentary loss of power, 30 second delay may or may not apply.*
Do not use the LED status indicators as evidence of applied voltage.

DIMENSIONAL DRAWING

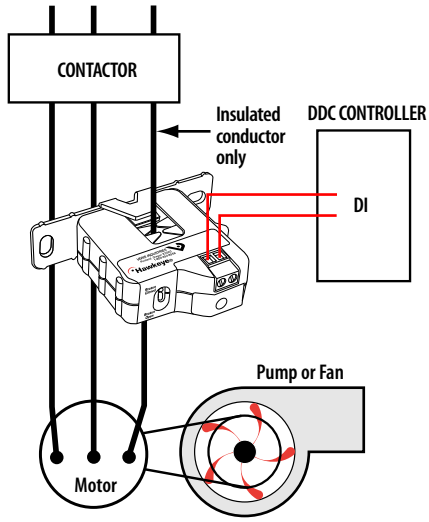
H10F



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

APPLICATION/WIRING DIAGRAM

Monitoring Fan /Pump Motors for Positive Proof of Flow



HOW IT WORKS

The compact split-core H10F current switch monitors a learned load current to detect power loss and electrical overload of fans, blowers, pumps, chillers, or any other critical motor functions. 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 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

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 ±20%
- ALARM will persist until the load current returns to within a nominal ±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 shuts 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.*

CURRENT MONITORING

ORDERING INFORMATION

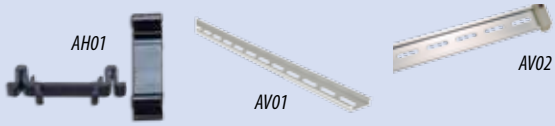
MODEL	AMPERAGE RANGE	STATUS OUTPUT	NOMINAL TRIP POINT TARGET RANGE*	NOMINAL ALARM RESET RANGE*	HOUSING	STATUS LED	UL	CE	RoHS
H10F	3.5 - 100A	N.O. 1.0A@30VAC/DC	±20%	±15%	Split-core	●	●[1]	●	●

**For best performance, monitor 5A or more current. At currents less than 5A, these ranges are approximate.*

[1] *Listed for use on 75°C insulated conductors.*

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



VFD Current Switch: Auto Calibration

Automatically Learns Load At Initial Power-Up

Hawkeye™

NEW!

DESCRIPTION

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 ±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).

FEATURES

- Microcontroller based learning technology...automatically learns load upon initial power-up...eliminates labor associated with calibration
- Automatic trip point (1.5 to 150 Amps, 12 to 115 Hz)...detect abnormal events
- Monitors current for both under- and over-load in one package
- Small size fits easily inside small starter enclosures...saves space
- 100% solid state...no moving parts to fail
- Removable mounting bracket for installation flexibility
- 5-year warranty

APPLICATIONS

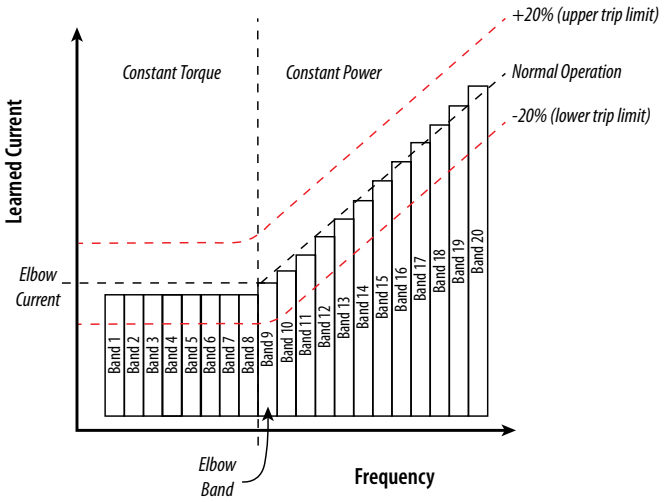
VFD Systems:

- Detecting belt loss, coupling shear, and mechanical failure
- HVAC fan/blower motor failure
- Detecting unauthorized duct access

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

PRODUCT FUNCTIONS



SPECIFICATIONS

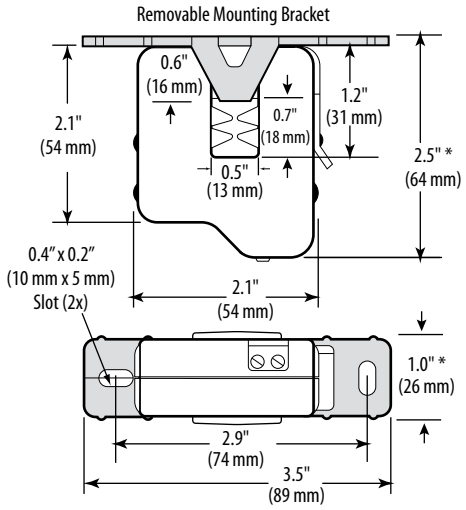
5 Year Warranty

Sensor Power	Induced from monitored conductor
Response Time	1 sec.
Learn Time	15 sec. learn period after frequency stabilizes
Frequency Range	12 to 115 Hz
Temperature Range	-15° to 60° C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Alarm Limits	±20% of learned current in every 5 Hz freq. band*
Normal-to-Alarm Status Output Delay	~7 second max.
Alarm-to-Normal Status Output Delay	1 sec. nominal**
Off Delay	<30 sec. nominal
Contact Ratings	30VAC/DC, 1A
Insulation Class	600VAC (UL); 300VAC RMS (CE)
Terminal Block Maximum Wire Size	24-14 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)
Agency Approvals	UL508 open device, CE: EN61010-1:2001-02, CAT III, pollution degree 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.*
*** If the H614 experiences a momentary loss of power, the Alarm-to-Normal output delay may exceed 1 sec.*
Specification Note: For CE compliance, conductor shall be insulated according to IEC 61010-1:2001.
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.

CURRENT MONITORING

DIMENSIONAL DRAWING

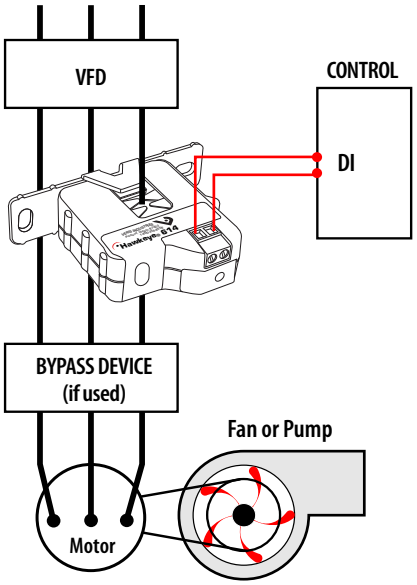


** Terminal block may extend up to 1/8" over the height dimensions shown.*

APPLICATION/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 (see "How It Works" for details).



HOW IT WORKS

During setup, the H614 automatically determines the normal amperage and frequency profile and stores it in nonvolatile memory. Then the microprocessor monitors for amperage changes greater than ±20% of this learned curve, indicating a potential system failure.

USAGE EXAMPLE

The H614 is designed for HVAC fan and blower systems, as well as some single stage pumping systems involving consistent viscosity liquids. If an H614 is installed on one phase of the VFD, it detects changes in that phase that result from the VFD compensating for changes elsewhere in the system. Alternatively, for increased sensitivity, H614s can be used on all three phases for immediate detection of phase balance changes anywhere in the system.

Sensor Mode	Status LED Blink Pattern
Learning Mode (first 15 sec of operation after frequency stabilizes)	Alternating Red/Green (1 per sec.)
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)
Status OK	Green blink (1 per sec.)
Alarm	Red blink (1 per sec.)

ORDERING INFORMATION

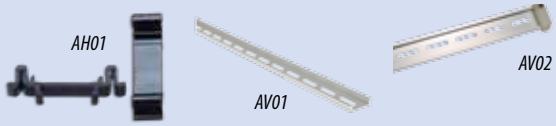
E150462

MODEL	AMPERAGE RANGE	FREQUENCY RANGE	STATUS OUTPUT	NOMINAL TRIP POINT TARGET RANGE	HOUSING	STATUS LED	UL	CE	RoHS
H614	1.5 - 150A	12 - 115 Hz	N.O. 1.0A@30VAC/DC	±20% in each of 20 bands	Split-core	●	●[1]	●	●

[1] *Listed for use on 75°C insulated conductors.*

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



CURRENT MONITORING

VFD Switches and Current Sensors

Variable Frequency Drive Monitoring and Control

DESCRIPTION

Hawkeye 904, 934, and 720 current monitoring devices provide unique solutions for accurately monitoring status of motors controlled by variable frequency drives.

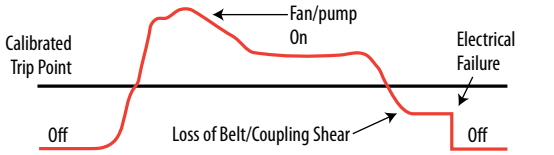
The microprocessor-based H904 and H934 store the sensed amperage values for normal operation at various frequency ranges in non-volatile memory. This information allows the device to distinguish between a reduced amp draw due to normal changes in the frequency and an abnormal amp drop due to belt loss 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.

APPLICATIONS

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

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.

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

FEATURES (H720)

- Analog output
- Superior to Hall effect and metal core sensors...frequency tolerant 10-80 Hz
- Accurate to 0.5% of full scale
- Suitable for load side monitoring of VFDs
- Adjustable zero and span for precise scaling
- Adjustable mounting bracket for easy placement

FEATURES (H904 and H934)

- Microprocessor-based...real labor saver...No need to calibrate to detect belt loss on VFDs
- Self-adjusting trip point...factory programmed to detect belt loss undercurrent conditions
- Provides accurate status for VFD loads...prevents costly long-term failures
- Automatically compensates for the effects of frequency and amperage changes associated with VFDs
- Nuisance Reduction feature...provides a secondary setpoint option of 50% of the originally measured current
- LED indicates normal and alarm conditions...rapid troubleshooting
- Huge labor savings...no need to calibrate in live starter enclosures... install and go
- Available with a relay (H934)...status and control in one package, saving time and space
- Bracket can be installed in three different configurations...added flexibility
- Monitors both frequency and amperage...distinguishes normal drops in amperage due to frequency changes from abnormal drops due to mechanical failure
- Split-core design is ideal for retrofits...no need to remove conductor
- 5-year warranty

SPECIFICATIONS

5 Year Warranty

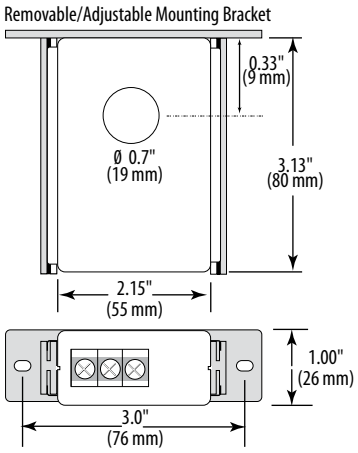
Sensor Power	H904/H934: Induced from monitored conductor; H720: 12-30VDC
Insulation Class	600VAC RMS
Frequency Range	H720: 10 to 80 Hz; H904/H934: 20 to 34 Hz for on/off status, 34 to 75 Hz for belt loss indication
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Off Delay (H904/H934)	0 sec to 2 min.
Accuracy (H720)	0.5% (combined linearity, hysteresis, and repeatability)
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing

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

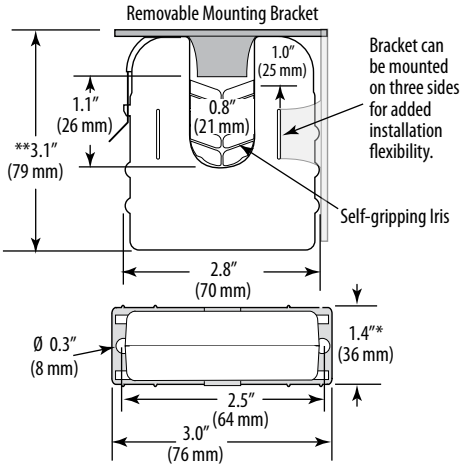
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

H720



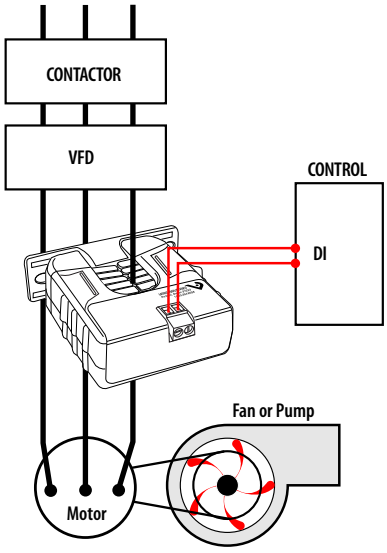
H904/934



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

APPLICATION/WIRING DIAGRAM (H904)

Monitoring Fan /Pump Motors for Positive Proof of Flow

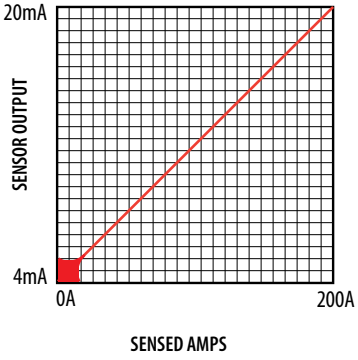


NOTE: The H904 is not intended for use in staged pump or variable inlet vane applications.

EXAMPLE LINEAR OUTPUT (H720)

Scale software as shown

Requires 12-30VDC for sensor power



H934 RELAY CONTACT RATINGS

Resistive.....5A@250VAC, 30VDC

TYPICAL COIL PERFORMANCE

Voltage	AC	DC
24V.....	10mA	10mA

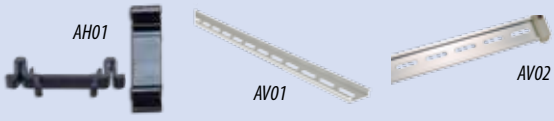
ORDERING INFORMATION

c UL us LISTED E150462

MODEL	AMPERAGE RANGE	STATUS OUTPUT	MIN. TRIP POINT	RELAY TYPE	HOUSING	STATUS LED	RELAY POWER LED	UL
H720	lower limit: 0A Upper limit: 20 to 200A	4-20mA	n/a	none	Solid-core			●
H904	3.5 - 135A, 20 - 75 Hz	Max. N.O. 0.1A@30VAC/DC	3.5A or less	none	Split-core	●		●
H934				SPST, N.O.		●	●	●

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



Current Switches with Relay: Fixed Trip Point

On/Off Status & Control In One Package

Hawkeye™

DESCRIPTION

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.

APPLICATIONS

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

FEATURES

- Reduce the number of installed components...saves time and space
- On/off status and command relay in a single labor and space saving device
- Cost-effectively monitor start/stop, unit vents, fan coils, exhaust fans, and other loads where belt loss is not a concern
- H740 and H940 feature a SPDT command relay
- No calibration required...easy setup and operation
- One device to install...reduces installation charges
- Easier to install than differential pressure switches...eliminates long wiring runs
- 100% solid state...no moving parts to fail
- Removable mounting bracket for installation flexibility
- Bracket on H930, H940, and H950 can be installed in three different configurations...added flexibility
- 5-year warranty

RELAY CONTACT RATINGS

Hx30, Hx50 (SPST, N.O.)

Resistive	10A@250VAC, 30VDC
Inductive	5A@250VAC, 30VDC

Hx40 (SPDT)

Resistive	8A@250VAC, 30VDC
Inductive	3.5A@250VAC, 30VDC

TYPICAL COIL PERFORMANCE

Voltage	**AC**	**DC**
24V	10mA	10mA
12V		20mA
Pull In Voltage		
Hx30		20.1VDC
Hx40		20.1VDC
Hx50		8.4VDC
Drop Out Voltage		
Hx30		5.2VDC
Hx40		5.2VDC
Hx50		3.0VDC

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

SPECIFICATIONS

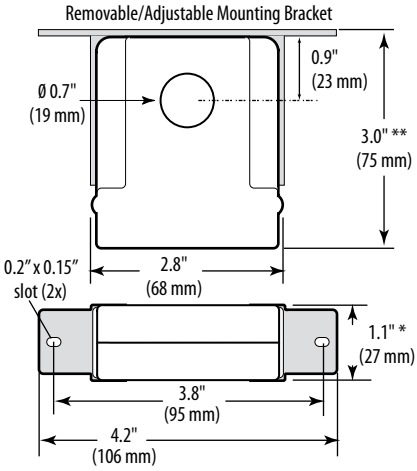
5 Year Warranty

Sensor Power	Induced from monitored conductor
Insulation Class	600VAC RMS
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Frequency	50/60 Hz
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing

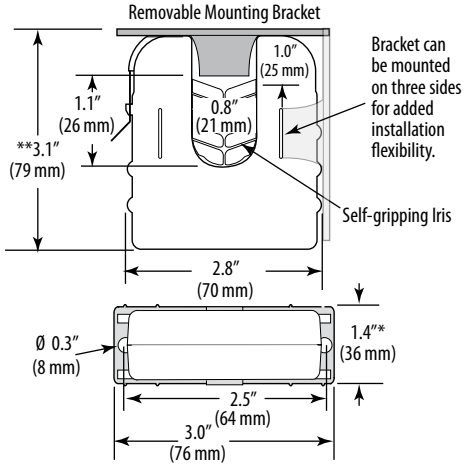
Do not use the LED status indicators as evidence of applied voltage.

DIMENSIONAL DRAWINGS

H730/740/750



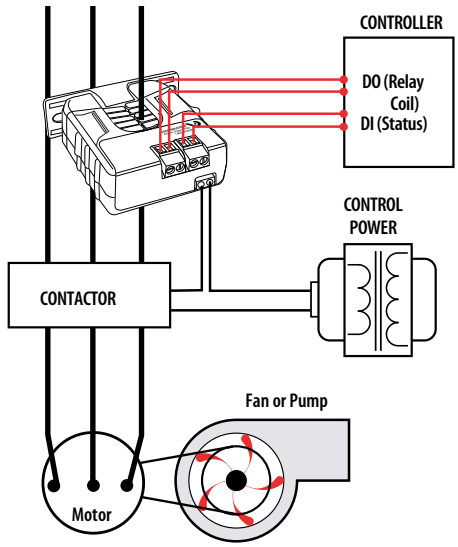
H930/940/950



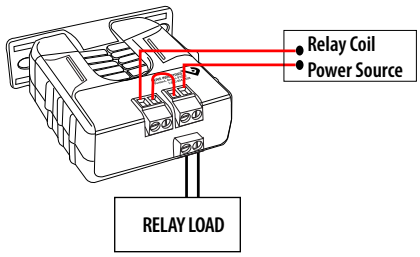
** Terminal block may extend up to 1/8" over the height dimensions shown.*

APPLICATION/WIRING DIAGRAM

Start/Stop Monitoring of Fan /Pump Motors



Relay Controlled Directly by Status Contacts



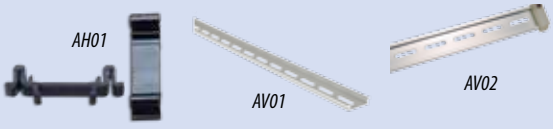
ORDERING INFORMATION

c UL us LISTED
E150462

MODEL	AMPERAGE RANGE	STATUS OUTPUT (max.)	TRIP POINT	RELAY	RELAY COIL	HOUSING	RELAY POWER LED	UL
H730	0.5 - 200A	N.O. 1.0A@30VAC/DC	0.5A or less	SPST, N.O.	24VAC/DC	Solid-core	●	●
H740	0.5 - 200A		0.5A or less	SPDT	24VAC/DC	Solid-core	●	●
H750	0.5 - 200A		0.5A or less	SPST, N.O.	12VDC nom.	Solid-core	●	●
H930	1.5 - 200A		1.5A or less	SPST, N.O.	24VAC/DC	Split-core	●	●
H940	1.5 - 200A		1.5A or less	SPDT	24VAC/DC	Split-core	●	●
H950	1.5 - 200A		1.5A or less	SPST, N.O.	12VDC nom.	Split-core	●	●

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



Current Switches with Relay: Adjustable Trip Point

Status And Control In One Package

Hawkeye™

DESCRIPTION

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.

APPLICATIONS

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

FEATURES

- Combines command relay and fan/pump status sensor in a single, easy to install unit
- Reduces number of components installed...fits better in small starter enclosures
- Detect belt loss and motor failure...ideal for fan and pump status
- H748 and H948 feature a SPDT command relay...control two outputs with a single relay
- Bracket on H938, H948, and H958 can be installed in three different configurations...added flexibility
- Reduced charges from electrician
- Relay and status LEDs for easy setup
- Polarity insensitive status output...fast and easy installation
- Adjustable setpoint for current sensor status...fits many applications
- 5-year warranty

CURRENT MONITORING

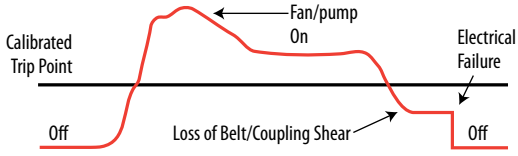
RELAY CONTACT RATINGS

H735 (SPST, N.O.)
Resistive.....5A@250VAC, 30VDC
Inductive.....3A@250VAC, 30VDC
Hx38, Hx58 (SPST, N.O.)
Resistive.....10A@250VAC, 30VDC
Inductive.....5A@250VAC, 30VDC
Hx48 (SPDT)
Resistive..... 8A@250VAC, 30VDC
Inductive..... 3.5A@250VAC, 30VDC

TYPICAL COIL PERFORMANCE

Voltage	AC	DC
24V	10mA	10mA
12V		20mA
Pull In Voltage		
Hx3x		20.1VDC
Hx48		20.1VDC
Hx58		8.4VDC
Drop Out Voltage		
Hx3x		5.2VDC
Hx48		5.2VDC
Hx58		3.0VDC

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.

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

SPECIFICATIONS

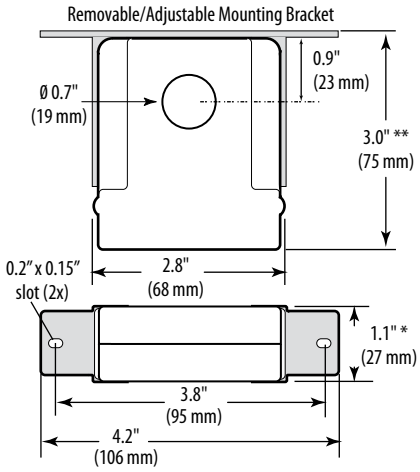
5 Year Warranty

Sensor Power	Induced from monitored conductor
Insulation Class	600VAC RMS
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Hysteresis	10% Typical
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing

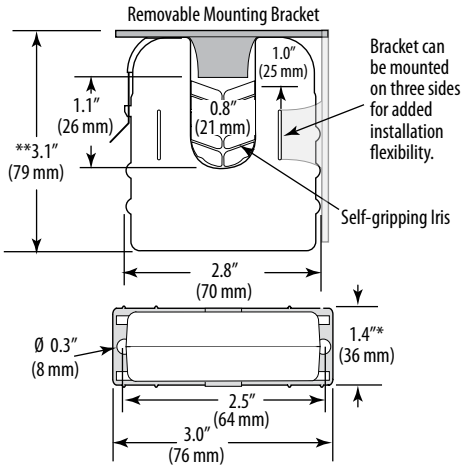
Do not use the LED status indicators as evidence of applied voltage.

DIMENSIONAL DRAWINGS

H735/738/748/758



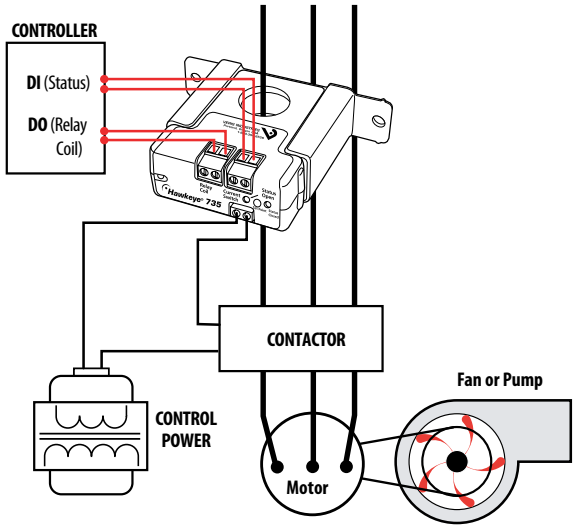
H938/948/958



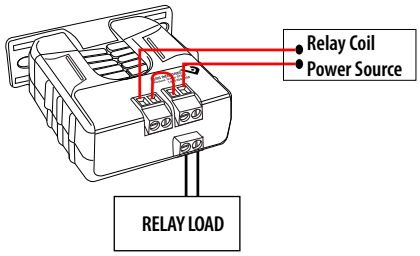
** Terminal block may extend up to 1/8" over the height dimensions shown.*

APPLICATION/WIRING DIAGRAMS

Start/Stop Monitoring of Fan /Pump Motors



Relay Controlled Directly by Status Contacts



ORDERING INFORMATION

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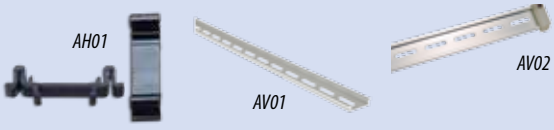
E150462

MODEL	AMPERAGE RANGE	STATUS OUTPUT(max.)	MIN. TRIP POINT	RELAY	COIL VOLTAGE	HOUSING	STATUS LED	RELAY POWER LED	UL
H735	1 - 135A	0.1A@30VAC/DC	1A or less	SPST, N.O.	24VAC/DC	Solid-core	●	●	●
H738	1 - 135A	1.0A@30VAC/DC	1A or less	SPST, N.O.	24VAC/DC	Solid-core	●	●	●
H748	1 - 135A		1A or less	SPDT	24VAC/DC	Solid-core	●	●	●
H758	1 - 135A		1A or less	SPST, N.O.	12VDC nom.	Solid-core	●	●	●
H938	2.5 - 135A		2.5A or less	SPST, N.O.	24VAC/DC	Split-core	●	●	●
H948	2.5 - 135A		2.5A or less	SPDT	24VAC/DC	Split-core	●	●	●
H958	2.5 - 135A		2.5A or less	SPST, N.O.	12VDC nom.	Split-core	●	●	●

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



Current Switches with Relay: Adjustable Trip Point, High Voltage Output

Status And Control In One Package

DESCRIPTION

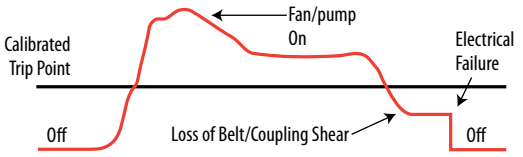
Hawkeye Relay Combination Series high voltage output current switches are the ideal solution for the automation installer. These units combine a current switch and relay into a single package, reducing the space required for total control of fans and pumps. The integrated current switch and relay operate 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.

APPLICATIONS

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

DETECTS BELT LOSS/COUPLING SHEAR!



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

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

FEATURES

- Combines command relay & fan/pump status sensor in a single, easy to install unit
- Reduces number of components installed...fits better in small starter enclosures
- Command relay and status in a single unit
- Easier to install than differential pressure switches...no additional wiring needed
- Detect belt loss and motor failure...ideal for fan and pump status
- Bracket on H939, H949, and H959 can be installed in three different configurations...added flexibility
- H749 and H949 feature SPDT command relay...saves installation time
- Reduced charges from electrician
- Relay and status LEDs for easy setup
- Polarity insensitive status output...fast trouble-free installation
- Adjustable trip point for current sensor status...fits many applications
- 5-year warranty

RELAY CONTACT RATINGS

Hx39, Hx59 (SPST, N.O.)

Resistive	10A@250VAC, 30VDC
Inductive	5A@250VAC, 30VDC

Hx49 (SPDT)

Resistive	8A@250VAC, 30VDC
Inductive	3.5A@250VAC, 30VDC

TYPICAL COIL PERFORMANCE

Voltage	**AC**	**DC**
24V	10mA	10mA
12V		20mA
Pull In Voltage		
Hx39		20.1VDC
Hx49		20.1VDC
Hx59		8.4VDC
Drop Out Voltage		
Hx39		5.2VDC
Hx49		5.2VDC
Hx59		3.0VDC

SPECIFICATIONS

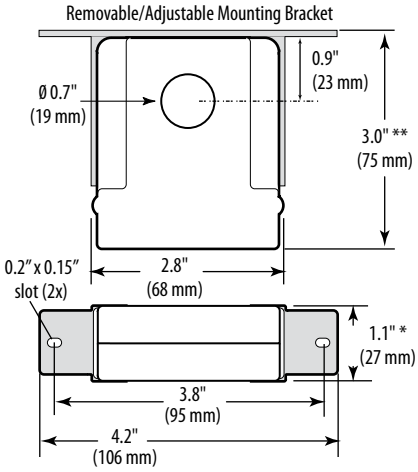
5 Year Warranty

Sensor Power	Induced from monitored conductor
Insulation Class	600VAC RMS
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Hysteresis	10% Typical
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing

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

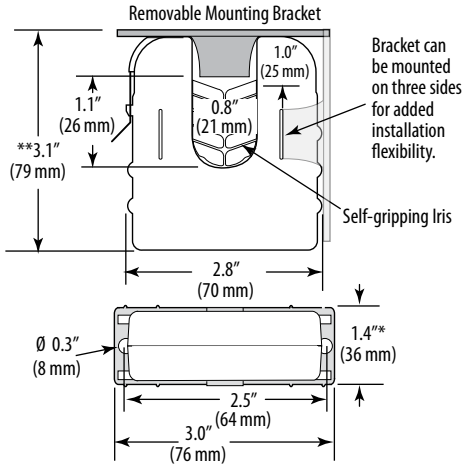
DIMENSIONAL DRAWINGS

H739/H749



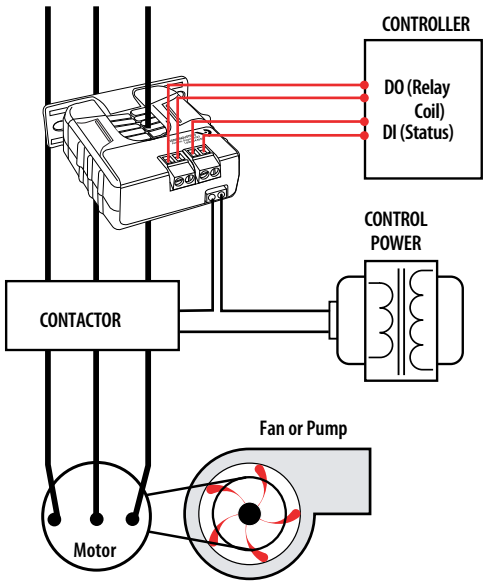
** Terminal block may extend up to 1/8" over the height dimensions shown.*

H939/H949/H959

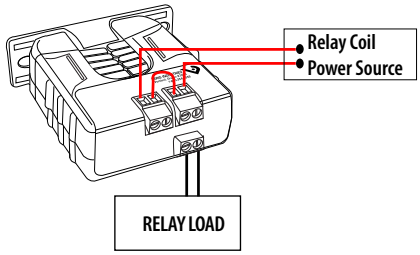


APPLICATION/WIRING DIAGRAMS

Start/Stop Monitoring of Fan /Pump Motors



Relay Controlled Directly by Status Contacts



ORDERING INFORMATION

c UL us LISTED

MODEL	AMPERAGE RANGE	STATUS OUTPUT (max.)	MIN. TRIP POINT	RELAY TYPE	RELAY COIL	HOUSING	STATUS LED	RELAY POWER LED	UL
H739	1 - 135A	N.O. 0.2A@120VAC/DC	1A or less	SPST, N.O.	24VAC/DC	Solid-core	●	●	●
H749	1 - 135A		1A or less	SPDT	24VAC/DC	Solid-core	●	●	●
H939	2.5 - 135A		2.5A or less	SPST, N.O.	24VAC/DC	Split-core	●	●	●
H949	2.5 - 135A		2.5A or less	SPDT	24VAC/DC	Split-core	●	●	●
H959	2.5 - 135A		2.5A or less	SPST, N.O.	12VDC nom.	Split-core	●	●	●

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)

CURRENT MONITORING

Current Sensors: 4-20mA Analog Output

Load Trending With 4-20mA Output

DESCRIPTION

The **Hawkeye 721LC, 721HC, and 921** provide accurate load trending information with a proportional 4-20mA output signal. Preset slide-switches provide easy field setup of sensed amperage range with no need for jumpers.

APPLICATIONS

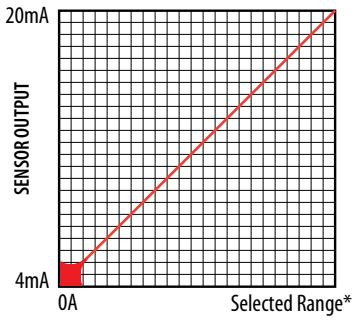
- Load trending
- Motor control
- Fan/Pump Status

FEATURES

- Power the sensor, and receive the signal with only two wires...lower cabling and commissioning costs than with traditional 3-wire sensors
- Self-gripping split-core for fast retrofit installation...no need to remove conductor (H921)
- Economical solid-core features adjustable bracket for easy alignment (H721)
- Factory calibrated switch-selectable ranges for high resolution and installation ease
- Three field-selectable ranges per unit...fewer versions to choose from, stock, and install
- Removable mounting bracket for installation flexibility
- Bracket on H921 can be installed in three different configurations... added flexibility
- 100% solid state, no moving parts to fail
- 5-year warranty

EXAMPLE LINEAR OUTPUT

Scale software as shown



SENSED AMPS

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

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

CURRENT MONITORING

SPECIFICATIONS

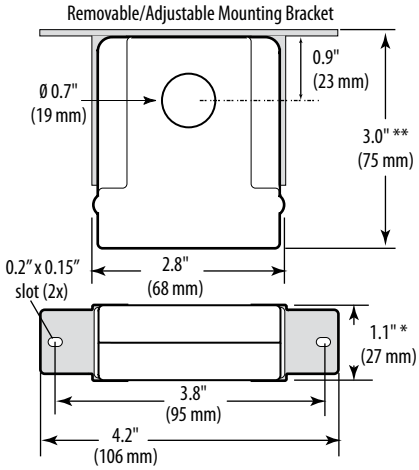
5 Year Warranty

Sensor Power	30mA (max)@12-30VDC
Insulation Class	600VAC RMS (UL), 300VAC RMS (CE)
Frequency	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% of selected range, but not less than ±0.4A
Response Time	2 sec.
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-2, CAT III, pollution degree 2, basic insulation

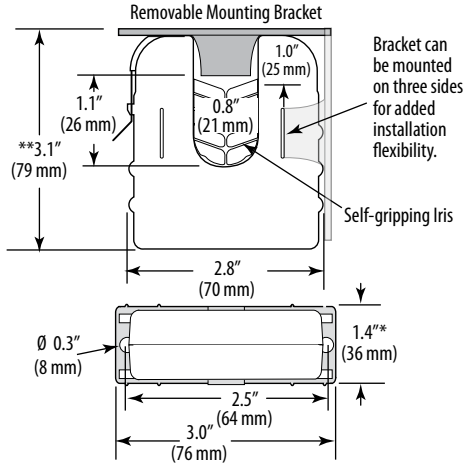
For applications requiring double or reinforced insulation, please contact the factory.

DIMENSIONAL DRAWINGS

H721LC/H721HC



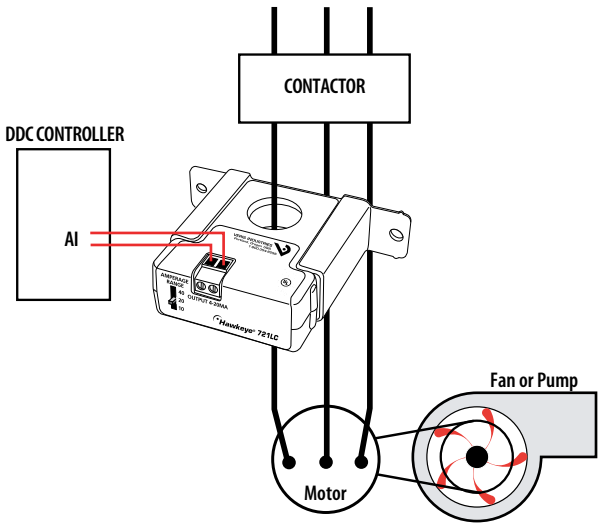
H921



** 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.*

APPLICATION/WIRING DIAGRAM

Monitoring Fan /Pump Motors for Positive Proof of Flow



ORDERING INFORMATION

MODEL	AMPERAGE RANGE	SENSOR OUTPUT	HOUSING	UL	CE
H721LC	0 - 10/20/40A	4-20mA DC	Solid-Core	●	●
H721HC	0 - 50/100/200A		Solid-Core	●	●
H921	0 - 30/60/120A		Split-Core	● [1]	●

[1] Listed for use on 75°C insulated conductors.
Note: For 10-80 Hz applications, see the H720 VFD sensor.

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)

Current Sensors: 4-20mA Analog Output, High Current Monitoring

Large Load Trending With 4-20mA Output

DESCRIPTION

Hawkeye x21/x21SP analog current sensors provide reliable load trending information for large motor loads (up to 2400A), with a proportional 4-20mA 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.

APPLICATIONS

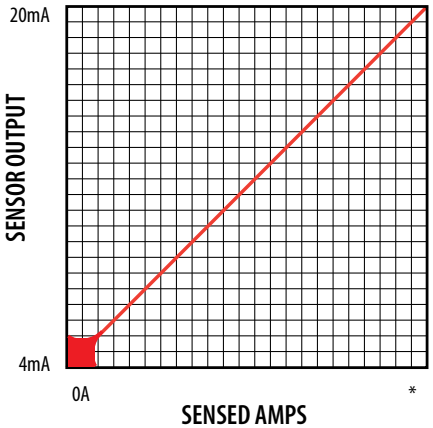
- Load trending of large motors and other loads up to 2400 Amps
- Monitor critical motors (compressor, fuel, etc.)

FEATURES

- Split-core design for easy installation and fast retrofits
- Eliminates need for external CTs on large conductors
- Large openings for heavy conductors
- Loop powered 4-20mA output
- Two-wire design reduces wiring cost
- Hx21 models offer zero and span adjustments for field flexibility
- Hx21SP models are factory-set at a range specified by the customer for easy setup and high confidence
- 100% solid state...no moving parts to fail
- 5-year warranty

CURRENT MONITORING

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)

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

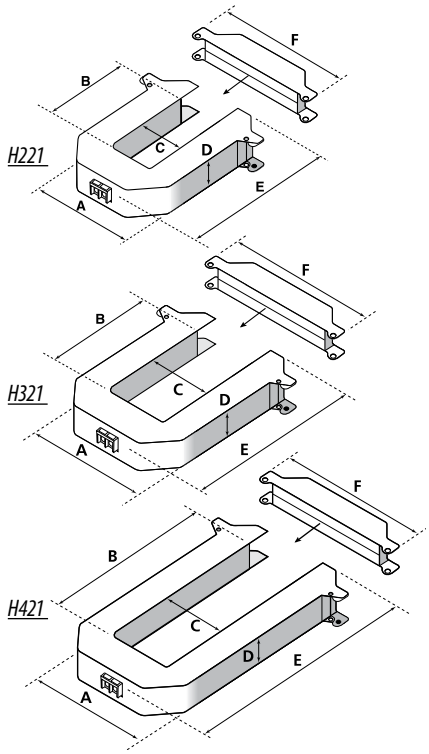
Maximize Reliability
Minimize Installed Cost

SPECIFICATIONS

5 Year Warranty

Sensor Power	30mA (max)@12-30VDC
Insulation Class	600VAC RMS
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH, non-condensing
Accuracy	±2% from 10 to 100% of full scale
Response Time	2 sec.
Zero Adjustment	nominal output@0A: 4mA ± 0.5
Terminal Block Maximum Wire Size	12 AWG (3.3 mm^2)
Terminal Block Torque	7 to 8 in-lbs (0.8 to 0.9 N-m)
Agency Approvals	UL 508 open device listing

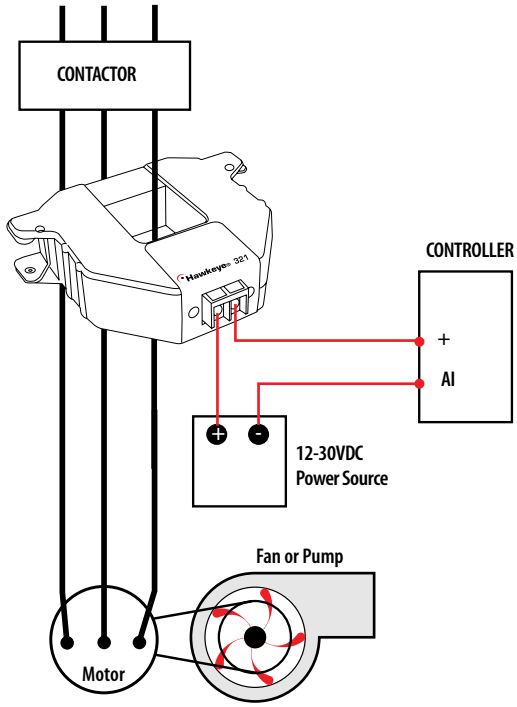
DIMENSIONAL DRAWINGS



H221			H321			H421		
A =	3.7"	(94 mm)	A =	4.9"	(124 mm)	A =	4.9"	(124 mm)
B =	1.6"	(40 mm)	B =	2.9"	(75 mm)	B =	5.5"	(141 mm)
C =	1.4"	(35 mm)	C =	2.5"	(63 mm)	C =	2.5"	(65 mm)
D =	1.1"	(29 mm)	D =	1.2"	(29 mm)	D =	1.1"	(29 mm)
E =	4.2"	(106 mm)	E =	5.5"	(140 mm)	E =	8.1"	(206 mm)
F =	4.7"	(120 mm)	F =	6.0"	(151 mm)	F =	6.0"	(151 mm)

APPLICATION/WIRING DIAGRAM

Monitoring Fan /Pump Motor Loads



ORDERING INFORMATION

LISTED E150462

MODEL	AMPERAGE RANGE		SENSOR OUTPUT	HOUSING	UL	CE	RoHS
	4mA (Lower Limit)	20mA (Upper Limit)					
H221	0A	100 to 300A	4-20mA DC	Split-core	● [1]	●	●
H221SP		100, 150, 200, 250, or 300A [2]			● [1]	●	●
H321		300 to 800A			● [1]	●	●
H321SP		300, 400, 500, 600, 700, or 800A [2]			● [1]	●	●
H421		1000 to 2400A					●
H421SP		1000, 1200, 1400, 1600, 1800, 2000, 2200, or 2400A [2]					●

ACCESSORIES

Universal Power Supply (PS Series)
Universal Mounting Bracket Kit (AH06)

PS

AH06

[1] Listed for use on 75°C insulated conductors.
[2] Standard factory-calibration, but no longer field adjustable
Note: When ordering HxxxSP versions, specify upper current limit for factory calibration (device is not field adjustable).

CURRENT MONITORING

Current Sensors: 0-5VDC Analog Output

Load Trending With 0-5VDC Output

DESCRIPTION

The **Hawkeye 722, 822, and 922** provide accurate load trending information with a proportional 0-5VDC output signal. Slide-switches provide easy field selection of monitored amperage range without jumpers (available on most models).

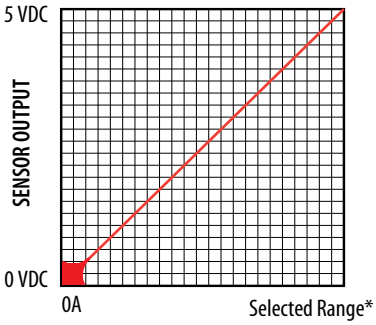
APPLICATIONS

- Load trending
- Motor control
- Positive proof of flow

FEATURES

- Self-powered analog current sensor simplifies installation
- No external power required for sensor...eliminate power supplies
- Self-gripping split-core for fast retrofit installation...no need to remove conductor (H922)
- Economical solid-core models feature adjustable bracket for easy alignment
- No jumpers on unit...reduces installation error
- Selectable factory calibrated ranges for increased flexibility and resolution
- Some models available with three field-selectable ranges per unit...fewer versions to choose from, stock, and install
- Mini-sized H822 fits easily in tight enclosures
- Removable bracket on H922 can be installed in three different configurations... added flexibility
- 100% solid state, no moving parts to fail
- 5-year warranty

EXAMPLE LINEAR OUTPUT
Scale software as shown



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

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

CURRENT MONITORING

SPECIFICATIONS

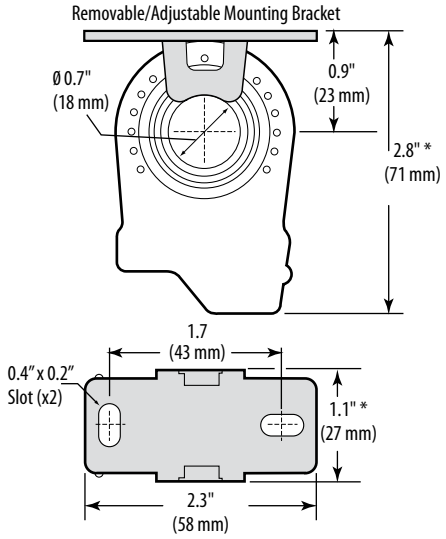
5 Year Warranty

Sensor Power	Induced from monitored conductor
Insulation Class	600VAC RMS (UL), 300VAC RMS (CE)
Frequency	50/60 Hz nominal
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% (selected range)
Response Time	2 sec.
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-2, CAT III, pollution degree 2, basic insulation

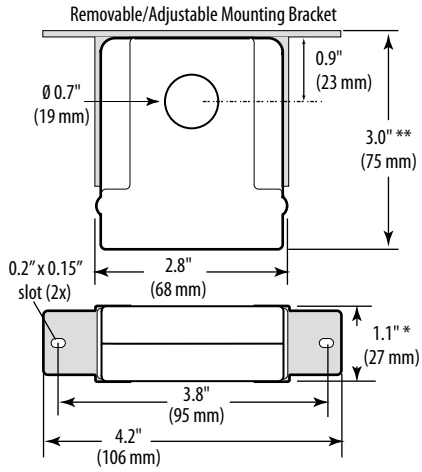
For applications requiring double or reinforced insulation, please contact the factory

DIMENSIONAL DRAWINGS

H822/H822-20

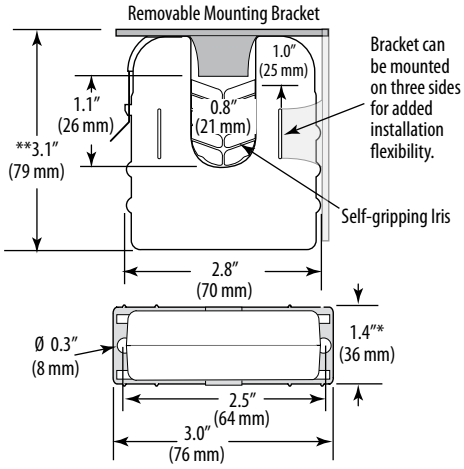


H722LC/H722HC



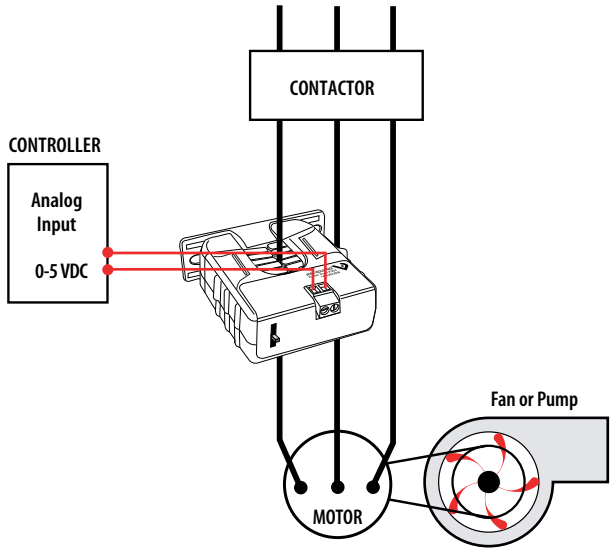
** Terminal block may extend up to 1/8" over the height dimensions shown.*
*** Slide switch may extend up to 1/4" over the height dimensions shown*

H922



APPLICATION/WIRING DIAGRAM

Monitoring Fan /Pump Motors for Positive Proof of Flow



ORDERING INFORMATION

c UL us LISTED E212445 E150462

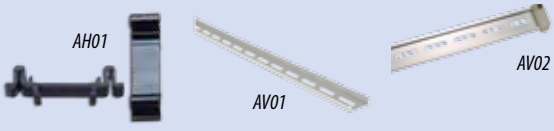
RoHS Compliant

MODEL	AMPERAGE RANGE	SENSOR OUTPUT	HOUSING	UL	CE	RoHS
H722LC	0 - 10/20/40A	0 - 5VDC	Solid-Core	●	●	
H722HC	0 - 50/100/200A		Solid-Core	●	●	
H822	0 - 10A		Solid-Core	●		●
H822-20	0 - 20A		Solid-Core	●		●
H922	0 - 30/60/120A		Split-Core	● [1]	●	
H922030A	0 - 30A		Split-Core		●	
H922060A	0 - 60A		Split-Core		●	
H922120A	0 - 120A		Split-Core		●	

[1] *Listed for use on 75°C insulated conductors.*

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



CURRENT MONITORING

Current Sensors: 0-10VDC Analog Output

Load Trending With 0-10VDC Output

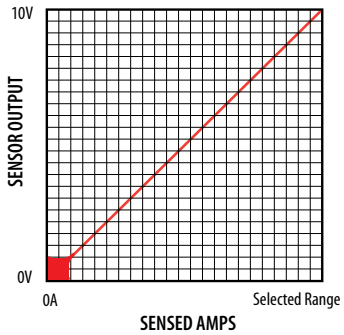
DESCRIPTION

The **Hawkeye 723LC, 723HC, and H923 Series** provide accurate load trending information with a proportional 0-10VDC output signal. Devices offer three amperage range options, with slide-switch selection for easy field adjustment – no need for jumpers.

APPLICATIONS

- Load trending
- Motor control
- Fan/pump status

EXAMPLE LINEAR OUTPUT
Scale software as shown



FEATURES

- Self-powered analog current sensor 0-10VDC output
- Self-gripping split-core for fast retrofit installation...no need to remove conductor (H923)
- No jumpers on unit...reduces installation error
- No external power required for sensor
- Factory calibrated field-selectable ranges for high resolution and installation ease
- One device to stock and install...reduces installation charges
- Removable mounting bracket for installation flexibility
- Bracket on H923 can be installed in three different configurations... added flexibility
- 100% solid state...no moving parts to fail
- 5-year warranty

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

SPECIFICATIONS

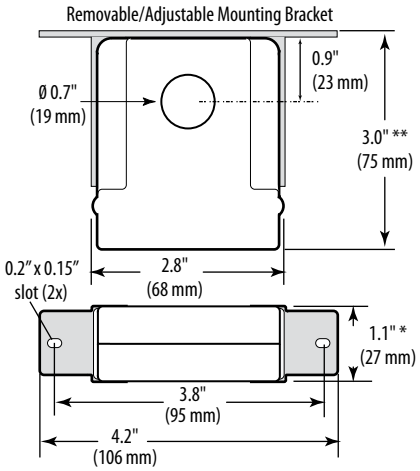
5 Year Warranty

Sensor Power	Induced from monitored current
Insulation Class	300VAC RMS
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH, non-condensing
Accuracy	±2% F.S. from 10% to 100% (selected range)
Response Time	2 sec.
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-2, CAT III, pollution degree 2, basic insulation

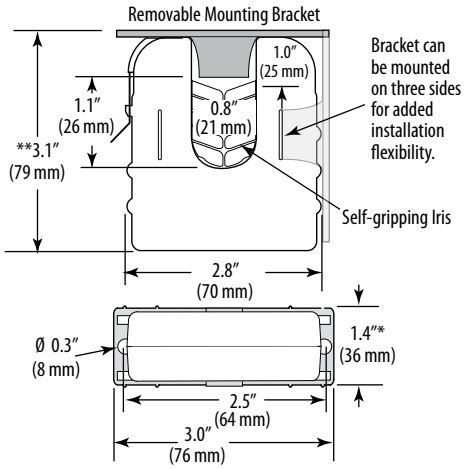
For applications requiring double or reinforced insulation, please contact the factory

DIMENSIONAL DRAWINGS

H723LC/H723HC



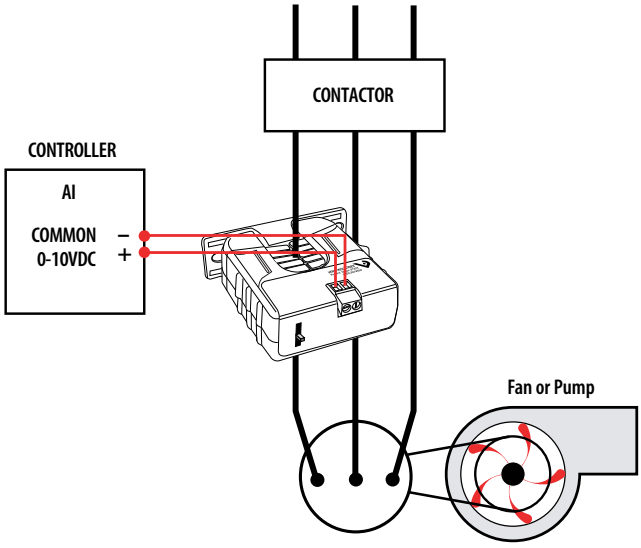
H923



** 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*

APPLICATION/WIRING DIAGRAM

Monitoring Fan /Pump Motors for Positive Proof of Flow

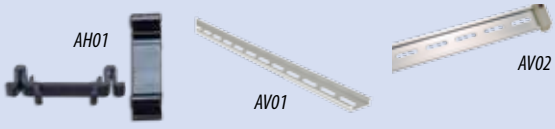


ORDERING INFORMATION

MODEL	AMPERAGE RANGE	SENSOR OUTPUT	HOUSING	CE
H723LC	0 - 10/20/40A	0 - 10VDC	Solid-core	●
H723HC	0 - 50/100/200A		Solid-core	●
H923	0 - 20/100/150A		Split-core	●

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



Current Sensors with Relay: 4-20mA Analog Output

Load Trending And Control Relay In One Package

H931

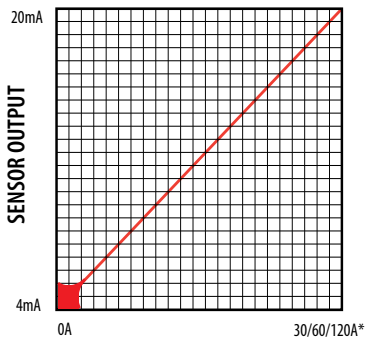
DESCRIPTION

The **Hawkeye 931 and 951** provide accurate load trending information with a proportional 4-20mA 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 sensor. This combination makes these products ideal for start/stop control and status monitoring of motors, using one device instead of two.

APPLICATIONS

- Load trending
- Motor control
- Positive proof of flow

EXAMPLE LINEAR OUTPUT
Scale software as shown



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

FEATURES

- Loop-powered analog current sensor with integral start/stop command relay
- Reduces the number of installed components...saves time and space
- Self-gripping split-core for fast retrofit installation...no need to remove conductor
- One device to install for start/stop & status...reduces installation charges
- Power the current sensor and receive the 4-20mA signal with only two wires... fewer wires required than with traditional 3-wire sensors
- Selectable factory calibrated ranges up to 120A for increased flexibility and resolution
- Factory calibrated switch-selectable ranges (30/60/120A) for high resolution and installation ease
- No jumpers on unit...reduce installation error
- Removable mounting bracket for installation flexibility
- Bracket can be installed in three different configurations...added flexibility
- Command relay switches up to 5A@250VAC
- 5-year warranty

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

CURRENT MONITORING

SPECIFICATIONS

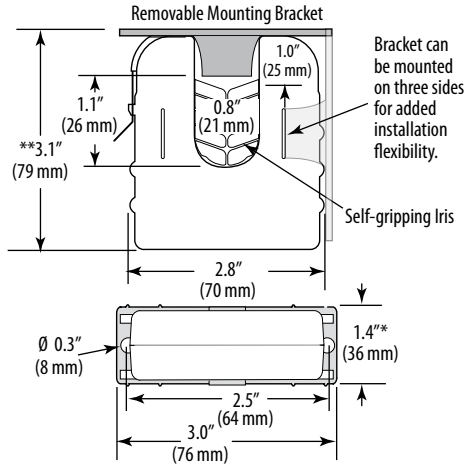
5 Year Warranty

Sensor Power	30mA (max.)@12-30VDC
Insulation Class	600VAC RMS
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% (selected range)
Response Time	2 sec.
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing

Do not use LED status indicators as evidence of applied voltage

DIMENSIONAL DRAWING

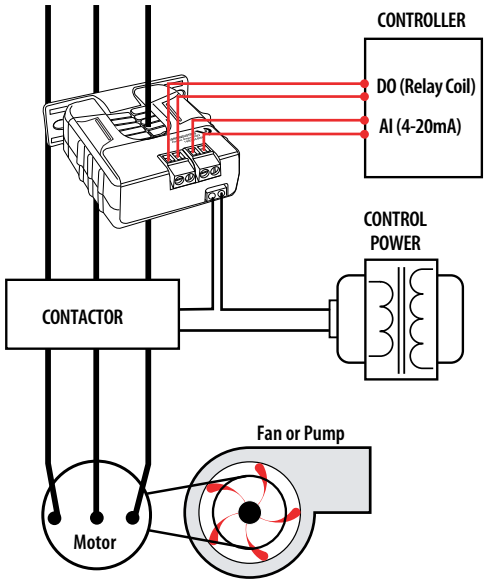
H931/H951



** 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*

APPLICATION/WIRING DIAGRAM

Trending & Controlling Motor Loads with the Hawkeye 931



RELAY CONTACT RATINGS (N.O.)

Resistive..... 5A(r)@250VAC
5A(r)@30VDC
Inductive..... 2A(r)@250VAC
2A(r)@30VDC

TYPICAL COIL PERFORMANCE

Voltage	AC	DC
24	15	15
12		20

Pull In Voltage (H951 only)
12VDC 8.4VDC

Drop Out Voltage (H951 only)
12VDC 3.0VDC

CURRENT MONITORING

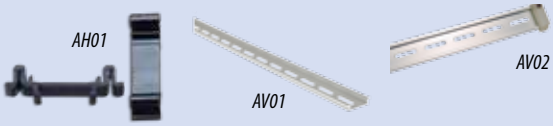
ORDERING INFORMATION

c UL us LISTED
E150462

MODEL	AMPERAGE RANGE	SENSOR OUTPUT	RELAY TYPE	RELAY COIL	RELAY	RELAY POWER LED	UL
H931	0 - 30/60/120A	4 - 20mA	SPST, N.O.	24VAC/DC	●	●	●
H951				12VDC nom.	●	●	●

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)



Current Sensors with Relay: 0-5VDC Analog Output

Load Trending And Control Relay In One Package

Hawkeye™

DESCRIPTION

The **Hawkeye 932 and H952 Series** provide accurate load trending information with a proportional 0-5VDC output signal. This feature combined with an integrated command relay makes these products ideal for start/stop and status monitoring of motors.

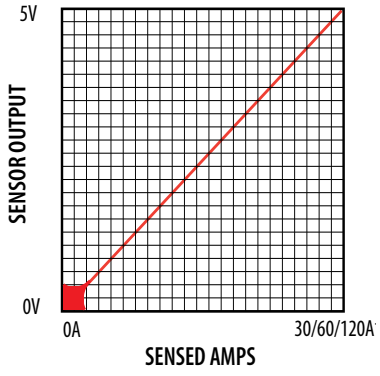
The relay is fully isolated from the current sensor, and all relay connections are externally available for maximum flexibility.

APPLICATIONS

- Load trending
- Motor control
- Fan/Pump status

H932/952 LINEAR OUTPUT

Scale software as shown



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

FEATURES

- Self-powered analog current sensor with integral start/stop command relay
- Reduces the number of installed components... saves time and space
- Self-gripping split-core for fast retrofit installation...no need to remove conductor
- One device to install for start/stop and status...reduces installation charges
- No external power required for current sensor
- Selectable factory calibrated ranges up to 120A for increased flexibility and resolution
- Factory calibrated switch-selectable ranges (30/60/120A) for high resolution and installation ease
- No jumpers on unit...reduces installation error
- Removable mounting bracket for installation flexibility
- Bracket can be installed in three different configurations...added flexibility
- Command relay switches up to 5A@250VAC
- 5-year warranty

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

CURRENT MONITORING

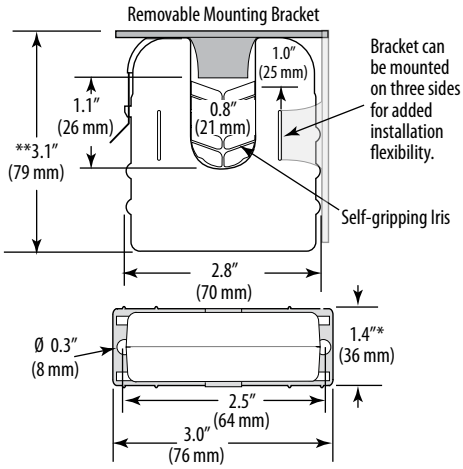
SPECIFICATIONS

5 Year Warranty

Sensor Power	Induced from monitored conductor
Insulation Class	600VAC RMS
Frequency Range	50/60 Hz nominal
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
Accuracy	±2% F.S. from 10% to 100% (selected range)
Response Time	2 sec.
Terminal Block Wire Size	24-14 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)
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-2, CAT III, pollution degree 2, basic insulation

DIMENSIONAL DRAWING

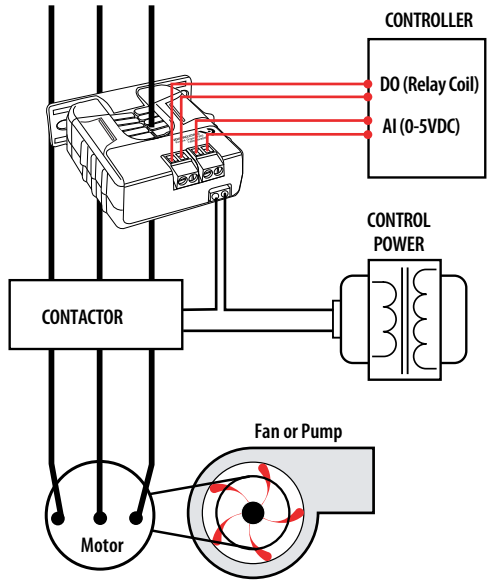
H932/H952



** 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*

APPLICATION/WIRING DIAGRAM

Trending & Controlling Motor Loads with the Hawkeye 932



RELAY CONTACT RATINGS (N.O.)

Resistive..... 5A@250VAC
5A@30VDC
Inductive..... 2A@250VAC
2A@30VDC

TYPICAL COIL PERFORMANCE

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

ORDERING INFORMATION

c UL us LISTED
E150462

MODEL	AMPERAGE RANGE	SENSOR OUTPUT	RELAY TYPE	RELAY COIL	HOUSING	UL
H932	0 - 30/60/120A	0 - 5VDC	SPST, N.O.	24VAC/DC	Split-core	●
H952				12VDC		●

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)

Direct Current Sensors: Split-Core, mA and Voltage Output

DC Applications

pulse reset technology™
U.S. Pat. #6,160,697; 6,522,517; 7,242,157

H971

Hawkeye™

DESCRIPTION

Hawkeye DC Sensors provide accurate load level monitoring of DC current loads. The H970 combines a Hall Effect sensor with proven transducer circuitry. Slide-switch selectable amperage ranges and field selectable mA and VDC outputs maximize flexibility. The H971 uses Pulse Reset Technology™ with field proven circuitry to provide a superior solution for DC applications with minimal risk of permanent magnetization, ensuring longer life and better accuracy.

The H970 has low and high current options with slide switch selectable amperage ranges and a choice of 0-5V, 0-10V, or 4-20mA outputs. The EA20 and the H971 have 4-20mA output only. The H971 also offers bidirectional sensing capability and a user-adjustable span to allow greater application flexibility.

APPLICATIONS

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

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

FEATURES

All Models

- Self-gripping iris for easy installation
- Bracket can be installed in three different configurations...added flexibility
- Status LED ensures proper wiring...easy set up
- 5-year warranty

H970 Multi-Output Model

- Factory calibrated switch-selectable amp ranges (20/40/80 or 50/100/200) for high resolution and installation ease
- mA and DC voltage outputs...maximum installation flexibility

H971 Bidirectional Model

- Patented Pulse Reset Technology™ significantly increases accuracy...sensor is not affected by stray magnetic fields...minimize worry of magnetization from over-current faults
- User-adjustable span from ±20A to ±200A
- Range can be factory-set per customer specifications (SP model)

EA20 Unidirectional Model

- Patented Pulse Reset Technology™ significantly increases accuracy...sensor is not affected by stray magnetic fields...minimize worry of magnetization from over-current faults
- 100, 150, and 200A span versions available...application flexibility

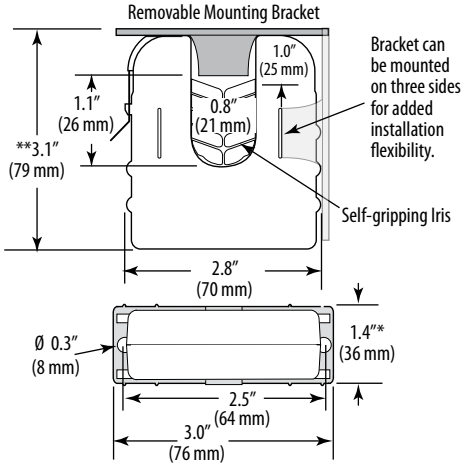
SPECIFICATIONS

5 Year Warranty

System Technology	**H970:** Open loop Hall effect; **H971, EA20:** Exclusive Pulse Reset Technology™
Amperage Range	**H970:** LC: 0-20/40/80; HC: 0-50/100/200 (slide switch selectable); **H971:** ±200ADC; **EA20:** 0-100ADC/0-150ADC/0-200ADC
Sensor Supply Voltage	**H970:** 15-30VAC/DC for 0-10VDC and 4-20mA outputs, 12-30VAC/DC for 0-5VDC output; **H971, EA20:** 12-24VDC*
Supply Current	35mA max.**
Insulation Class	**H970:** 840VDC; **H971:** 600VDC, **EA20:** 1000VDC
Temperature Range	**H970:** -15° to 60°C (5° to 140°F); **H971, EA20:** -30° to 60°C (-22° to 140°F)
Humidity Range	10-90% RH non-condensing
Output	**H970:** 4-20mA, 0-5VDC, 0-10VDC (2 options allowed per sensor); **H971:** Bidirectional 4-20mA (adjustable span)***; **EA20:** Unidirectional 4-20mA
Terminal Block Wire Size	24-14 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)
H970 Accuracy:	
Accuracy	±3% F.S. (combined linearity, hysteresis, and repeatability)
Repeatability	±1%
Linearity	±1%
H971/EA20 Accuracy:	
Accuracy at Ranges Below 100A	±0.5A (combined linearity, hysteresis, and repeatability)****
Accuracy at Ranges Above 100A	±0.5% full scale (combined linearity, hysteresis, and repeatability)****
Withstand Current	25,000ADC
Response Time	H970: 2 sec; H971, EA20: Less than 150 msec
Agency Approvals	UL 508 open device listing; CE: EN61010-1:2001-2, CAT III, pollution degree 2, basic insulation

Do not use the LED status indicators as evidence of applied voltage. For applications requiring double or reinforced insulation, please contact the factory.
** For currents over 120A, supply voltage must be at least 15V.*
*** For H971, at zero load current: 35mA max.; at 200A load current: 55mA to 100mA depending on supply voltage and current polarity.*
**** Unless factory set per customer specifications (H971SP only).*
***** For single conductor through product (no wraps).*

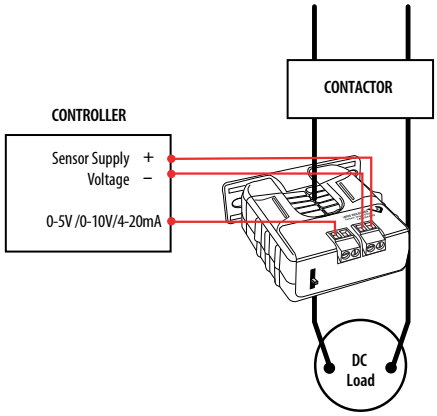
DIMENSIONAL DRAWING



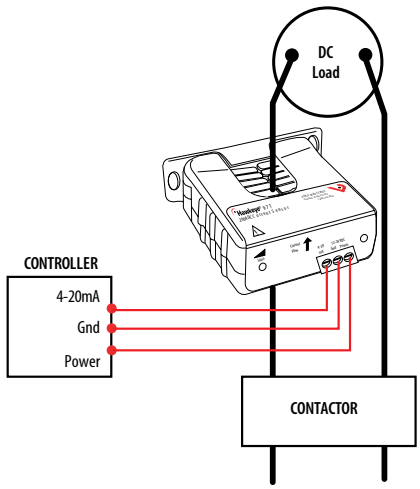
** Terminal block may extend up to 1/8" over the height dimensions shown.*
*** Slide switch may extend up to 1/4" over the height dimensions shown*

APPLICATION/WIRING DIAGRAMS

H970

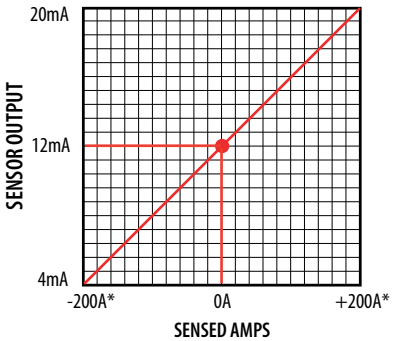


H971/EA20



H971 BIDIRECTIONAL OUTPUT

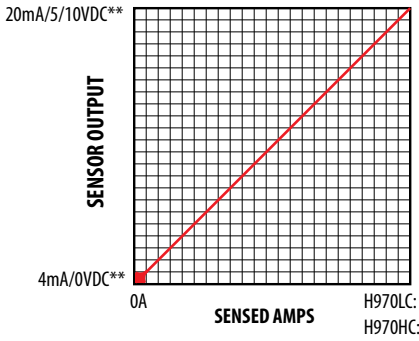
Scale software as shown



**Field Adjustable from ±20A to ±200A*
(not applicable to customer-specified factory scaled models)

H970/EA20 LINEAR OUTPUT

Scale software as shown



H970LC: 20/40/80A*
H970HC: 50/100/200A*
EA20: 100/150/200A

**Slide-Switch Selectable*
*** Voltage option not available on EA20*

ORDERING INFORMATION

MODEL	PULSE RESET TECHNOLOGY	AMPERAGE RANGE (DC)	SENSOR OUTPUT	HOUSING	STATUS LED	UL	CE	RoHS
Hawkeye Series								
H971	●	0 - 200A	Bidirectional 4-20mA	Split-core	●	●	●	●
H971SP	●	0 - 200A*	Bidirectional 4-20mA	Split-core	●	●	●	●
H970LCA		0 to 20/40/80A	4-20mA and 0-5VDC	Split-core	●			
H970LCB			4-20mA and 0-10VDC	Split-core	●			
H970HCA		0 to 50/100/200A	4-20mA and 0-5VDC	Split-core	●			
H970HCB			4-20mA and 0-10VDC	Split-core	●			
EA Series								
EA20BB010	●	0-100A	Unidirectional 4-20mA	Split-core	●	●**	●	●
EA20BB015	●	0-150A	Unidirectional 4-20mA	Split-core	●	●**	●	●
EA20BB020	●	0-200A	Unidirectional 4-20mA	Split-core	●	●**	●	●

** Range set in factory per customer specified value from 0 to ±20A through 0 to ±199A.*
*** UL Recognized*

ACCESSORIES

DIN Rail Clip Set (AH01)
DIN Rail (AV01) and DIN Stop Clip (AV02)

CURRENT MONITORING

Direct Current String Monitor

DC Monitoring for Combiner Boxes

DESCRIPTION

The **EA10** DC monitoring system provides the perfect solution for string monitoring in combiner and sub-combiner boxes or other DC loads. The modular construction allows easy installation for monitoring 8 to 32 strings in a single system. Pulse Reset technology means no output drift and immunity to power spikes and surges up to 20kA.

This system includes a communications unit that supplies power and provides Modbus communication. Up to four current sensing modules can connect serially to one communications unit, each with eight DC current sensors, for a total of 32 monitoring nodes. Connect up to 63 communications units in a daisy chain for full system monitoring. All boards can be mounted on standard DIN rail for easy installation.

APPLICATIONS

- Renewable energy and string monitors
- Industrial monitoring
- Data centers

FEATURES

- Pulse Reset technology...high immunity to power surges...greater repeatability over time
- Modular construction...connect up to four current sensing modules to one communications unit...easy to install
- Fully encapsulated...robust design is resistant to the elements
- Monitors 2016 points total...minimize home run wiring
- Up to 1000VDC isolation for high voltage strings
- RS-485 Modbus communications...quick commissioning
- Wide range DC power requirements...versatility
- Fits onto standard 35 mm DIN rail...convenient installation
- Amp-hour calculation...read once per day for less network traffic
- LED indication of faults...quick visible troubleshooting
- May be installed in UL1741 systems...smart combiner capability

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

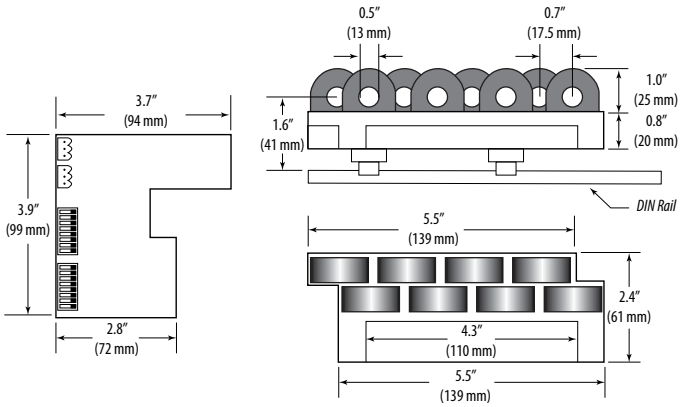
Maximize Reliability
Minimize Installed Cost

SPECIFICATIONS

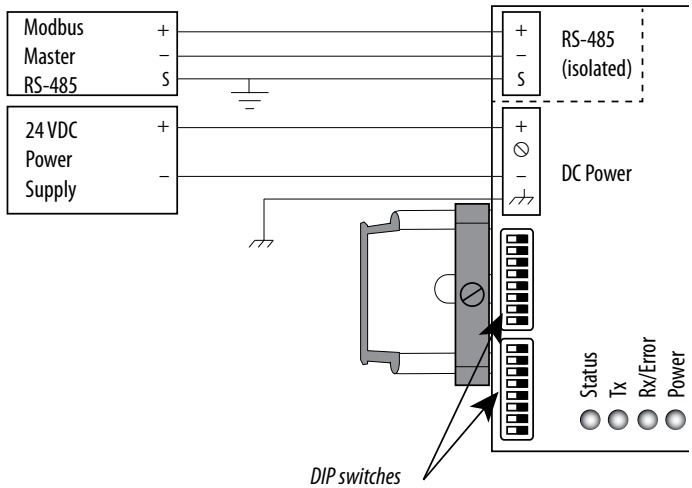
Inputs:	
Control Power	Class 2/SELV 24VDC to 42VDC
Maximum Power Consumption	7W at 32 channels
Maximum Current Input	Up to 20A per point
Accuracy:	
Current	0.5% full scale (combined linearity, hysteresis, and repeatability)
Outputs:	
Communication	2-wire RS-485, 1200 to 38400 baud, Modbus RTU
Available Information	Current per point, both instantaneous amps & cumulative amp-hours, events
Update Rate	2 sec
Maximum Measurement Points	8, 16, 24, or 32
Mechanical:	
Mounting	T35 (35 mm) DIN Rail per EN50022
Terminal Block Wire Size	24 to 12 AWG (0.21 to 3.31 mm^2)
Terminal Block Torque	0.37 ft-lb (0.5 N•m) nominal/0.44 ft-lb (0.6 N•m) max.
Insulation (from current sensor to control power or RS-485 interface)	Up to 1000 VDC (insulated conductor)
Dielectric Strength	10000 VDC
Environmental:	
Operating Temperature Range	-30° to 75°C (-22° to 167°F)
Storage Temperature Range	-40° to 85°C (-40° to 185°F)
Humidity Range	<95% RH noncondensing
Altitude of Operation	3 km
Agency Approvals:	
US and Canada Recognized (cRUus)	UL61010-1, Acceptable in UL1741 Combiner Box
Europe (CE)	EN61010-1
Installation Category	Cat. IV, pollution degree 3
EMC:	
Conducted and Radiated Emissions	FCC Part 15 Class B, EN55011 / EN61000 Class B (residential and light industrial)
Conducted and Radiated Immunity	EN61000 Class A (heavy industrial)

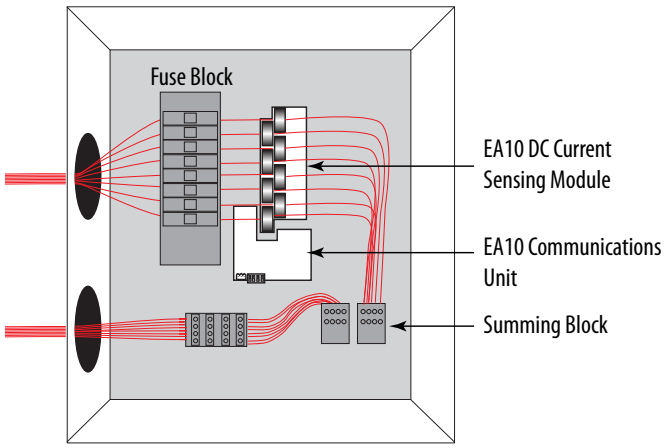
VERIS INDUSTRIES

DIMENSIONAL DRAWING



APPLICATION/WIRING DIAGRAM





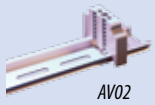
CURRENT MONITORING

ORDERING INFORMATION

MODEL	NUMBER OF CTs	AMPERAGE RANGE	OUTPUT
EA10DD08B	DC current sensing module with 8 strings, encapsulated	Up to 20A per CT	
EA10HC1AB	Communications unit, Modbus RTU, encapsulated, 24 VDC, supports up to four EA10DD08B units (up to 32 strings per communications unit)		Modbus RTU

ACCESSORIES

DIN Rail (AV01) and DIN Stop Clip (AV02)



Field Mount Motor Control Device

Line and Low Voltage Separated Fractional Motor Status with Command Relay

H40

Hawkeye™

DESCRIPTION

The **Hawkeye 40 Series** combines a switching relay, a current status sensor, and a Hand-Off-Auto (HOA) switch into a single nipple-mounted housing. The low voltage and line voltage wires are functionally separated from each other. A hinged lid on the low voltage side allows easy relay connection and trip point adjustment, while the high voltage side is closed for added safety. The H40 is connected in series between the power source and the motor, and the relay and HOA switch control the on/off functioning of the motor.

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

FEATURES

- Separate high and low voltage sections...fast and economical installation by low voltage electricians
- Combines status sensor, command relay, and HOA switch in a single series circuit...one line connection for three devices
- Remote mounted enclosure eliminates the need to cram multiple devices into a junction box
- HOA provides true relay control...ideal for troubleshooting control wiring
- SPST relay is field-selectable for N.O. or N.C. operation (some models)
- 5-year warranty

CURRENT MONITORING

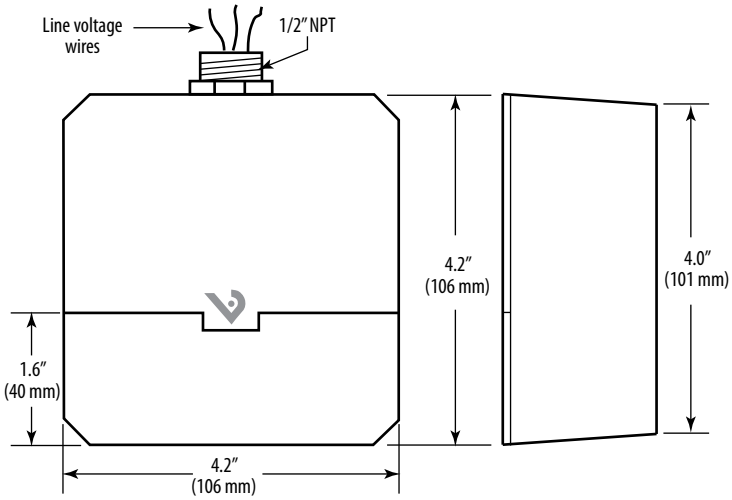
SPECIFICATIONS

5 Year Warranty

Sensor Power (H40NE8A and H40ME8X only)	Induced
Operating Temperature Range	-15°C to 50°C (5° to 122°F)
Operating Humidity Range	0-95% RH non-condensing
Frequency Range	50-60 Hz
Wire to Relay Contacts	**H40 NE8A, H40NEXA, H40ME8X, H40MEXX:** use 12 AWG (3.3 mm^2) or larger wire **H40BAXA, H40AAXX:** use 16 AWG (1.3 mm^2) or larger wire
Low Voltage Terminal Block Wire Size	24-14 AWG (0.2 to 2.1 mm^2)
Low Voltage Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Relay:	
Relay Contact Ratings	**H40NE8A, H40NEXA:** 16A@120/250VAC, 12A@277VAC, 1HP@120VAC, 8A@28VDC **H40ME8X, H40MEXX:** SPDT 16A@120/277VAC, 1HP@120VAC, 2HP@277VAC, 16A@28VDC **H40BAXA:** 10A@120/240/277VAC, 1/3HP@120VAC, 8A@28VDC **H40AAXX:** SPDT 10A@120/240/277VAC, 1/3HP@120VAC, 10A@28VDC
Relay Coil Ratings	**H40NE8A, H40ME8X, H40MEXX, H40NEXA:** 24VDC 45mA nom.; 24VAC 78mA nom.; Class 2* **H40AAXX, H40BAXA:** 10-30VAC@24-38mA; 10-30VDC@10-16mA; Class 2*
Agency Approvals	UL 508 open device listing

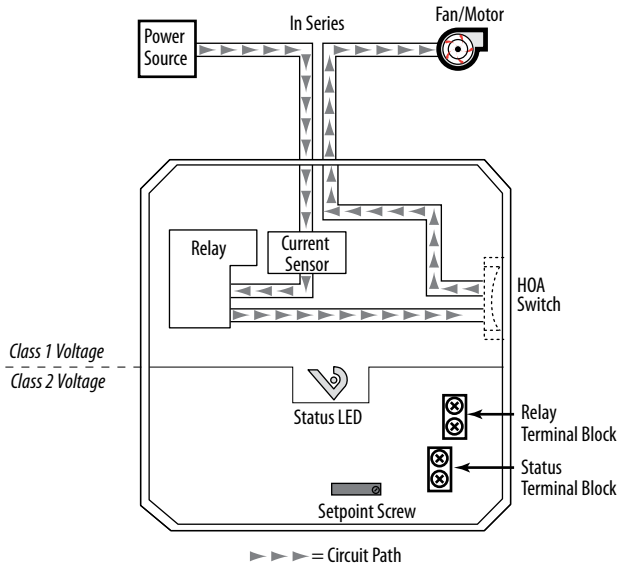
** In addition, coil input from other sources may be used as detailed in NEC 2008, Article 725.121.*

DIMENSIONAL DRAWING

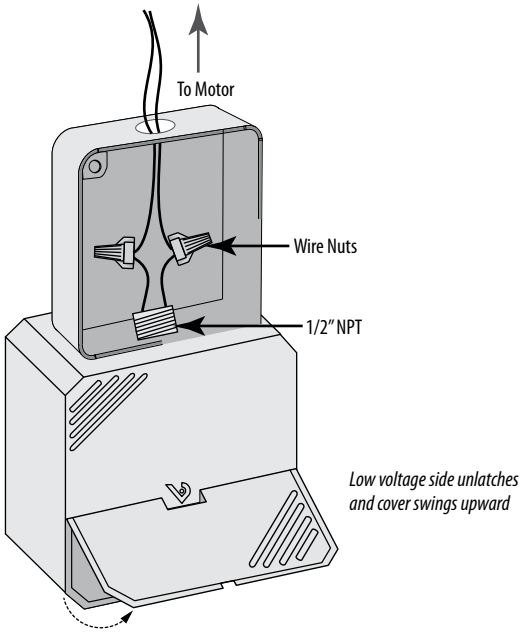


APPLICATION/WIRING DIAGRAM

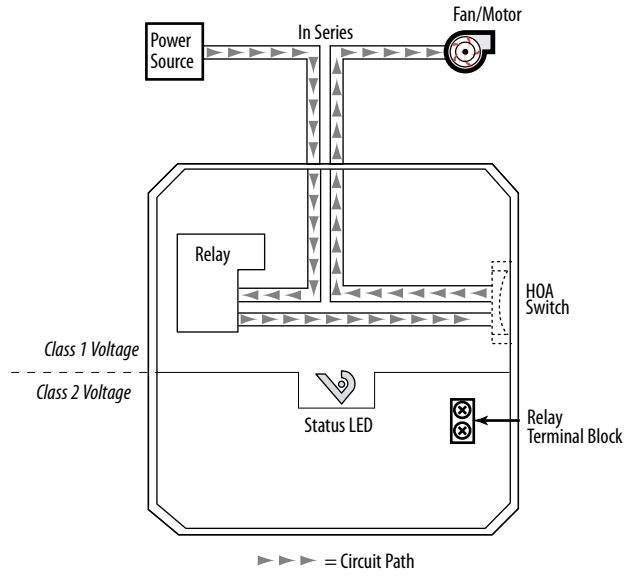
H40ME8X/H40NE8A



MOUNTING OPTIONS



H40NEXA/H40MEXX/H40BAXA/H40AAXX



ORDERING INFORMATION

c UL us LISTED

RoHS Compliant

MODEL	AMPERAGE RANGE	STATUS OUTPUT	TRIP POINT	RELAY	RELAY COIL	HOA SWITCH	UL	RoHS
H40NE8A	0.25 - 16A	N.O. 1.0A@30VAC/DC	Adjustable	SPST, N.O	24VDC 45mA nom. 24VAC 78mA nom.	●	●	●
H40ME8X	0.25 - 16A	N.O. 1.0A@30VAC/DC	Adjustable	SPST, FS N.O. or N.C.	24VDC 45mA nom. 24VAC 78mA nom.		●	●
H40NEXA	0.25 - 16A	Relay only		SPST, N.O	24VDC 45mA nom. 24VAC 78mA nom.	●	●	●
H40MEXX	0.25 - 16A	Relay only		SPST, FS N.O. or N.C.	24VDC 45mA nom. 24VAC 78mA nom.		●	●
H40BAXA	0.25 - 10A	Relay only		SPST, N.O	10-30VAC@24-38mA 10-30VDC@10-16mA	●	●	●
H40AAXX	0.25 - 10A	Relay only		SPST, FS N.O. or N.C.	10-30VAC@24-38mA 10-30VDC@10-16mA		●	●

Field Mount Motor Control Device

Combination Switching Relay, Current Status Switch, and HOA Switch

Hawkeye™

H535

H548

DESCRIPTION

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.

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.

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

FEATURES

- Remote mounted current status sensor and command relay with or without HOA switch
- Combines status sensor, command relay, and HOA switch in a single series circuit...one line connection for three devices
- Remote mounted enclosure eliminates the need to cram multiple devices into a junction box
- HOA provides true relay control...ideal for troubleshooting control wiring
- SPST relay is field-selectable for N.O. or N.C. operation
- All models rated up to 1HP@120VAC, NS Versions 1HP@120VAC and 1.5HP@277VAC... one product for all fractional HP motor control and status applications
- Mounts directly on gang boxes, flush to existing enclosures or stand alone... maximum installation flexibility
- 5-year warranty

CURRENT SENSING THE ULTIMATE PROOF OF FLOW

Maximize Reliability
Minimize Installed Cost

RELAY CONTACT RATINGS

SPDT (NS) Models

Resistive.....15A@277VAC
Motor.....1HP@120VAC
1.5HP@277VAC

SPST (HOA) Models

Resistive.....15A@250VAC
Motor.....1HP@120VAC

TYPICAL COIL PERFORMANCE

Voltage	AC	DC
24V	36mA	36mA

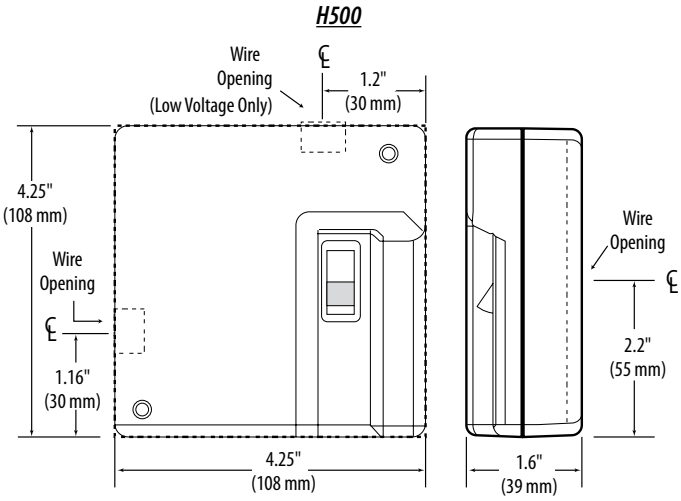
SPECIFICATIONS

5 Year Warranty

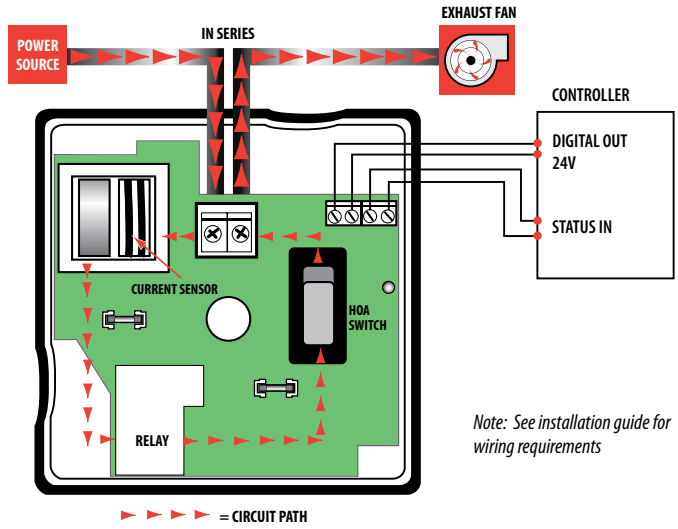
Sensor Power	Induced from monitored conductor
Frequency Range	50/60 Hz
Humidity Range	10-90% RH non-condensing
Temperature Range	-15° to 50°C (5° to 122°F)
Terminal Block Wire Size	24-14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Agency Approvals	UL 508 open device listing

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

DIMENSIONAL DRAWING



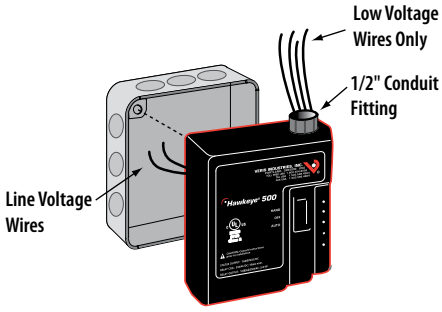
APPLICATION/WIRING DIAGRAM



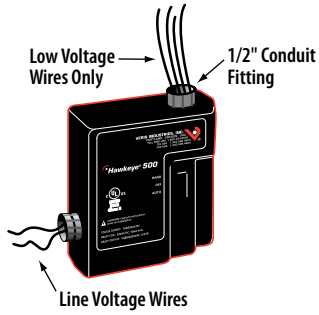
Note: See installation guide for wiring requirements

MOUNTING OPTIONS

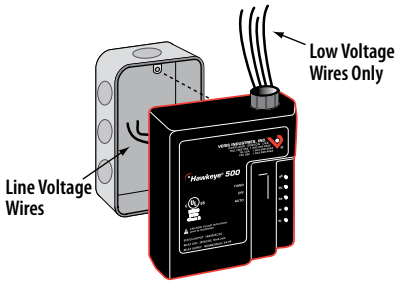
Mounts directly on 4-gang junction box



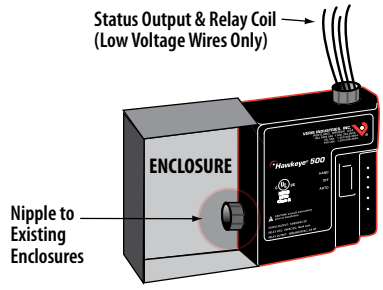
Mounts directly on wall or panel



Mounts directly on 2-gang junction box



Enclosure Mount



ORDERING INFORMATION

c UL us LISTED
E150462

MODEL	AMPERAGE RANGE	STATUS OUTPUT	TRIP POINT	RELAY	RELAY COIL	HOA SWITCH	STATUS LEDS	RELAY POWER LED	UL
H535	0.25 - 15A	Relay Only		SPST, Field-Selectable N.O/N.C.	24VAC/DC	●		●	●
H535NS	0.25 - 15A	Relay Only		SPDT				●	●
H540	0.25 - 15A	N. O., 1.0A@30VAC/DC	0.25A or less, Fixed	SPST, Field-Selectable N.O/N.C		●		●	●
H540NS	0.25 - 15A	N. O., 1.0A@30VAC/DC	0.25A or less, Fixed	SPDT				●	●
H548	0.5 - 15A	N. O., 1.0A@30VAC/DC	0.5A or less, Adjustable	SPST, Field-Selectable N.O/N.C		●	●	●	●
H548NS	0.5 - 15A	N. O., 1.0A@30VAC/DC	0.5A or less, Adjustable	SPDT			●	●	●

ACCESSORIES

Ground bonding kit (AH10)

Field Mount Status Relay

SPST Status Relay With Integral Current Switch

H120

Hawkeye™

DESCRIPTION

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. Eliminate the labor associated with installing a separate current sensor.

APPLICATIONS

- Unit Ventilators
- Fan Coil Units
- Exhaust Fans
- Fan Terminal Units
- Fractional HP Motors
- Light Resistive Loads

FEATURES

- The current switch and relay are in series...connect the contacts to the load and your current switch is automatically installed
- The nipple mount housing can be connected to any 1/2" conduit knockout for installation versatility
- Relay coil LED streamlines job commissioning and check out
- HP ratings make the H120 ideal for control and status of fractional HP motors
- 5-year warranty
- NEMA 1 rated housing may be used in plenum spaces
- Can be externally mounted to the electrical enclosure...space saver
- 0.1A turn-on...easily monitors the smallest motors

CURRENT MONITORING

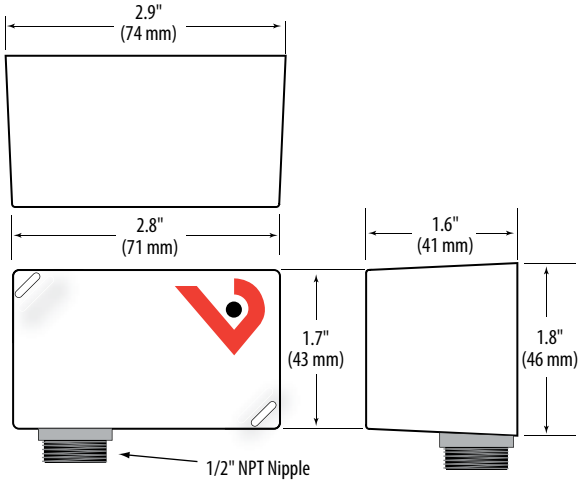
SPECIFICATIONS

5 Year Warranty

Sensor Power	Induced from relay coil power
Operating Temperature	-15° to 60°C (5° to 140°F) (13.8A max.), -15° to 50°C (5° to 122°F) (20A max.)
Operating Humidity	10-90% RH non-condensing
Expected Relay Life (mechanical)	10 million cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; Status: 16 AWG
Agency Approvals	UL 508 open device listing

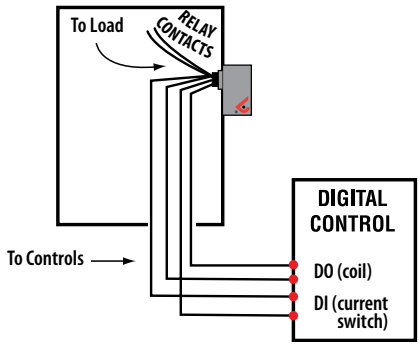
Do not use the LED status indicators as evidence of applied voltage.

DIMENSIONAL DRAWING

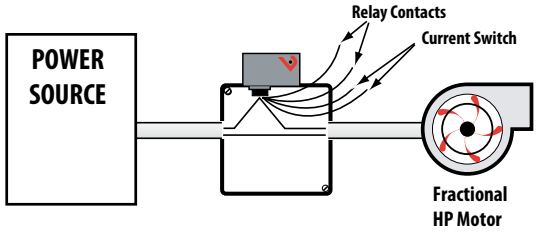


APPLICATION/WIRING DIAGRAMS

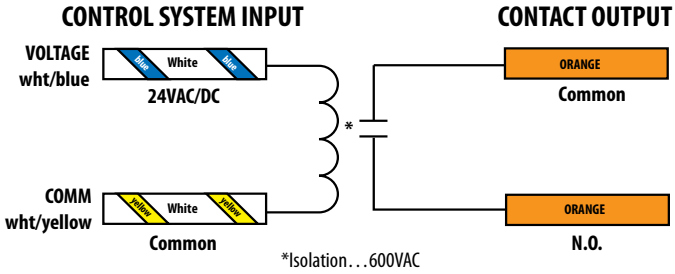
Nipple mount directly to a panel

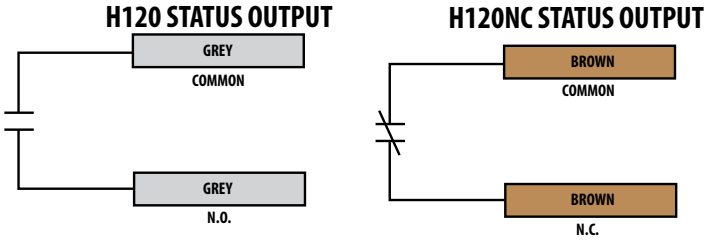


Nipple mount to 4x electrical box



WIRE COLOR CODES





RELAY CONTACT RATINGS (N.O.)

Resistive	20A(r)*@277VAC/28VDC (250,000 Cycles)
Motor	120VAC, 1HP 208VAC, 1HP 250VAC, 2HP 277VAC, 2HP
Ballast	277VAC, 20A
Tungsten	120VAC, 10A

TYPICAL COIL PERFORMANCE

Voltage	Coil Current	
	AC	DC
24V	75mA	32mA

**See operating temperature specification*

ORDERING INFORMATION

c UL us LISTED
E150462

MODEL	AMPERAGE RANGE	COIL	RELAY	STATUS OUTPUT	TRIP POINT	HOUSING	RELAY POWER LED	UL
H120	0.1A - 20A	24VAC/DC	SPST, N.O.	N.O. 100mA@30VAC/DC	0.1A or less	Nipple Mount	●	●
H120NC				N.C. 100mA@30VAC/DC			●	●

Load Status Switch

Provides Status For Manually Switched Loads

Hawkeye™

DESCRIPTION

The **H280** load status switch monitors both voltage and current on manually-switched loads (e.g., lights/fans in bathrooms). This device provides status monitoring for loads that are not, or cannot be, controlled by a control system. The H280 also saves cost by eliminating the need to connect a digital output to prove status.

APPLICATIONS

- Lighting
- Bathroom Fans
- Sump Pumps
- Traffic Lights
- Roadside Lighted Areas (e.g., bus stations)
- Parking Lots/Garages

FEATURES

- Wide voltage range (110-277VAC)...easy to use in many applications
- Low current threshold (100mA) offers great sensitivity for those small loads
- Nipple mount housing can be connected to any 1/2" conduit knockout for installation versatility
- Dual-color LED for easy visual inspection...control system is not required
- Isolated status output protects control system

CURRENT MONITORING

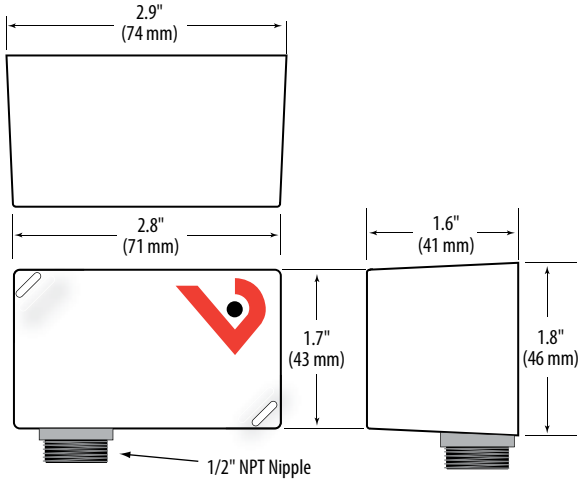
SPECIFICATIONS

5 Year Warranty

Sensor Power	Line powered
Operating Temperature	-15° to 60°C (5° to 140°F)
Operating Humidity	10-90% RH noncondensing
LED Status	GREEN LED=status normal; RED LED=status alarm
Frequency	50/60 Hz
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Neutral: 18 AWG; Line: 12 AWG; Status: 16 AWG
Agency Approvals	UL 508 open device listing

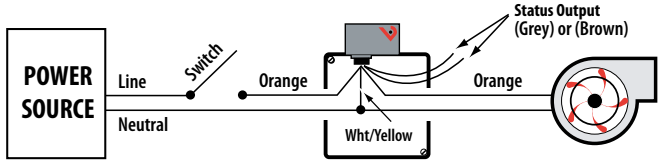
Do not use the LED status indicators as evidence of applied voltage.

DIMENSIONAL DRAWING



APPLICATION/WIRING DIAGRAM

Nipple mount to 4x electrical box



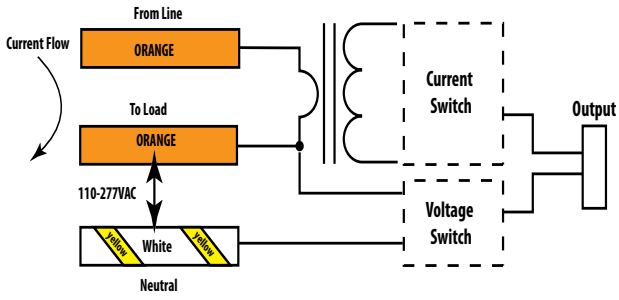
NOTE: Incidental loads as small as 30mA AC, such as pilot lamps or control circuits, connected in parallel to the sensed load may draw enough current to give a false load presence signal, even though the true load has been interrupted.

HOW IT WORKS

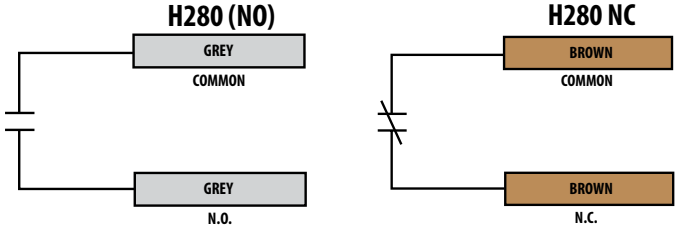
		STATUS OUTPUT		
VOLTAGE	CURRENT	H280	H280NC	LED
ON	ON	OPEN	CLOSED	GREEN
ON	OFF	CLOSED	OPEN	RED
OFF	OFF	OPEN	CLOSED	OFF

WIRE COLOR CODES

Line Connections



Status Outputs



ORDERING INFORMATION

c UL us LISTED
E150462

MODEL	AMPERAGE RANGE	VOLTAGE RANGE	STATUS OUTPUT (max.)	TRIP POINT	HOUSING	STATUS LED	RELAY POWER LED	UL
H280	0.1 - 20A	110 - 277VAC	N.O. 100mA@120VAC/DC	0.1A or less	Nipple Mount	●	●	●
H280NC			N.C. 100mA@120VAC/DC			●	●	●

Flow Contents

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-style 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)	92
220, 228	Insertion Meters, Standard Impeller	94
225, 226	Insertion Meters, Standard Impeller, Hot Tap	95
250	Tee Meter, Brass	96
228PV, 735, 4000	Tee Meter, Plastic	98
380	Tee Meter, BTU System	100
3000, 3050	Monitor: Local Display Output and BTU	102
310, 320, 340	Transmitter: Analog, BTU, Pulse, and Protocol Output	104
Magnetoflow	Electromagnetic (Mag) Meter	106
170, RCDL	Nutating Disc Meter	108
450, 1000	Turbine Meter	109
FST/FSR	Ultrasonic	110
Accessories		325

Flow Sensor Selection Guide

FLOW SENSORS

(manfacturer's part number)

FEATURES	Insert	Plastic Tee	Metal Tee
Basic Model	220/228 page 94	228PV/735/4000 page 98	228, 250 pages 94, 96
Hot Tap Capability	SDI, 225/226 pages 92, 95		
BTU Measurement			380 page 100
Small Diameter Impeller	SDI page 92		
Built-in Transmitter	SDI page 92		

TRANSMITTERS AND MONITORS

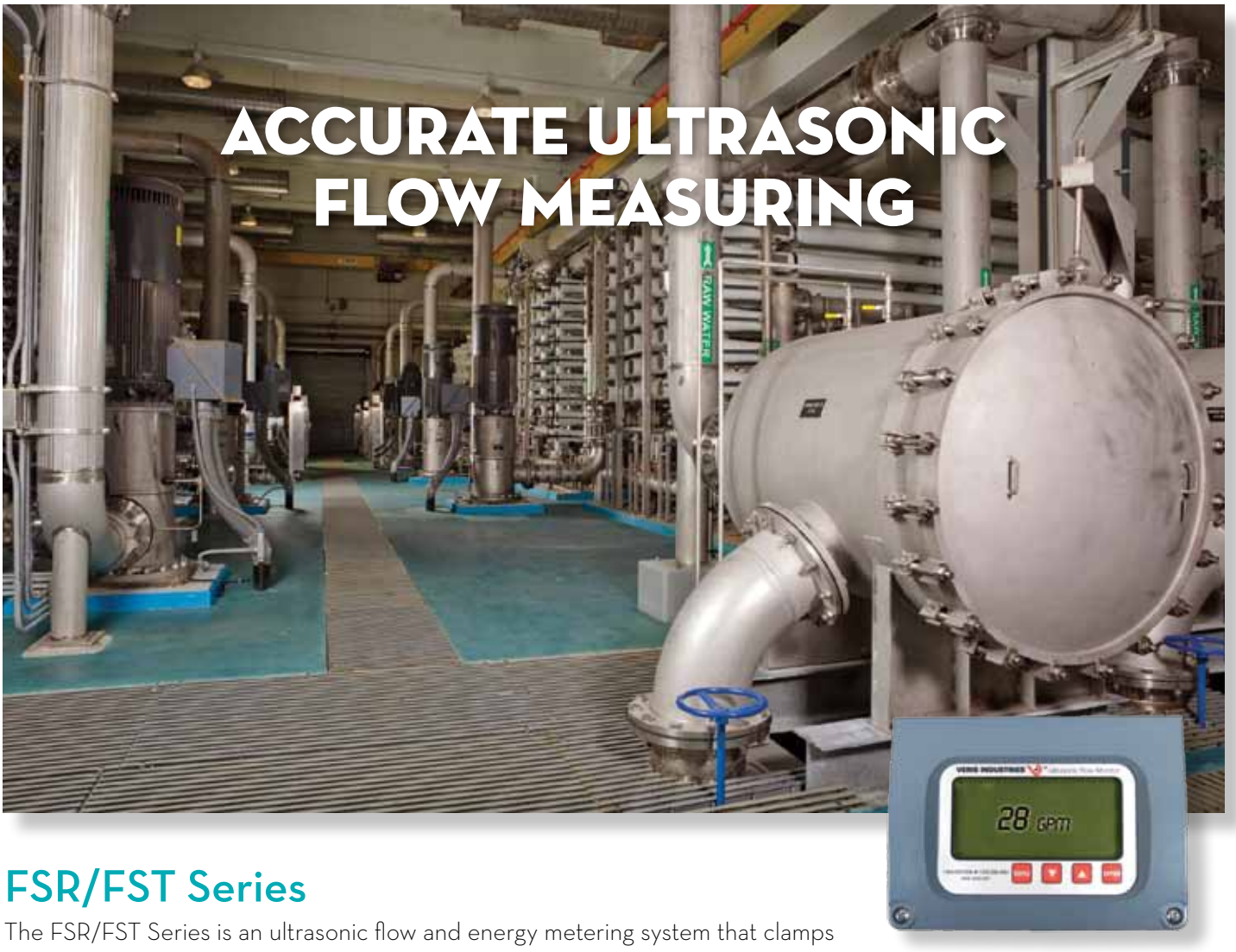
(manfacturer's part number)

FEATURES	Analog Output	Scaled Pulse Output	Protocol Output
Transmitter	310 page 104	320 page 104	
Transmitter with BTU Calculation	340 page 104		340 page 104
Flow Monitor with LCD Display	3000 page 102	3000 page 102	3000 page 102
Flow Monitor with LCD Display and BTU Calculation	3050 page 102	3050 page 102	3050 page 102

SPECIALITY METERS

FEATURES	Description			
Non-Impeller Styles	Electromagnetic page 106	Nutating Disc page 108	Turbine page 109	Ultrasonic page 110

ACCURATE ULTRASONIC FLOW MEASURING



FSR/FST Series

The FSR/FST Series is an ultrasonic flow and energy metering system that clamps onto the outside of the pipe, eliminating contact with the internal liquid. The FSR/FST Series state-of-the-art technology reduces installation costs, provides no pressure head loss, no moving parts to maintain or replace, and a wide bi-directional measuring range.

- Wide range of measurable fluids, including water, brine, raw sewage, ethylene glycol, glycerin, and more...flexibility in commercial and industrial applications
- Bidirectional flow measurement...can measure forward flow, reverse flow, and net total
- No contact with fluid...safe from fouling and damage from system pressure
- Modbus RTU and BAcnet/IP communications available...easy integration with existing data collection systems
- Compact, rugged aluminum housing...long service in harsh environments
- Digital LCD...easy to read

Applications

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

Insert Meter, Small Diameter Impeller (SDI)

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

DESCRIPTION

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

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

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

APPLICATIONS

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

FEATURES

- NEMA 4 electronics housing...rugged and weather-proof
- Scaled pulse and 4-20mA output available
- Viton® O-ring seal...no leaks
- Stainless steel impeller, tungsten carbide shaft and polyamide-imide bearing... highly durable

FLOW

SPECIFICATIONS

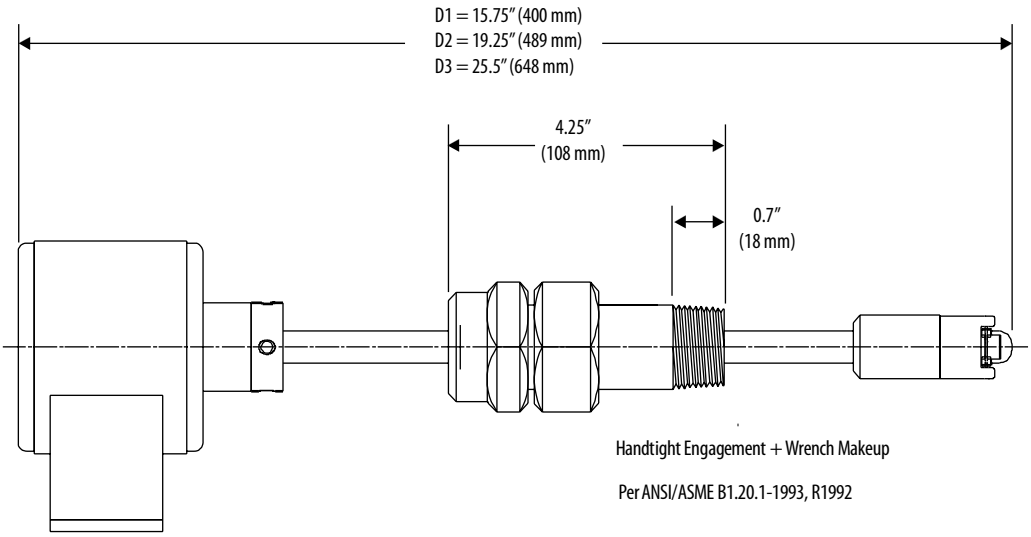
1 Year Warranty

Recommended Design Flow Range	0.3 to 20 ft./sec
Pressure Rating	1000 psi @ 21°C (70°F)
Maximum Temperature 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" dia and up
Accuracy	±1% of rate over optimum flow range*
Repeatability	±0.5%

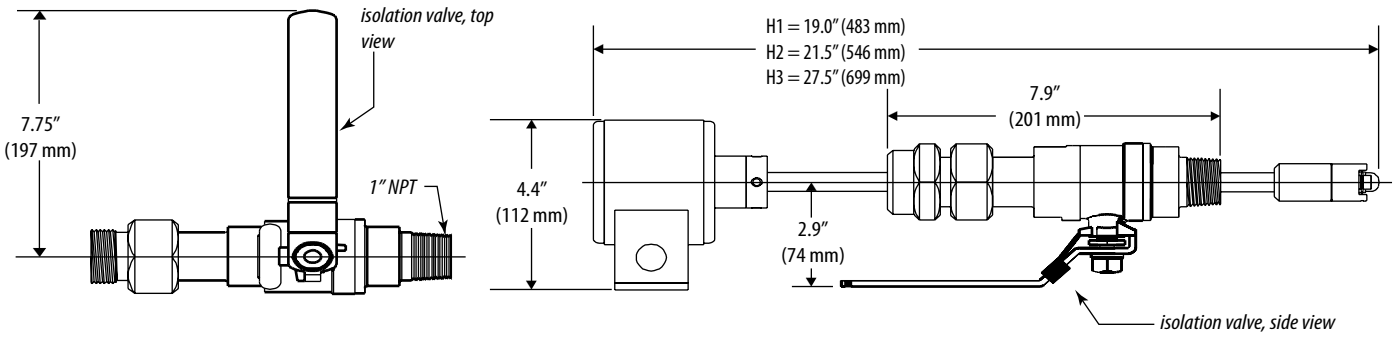
** ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.*

DIMENSIONAL DRAWINGS

SDI1D1N20-0200



SDI0H1N20-0200



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0020	**A301-20***	Flow, Programming Cable with CD for Badger/DI prod
U001-0021	**SDI0D1N10-0200**	Flow, SDI, SS, 1.5 to 10, 4-20mA, No Display
U001-0022	**SDI0H1N10-0200**	Flow, SDI, Hot Tap, SS, 1.5 to 10, 4-20mA, No Display
U001-0050	**A1027****	Flow, Tool, Hot Tap Adapter, 1" machine to 1" NPT
U001-0063	**SD10D1N00-0200**	Flow, SDI, SS, 1.5 to 10, Frequency, No Display
U001-0064	**SD10H1N00-0200**	Flow, SDI, SS, 1.5 to 10, Hot Tap, Frequency, No Display
U001-0149	**40134-0002***	Flow, Programming Data Converter with Cable and CD

** 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.*

Example:

SDI	1	D3	N	6	0	0	2	0	0

Other models available:

SDI [Material] [Type] [Electronic Housing] [Output] [Display] — [O-Ring] [Shaft] [Impeller] [Bearing]

Material
- **0** = Stainless Steel/ PPS plastic Tip
- **1** = Brass/PPS plastic Tip (no Hot Tap)
- **2** = Stainless Steel/ PEEK plastic Tip

Type
- **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

Electronic Housing
- **N** = NEMA 4X

Output
- **0** = Frequency (standard)
- **1** = Analog 4-20mA
- **2** = Scaled Pulse
- **5** = Bidirectional, analog, 4-20mA (hot tap SS only)
- **6** = Bidirectional, scaled pulse (hot tap SS only)

Display
- **0** = No Display
- **1** = LCD Option (requires output option 1 or 2)

O-Ring
- **0** = Viton® (standard)
- **1** = EDPM
- **2** = AFLAS®

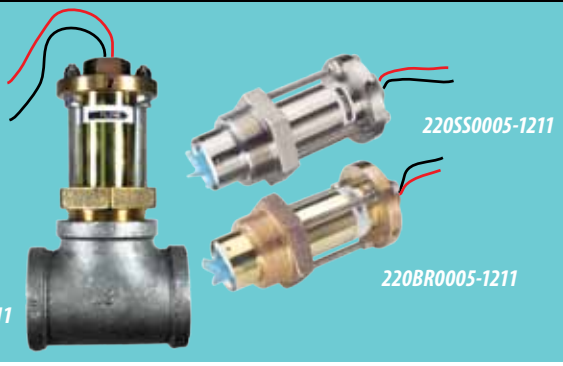
Shaft
- **0** = Zirconia Ceramic (optional)
- **1** = Hastelloy® C-276 (optional)
- **2** = Tungsten Carbide (standard)

Impeller
- **0** = Stainless Steel

Bearing
- **0** = Torion®

Insertion Meter, Standard Impeller

Ideal For Pipe Sizes 3" To Over 40"



DESCRIPTION

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 in indoor or protected areas.

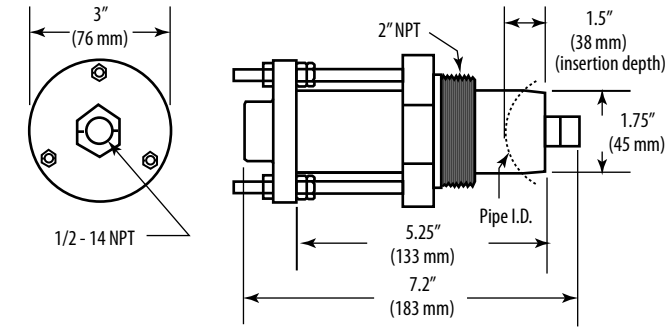
APPLICATIONS

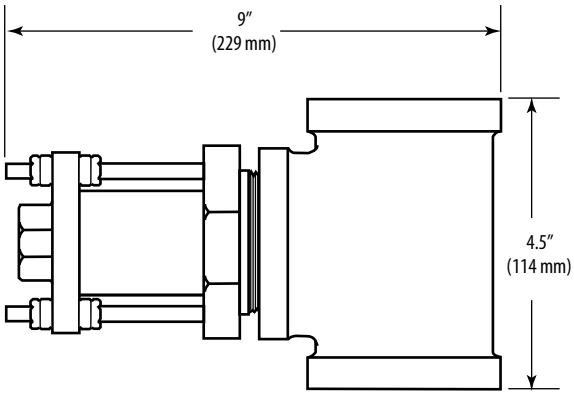
- Measuring liquid flow rates
- Accounting for total accumulated flow

FEATURES

- Six-bladed impeller design with a proprietary, non-magnetic sensing mechanism...high accuracy and repeatability
- Forward-swept impeller is less prone to fouling by water-borne debris...reliable performance with minimal downtime
- Signal can travel up to 2000 ft (609 m) between the sensor and the display unit without amplification
- Supplied with 20 ft (6 m) of 2-conductor 20-AWG UL type PTLC cable (105°C rated)
- Sensors of similar type are interchangeable...no need for recalibration after servicing or replacement...quick install and fast maintenance

DIMENSIONAL DRAWINGS





SPECIFICATIONS

1 Year Warranty

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 msec ±25%

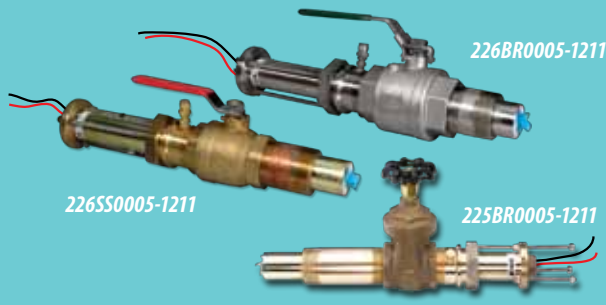
ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0001	**220BR0005-1211**	Flow, Sensor, Insert, Brass Sleeve, 3" to 40" (77 to 1016 mm) pipe
U001-0002	**220SS0005-1211**	Flow, Sensor, Insert, SS Sleeve, 3" to 40" (77 to 1016 mm) pipe
U001-0006	**228BR2005-1211**	Flow, Sensor, Insert, Bronze, 2" Bronze Tee
U001-0007	**228CB2005-1211**	Flow, Sensor, Insert, Bronze, 2" Iron Tee
U001-0025	**228BR2505-1211**	Flow, Sensor, Insert, Brass, 2.5" Bronze Tee
U001-0030	**228CB2505-1211**	Flow, Sensor, Insert, Brass, 2.5" Iron Tee
U001-0072	**228BR2004-0211**	Flow, Sensor, Insert, Brass, 2" FMCSA, Viton

VERIS INDUSTRIES

Insertion Meter, Standard Impeller, Hot Tap

Permits Service While System Is Pressurized



DESCRIPTION

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 Veris flow monitor or transmitter for a complete flow monitoring system.

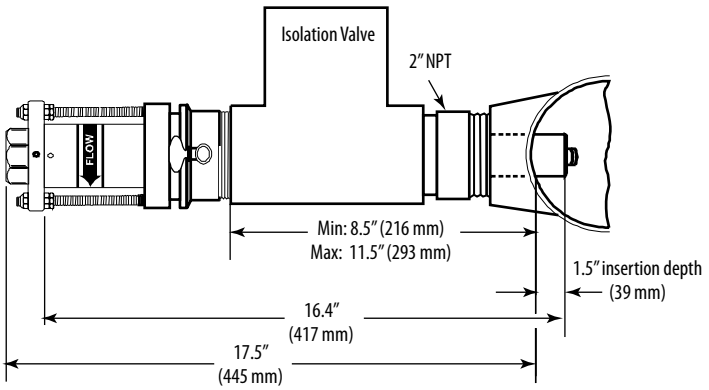
APPLICATIONS

- Measuring liquid flow rates
- Accounting for total accumulated flow

FEATURES

- Hot tap design for use in applications where the pipe cannot be drained for service after installation...reduce downtime for maintenance
- Six-bladed impeller design with a proprietary, non-magnetic sensing mechanism...high accuracy and repeatability
- Forward-swept impeller is less prone to fouling by water-borne debris...reliable performance with minimal downtime
- Signal can travel up to 2000 ft (609 m) between the sensor and the display unit without the need for amplification
- Supplied with 20 ft (6 m) of 2-conductor 20 AWG UL type PTLC cable (105°C rated)

DIMENSIONAL DRAWING



SPECIFICATIONS

1 Year Warranty

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 msec ±25%

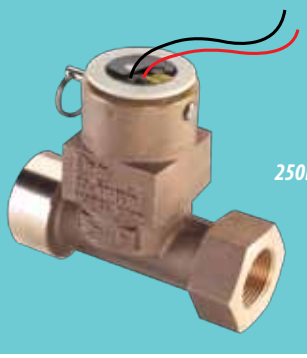
** ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.*

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

** If pipe is charged, HTT tool is required for insertion into 2" NPT hole.*

Tee Meter, Brass



For Pipe Sizes 1/2" To 1.5" NPT

DESCRIPTION

Metal tee-style liquid flow sensor with cast brass housing fits 1/2" to 1.5" NPT. These sensors are accurate, even at low flow rates. Use in conjunction with a Veris flow monitor or transmitter for a complete flow monitoring system.

APPLICATIONS

- Measuring liquid flow rates
- Accounting for total accumulated flow

FEATURES

- PPS electronics housing...highly durable
- Six-bladed impeller design with a proprietary, non-magnetic sensing mechanism...high accuracy and repeatability
- Forward-swept impeller is less prone to fouling by water-borne debris... reliable performance with minimal downtime
- Operation and repeatability even at low flow rates
- Signal can travel up to 2000 ft (609 m) between the sensor and the display unit without the need for amplification
- Supplied with 20 ft (6 m) of 2-conductor AWG 20 UL type PTLC cable (105°C rated)
- Sensors of similar type are interchangeable,...need for recalibration after servicing or replacement...quick install and fast maintenance

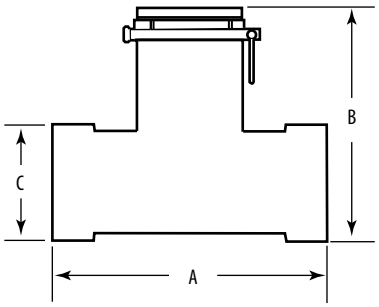
SPECIFICATIONS

1 Year Warranty

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

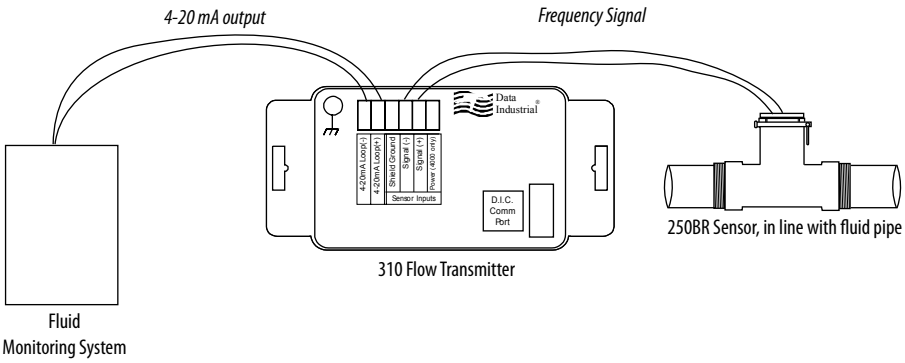
** ≥10 upstream and ≥5 downstream straight pipe diameters, uninterrupted flow.*

DIMENSIONAL DRAWING



Model U001-	A	B	C
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)

APPLICATION DIAGRAM

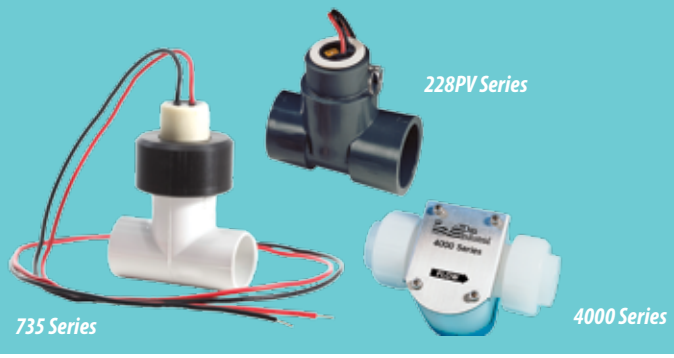


ORDERING INFORMATION

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

Tee Meter, Plastic

For Pipe Sizes 1/2" To 4"



DESCRIPTION

Plastic tee-style liquid flow sensors are designed for use in liquid systems employing plastic piping. Used in conjunction with a flow monitor or transmitter, these non-magnetic impeller sensors offer high accuracy in liquid flow measurement and total accumulated flow.

APPLICATIONS

- Measuring liquid flow rates
- Accounting for total accumulated flow
- Municipal and groundwater monitoring
- Submetering where flow rate is between 2 and 20 ft/sec. and temperature is below 43°C (110°F)

FEATURES

228PV Series Features

- Glass filled PPS plastic electronics housing...corrosion and impact resistant
- Tungsten carbide impeller shaft...long trouble-free life
- Electronics potted in an epoxy compound... prolonged immersion will not harm
- Schedule 80 PVC tee, solvent weld...durable
- 2 single-conductor, 48" 18 AWG leads...easy installation
- Handles flow rates from 0.5 ft/sec to 30 ft/sec with linearity of ±1% and repeatability of ±1%...accurate readings over whole flow range
- Available with 1-1/2", 2", 3", and 4" socket end connections... application flexibility

735 Series Features

- Low price...cost effective for tight budgets
- Handles flow rates from 2 ft/sec to 20 ft/sec
- 18 AWG solid copper with heads...durable
- Modified PVC tee with solvent weld socket end connections in sizes of 1/2", 3/4" and 1"...application flexibility

4000 Series Features

- 4-20 mA output, programmable in the field...compatible with standard control systems
- Low flow accuracy...measure flow rates as low as 0.25 ft/sec
- Superior particle shedding performance

SPECIFICATIONS

228PV Series:

Flow Range	0.5 to 30 ft/sec
Operating Temperature 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 msec ± 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 msec ± 25% output pulse width

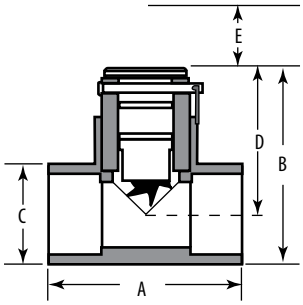
4000 Series:

Flow Range	Standard range: 1 to 20 ft/sec; low flow range: 0 to 20 ft/sec
Maximum Operating Temperature	PVC: 60°C (140°F); PVDF: 104°C (220°F)
Maximum Operating Pressure	PVC: 350 psi @ 60°C (140°F); PVDF: 275 psi @ 105°C (220°F)
Accuracy	<1%
Repeatability	±0.5%
Output	pulse or 4-20mA analog

DIMENSIONAL DRAWINGS

228PV Series

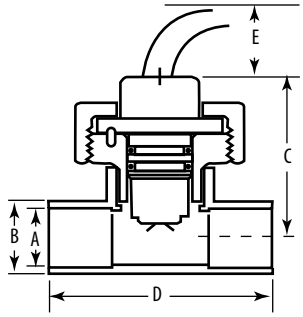
(minimum clearance for sensor removal)



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)

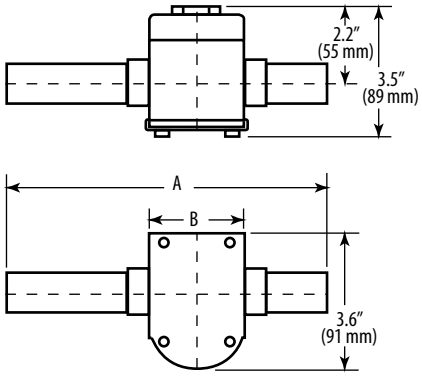
735 Series

(minimum clearance for sensor removal)



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



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)

FLOW

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0032	**402210-0021**	Flow, Sensor, PurH2O, PVC80, 1″, 4-20mA
U001-0033	**411210-0021**	Flow, Sensor, PurH2O, PVC80, 3/4″, 4-20mA
U001-0034	**400210-0021**	Flow, Sensor, PurH2O, PVC80, 1/2″, 4-20mA
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, PurH2O, PVC80, 3/4″, 4-20mA

Tee Meter, BTU System

METER & TEMPERATURE SENSORS ALL IN ONE PIECE!

380 Series

Measures Temperature And Flow Rate And Calculates Energy

DESCRIPTION

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).

FEATURES

- Rugged, compact design with two temperature probes
- 316 SS impeller with tungsten carbide shaft
- PEEK housing
- Cast bronze tee
- Minimal connections...simplify installation, saving time and cost
- Integration of flow and temperature sensors with metering components... single solution for metering
- BACnet and Modbus protocols are standard features...compatibility with existing control systems
- Multiple size options...installation flexibility

APPLICATIONS

- Energy management and data systems

FLOW

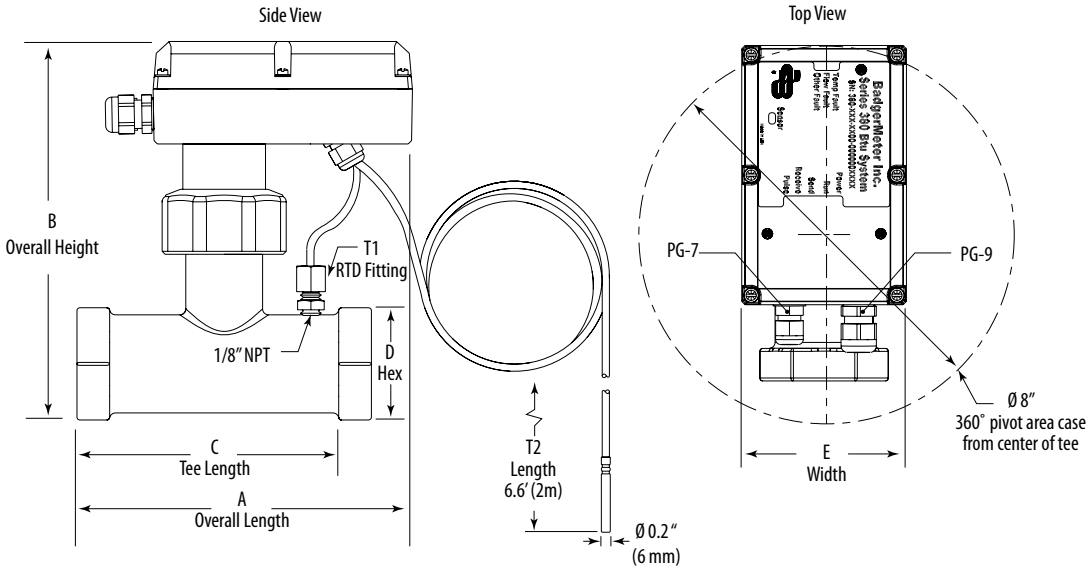
SPECIFICATIONS

1 Year Warranty

Input Power	12-35VDC/12-28VAC, 200mA
Communication	Modbus RTU, BACnet MSTP
Output	Scaled pulse, open drain
Flow Calculation Accuracy	±2% of flow rate within range; ±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	Chilled: -20° to 60°C (-4° to 140°F); Hot: 4° to 125°C (39° to 257°F)
Ambient Temperature	-20° to 65°C (-4° to 149°F)

VERIS INDUSTRIES

DIMENSIONAL DRAWINGS



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, ¾" 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 ¼" tee NPT, with pulse, Modbus and BACNet outputs	70
U001-0101	**380015000-1200*.****	BTU system, cold service, 1 ½" 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, ¾" 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 ¼" tee NPT, with pulse, Modbus and BACNet outputs	70
U001-0106	**380115000-2202****	BTU system, hot service, 1 ½" 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*

Monitor: Local Display, Output & BTU

Displays Flow Rate, Flow Total, and Energy

3000 Digital Flow Monitor

DESCRIPTION

3000 and 3050 Series digital flow monitors are designed for HVAC submetering applications. With panel and wall mounting options, these compact devices display flow rate and 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 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.

APPLICATIONS

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

FEATURES

- Provides a display of energy rate, energy total, flow rate, and total flow with user-configurable units for convenient viewing (U001-0015 only)
- Password-based access control for added security
- 2-line x 16-character backlit LCD for easy visibility
- Conforms to DIN 96 mm standard dimensions...compatible with existing panels and enclosures
- NEMA 4 rated front panel...durable
- Information stored in non-volatile memory...no power required for memory backup of calibration information, units of measure, and flow totals
- High level communication with optional USB, RS-485 Modbus, and BACnet/MSTP

SPECIFICATIONS

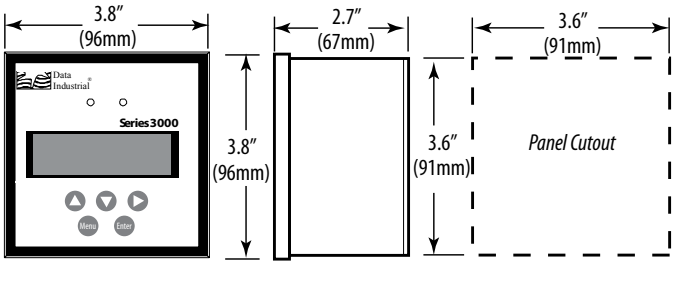
1 Year Warranty

Input Power	+12-24VDC/VAC; limits: 8-35VDC, 8-28VAC
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)
Maximum Sinking Current	150mA@+24VDC
Display	16 x 2 alphanumeric backlit LCD

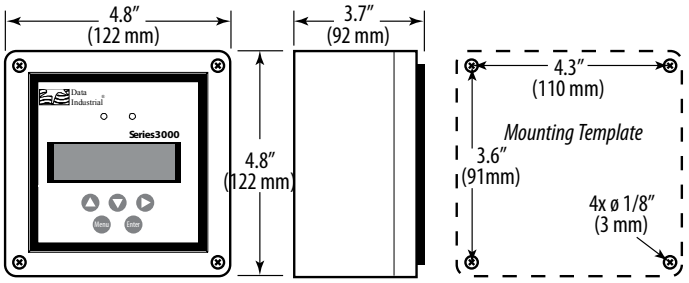
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

Panel Mount

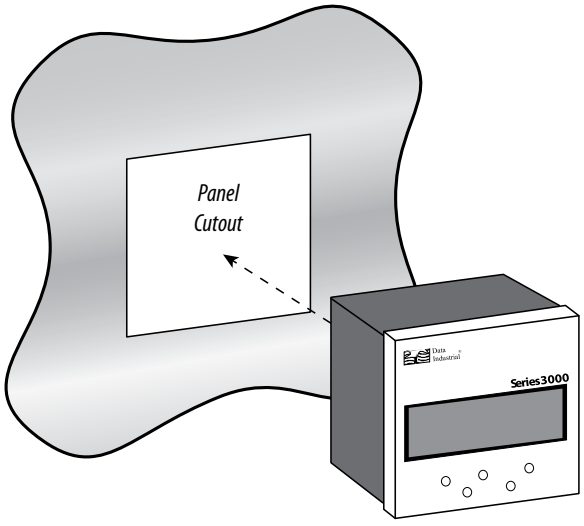


Wall Mount



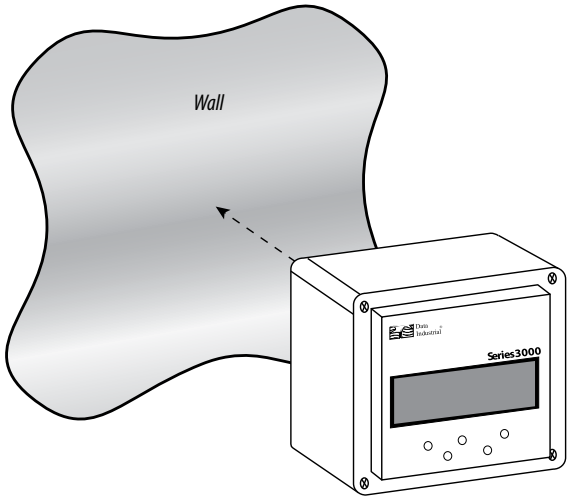
MOUNTING DIAGRAMS

Panel Mount



Insert monitor into panel cutout

Wall Mount



Mount monitor onto wall

FLOW

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.

Transmitter: Analog, BTU, Pulse and Protocol Output

Converts Flow Signal To A Linear 4-20mA Analog or a Protocol Signal

DESCRIPTION

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

FEATURES

- Programmable (units of measure, calibration, etc.) using computer with Windows™-based operating system...save installation time in the field by pre-programming the device
- Accepts sine wave input from a variety of other sources for application flexibility
- Compact size...saves space in crowded enclosures
- Communication protocols available on the 340 models

APPLICATIONS

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

FLOW

310 SPECIFICATIONS

1 Year Warranty

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

320 SPECIFICATIONS

Power Requirements	12-30VACm 85mA max.; 12-40VDC, 30mA max.; Reverse and over voltage protected to 40VDC
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 msec to 1.0 sec pulse output width in 50 msec increments
Maximum Sinking Current	100mA@36VDC
Operating Temperature Range	-29° to 70°C (-20° to 158°F)
Storage Temperature Range	-40° to 85°C (-40° to 185°F)

340 SPECIFICATIONS

Power Requirements	12-24VDC or 12-24VAC, 70mA max.
Flow Sensor Input	Excitation voltage 3-wire sensors: 9.1VDC 500Ω source impedance
Frequency	4-10000 Hz
Temperature Sensor Input	10k Dale Thermistor (requires 2, sold separately)
Operating Temperature Range	-29° to 70°C (-20° to 158°F)
Storage Temperature Range	-40° to 85°C (-40° to 185°F)

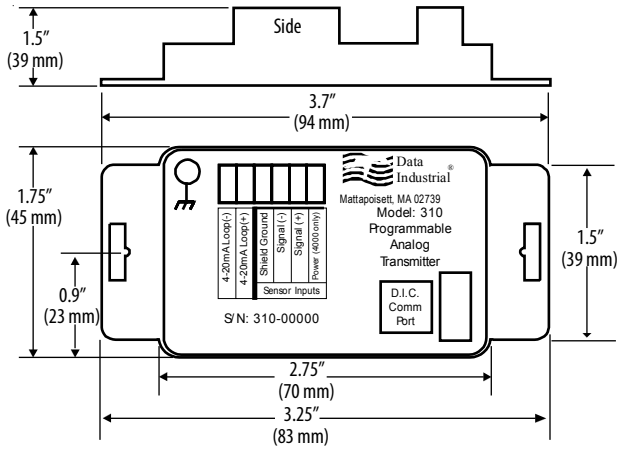
Units of Measure:

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

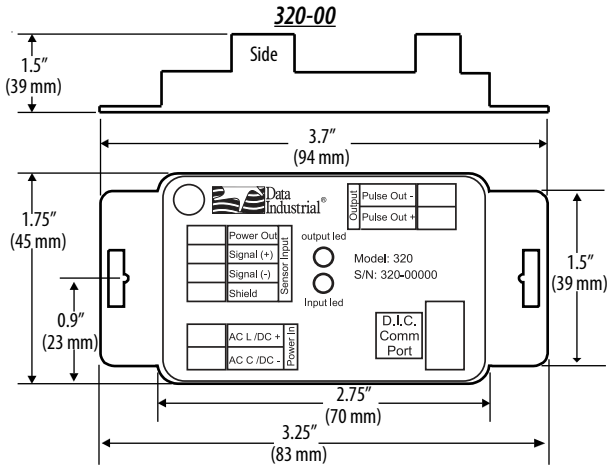
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

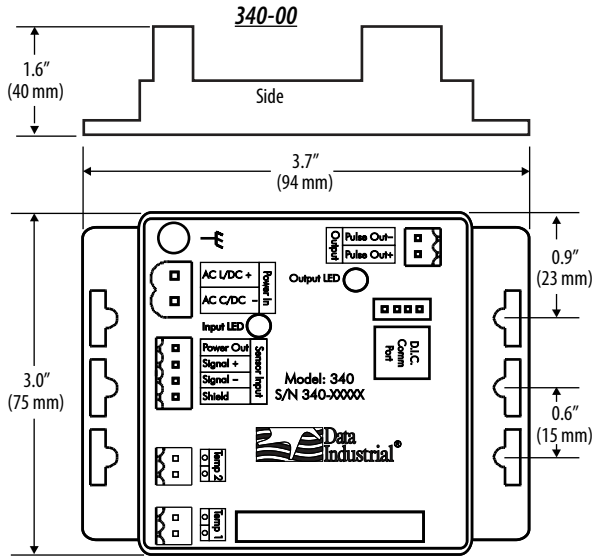
310-00



320-00



340-00



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U001-0013	**310-00***	Flow Transmitter, Analog, Programmable, 4-20mA 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, 4-20mA, DIN mounting
U001-0038	**340N2-02****	Flow Transmitter, BTU, Analog, Programmable, N2 output, metal enclosure
U001-0042	**310-01***	Flow Transmitter, Analog, 4-20mA, 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

Other models available:

Model ☐

- **310** = Analog
- **320** = Pulse
- **340** = BTU
- **340N2** = BTU; N2 protocol
- **340BN/MB** = BTU; Bacnet and Modbus protocol
- **340LW** = BTU; LonWorks

Options ☐

- **00** = Transmitter only
- **01** = NEMA 4 enclosure (310, 320 only)
- **02** = Metal weathertight enclosure
- **03** = Plastic weathertight enclosure
- **04** = DIN rail mounting clips

Example:

340 | 02

** 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.*

Electromagnetic (Mag) Meter

Measure Fluid Flow In Wastewater And Slurries

Electromagnetic Series

DESCRIPTION

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 ensures durability.

APPLICATIONS

- Monitoring flow in systems likely to contain solids

FEATURES

- Open flow tube design...no head loss, no moving parts to fail
- Works with most solids common in liquid systems...great for well water and reclaimed water systems...not fouled by sand, gravel, or debris
- Bi-directional flow measurement capability...suitable for inter-city billing
- Password protection...protect against unwanted program changes
- Wide flow range...exceeds operating characteristics of turbine and propeller meters
- 0.25% accuracy independent of fluid viscosity, density, and temperature
- Corrosion resistant liners...ensures long life
- Rubber or PTFE lined...application flexibility
- Electronics (head) can be mounted remotely...added control options

FLOW

SPECIFICATIONS

1 Year Warranty

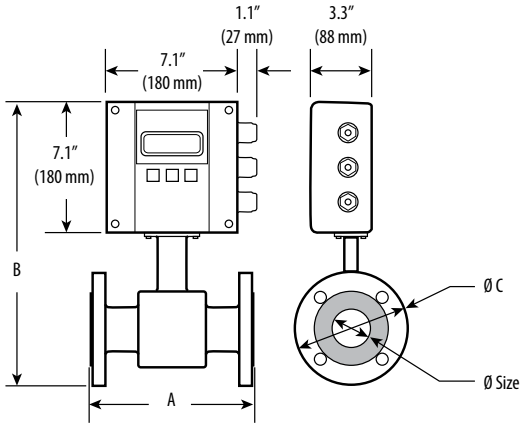
Flow Range	0.1 to 39.4 fps (0.03 to 12 m/s)
Maximum Operating Pressure	150 psi
Accuracy	±0.25% of rate for velocities greater than 1.64 fps (0.50 m/s); ±0.004 fps (±0.001 m/s) for velocities less than 1.64 fps (0.50 m/s)
Repeatability	±0.1%
Analog Outputs	4-20mA, 0-20mA, 0-10mA, 2-10mA (programmable and scalable) Voltage sourced 24VDC (isolated); max. loop resistance < 800 Ω
Digital Outputs	Four total, configurable 24VDC sourcing active output (up to two), 100mA total, 50mA each; sinking open collector output (up to four), 30VDC max., 100mA each; AC solid-state relay (up to two), 48VAC, 500mA max.
Pulse Outputs	Scalable up to 10 kHz, passive open collector up to 10 kHz, active switched 24VDC Up to two outputs (forward and reverse) Pulse width programmable from 1-1100 msec or 50% duty cycle
Minimum Fluid Conductivity	5.0 µΩ/cm
Flow Direction	Unidirectional or bidirectional, 2 separate totalizers (programmable)
Coil Power	Pulsed DC
Minimum Conductivity	≥5 µΩ/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 and hard rubber from 1" thru 54"
NSF Listed	Models with hard rubber liner 4" size and up; Models with PTFE liner all sizes
Fluid Temperature	With remote amplifier: PFA, PTFE, 155°C (311°F) With Meter Mounted Amplifier: Rubber 80°C (178°F); PFA, PTFE 100°C (212°F)
Pipe Spool Material	316 stainless steel
Meter Housing Material	Carbon steel welded
Flanges	Standard (ANSI B16.5 Class 150 RF): carbon steel; Optional: 316 stainless steel
Meter Enclosure Classification	NEMA 4X (IP66); Optional: Submersible NEMA 6P (remote amplifier required)
Junction Box Enclosure Protection	For remote amplifier option: powder coated die-cast aluminum, NEMA 4 (IP65)
Cable Entries	½" NPT cord grip
Optional Stainless Steel Grounding Ring Thickness	For meter sizes up to 10": 0.135" thickness per ring; For meter sizes above 10": 0.187" thickness per ring

Power Supply:

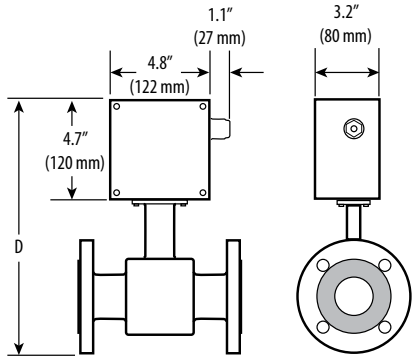
AC	85-265VAC; typical power: 20VA or 15W; max. power: 26VA or 20W
DC (optional)	10-36VDC; Typical power: 10W; max. power: 14W

VERIS INDUSTRIES

DIMENSIONAL DRAWINGS



Meter with M2000 amplifier



Meter with junction box for remote M2000 amplifier

Size		A		B		C		D		Est. Weight with M-2000		Flow Range LPM		Flow Range GPM	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lb	kg	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

MODEL	MANUF. PART #	DESCRIPTION
U001-0067	**M-2000 Electromagnetic 4″**	Flow, Mag, 4″, H-rubb, Flg, w-amp
U001-0068	**M-2000 Electromagnetic 6″**	Flow, Mag, 6″, H-rubb, Flg, w-amp
U001-0069	**Gnd Rng Electromagnetic SS 4″**	Flow, Acc, Grounding Ring, Mag, SS, 4″
U001-0070	**Gnd Rng Electromagnetic SS 6″**	Flow, Acc, Grounding Ring, Mag, SS, 6″
U001-0079	**M-2000 Electromagnetic 6″ PTFE**	Flow, Mag, 6″, PFT-2E, Flg, w-amp
U001-0080	**M-2000 Electromagnetic 14″**	Flow, Mag, 14″, H-Rubb, Flg, w-amp
U001-0081	**Gnd Rng Electromagnetic SS 14″**	Flow, Acc, Grounding Ring, Mag, SS, 14″
U001-0082	**Junction Box Mag Meter**	Flow, Acc, Junction Box-Remote, Mag Meter
U001-0083	**Remote Cable 30 feet**	Flow, Acc, Remote-Cable, 30′, Mag Meter
U001-0084	**Remote Cable 50 feet**	Flow, Acc, Remote-Cable, 50′, Mag Meter

ACCESSORIES (for Remote Monitoring)

Grounding Rings (recommended for all meters)
Junction Box with Cable: Specify cable length: 15 feet (5 m); 30 feet (10 m); 50 feet (16 m); 100 feet (31 m); 150 feet (46 m); 300 feet (61 m); 350 feet (107 m); 400 feet (122 m); 500 feet (153 m); Custom lengths: min. 3 feet (1 m)

Other models available:

Size

1/4″ (6 mm)
5/16″ (8 mm)
3/8″ (10 mm)
1/2″ (15 mm)
3/4″ (20 mm)
1″ (25 mm)
1 1/4″ (32 mm)
1 1/2″ (40 mm)
2″ (50 mm)
2 1/2″ (65 mm)
3″ (80 mm)
4″ (100 mm)
5″ (125 mm)
6″ (150 mm)
8″ (200 mm)
10″ (250 mm)
12″ (300 mm)
14″ (350 mm)
16″ (400 mm)
18″ (450 mm)
20″ (500 mm)
22″ (550 mm)
24″ (600 mm)
28″ (700 mm)
30″ (750 mm)
32″ (800 mm)
36″ (900 mm)
40″ (1000 mm)
42″ (1050 mm)
48″ (1200 mm)
54″ (1400 mm)

Liner Material

Rubber, 1″ thru 54″
PTFE, 1/2″ thru 24″
PFA, 1/4″ thru 3/8″

Flange

316 stainless steel (standard)
300# cast steel

Grounding Ring

optional, but recommended

Example:

3″ meter, rubber liner, 316 stainless steel, with grounding rings

Nutating Disc Meter

Cost-Effective Metering for Industrial Applications

Model 170 (shown with optional test port)

DESCRIPTION

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 spin. This motion is sensed by a magnet, which transmits flow data.

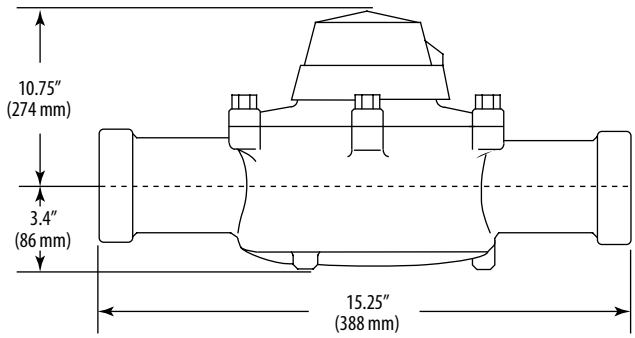
FEATURES

- Wide flow range...increased accuracy at high and low flow rates
- Rugged bronze or plastic construction
- Easily maintained with no need to remove from the line...reduce costly downtime
- Durable components...minimal maintenance required
- Mechanical dial display...easy operation
- Optional pulse output transmitter...added versatility

APPLICATIONS

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

DIMENSIONAL DRAWING



SPECIFICATIONS

1 Year Warranty

Maximum Flow Rate	170 GPM
Maximum Operating Pressure	150 psi
Maximum Operating Temperature	49°C (120°F)
Operating Temperature Range	0° to 49°C (32° to 120°F)
Accuracy	±1.5% of full scale
Repeatability	±0.5%
Wetted Materials	Brass, SAN, Noryl, Nylon, Polyethylene, Polypropylene

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U015-0001	**170 Bronze**	Flow, Sensor, RCDL, 170 Bronze, 2"
U015-0002	**RCDL 170 Connection Rings**	Accy, RCDL Connection Rings, 2"
U015-0003	**RCDL RTR**	Accy, Scaled Pulse Totalizer, Use with RCDL
U015-0004	**PFT-2E**	Flow, Transmitter, Disk, Unscaled Pulse
U015-0005	**RCDL 35 Bronze**	Flow, Sensor, RCDL, 35 Bronze 3/4 in.
U015-0006	**RCDL 35 Connection Rings**	Accy, RCDL Connection Rings, 3/4 in.
U015-0007	**RCDL 70 Bronze**	Flow, Sensor, RCDL, 70 Bronze, 1 in.
U015-0008	**RCDL 70 Connection Rings**	Accy, RCDL Connection Rings, 1 in.

Also Available in 5/8" and 1-1/2" sizes. Call for more information.

Turbine Meter

For Pipe Sizes 2", 3", 4", and 6"

Model 450

DESCRIPTION

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.

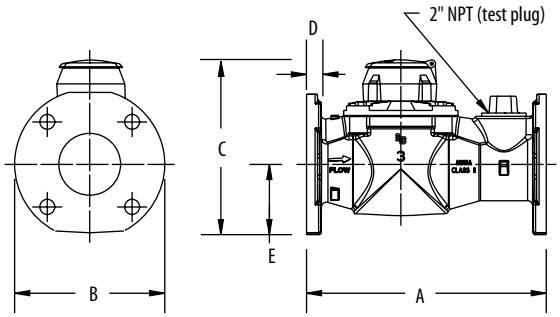
APPLICATIONS

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

FEATURES

- Long lasting ceramic bearings
- Easy to service in-line...minimize downtime
- Suitable for a wide flow range...application flexibility
- Direct drive mechanism...highest low flow sensitivity
- Ideal where continuous service and minimal maintenance are required
- Mechanical dial display...easy operation
- Optional pulse output transmitter...added versatility

DIMENSIONAL DRAWING



	450 (3" pipe)	1000 (4" pipe)
A	12.0" (305 mm)	14.0" (356 mm)
B	7.5" (191 mm)	9.0" (229 mm)
C	8.7" (220 mm)	9.7" (245 mm)
D	0.75" (19 mm)	0.8" (21 mm)
E	3.4" (85 mm)	4.3" (109 mm)

SPECIFICATIONS

1 Year Warranty

Flow Range	450: 5-450 GPM; 1000: 10-1000 GPM (continuous)
Maximum Operating Pressure	150 psi
Maximum Operating Temperature	49°C (120°F)
Accuracy	±1.5% of full scale
Repeatability	±0.5%

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U014-0001	**450, Recordall Turbo Model**	Flow, Sensor, Turbo-450, Inline, Bronze,RndFlng
U014-0002	**1000, Recordall Turbo Model**	Flow, Sensor, Turbo-1000, Inline, Bronze,RndFlng
U014-0003	**RTR**	Flow, Transmitter, Fixed Pulse with Totalizer
U014-0004	**Connectors, Recordall Turbo, 450**	Flow, Acc, 3 in, Connections, Cast Iron
U014-0005	**Connectors, Recordall Turbo, 1000**	Flow, Acc, 4 in, Connections, Cast Iron

VERIS INDUSTRIES

Ultrasonic Flow and Energy BTU Meter

Accurate Readings From Outside the Pipe

DESCRIPTION

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 bidirectional measuring range that ensures 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 versions. 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.

APPLICATIONS

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

FEATURES

- Wide range of measurable fluids, including water, brine, raw sewage, ethylene glycol, glycerin, and more...flexibility in commercial and industrial applications
- Bidirectional flow measurement...can measure forward flow, reverse flow, and net total
- No contact with fluid...safe from fouling and damage from system pressure
- Modbus RTU and BAcnet/IP communications available...easy integration with existing data collection systems
- Compact, rugged aluminum housing...long service in harsh environments
- Digital LCD...easy to read
- Universal AC or DC power with clamp-on or insertion temperature sensors and numerous measurement unit choices...lots of flexibility
- Factory programming included using a web-based tool at time of ordering (www.veris.com)...save time in installation

FLOW

SPECIFICATIONS

1 Year Warranty

System:

Velocity Range	All models: Bidirectional flow; **FST1, FST2, FST3:** 2 to 40 FPS (0.6 to 12.1 MPS); **FST4, FST5:** 1 to 40 FPS (0.3 to 12.1 MPS)
Flow Accuracy	**FST4, FST5:** 1% of reading at rates > 1 FPS (0.3 MPS); within 0.01 FPS (0.003 MPS) at lower rates **FST1, FST2, FST3, 1" and larger units:** 1% of reading from 4-40 FPS (1.2-12 MPS); ± 0.04 FPS (0.012 MPS) at rates < 4 FPS 91.2-12 MPS) **FST1, FST2, FST3, units smaller than 1":** 1% of full scale
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, 95-264VAC, 47-63 Hz at 17VA max.; DC: auto-reset fuse, 10-28VDC at 5.0W, reverse polarity and transient supression protected
Display	2 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), 0-95% RH (noncondensing)
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

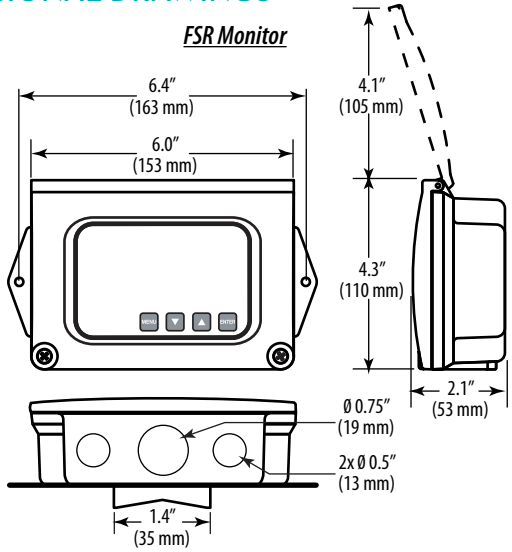
Transducers:

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

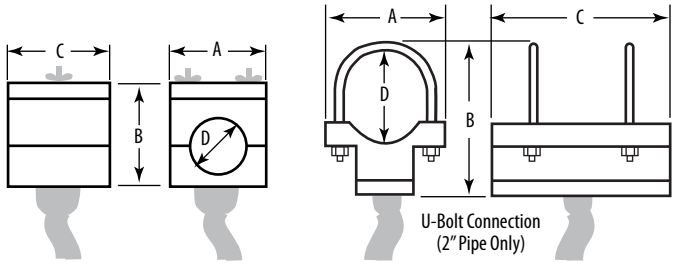
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

FSR Monitor



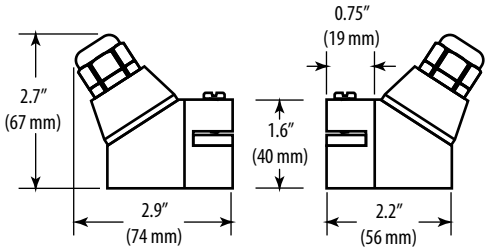
FST1, FST2, FST3 Transducers



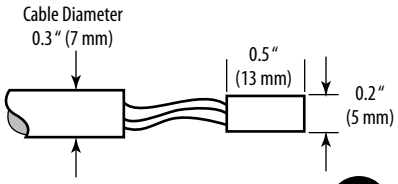
Pipe Size	Pipe Material	A	B	C	D
1/2″	ANSI	2.46″ (63 mm)	2.36″ (60 mm)	2.66″ (68 mm)	0.840 (22 mm)
	Copper	2.46″ (63 mm)	2.36″ (60 mm)	3.33″ (85 mm)	0.625″ (16 mm)
	Tubing	2.46″ (63 mm)	2.28″ (58 mm)	3.33″ (85 mm)	0.500″ (13 mm)
3/4″	ANSI	2.46″ (63 mm)	2.57″ (66 mm)	2.66″ (68 mm)	1.050″ (27 mm)
	Copper	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″ (U-bolt only)	ANSI	3.71″ (95 mm)	3.42″ (87 mm)	5.50″ (140 mm)	2.375″ (61 mm) *
	Copper	3.71″ (95 mm)	3.38″ (86 mm)	5.50″ (140 mm)	2.125″ (54 mm) *
	Tubing	3.21″ (82 mm)	3.85″ (98 mm)	4.75″ (121 mm)	2.000″ (51 mm) *

** Varies due to U-bolt feature*

FST4, FST5 Transducer



Clamp-On RTD Temperature Sensor



Electrical and Hazardous Location Safety E112904

ORDERING INFORMATION

Monitors:

Type	Power		Output	
FSR [ ]	[ ]	K	[ ]	X
1 = Flow Meter **2** = Energy/BTU Meter	**A** = AC, 95-264 V **D** = DC		**1** = Analog 4-20mA, Modbus, frequency or temperature * **2** = 10/100 Base-T, ethernet, BACnet, Modbus, TCP-IP	

Energy/BTU Included Temp. Sensor

Temp. Sensor Cable Length	Temp. Sensor Type
[ ]	[ ]
02 = 20 ft. (6.1 m) **05** = 50 ft. (15.2 m) ** **10** = 100 ft. (30.4 m) **	**A** = Clamp-on RTD **B** = Insertion RTD

Transducers:

Pipe Type	Pipe Size	Cable Length
FST [ ]	[ ]	020
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″	= 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).*
*** Call for availability.*
† Works with most pipe materials. See website for details.
‡ Call for other length options.

Pipe Type	Pipe Size	Cable Length
FST [ ]	A	020
4 = most materials 2″ to 24″ **5** = most materials >24″	= greater than 2″ †	= 20 ft. (6.1 m) ‡

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

ACCESSORIES

PART #	DESCRIPTION
FSA001	Kit, software CD, Veris Ultrasonic, USB
FSA002	Acc, Flow, US, transducer coupling grease, 5.3 oz.
FSA003	Acc, Flow, US, kit, 200°C temperature clamp, 1k RTD, 20 ft. lead
FSA004	Acc, Flow, US, kit, 200°C temperature clamp, 1k RTD, 50 ft. lead
FSA005	Acc, Flow, US, kit, 200°C temperature clamp, 1k RTD, 100 ft. lead
FSA006	Acc, Flow, US, kit, 200°C temperature insert, 3 x 1/4, 1k RTD 20
FSA007	Acc, Flow, US,Extra heat sink grease, 4 g
FSA008	Acc, Flow, US, temperature clamp tape, 6 ft.
FSA009	Acc, Flow, US, connector, RTD replacement
FSA010	Acc, Flow, US, kit, 200°C temperature insert, 3 x 1/4, 1k RTD 50
PS24 - 7.5W	Power Supply, 24VDC, 7.5W

FLOW

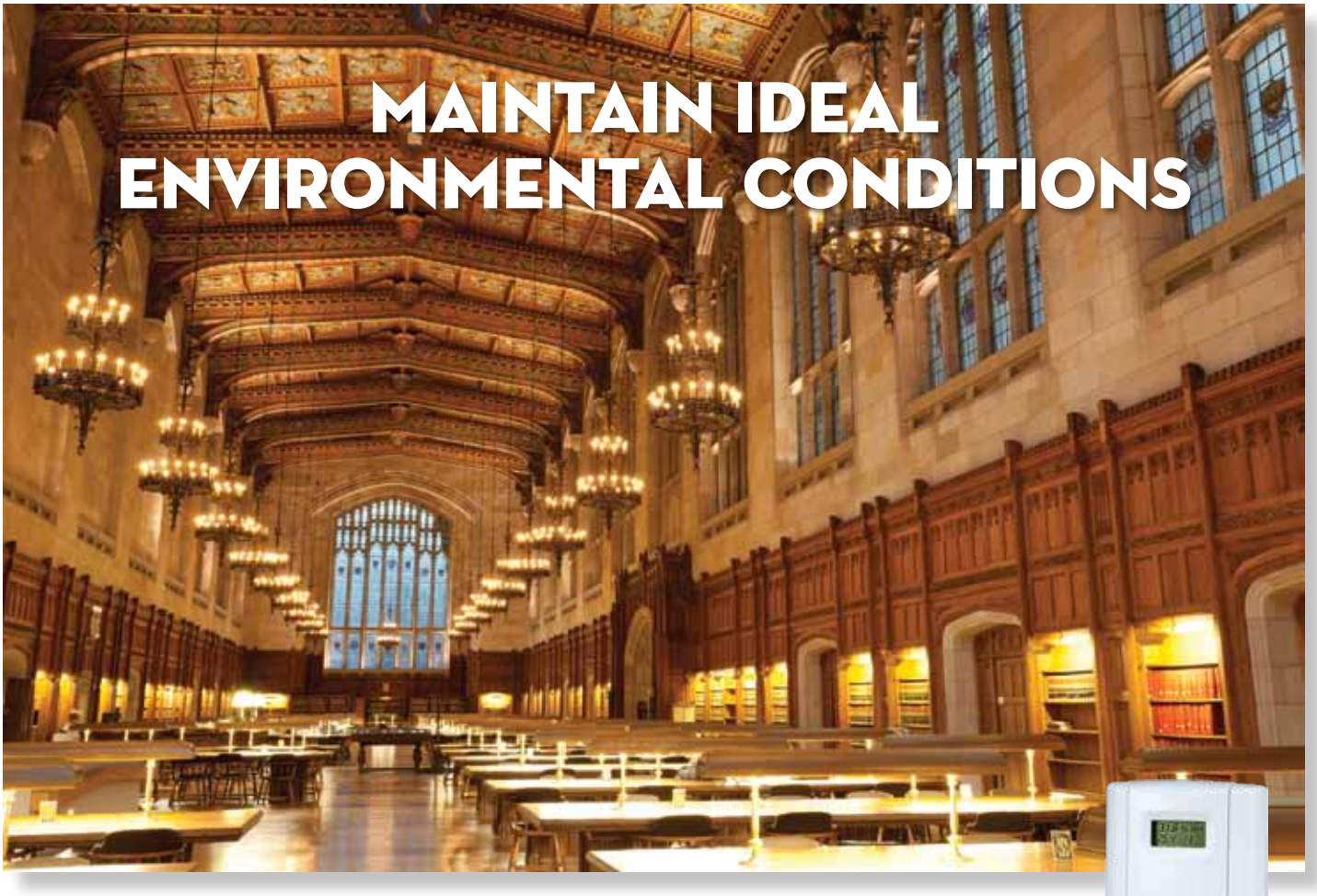
Humidity Contents

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	114
HWL	Deluxe Wall Humidity Sensors	116
HWLP	Deluxe Wall Humidity Sensors with Protocol Output	118
HED	Standard Duct Humidity Sensors	120
HEW	Standard Wall Humidity Sensors	122
HN/HP	Specialty Type Humidity Sensors	124
HS	Replaceable Humidity Element	126
Accessories		323

Humidity Sensor Selection Guide

FEATURES/OPTIONS	Wall Mount	Duct Mount	Outdoor Mount	Probe
Analog Output	HEW page 122	HD, HED pages 114, 120	HO page 114	HN/HP page 124
Protocol Communication	HWLP page 118			
NIST Traceable Accuracy down to 1%	HWL page 116	HD page 114	HO page 114	HN/HP page 124
Resistive Temperature Sensing	HWL page 116	HD page 114	HO page 114	HN/HP page 124
LCD Display	HWL, HWLP pages 116, 118			



MAINTAIN IDEAL ENVIRONMENTAL CONDITIONS

HUMIDITY

HW Protocol

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

- Embedded BACnet and Modbus communications protocols.
- Configurable to multiple baud rates
- Humidity, and temperature sensors in one device at one address – provides more information

HED & HEW – Designed for the Bid Spec Market

The HED and HEW Series 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. The sensors also offer a temperature sensing option.

- Monitor humidity and temperature with a single device
- Semiconductor, temperature transmitter, or popular thermistor/RTD sensors available
- Easy to install, discrete housings

COMING SOON! Aerospond™ HWX and TWX Wireless Sensors

- Individual or combination humidity and temperature sensors
- Low power Wi-Fi communication
- Direct integration into a Tridium/JACE controller, no need for gateway
- Up to 5 year battery life

VERIS INDUSTRIES™

Deluxe Duct & Outdoor Humidity Sensors

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

DESCRIPTION

HD and HO 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 models come with a standard five-year warranty.

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

FEATURES

- Thin-film capacitive sensor element recovers from 100% saturation
- Fully interchangeable element to 1%, 2%, 3%, or 5% accuracy...no calibration (1% not available on HO models)
- Replace element in the field...maintain accuracy and minimize downtime
- Duct sensor element can be serviced without disturbing conduit
- Polarity insensitive two-wire 4-20mA or 3-wire 0-5/0-10VDC versions...flexible systems compatibity
- Potted circuitry prevents costly condensate shorts
- Calibration-free interchangeable NIST traceable HS element
- HS element is microprocessor profiled with on-board nonvolatile memory
- Multi-point digital calibration to NIST standards
- NIST certification available
- Minimizes field calibration downtime

HUMIDITY

SPECIFICATIONS

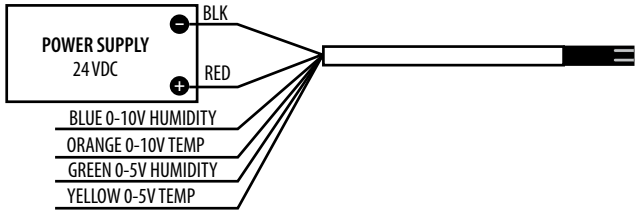
5 Year Warranty

*Input Power:**	
Voltage Model	12-30VDC/24VAC, 15mA max.
mA Model	Loop powered 12-30VDC only, 30mA max.
Output Power:	
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**	±1% (HD only), 2%, 3%, or 5% (specify); multi-point calibration, NIST traceable
Temperature Effect, Duct Model	±0.1% RH/°C above or below 25°C (typical)
Temperature Effect, Outdoor Model	4-20mA version: (0.0013x%RHx(T°C-25)); 0-5 V/0-10V versions: (0.0015x%RHx(T°C-25))–(%RHx0.0008xabs(T°C-25))
Scaling	0-100% RH
Hysteresis	1.5% typical
Linearity	Included in accuracy spec.
Reset Rate***	24 hours
Stability	±1%@20°C (68°F) annually, for two years
Temperature:	
Optional Temperature Transmitter Output	Digital, 4-20mA (clipped and capped) or 0-5V/0-10V 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 noncondensing
Operating Temperature Range	-40° to 50°C (-40° to 122°F)

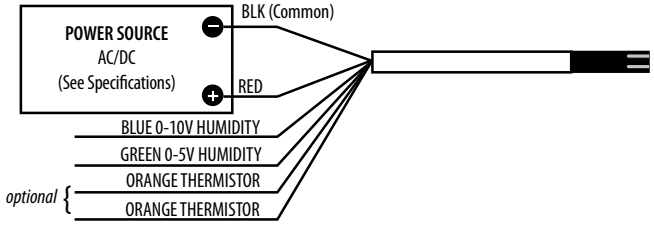
† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.
** One side of transformer secondary is connected to signal common, so an Isolation transformer or dedicated power supply may be required.*
*** Specified accuracy with 24VDC supplied power with rising 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 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).

APPLICATION/WIRING DIAGRAMS

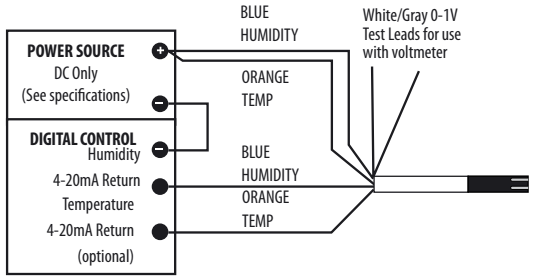
HD/HO 0–5V/0–10V Temperature Transmitter Versions



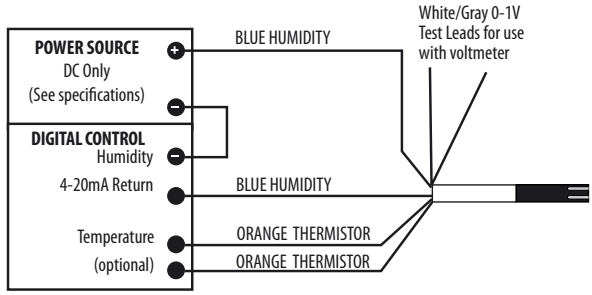
HO (0–5V/0–10V Resistance Versions)



HD/HO 4-20mA Temperature Transmitter Versions

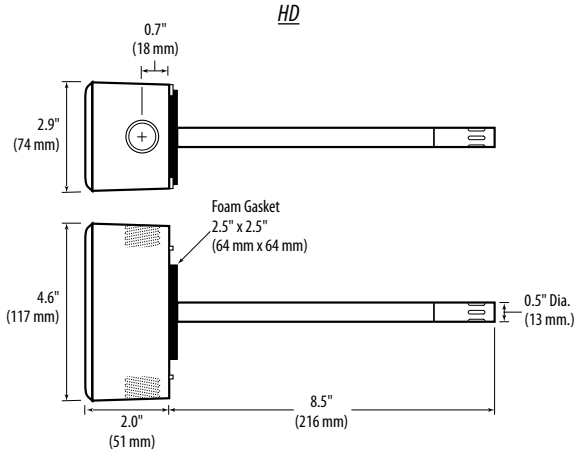


HO 4-20mA Resistance Versions

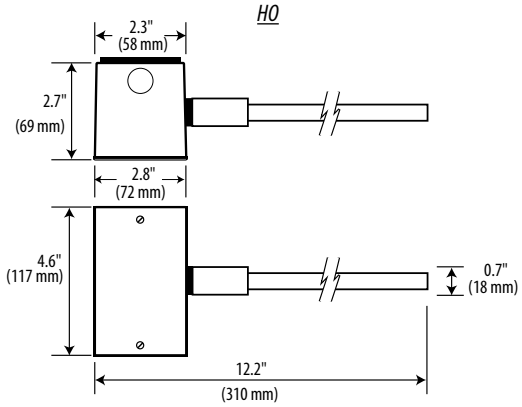


DIMENSIONAL DRAWINGS

HD



HO



ORDERING INFORMATION

CE *Available*

Enclosure — H [ ]
- **D** = RH Duct
- **O** = Outdoor

Accuracy [ ]
- **1** = 1%
- **2** = 2%
- **3** = 3%
- **5** = 5%
- (1% not available on HO)

NIST [ ]
- **N** = NIST 1% & 2% only
- **X** = None 2%, 3%, 5% only

Output [ ]
- **M** = 4-20mA
- **V** = 0-5V/0-10VDC

US or EU [ ]
- **S** = Standard
- **C** = CE

Temp. [ ]
- **T** = Temp
- **X** = No Temp (Stop here)

Humidity Transmitter Combination

Sensor Type [A]
- = Transmitter

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

OPTION Temp Cert [ ]
- **Blank** = None
- **1** =1pt Cal
- **2** = 2pt Cal

Humidity RTD/Thermistor Combination

Sensor Type [ ]
- **B** = 100R Platinum, RTD
- **C** = 1k Platinum, RTD
- **D** = 10k T2, Thermistor
- **E** = 2.2k, Thermistor
- **F** = 3k, Thermistor
- **G** = 10k CPC, Thermistor
- **H** = 10k T3, Thermistor
- **J** = 10k Dale, Thermistor
- **K** = 10k with 11k shunt, Thermistor
- **M** = 20k NTC, Thermistor
- **N** = 1800 ohm TAC, Thermistor
- **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
- **Z** = 10k E1, Thermistor

OPTION Temp Cert [ ]
- **Blank** = None
- **1** =1pt Cal
- **2** = 2pt Cal

Example: (No Temp)

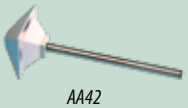
H [0] [2] [X] [M] [S] [X]

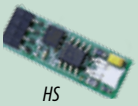
Example: (With Temp)

H [D] [2] [N] [V] [C] [T] [C] [2]

ACCESSORIES

Water guard (AA42)
Replacement humidity element (HS)


AA42


HS

Deluxe Wall Humidity Sensors

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

HWL

DESCRIPTION

HW 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.

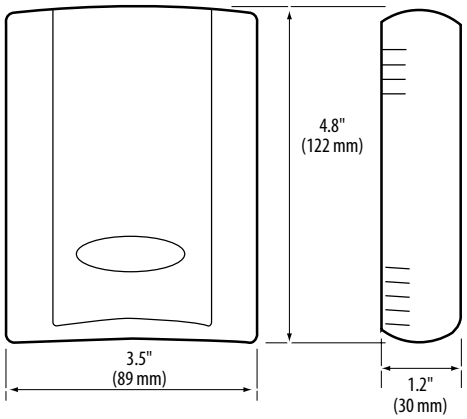
APPLICATIONS

- 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

FEATURES

- Thin-film capacitive sensor element recovers from 100% saturation
- Fully interchangeable element to 1%, 2%, 3%, or 5% accuracy...no calibration
- Replace element in the field...maintain accuracy and minimize downtime
- Polarity insensitive, two-wire 4-20 mA or 3-wire 0-5/0-10 VDC versions... flexible systems compatibity...save time in the field and stock fewer devices
- Calibration-free interchangeable NIST traceable HS element
- HS element is microprocessor profiled with on-board nonvolatile memory
- Multi-point digital calibration to NIST standards
- NIST certification available
- Minimizes field calibration downtime

DIMENSIONAL DRAWING



SPECIFICATIONS

5 Year Warranty

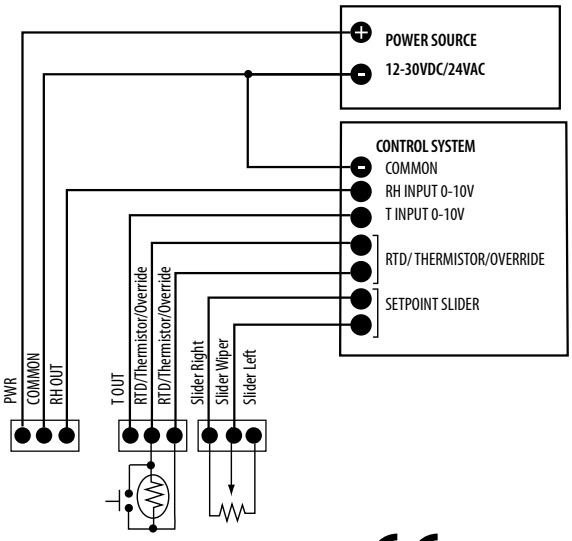
HS Element	Digitally profiled thin-film capacitive (32 bit mathematics) U.S. Patent 5,844,138†
Accuracy at 25°C from 10-80% RH*	±2%, 3%, or 5% models; ±1% at 12-60% RH in voltage output mode; ±1% at 12-60% RH in mA output mode with temp transmitter; ±1% at 20-40% RH in mA output mode; (multi-point calibration, NIST traceable)
Reset Rate**	24 hours
Stability	±1%@20°C (68°F) annually, for two years
Operating Humidity Range	0 to 100% RH noncondensing
Hysteresis	1.5% typical
Linearity	Included in accuracy spec.
Temperature Coefficient	±0.1% RH/°C above or below 25°C (typical)
Analog Output	4-20mA mode: 2-wire, not polarity sensitive (clipped and capped); 0-5V/0-10V mode: 3-wire, observe polarity
Scaling	0-100% RH
Operating Temperature Range	10° to 35°C (50° to 95°F)
Input Power***	4-20 mA mode: loop powered 12-30VDC only, 30mA max.; 0-5V/0-10V mode: 12-30VDC/24VAC, 15mA max.
Optional Temperature Transmitter Output	Digital, 4-20mA (clipped and capped) or 0-5V/0-10V output; accuracy ±0.5°C (±1°F) typical 10° to 35°C (50° to 95°F and 0° to 50°C (32° to 122°F) (switchable)

† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.
** 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.*
**** One side of transformer secondary is connected to signal common, so an Isolation transformer or dedicated power supply may be required.*
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 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).

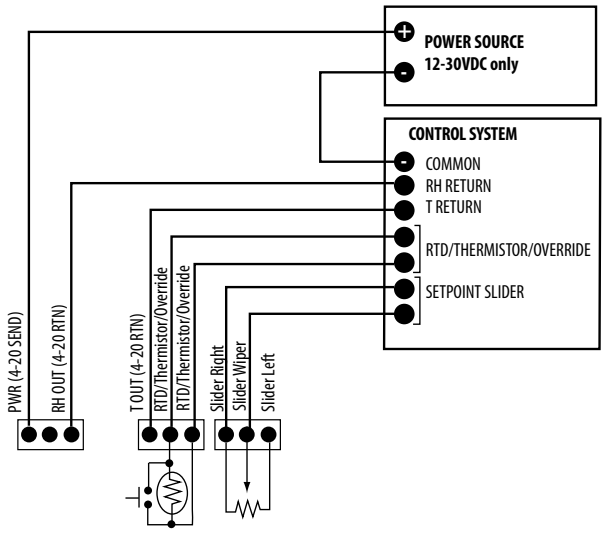
VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAMS

HW Voltage Output (3-Wire, 0-5V/0-10V)



HW Current Output (2-Wire, 4-20mA)



ORDERING INFORMATION

CE *Available*

Options Available

	Display	Accuracy	NIST	US or EU	Temp.	Sensor Type	Temp Cal Cert	Option	Value	Housing
HW	X									
	= No	**1** = 1% **2** = 2% **3** = 3% **5** = 5%	**N** = NIST (1% and 2% only) **X** = No (2%, 3%, and 5% only)	**S** = Standard **C** = CE	**T** = Temp* **X** = No Temp (Stop here)	**A** = Transmitter: 10° - 35°C (50° - 95°F and 0° - 50°C (32° - 122°F) *(switchable)* **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 **T** = 100k, Thermistor **U** = 20k "D", Thermistor **W** = 10k T2 high accuracy, Thermistor **Y** = 10k T3 high accuracy, Thermistor **Z** = 10k E1, Thermistor	**X** = No Cert **1** = 1pt Cal **2** = 2pt Cal	**1** = Push Button Override **2** = Set Point Slider **3** = Push Button Override and Set Point Slider	**A** = 1k **F** = 10k **G** = 20k **K** = 50k **M** =100k	**Blank** = Cloud white **B** = Black

Options Available

	Display	Accuracy	NIST	US or EU	Temp.	Sensor Type	Temp Cal Cert	Option	Value	Housing
HW	L									
	= LCD	**1** = 1% **2** = 2% **3** = 3% **5** = 5%	**N** = NIST (1% and 2% only) **X** = No (2%, 3%, and 5% only)	**S** = Standard **C** = CE	**T** = Temp* **TA** = Transmitter only **D** = Transmitter and resistive element **X** = No Temp (Stop here)	**None** = Select for TA temp option only **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 **T** = 100k, Thermistor **U** = 20k "D", Thermistor **W** = 10k T2 high accuracy, Thermistor **Y** = 10k T3 high accuracy, Thermistor **Z** = 10k E1, Thermistor	**X** = No Cert **1** = 1pt Cal **2** = 2pt Cal	**1** = Push Button Override **2** = Set Point Slider **3** = Push Button Override and Set Point Slider	**A** = 1k **F** = 10k **G** = 20k **K** = 50k **M** =100k	**Blank** = Cloud white **B** = Black

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.

ACCESSORIES

Replacement humidity element (HS)
Replacement covers for wall units (AA51, AA51B, AA52, AA52B)
Replacement cloud white wall housing (AA55)

HUMIDITY

Deluxe Wall Humidity & Temperature Sensor, Protocol Communication

Modbus and BACnet Protocol Communication

HWLP

DESCRIPTION

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 offer additional local control.

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

APPLICATIONS

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

FEATURES

- Embedded BACnet and Modbus communication protocols...compatible with many existing control systems
- Configurable to multiple baud rates
- Humidity and temperature sensors in one device at one address...provides more information and maximizes system capacity
- Pushbutton override capability from the building control system...local control in individual rooms to maximize comfort
- Innovative self-calibration algorithm...maximizes performance
- Field calibratable
- Thin-film capacitive sensor element recovers from 100% saturation
- Fully interchangeable element to 1% or 2% accuracy...no calibration
- Calibration-free interchangeable NIST traceable HS element
- HS element is microprocessor profiled with on-board nonvolatile memory
- Multi-point digital calibration to NIST standards
- NIST certification available
- Replace element in the field...minimizes field calibration downtime

HUMIDITY

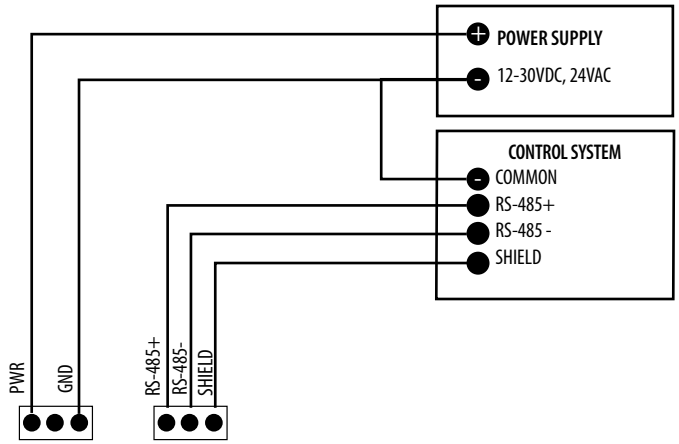
SPECIFICATIONS

5 Year Warranty

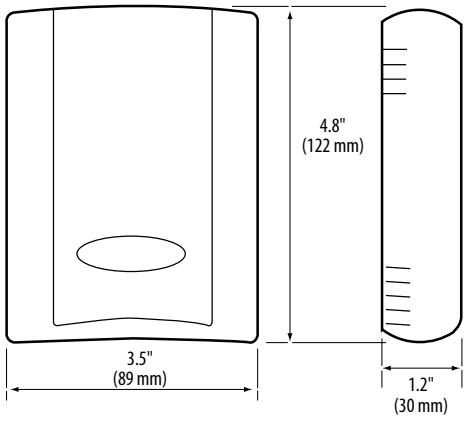
Input Power	12 to 30VDC, 24VAC; 100mA max.
Housing Material	High impact ABS plastic , UL 94 V0
Communication:	
Protocol	BACnet or Modbus (selectable)
Connection	2-wire RS-485
Data Rate	9600, 19200, 38400, 57600 (Modbus), bps (selectable); 9600, 19200, 38400, 76800 (BACnet), bps (selectable)
Parity	None/Odd/Even (selectable-Modbus); None (BACnet)
Address Range	1-127
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 noncondensing
Operating Temperature Range	10° to 35°C (50° to 95°F)
Temperature Coefficient	±0.1% RH/°C above or below 25°C (typical)
Operating Environment:	
Operating Temperature Range	10° to 35°C (50° to 95°F)
Temperature Transmitter Option:	
Sensor Type	Solid-state, integrated circuit
Accuracy	±0.5°C (±1°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

† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.
** Specified accuracy with 24VDC 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 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)

APPLICATION/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).*

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

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 zero.
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

HUMIDITY

ORDERING INFORMATION

	Local Display	Protocol	RH Option	Temp. Option	Temp. Cal. Cert.	Option	Housing
HW	☐	P	☐	☐	☐	☐	☐
	L = LCD **X** = No Display	= Protocol	**1** = RH 1% NIST **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.* **3** = 3 pt. cal. cert.*	**Blank** = None **1** = Pushbutton override **2** = Set point slider **3** = Pushbutton override + set point slider	**Blank** = Cloud white **B** = Black

** Only available if temperature option is selected.*

Example:

HW	L	P	H	T	X	3	

ACCESSORIES

Replacement humidity element (HS)
Handheld digital hygrometer/psychrometer (597C1)
Replacement covers for wall units (AA51, AA51B, AA52, AA52B)
Replacement cloud white wall housing (AA55)

597C1

HS

AA55

AA51/AA51B

AA52/AA52B

Standard Duct Humidity Sensors

2%, 3%, and 5% Accuracies

IDEAL FOR BID SPEC!

HED

DESCRIPTION

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.

FEATURES

- Monitor humidity and temperature with a single device...reduce installation costs
- Semiconductor, temperature transmitter, or popular thermistor/RTD sensors available
- Tool-less gasketed entry lid...no more lost screws
- Large cage clamp terminal blocks...easy hoop-up with no wire nuts
- Circuitry is embedded in the probe for durability and protection

APPLICATIONS

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

HUMIDITY

SPECIFICATIONS

1 Year Warranty

Input Power:

Input Power, Voltage Version	12-24VDC or 24VAC
Input Power, mA Version	12-24VDC
AC Voltage Tolerance	±10%
AC Frequency	50-60 Hz
Max. Inrush Current after 1 msec (mA version)	25mA

Output Power:

mA Output	4-20mA, 2-wire, not polarity sensitive
mA Max. Loop Resistance	500Ω at 24VDC input voltage; 250Ω at 12VDC input voltage
Voltage Output	0-5V or 0-10V (jumper selectable)
Voltage Min. Load Resistance	5kΩ
Voltage Min. Sinking Current	0.2mA

Humidity:

RH Element	Digitally profiled thin-film capacitive, non-removable
Accuracy	±2%, 3%, or 5% (10-90% 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	0-100% RH

Temperature:

Active Output Accuracy	±0.5°C
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	0-100% RH noncondensing (Unit will recover from saturation)

Housing:

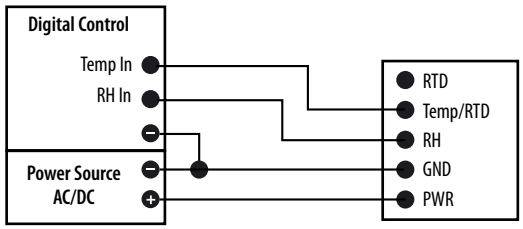
Material	ABS plastic with UL V-0 5VA Flame Class

EMC Conformance: EN61000-6-3:2007+A1:2011 Class B; EN61326-1:2006 Class B; EN61000-6-1:2007
Meets UL requirements for plenum rating.

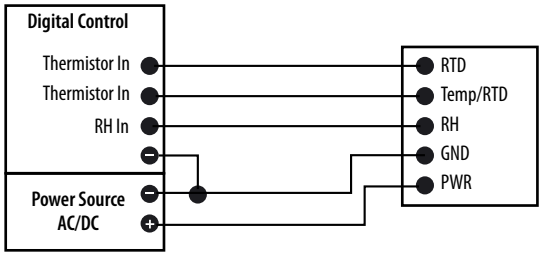
VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAMS

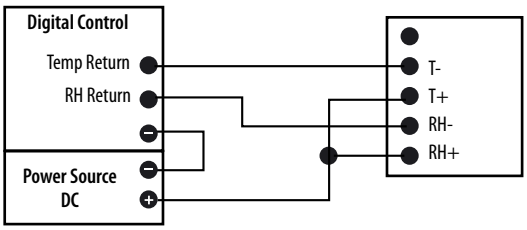
0–5V/0–10V Models, No Thermistor



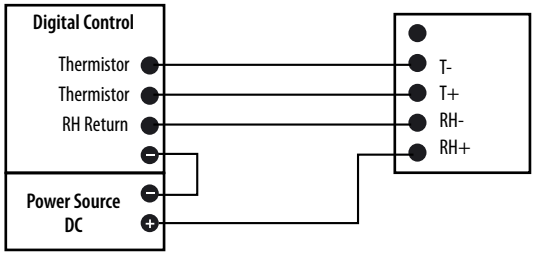
0–5V/0–10V Models, Thermistor



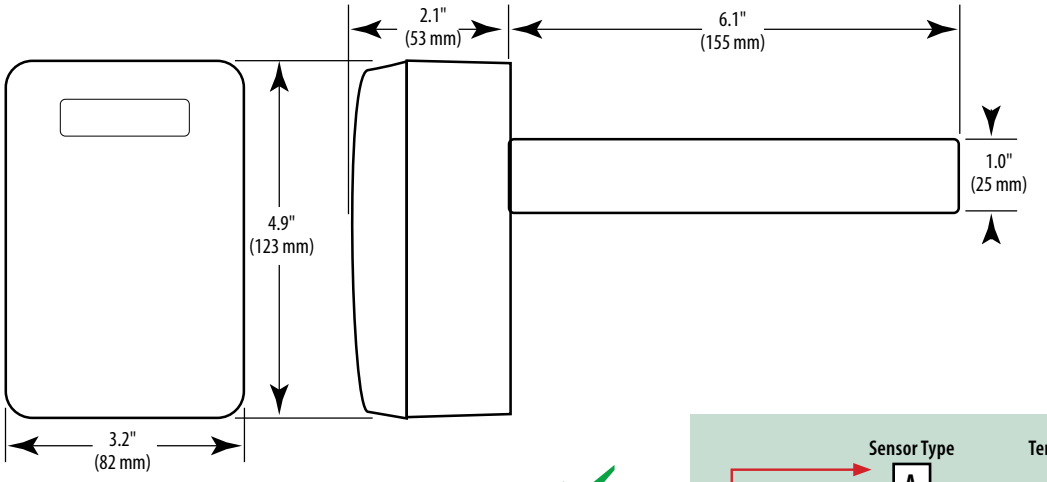
4-20mA Models, No Thermistor



4-20mA Models, Thermistor



DIMENSIONAL DRAWING



ORDERING INFORMATION

HED [Accuracy] [Output] [US or EU] [Temp.]

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

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

US or EU
S = Standard

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

Sensor Type [A]
= Temp. transmitter

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

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

Sensor Type
B = 100R Platinum, RTD
C = 1k Platinum, RTD
D = 10k T2, Thermistor
E = 2.2k, Thermistor
F = 3k, Thermistor
G = 10k CPC Thermistor
H = 10k T3, Thermistor
J = 10k Dale, Thermistor
K = 10k with 11k shunt, Thermistor
M = 20k NTC, Thermistor
N = 1800 ohm TAC, Thermistor
R = 10k US, Thermistor
S = 10k 3A 221 Thermistor
T = 100k, Thermistor
U = 20k "D", Thermistor
W = 10k T2 high accuracy, Thermistor
Y = 10k T3 high accuracy, Thermistor
Z = 10k E1, Thermistor

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

Example:

With Temp
HED 3 M S T C

Without Temp
HED 3 V S X *Stop Here*

HUMIDITY

Standard Wall Humidity Sensors

2%, 3%, and 5% Accuracies

IDEAL FOR BID SPEC!

HEW

DESCRIPTION

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.

FEATURES

- Monitor humidity and temperature with a single device...reduces installation costs
- Semiconductor, temperature transmitter, or popular thermistor/RTD sensors available
- Housing is low-profile...perfect for schools and museums

APPLICATIONS

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

HUMIDITY

SPECIFICATIONS

1 Year Warranty

Input Power:

Input Power, Voltage Version	12-24VDC or 24VAC
Input Power, mA Version	12-24VDC
AC Voltage Tolerance	±10%
AC Frequency	50-60 Hz
Max. Inrush Current after 1 msec (mA version)	25mA

Output Power:

mA Output	4-20mA, 2-wire, not polarity sensitive
mA Max. Loop Resistance	500Ω at 24VDC input voltage; 250Ω at 12VDC input voltage
Voltage Output	0-5V or 0-10V (jumper selectable)
Voltage Min. Load Resistance	5kΩ
Voltage Min. Sinking Current	0.2mA

Humidity:

RH Element	Digitally profiled thin-film capacitive, non-removable
Accuracy	±2%, 3%, or 5% (10-90% 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	0-100% RH

Temperature:

Active Output Accuracy	±0.5°C
Active Output Temperature 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	0-100% RH noncondensing (Unit will recover from saturation)

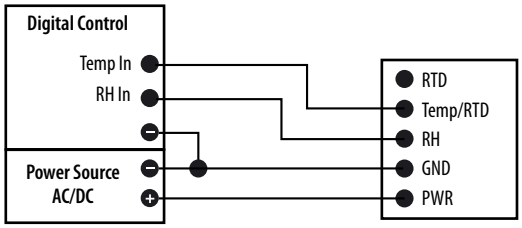
Housing:

Material	ABS plastic with UL V-0 5VB Flame Class
Mounting Holes	US and European junction box

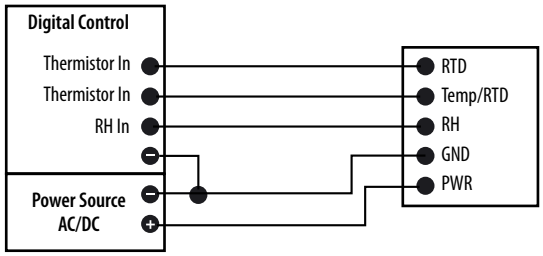
EMC Conformance: EN61000-6-3:2007+A1:2011 Class B; EN61326-1:2006 Class B; EN61000-6-1:2007

APPLICATION/WIRING DIAGRAMS

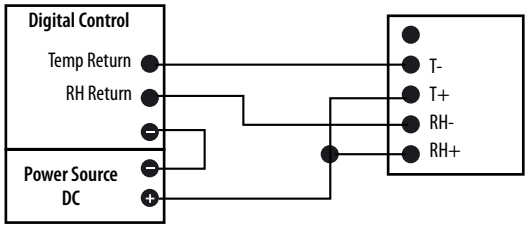
0–5V/0–10V Models, No Thermistor



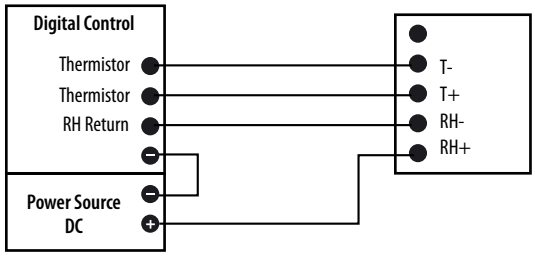
0–5V/0–10V Models, Thermistor



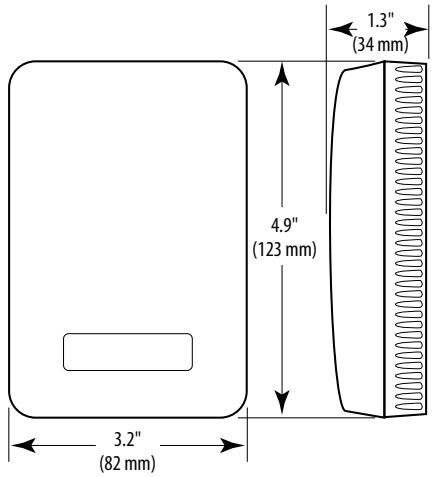
4-20mA Models, No Thermistor



4-20mA Models, Thermistor



DIMENSIONAL DRAWING



ORDERING INFORMATION

CE RoHS Compliant

HEW [Accuracy] [Output] [US or EU] [Temp.] [Sensor Type]

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

Output
- **M** = 4-20mA
- **V** = 0-5VDC/0-10VDC

US or EU
- **S** = Standard

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

Sensor Type
- **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
- **Z** = 10k E1, Thermistor

Example:

With Temp

HEW | 3 | M | S | T | C

Without Temp

HEW | 3 | V | S | X | *Stop Here*

Specialty Humidity Sensors

Pendant and Insertion

DESCRIPTION

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 the best in the industry. The electronics are embedded inside the probe, protecting them from condensation-related failures. The thin-film capacitive HS sensor elements are factory calibrated using NIST traceable calibration equipment, eliminating the need for field calibration. Field replacement of the sensor element is a snap with the patented removable sensor, lowering costs and reducing downtime.

APPLICATIONS

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

FEATURES

- Thin-film capacitive sensor element recovers from 100% saturation
- Electronics are encapsulated in stainless probe to resist corrosion
- Fully interchangeable element to 1%, 2%, 3%, or 5% accuracy...no calibration
- Pendant and insertion versions for application flexibility
- Polarity insensitive two-wire 4-20mA or 3-wire 0-5/0-10VDC versions... flexible systems compatibity
- Calibration-free interchangeable NIST traceable HS element
- Replace digital sensor quickly without calibration...maintain accuracy and eliminate downtime
- HS element is microprocessor profiled with on-board nonvolatile memory
- Multi-point digital calibration to NIST standards
- NIST certification available
- Recovers from 100% saturation...no damage to sensor

HUMIDITY

SPECIFICATIONS

5 Year Warranty

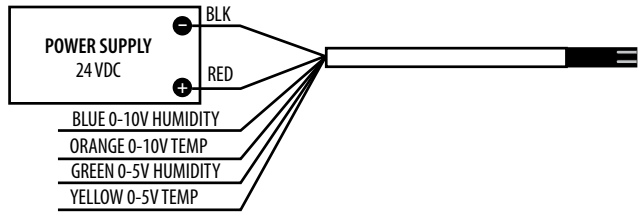
*Input Power:**	
Voltage Model	12-30VDC/24VAC, 15mA max.
mA Model	Loop powered 12-30VDC only, 30mA max.
Output Power:	
Voltage Model	3-wire, observe polarity
mA Model	2-wire, not polarity sensitive (clipped and capped)
Humidity:	
HS Element	Digitally profiled thin-film capacitive (32 bit mathematics) U.S. Patent 5,844,138†
Accuracy @ 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	0-100% RH
Temperature:	
Optional Temperature Transmitter Output	Digital, 4-20mA (clipped and capped) or 0-5V/0-10V output; accuracy ±0.5°C (±1°F) typical
Operating Environment:	
Operating Humidity Range	0 to 100% RH noncondensing
Operating Temperature Range	-40° to 50°C (-40° to 122°F)

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

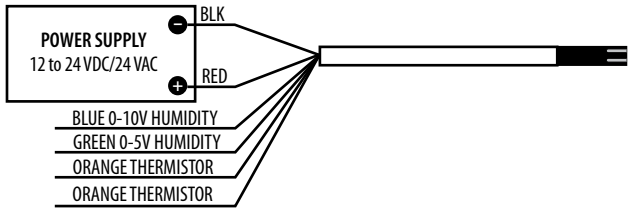
VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAMS

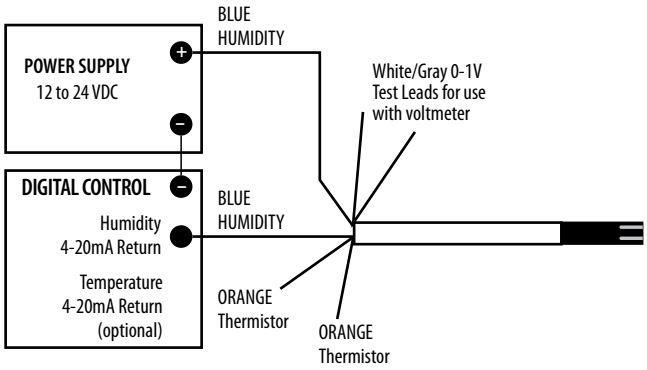
HN/HP 0-5V/0-10V Versions



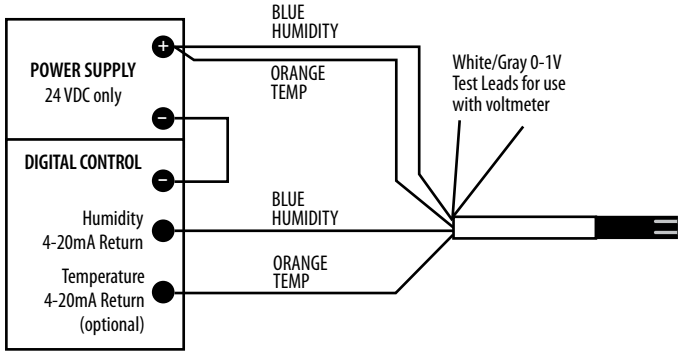
HN/HP with RTD/Thermistor0-5V/0-10V Versions



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

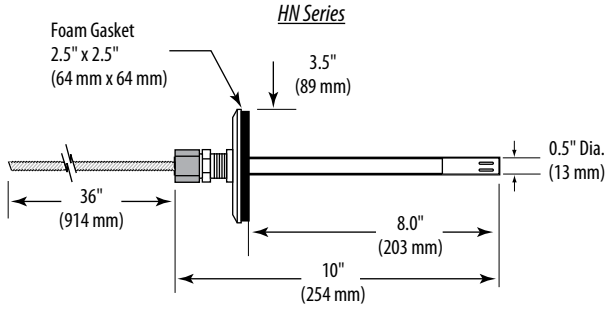


HN/HP 4-20mA Versions

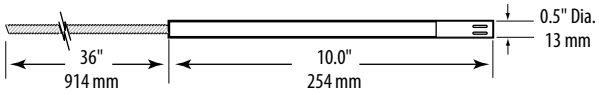


DIMENSIONAL DRAWINGS

HN Series



HP Series



ORDERING INFORMATION

CE *Available*

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

Example: (No Temp)

H	P	2	X	V	S	X

Stop Here

Example: (With Temp)

H	N	2	X	V	S	T	C	2

Humidity Transmitter Combination

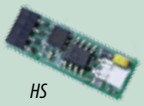
Sensor Type	Range	OPTION Temp Cert
A		
= Transmitter	**1** = -40° - 122°F (-40° - 50°C) **2** = 32° -122°F (0° - 50°C)	**Blank** = None **1** = 1pt Cal **2** = 2pt Cal

Humidity RTD/Thermistor Combination

Sensor Type	OPTION Temp Cert
B = 100R Platinum, RTD **C** = 1k Platinum, RTD **D** = 10k T2, Thermistor **E** = 2.2k, Thermistor **F** = 3k, Thermistor **G** = 10k CPC,Thermistor **H** = 10k T3, Thermistor **J** = 10k Dale, Thermistor **K** = 10k with 11k shunt, Thermistor **M** = 20k NTC, Thermistor **N** = 1800 ohm TAC, Thermistor **Q** = 1uA/°C, Linitemp **R** = 10k US, Thermistor **S** = 10k 3A 221, Thermistor **T** = 100k, Thermistor **U** = 20k "D", Thermistor **W** = 10k T2 high accuracy, Thermistor **Y** = 10k T3 high accuracy, Thermistor **Z** = 10k E1, Thermistor	**Blank** = None **1** = 1pt Cal **2** = 2pt Cal

ACCESSORIES

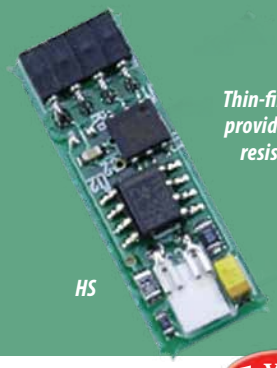
Replacement humidity element (HS)



HS

HUMIDITY

Replaceable Humidity Element



Thin-film capacitive technology provides superior accuracy and resistance to contaminants

Provides Easy Field Replacement For Veris Deluxe Humidity Sensors

U.S. Patent No. 5,844,138

DESCRIPTION

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 the device.

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

1 Year Warranty

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

Example:

HS [5] [X] [X]

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

HUMIDITY

VERIS INDUSTRIES

VERIS INDUSTRIES

Certificate of Performance

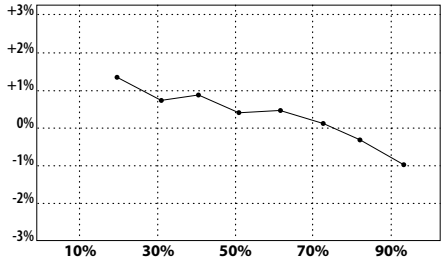
HS Digital Humidity Sensor

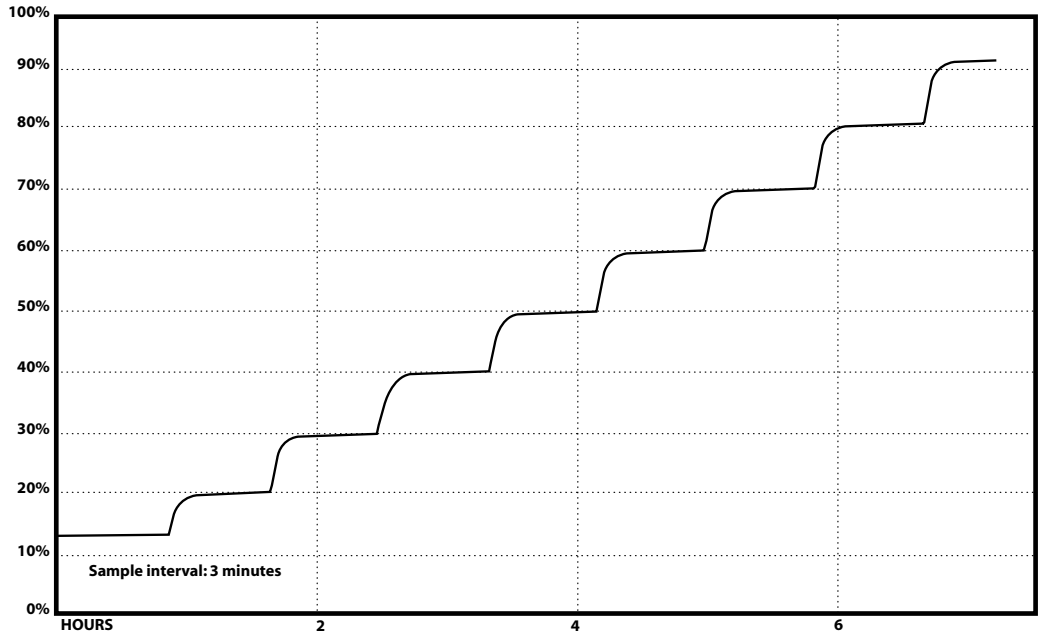
Serial Number: SAMPLE **Date:** _____ **Accepted by:** _____

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

HUMIDITY

Leak Detection Contents

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
LD300/LD1000/LDRA6	Zone Leak Detection Panels	130
LD1500/LD2100	Distance Read Panel	132
LD5200	Distance Read Panel, Touch Screen	134
SD/SDR01/SD-Z/MX1	Spot Leak Detectors	136
SC/SC-C/SC-H/NSC	Cables	138
LC-KIT	LD300 Meter, with Sensing Cables, EOL, Leader Cable, and Power Supply	140
Accessories		326

Leak Detection Sensor Selection Guide

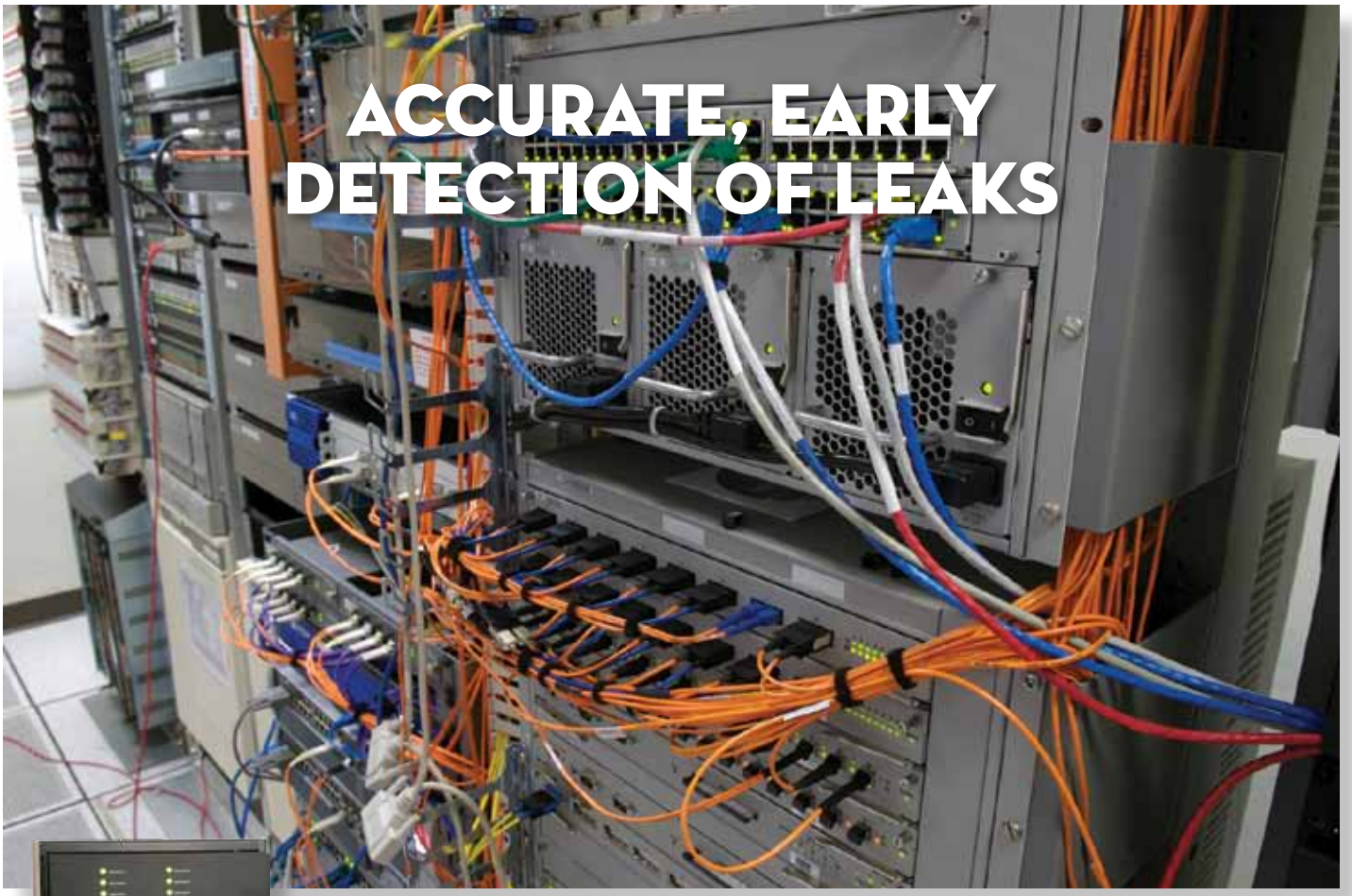
SENSORS AND CONTROL PANELS

FEATURES	Spot Detection	Single Zone	Multi-zone	Distance Read
Basic Model	SD/SD-Z/MX1 page 136			
Leak Detection with Relay Output	SDR01 page 136	LD300/LD1000 page 130	LDRA6 page 130	LD1500/LD2000/LD5200 page 132, 134
Modbus Output			LDRA6 page 130	LD1500/LD2000/LD5200 page 132, 134

CABLES

FEATURES	Cable Kits	Conductive Fluids	Chemical Fluids	Hydrocarbon Fluids	Non-Sensing Leader Cable
Basic Model	LC-KIT page 140	SC page 138	SC-C page 138	SC-H page 138	NSC page 138

ACCURATE, EARLY DETECTION OF LEAKS



LDRA Series

The LDRA Series Zone Leak Detection Panels continuously monitor up to 1,000 ft. of SC water detection cable per zone. If conductive fluid is detected the panel illuminates the affected zone's LED, clearly indicating where a leak is occurring.

- Monitor up to 1,000 ft. of water leak detection cable per zone
- Two LED indicators per zone to indicate both leaks and cable faults
- Sensitivity settings for each zone reduce false alarms

LD5200

The LD5200 distance read panel combined with the SC water detection sensing cable detects and reports the presence and exact location of water & other conductive fluids.

- Adjustable leak and contamination alarm thresholds to prevent false alarms due to high humidity
- Embedded BACnet and Modbus protocol
- RS-232 port allows configuration with PC

Leak Detection Kits

Single zone leak detection controller kits are pre-configured in popular lengths for monitoring single areas or rooms. Kits come with an LD300 single zone control panel, a leader cable kit with end of line terminator, sensing cable, and a WA-DC-05 power supply.

- LED indicator for alarm status and cable fault
- Sensitivity setting for each zone
- Monitor up to 3', 10', 17', 25', 50', or 100' of leak detection cable

VERIS INDUSTRIES

Zone Leak Detection Panels

Zone Leak Detection Controller

DESCRIPTION

LD300, LD1000, and LDRA6 control panels continuously monitor up to 1,000 ft. (300 ft. for the LD300) of SC, SC-Con, or SC-H 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 LD300, audible for all others) signals the presence of a leak. Additionally, if the cable fails or 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.

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

FEATURES

- Monitor up to 1,000 ft. (300 m) of water leak detection cable per zone with the LD100 and LDRA6 or 300 ft. per zone with the LD300...application flexibility
- Two LED indicators per zone...leak and cable fault (LD1000 and LDRA6)
- Sensitivity settings for each zone help eliminate false alarms...maximum detection accuracy
- Summary alarm relay output...fast response
- 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)...output versatility

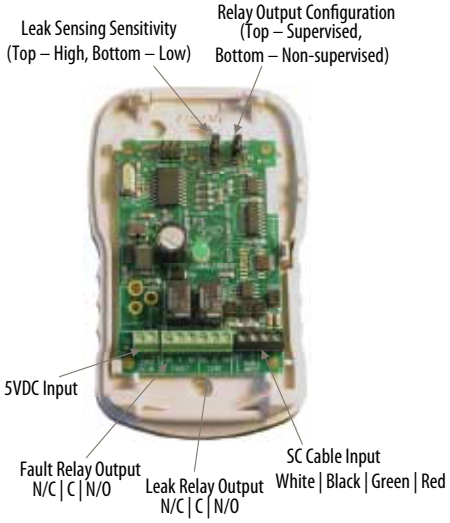
LEAK DETECTION

SPECIFICATIONS

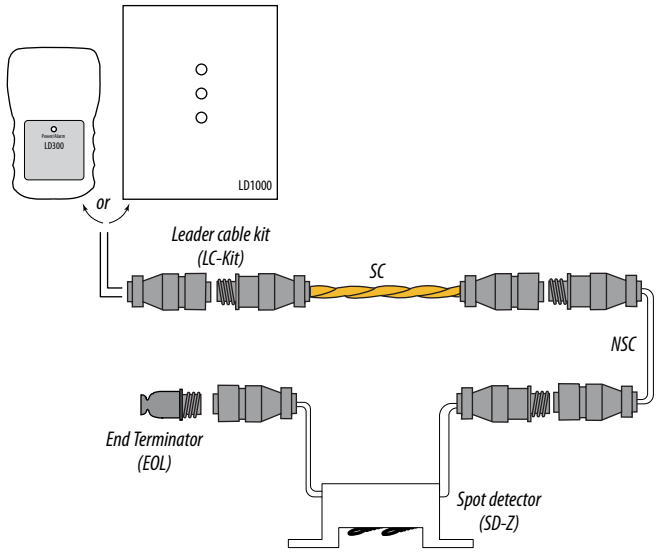
Input Power	**LD300:** 5VDC ±10%; **LD1000:** 24VAC/DC (±10%)@300mA max.; **LDRA6:** 24VAC/DC (±10%)@600mA max.
Inputs:	
Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable kit (LC-Kit) per zone
Maximum Cable Length	**LD300:** 300 ft. (91 m); **LD1000, LDRA6:** 1000 ft. (305 m)
Detection Response Time	**LD300:** < 20 sec (10 sec typical); **LD1000:** Configurable for 10 sec or 2 min, ± 10%
	LDRA6: 20-3600 sec, software adjustable in 10 sec increments, ± 2%
Relay Output	**LD300:** 2 Form C relays (leak and fault); 1A@24VDC, 0.5A resistive@120VAC; **LD1000:** 2 Form C relays (leak and fault); 1A@24VDC, 0.5A resistive@120VAC
	LDRA6: 1 Form C summary alarm relay, 1 Form C relay for each zone/alarm; 1A@24VDC, 0.5A resistive@120VAC
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
Alarm Notification Audible Alarm	**LD1000:** 85 dBA@2 ft. (0.6 m); **LDRA6:** 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	**LD300:** 3 oz. (85 g); **LD1000:** 27 oz. (766 g); **LDRA6:** 4 lbs. (2 kg)
Agency Approvals	**LD300:** CE, RoHS compliant; **LD1000:** CE, ETL listed; conforms to UL 61010-1, RoHS compliant
	LDRA6: CE; ETL Listed; conforms to UL 61010-1, EN 61010-1, CAN/CSA C22.2 No. 1010.1, RoHS compliant

APPLICATION/WIRING DIAGRAMS

LD300 Wiring

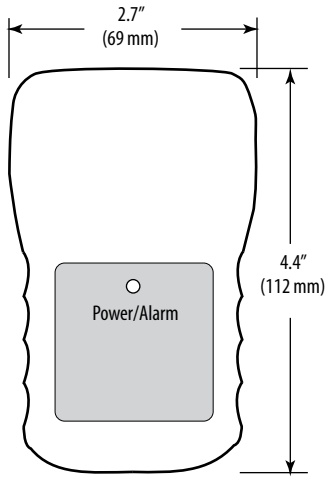


LD300 or LD1000 basic installation with SC Sensing Cable and SD-Z Spot Detector

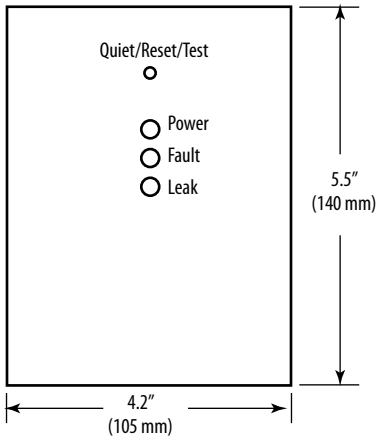


DIMENSIONAL DRAWINGS

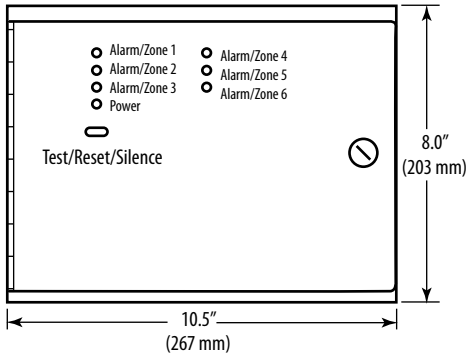
LD300



LD1000



LDRA6



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U006-0002*	**LD300***	Leak Panel, 1 zone, LED, 2 relay outputs
U006-0001**	**LD1000****	Leak Panel/Remote Annunciator, 1 zone, supervised, relay output
U006-0036**	**LDRA6****	Leak Panel, up to 6 zones, supervised, relay output, Modbus RTU
U006-0035	**LC-KIT**†**	Leader cable kit for SC cables (connects from leak panel to SC or NSC cable)
U006-0061	**LC-KIT-M**††**	Leader cable kit for SC-C and SC-H 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 PS24-7.5W power supply or equivalent.*
† Included with LD300 and LD1000.
†† Not included with LD300 and LD1000. Required for installation of SC-C ad SC-H cables.

BLINK CODE KEY

Model	LED Indication	Device Status
LD300	Solid green (on or off)	Normal operation
LD300	Flashing green (0.5 sec on/2.5 sec off)	Cable fault
LD300	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

Distance Read Panel

Helps Eliminate High Humidity False Alarms

DESCRIPTION

Together with our SC, SC-C, or SC-H sensing cable, the **LD1500 and LD2100** panels detect and report the presence and exact 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.

FEATURES

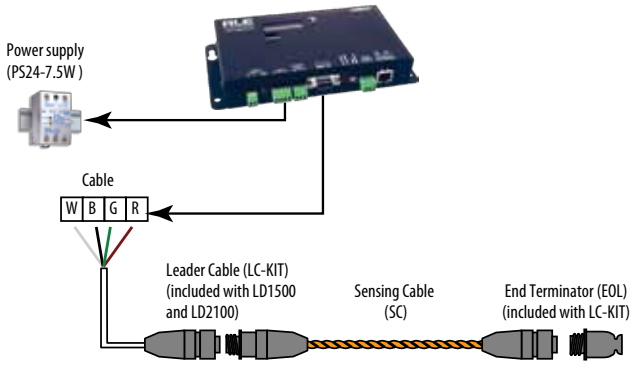
- Adjustable leak and contamination alarm thresholds to prevent false alarms due to high humidity...high detection accuracy
- RS-232 port allows configuration with PC

SPECIFICATIONS

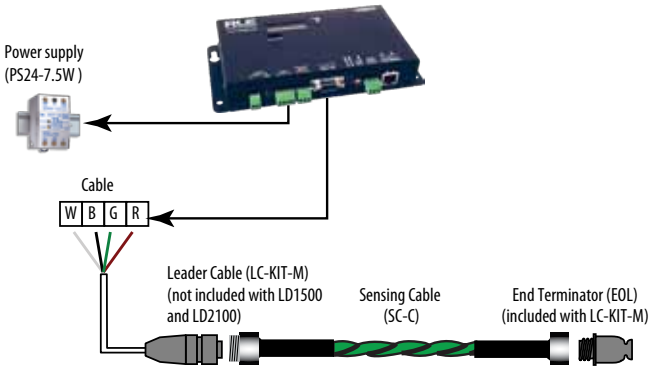
Input Power	24VAC@600mA max., 50/60 Hz; 24VDC@600mA max.
Inputs:	
Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable kit (LC-KIT or LC-KIT-M)
Maximum Length	1500 ft. (457 m); LD2100: 2000 ft. (609 m)
Detection Accuracy	± 2 ft (0.6 m) + 0.5% of the cable length
Detection Repeatability	± 2 ft (0.6 m) + 0.25% of the cable length
Detection Response Time	5-995 sec ± 2 sec
Outputs:	
Relay (LD2100 only)	1A@24VDC, 0.5A resistive@120VAC
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)
Visual Alarm	**LD1500:** Red, 4-digit; 7 segment LED display; bi-color status LED; **LD2100:** 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:** Last 10 events; **LD2100:** 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/Rest; **LD5200:** Up, down, right, left, enter
LED Indicator	**LD1500:** 1 tri-color Power/Status (green = power on; red = alarm; yellow = cable fault; **LD2100:** 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)
Agency Approvals	CE; ETL listed: conforms to UL 61010-1, EN 61010-1; CSA C22.2; RoHS compliant,

APPLICATION/WIRING DIAGRAMS

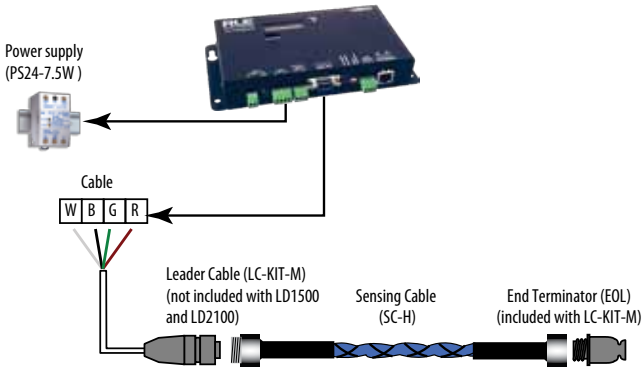
LD1500/LD2100 Basic SC Installation



LD1500/LD2100 Basic SC-C Installation

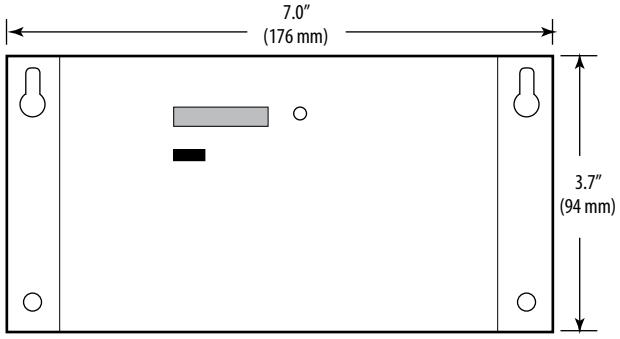


LD1500/LD2100 Basic SC-H Installation

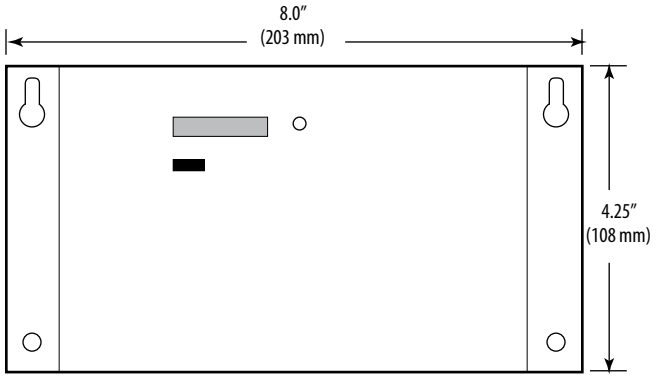


DIMENSIONAL DRAWINGS

LD1500



LD2100



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 and SC-H cables (connects from leak panel to SC-C or SC-H 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 PS24-7.5W power supply or equivalent.*
† Included with LD1500 and LD2100.
†† Not included with LD1500 or LD2100. Required for installation of SC-C ad SC-H cables.

Distance Read Panel, Touch Screen

Helps Eliminate High Humidity False Alarms

LD5200

DESCRIPTION

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 exact location in the building where the alarm occurred. Multiple communication protocols make the LD5200 readily compatible with existing building systems. Use with our SC, SC-C, or SC-H sensing cable for a complete solution to leak detection.

FEATURES

- Touch screen interface allows access to basic functions...stand-alone configuration and monitoring
- Web interface offers expanded capabilities through the building mapping tool...pinpoint leaks quickly and accurately
- Multiple communication protocols available...easy integration into building systems
- Acts as a master device for up to 127 leak detection units with up to 1000 feet of SC cable or 7000 feet of SC-C cable...monitor large areas with only one device
- Detailed alarm history with time and date stamps...assists in troubleshooting

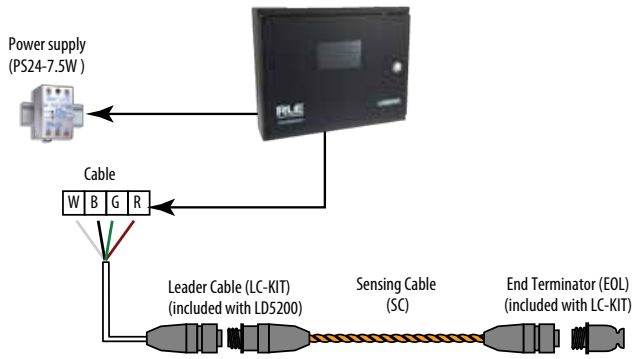
LEAK DETECTION

SPECIFICATIONS

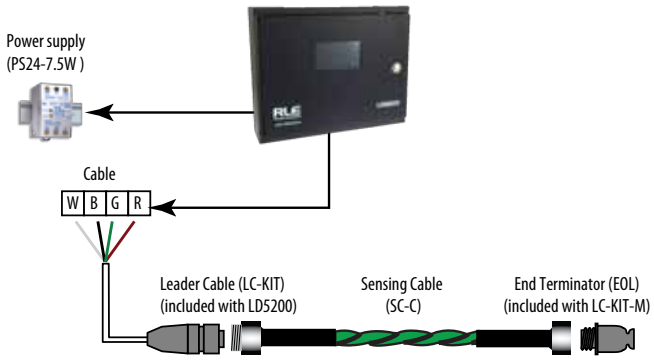
Input Power	100-240VAC@500mA max., 50/60 Hz
Inputs:	
Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable kit (LC-KIT or LC-KIT-M)
Maximum Length	10000 ft. (3048 m)
Minimum Length	35 ft. (1037 m)
Detection Accuracy	± 2 ft (0.6 m) + 0.5% of the cable length
Detection Repeatability	± 2 ft (0.6 m) + 0.25% of the cable length
Detection Response Time	5-990 sec ± 2 sec, software adjustable in 5 sec increments
Outputs:	
Analog	4-20mA Loop Powered, 18-36VDC, RL = 500 Ω max.
Relay	2 Form C Leak Relays, 2 Form C Cable Break Relays; 1A@24VDC, 0.5A resistive@120VAC; configurable for supervised or non-supervised, latched or non-latched
Maintenance Relay	1A@24VDC, 0.5A resistive @120VAC; configurable for supervised or non-supervised, latched or non-latched
Communications Ports:	
EIA-232	9600 baud, No parity, 8 data bits, 1 stop bit
EIA-485 (Port 1, Port 2, Port 3)	9600, 19200, or 38400 baud (selectable); No parity, 8 data bits, 1 stop bit
RJ-45	10/100 Bast T ethernet port (TCP/IP)
Protocols:	
Terminal Emulation (EIA-232)	VT100 compatible
Modbus RTU (EIA-485)	Master and slave; RTU Mode; BACnet MS/TP; N2, slave
RJ-45	Ethernet, TCP/IP; Modbus/TCP/UDP, Master and slave; SNMP V1, V2, V3, NTP, SMTP, DNS, BACnet/IP
Alarm Notification:	
Audible Alarm	85dBA@2 ft. (0.6 m); re-sound 0-999 min
Visible Alarm	Indicated on LCD touch screen and 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 and data. Administrator password limits access to configuration options.
Web Interface	Username and password can be configured
Front Panel Interface:	
Display	480 x 272 pixel color backlit LCD touch screen; 95.04 mm x 53-85 mm
Operating Environment:	
Temperature	0° to 50°C (32° to 122°F)
Humidity	5% to 95% RH non-condensing
Altitude	15000 ft. (4572 m) max.
Mounting	Type 1 wall mount enclosure
Agency Approvals	CE; ETL listed: conforms to UL 61010-1, EN 61010-1; CAN/CSA C22.2 No. 61010-1; RoHS compliant

APPLICATION/WIRING DIAGRAMS

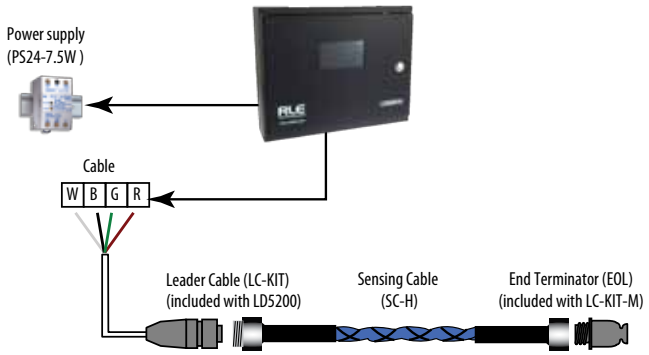
LD5200 Basic SC Installation



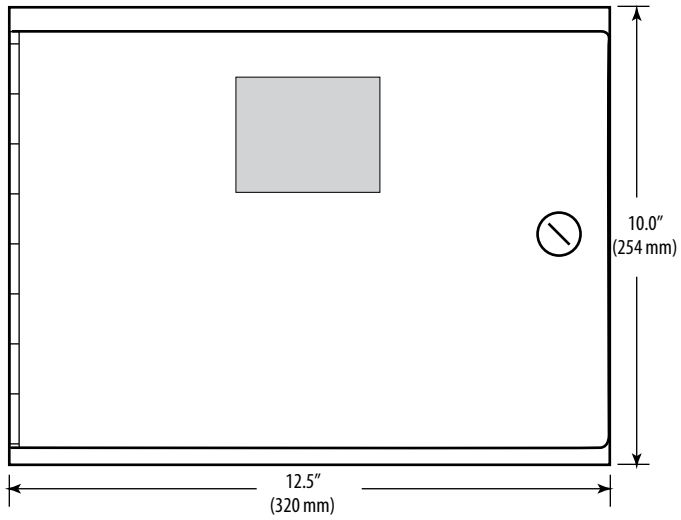
LD5200 Basic SC-C Installation



LD5200 Basic SC-H Installation



DIMENSIONAL DRAWING



WEB INTERFACE

A robust web interface supports remote access, any time, any place.

LEAK DETECTION

ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION
U006-0079*	**LD5200***	Leak Panel, Distance Read, supervised, multiple outputs: relay, 4-20mA, 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 and SC-H cables (connects from leak panel to SC-C or SC-H cable)
U006-0004	**FM1114**	Reference map, framed (11" x 14")

** Power supply not included. Use Veris PS24-7.5W power supply or equivalent.*
† Included with LD5200.
†† Not included with LD5200. Required for installation of SC-C ad SC-H cables.

Spot Leak Detectors

Spot Leak Detectors

DESCRIPTION

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.

MODEL	DESCRIPTION
SD Spot Detector	■ Operates on either 12-36VAC or 18-36VDC power ■ Includes a 14 ft (4.2 m) leader cable
SD-R01 Spot Detector with Relay Output	■ Works with any system that accepts dry contacts ■ Operates on 24VAC/VDC±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	■ Designed for use with the all detection panels, with SC sensing cable to integrate both zone and spot detection into one panel ■ Powered by the LD300, LD1000, LD5100, LDRA6, or LD2000 ■ When used with a distance read panel (LD2000 or OD5200), 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	■ Battery-operated or 12-30VDC/24VAC powered

FEATURES

- Simple installation – screw, or ram-set to floor (SD, SD-R01, SD-Z)
- Simple operation – no maintenance
- Solid-state design...no moving parts to fail
- SD, SD-R01, SD-Z models have polymer-coated sensing probes...no exposed metal that will rust
- All models are fully potted for water-proofing...maximum durability

SPECIFICATIONS (SD, SD-R01, SD-Z)

5 Year Warranty

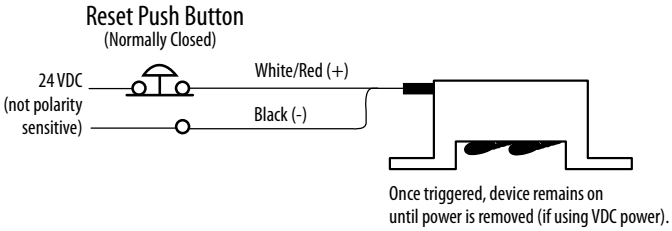
Input Power (SD-R01 Only)	24VAC/VDC ± 10%; 0.1A max.
Outputs:	
Solid-state (SD Only)	12-36VAC@0.01A min., 0.1A max.; 18-36VDC@0.01A min., 0.1A max.
Relay (SD-R01 Only)	Dry Contact, Form C; 1 A@24VDC, 0.5A resistive@120VAC
Leader Cable (NSC):	
Length	SD: 14 ft. (4.2 m); SD-R01: 14 ft. (4.2 m); SD-Z: 10 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.
Storage Environment	-20° to 70°C (-4°to158°F)

SPECIFICATIONS (MX1)

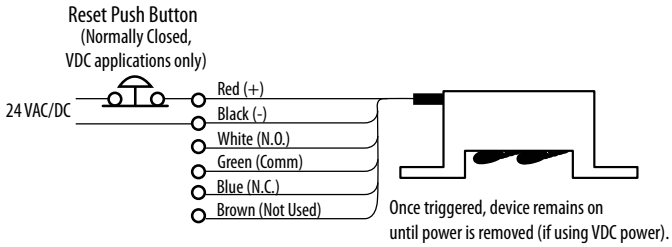
Input Power	12-30VDC/24VAC; 10-year lithium battery model available
Max Current Draw, Voltage Units Only	10mA
Output	N.C. solid-state, (opens on alarm)
Output Rating	30VAC/DC@0.1A max., not polarity sensitive
Sensing Electrodes	Gold plated
Operating Environment:	
Temperature	-20° to 80°C (-4° to 176°F)
Humidity	0 to 100% RH

APPLICATION/WIRING DIAGRAMS

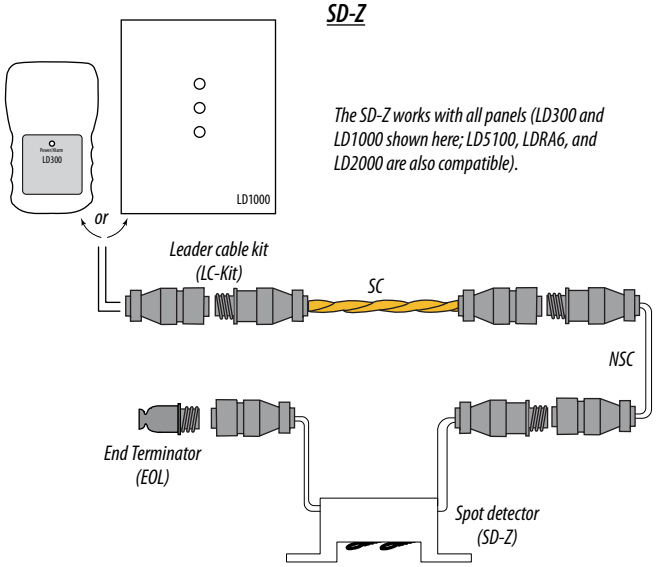
SD



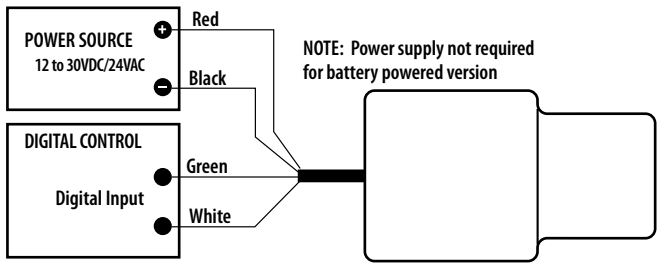
SD-R01



SD-Z

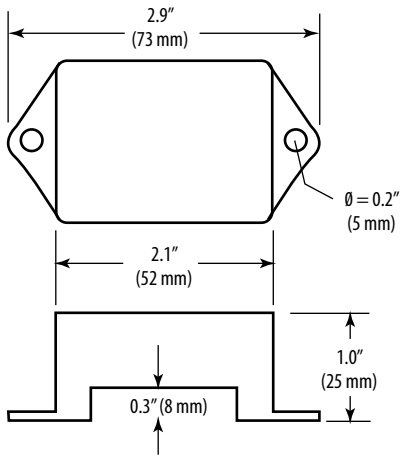


MX1 Series

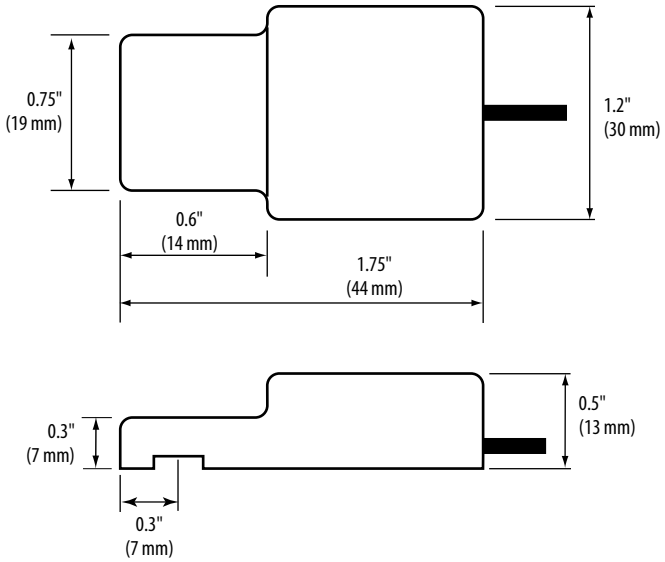


DIMENSIONAL DRAWINGS

SD thru SD-Z



MX1 Series



ORDERING INFORMATION

MODEL	MANUF. PART #	DESCRIPTION	CE	RoHS	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, 12-30VDC/24VAC			

** The SD-Z uses DIN style connectors. Connect it via the LC-KIT, or integrate it into an LC-KIT-SC/NSC cable configuration.*

Cables

Highly Flexible, Resists Bends and Kinks, Abrasion Resistant

DESCRIPTION

Sensing and non-sensing cables are designed for use with Zone and Distance Read panels. The sensing cables detect the presence of liquid, and send a signal to the panel. The panel generates an alarm and pinpoints the exact location of the leak or spill along the cable's length. Sensing cables are designed for the highest 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). **SC-H** hydrocarbon sensing cable locates hydrocarbons within 1 foot (0.33 m) of the actual leak, with as little as 2 inches (51 mm) of wetted cable, and is impervious to the presence of water.

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 water 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 they 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.

FEATURES

- Strong, durable, and abrasion resistant
- Expansion with mating end connectors...easy installation
- Available in pre-measured and custom lengths with pre-installed end connectors...installation flexibility
- Plenum rated and UL listed
- Highly accurate alarm notification...no false alarms
- SC, SC-C, and SC-H cables detect the presence of specific fluids...application versatility

SPECIFICATIONS

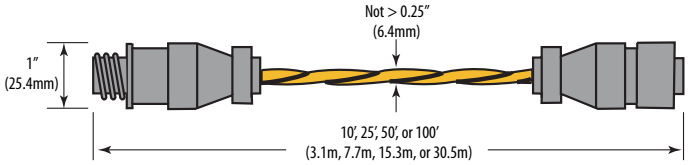
Plenum Rating	**SC:** CL2P/CMP C(UL); **NSC:** CL3P/CMP C(UL) California State Fire Marshall approved
Shear Strength	**SC/NSC:** >180 lbs (>81.65 kg); **SC-C:** 160 lb (72.6 kg)
Cut Through Resistance	**SC/NSC:** >40 lbs (>18.2 kg) with 0.005" (0.13 mm) blade; **SC-C:** >50 lbs (>27.7 kg) with 0.005" (0.13 mm) blade
Abrasion Resistance	**SC/NSC:** 60 cycles per UL 719; **SC-C:** >65 cycles per UL719
Connector	**SC/NSC:** 4 pin, 1" (25.4 mm) diameter, circular, locking, 4 pin; **SC-C:** 0.5" (13 mm) diameter
Operating Environment:	
Temperature	**SC/NSC:** 0° to 75°C (32° to 167°F); **SC-C:** 90°C (194°F) max.; **SC-H:** -20° to 90°C (-4° to 140°F)
Humidity	**SC/NSC:** 5% to 95% RH non-condensing
Altitude	**SC/NSC:** 10,000 ft. (3,048 m) max.
Storage Environment	**SC:** -30° to 85°C (-22° to 185°F); **NSC:** 0° to 75°C (32° to 167°F)
Standard Lengths:	
SC-10/NSC-10	10 ft. (3.1 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)
Weight	0.02 lbs/ft (29.7 g/m)
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)
Chemical Resistance, SC-H*	In accordance with ASTM D543, cable functions normally after seven days' exposure to the following: Unleaded gasoline, #1 diesel fuel, #2 diesel fuel, JP5 jet fuel, JP8 jet fuel, Jet-A jet fuel, xylene, kerosene, cigarette lighter fuel (completely water resistant)
Agency Approvals	**SC:** CE; UL E162948; RoHS compliant **NSC:** 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

** Prolonged exposure to concentrated ketones may cause temporary reduction of sensitivity; call for details.*

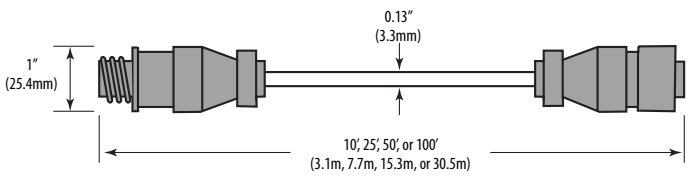
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

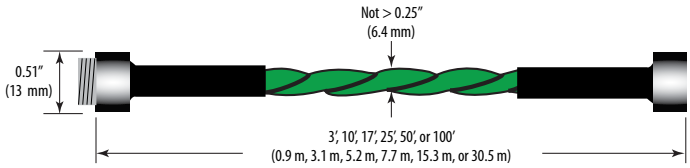
SC



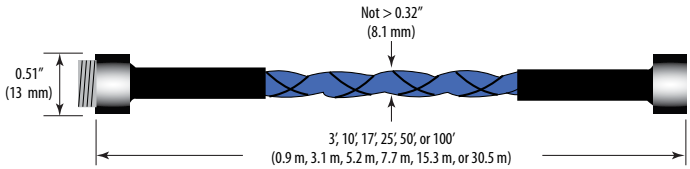
NSC



SC-C



SC-H



ORDERING INFORMATION

RoHS Compliant

c UL us LISTED

Sensing Cable

MODEL	MANUF. PART #	DESCRIPTION
U006-0009	**SC-10**	Sensing Cable, Water, 10 feet
U001-0048	**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
U006-0055	**SC-H-3**	Sensing Cable, Hydrocarbons, 3 ft
U006-0056	**SC-H-10**	Sensing Cable, Hydrocarbons, 10 ft
U006-0057	**SC-H-17**	Sensing Cable, Hydrocarbons, 17 ft
U006-0058	**SC-H-25**	Sensing Cable, Hydrocarbons, 25 ft
U006-0059	**SC-H-50**	Sensing Cable, Hydrocarbons, 50 ft
U006-0060	**SC-H-100**	Sensing Cable, Hydrocarbons, 100 ft

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), SPSL (U006-0040), and SCCS (U006-0041) tools are required for installation. LCDE (U006-0029) is highly recommended.*

Leak Detection Kits

Single Zone Leak Detection Controller Kits

DESCRIPTION

Veris' 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 LD300 single zone control panel, a leader cable kit with end-of-line terminator, sensing cable, and a WA-DC-05 power supply. **LD300** control panels continuously monitor up to 300 ft. of leak detection cable. If the cable detects 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 fails or loses continuity, the panel will activate a cable fault LED pattern.

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

FEATURES

- Monitor up to 3'*, 10', 17', 25', 50', or 100' of leak detection cable...application flexibility**
- LED indicator for alarm status and cable fault...easy indication of leaks or equipment problems
- Sensitivity settings for each zone help eliminate false alarms...maximum detection accuracy
- Summary alarm relay output...fast response

** 3 foot cable option only available with SC-C and SC-H cables.*
*** Additional cables may be ordered separately and added to the kit to expand the monitored zone up to a maximum of 300 feet (includes the 15 foot leader cable).*

SPECIFICATIONS (LD300 Control Panel)

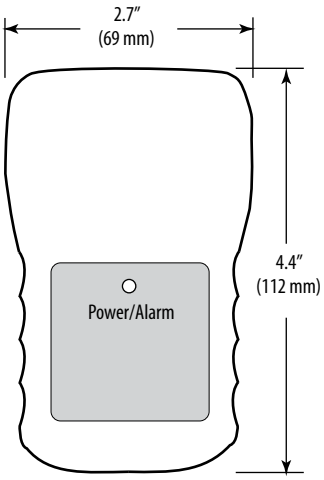
Input Power	5VDC ±10%
Inputs:	
Water Leak Detection Cable	Requires 15 ft. (4.5 m) leader cable kit
Maximum Cable Length	300 ft. (91 m)
Detection Response Time	<20 sec (10 sec typical)
Relay Output	2 Form C relays (leak and fault); 1A@24VDC, 0.5A resistive@120VAC
Operating Environment:	
Temperature	0° 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	3 oz. (85 g)

SPECIFICATIONS (Cables)

Plenum Rating	**SC:** CL2P/CMP C(UL); **NSC:** CL3P/CMP C(UL) California State Fire Marshall approved
Shear Strength	**SC/NSC:** >180 lbs (>81.65 kg); **SC-C:** 160 lb (72.6 kg)
Cut Through Resistance	**SC/NSC:** >40 lbs (>18.2 kg) with 0.005" (0.13 mm) blade; **SC-C:** >50 lbs (>27.7 kg) with 0.005" (0.13 mm) blade
Abrasion Resistance	**SC/NSC:** 60 cycles per UL 719; **SC-C:** >65 cycles per UL719
Connector	**SC/NSC:** 4 pin, 1" (25.4 mm) diameter, circular, locking, 4 pin; **SC-C:** 0.5" (13 mm) diameter
Operating Environment:	
Temperature	**SC/NSC:** 0° to 75°C (32° to 167°F); **SC-C:** 90°C (194°F) max.; **SC-H:** -20° to 90°C (-4° to 140°F)
Humidity	**SC/NSC:** 5% to 95% RH non-condensing
Altitude	**SC/NSC:** 10,000 ft. (3,048 m) max.
Storage Environment	**SC:** -30° to 85°C (-22° to 185°F); **NSC:** 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)
Chemical Resistance, SC-H†	In accordance with ASTM D543, cable functions normally after seven days' exposure to the following: Unleaded gasoline, #1 diesel fuel, #2 diesel fuel, JP5 jet fuel, JP8 jet fuel, Jet-A jet fuel, xylene, kerosene, cigarette lighter fuel (completely water resistant)
Agency Approvals	**LD300:** CE; RoHS compliant; **SC:** CE; UL E162948; RoHS compliant **NSC:** 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

† *Prolonged exposure to concentrated ketones may cause temporary reduction of sensitivity; call for details.*

DIMENSIONAL DRAWINGS

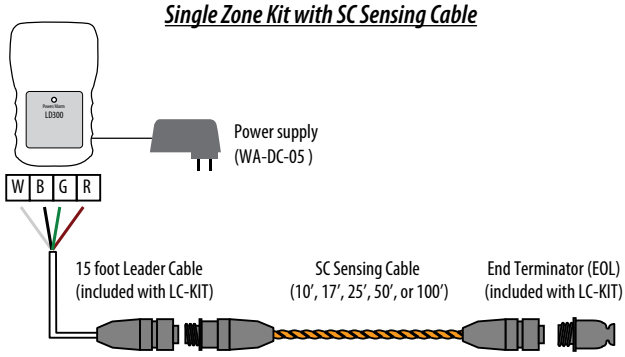


BLINK CODE KEY

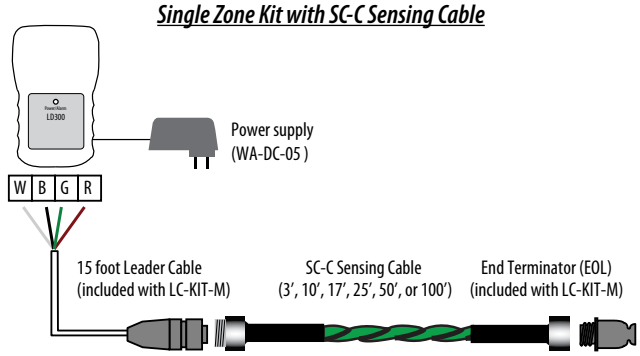
LED Indication	Device Status
Solid green (on or off)	Normal operation
Flashing green (0.5 sec on/2.5 sec off)	Cable fault
Flashing green (0.5 sec on/0.5 sec off)	Leak detected

APPLICATION/WIRING DIAGRAMS

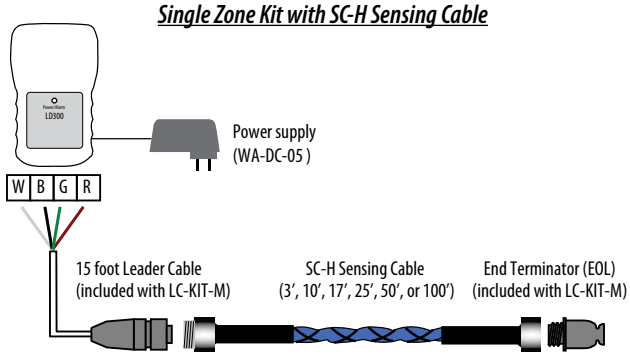
Single Zone Kit with SC Sensing Cable



Single Zone Kit with SC-C Sensing Cable



Single Zone Kit with SC-H Sensing Cable



ORDERING INFORMATION

CE RoHS Compliant c UL us LISTED ††

MODEL	DESCRIPTION	KIT INCLUDES THESE MANUF. PART #s
U006-0062	Kit, LeakDet, LD300, 10 ft Conductive Fluid	LD300, LC-Kit, SC-10 & WA-DC-05
U006-0063	Kit, LeakDet, LD300, 17 ft Conductive Fluid	LD300, LC-Kit, SC-17 & WA-DC-05
U006-0064	Kit, LeakDet, LD300, 25 ft Conductive Fluid	LD300, LC-Kit, SC-25 & WA-DC-05
U006-0065	Kit, LeakDet, LD300, 50 ft Conductive Fluid	LD300, LC-Kit, SC-50 & WA-DC-05
U006-0066	Kit, LeakDet, LD300, 100 ft Conductive Fluid	LD300, LC-Kit, SC-100 & WA-DC-05
U006-0067	Kit, LeakDet, LD300, 3 ft Chemical	LD300, LC-Kit-M, SC-C-3 & WA-DC-05
U006-0068	Kit, LeakDet, LD300, 10 ft Chemical	LD300, LC-Kit-M, SC-C-10 & WA-DC-05
U006-0069	Kit, LeakDet, LD300, 17 ft Chemical	LD300, LC-Kit-M, SC-C-17 & WA-DC-05
U006-0070	Kit, LeakDet, LD300, 25 ft Chemical	LD300, LC-Kit-M, SC-C-25 & WA-DC-05
U006-0071	Kit, LeakDet, LD300, 50 ft Chemical	LD300, LC-Kit-M, SC-C-50 & WA-DC-05
U006-0072	Kit, LeakDet, LD300, 100 ft Chemical	LD300, LC-Kit-M, SC-C-100 & WA-DC-05
U006-0073	Kit, LeakDet, LD300, 3 ft Hydrocarbon	LD300, LC-Kit-M, SC-H-3 & WA-DC-05
U006-0074	Kit, LeakDet, LD300,10 ft Hydrocarbon	LD300, LC-Kit-M, SC-H-10 & WA-DC-05
U006-0075	Kit, LeakDet, LD300,17 ft Hydrocarbon	LD300, LC-Kit-M, SC-H-17 & WA-DC-05
U006-0076	Kit, LeakDet, LD300, 25 ft Hydrocarbon	LD300, LC-Kit-M, SC-H-25 & WA-DC-05
U006-0077	Kit, LeakDet, LD300, 50 ft Hydrocarbon	LD300, LC-Kit-M, SC-H-50 & WA-DC-05
U006-0078	Kit, LeakDet, LD300, 100 ft Hydrocarbon	LD300, LC-Kit-M, SC-H-100 & WA-DC-05

†† Cables, EOL, and power supply only.

Lighting Controls Contents

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 different mounting styles and an adjustable time delay, these sensors give you 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 Series	Ceiling Mount Occupancy Sensors	144
MSB Series	Wall Switch Occupancy Sensors	146

Lighting Control Selection Guide

Ceiling Mount	Wall Mount
MSC page 144	MSB page 146

REDUCE ENERGY CONSUMPTION AND CONTROL ENERGY WASTE

MSC Series

The MSC Series ceiling mount occupancy sensors employ passive infrared (PIR) and/or ultrasonic technologies to accurately detect occupancy and automatically switch room lighting.

- Up to 2000 square foot coverage area
- 360 degree field of view
- Daylight level sensing, reduces unnecessary lighting

MSB Series

The MSB Series employs the latest passive infrared (PIR) technology to automatically control lighting for areas up to 1000 square feet. The MSB Series fits in place of existing wall switches, connecting to existing active line and ground wiring.

- Bypass button for "always on" operability
- 180-degree motion detection
- Line powered, no separate supply needed

Ceiling Mount Occupancy Sensors

Uses The Latest Passive Infrared And Ultrasonic Technologies

MSCD

MSCU

DESCRIPTION

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.

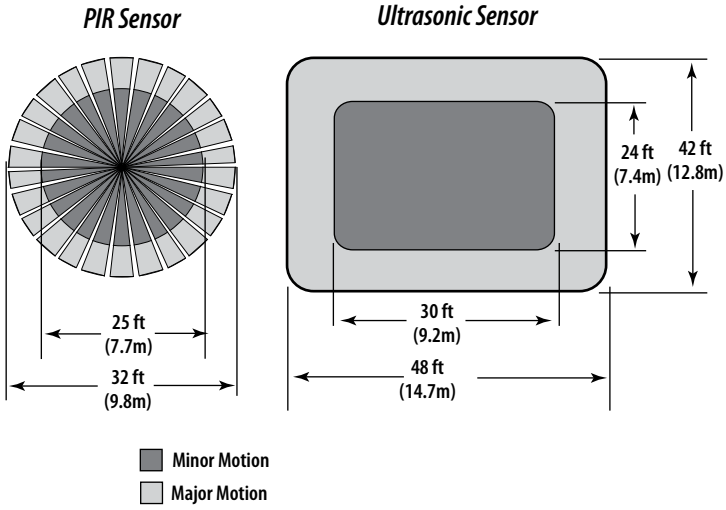
APPLICATIONS

- Lighting control based on occupancy
- Reducing energy usage
- Key component for LEED* certification programs
- 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

FEATURES

- Up to 2000 square foot coverage area
- 360 degree field of view
- Daylight level sensing (from 0.5 to 250 foot-candles)...eliminates unneccessary lighting
- Adjustable time delay (preset time delays from 15 seconds [test] to 30 minutes)...provides ultimate flexibility
- Adjustable coverage sensitivity (from 60-100%)
- Auxiliary relay...easily communicates with building control system
- Adjustment compartment cover
- LED motion indicator...provides quick visual status
- Manual bypass...for easy commissioning

Coverage Patterns for 9 ft (2.8m) Ceiling Height



SPECIFICATIONS

1 Year Warranty

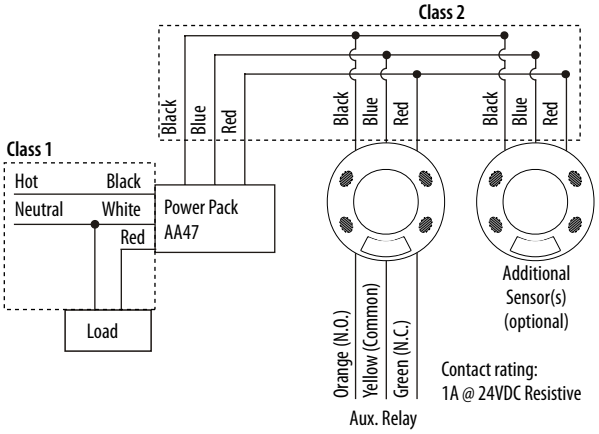
Standards	UL and cUL Listed; FCC part 15 (Class B) for Home and Office Use
Input Voltage	24VDC
Current Consumption@24VDC:*	
PIR	21mA nominal
Ultrasonic	34mA nominal
Dual	37mA nominal
Isolated Relay	Contact rating: 1A@24VDC Resistive
Temperature	0° to 50°C (32° to 122°F)
Humidity	Max. 90% RH noncondensing
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

For local line switching control, power must be provided by AA47 Power Pack or an approved equivalent.
**Leadership in Energy and Environmental Design (LEED) is a registered mark of the US Green Building Council*

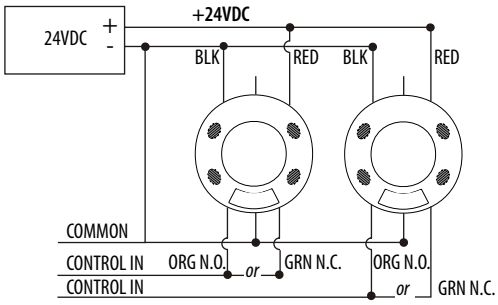
VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAMS

Local Line-Power Control MSC

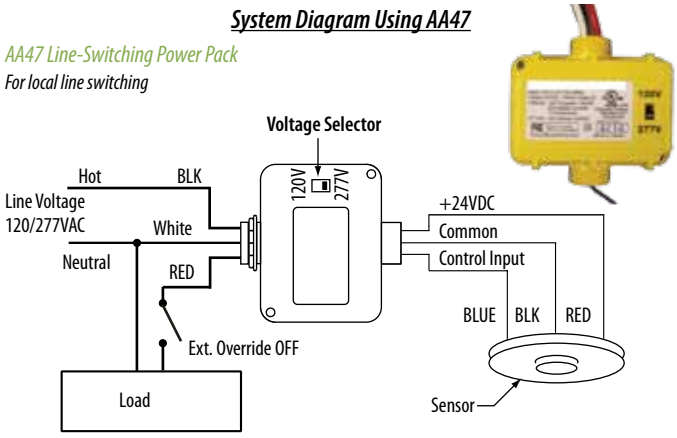


Building Control Panel



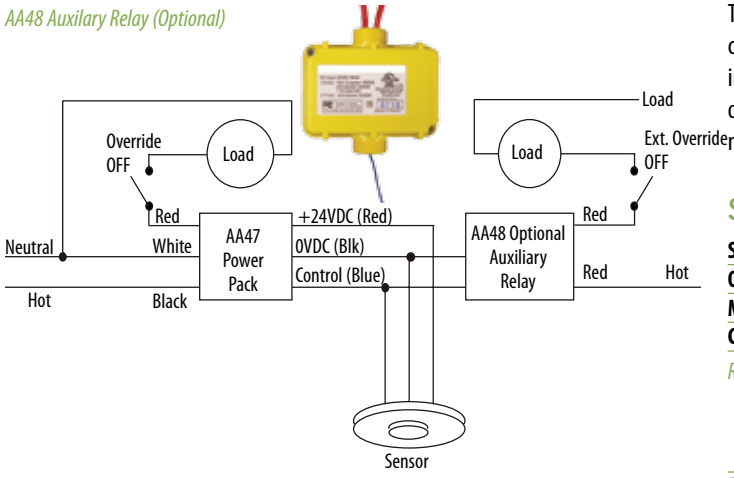
System Diagram Using AA47

AA47 Line-Switching Power Pack
For local line switching



System Diagram Using AA48

AA48 Auxilary Relay (Optional)



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 120/277VAC, 60 Hz line power directly to a Form A relay contact (SPST) to control a load and generates full-wave, 24VDC to power up to four MSC sensors (dependent on model). The AA47 can be mounted either inside or outside an electrical box, and sensor power can be routed via plenum-rated cable to the sensor(s).

SPECIFICATIONS - AA47

Storage Temperature	-29° to 65°C (-20° to 150°F)
Operating Temperature	0° to 40°C (32° to 104°F)
Maximum Humidity	90% RH noncondensing
AC Power Input	120/277VAC ± 10%, 60 Hz
Output Voltage	24VDC
Output Current	100mA max.
Relay Contacts:	
Horsepower Rating	1HP@120V
Switching Capacity	120VAC, 60 Hz; 15A tungsten 1800W 277VAC, 60 Hz; 20A Ballast
Dimensions	3.2" (81.3 mm) x 3" (76.2 mm) x 1.75" (44.5 mm)

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 noncondensing
Control Input	24VDC, 36mA nominal
Relay Contacts:	
Horsepower Rating	1HP@120V
Switching Capacity	120VAC, 60 Hz; 15A tungsten 1800W 120/277VAC, 60 Hz; 20A ballast
Dimensions	3.2" (81.3 mm) x 3" (76.2 mm) x 1.75" (44.5 mm)

ORDERING INFORMATION

c UL us LISTED

Sensing Technology

MSC [ ]

- **U** = Ultrasonic
- **D** = PIR + Ultrasonic
- **P**= Passive Infrared (PIR)

Coverage

[ ]

- **1000** = 1000 Sq. Ft. (Passive Infared only)
- **2000** = 2000 Sq. Ft. (Ultrasonic or Dual technology only)

Example:

MSC [D] [2000]

Wall Switch Occupancy Sensors

Employs A Low-Energy Switch Circuit To Maximize Contact Life

MSBP

DESCRIPTION

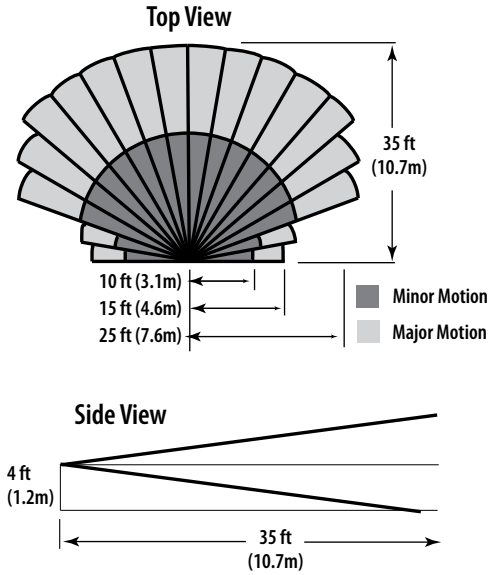
The **MSB Series** employs the latest passive infrared (PIR) technology to automatically control lighting for areas up to 1000 square feet, achieving energy savings and convenience.

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 active line and ground 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.

Coverage Patterns



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 exististing active line and ground wiring... great for retrofit installations

FEATURES

- Adjustable time delay
- Bypass button for “always on” operability...simpilifies commissioning
- 180-degree motion detection
- Line powered...no separate supply needed
- Compatible with all magnetic and electronic ballasts...provides ultimate flexibility
- No minimum loading requirement
- Automatic ON/Automatic OFF or manual ON/Automatic OFF versions
- 300 square feet minor motion detection...improves sensor accuracy
- Decorative faceplate
- Zero-voltage switching
- LED indication...provides visual sensor status
- Single-gang box mount...simplifies installation

SPECIFICATIONS

1 Year Warranty

Standards	UL and cUL Listed; FCC part 15 (Class B) for Home and Office Use
Input	120 or 277VAC±10% 60 Hz
Output	120VAC, 1000W max. tungsten incandescent load; 1000VA max. ballast load; ¼ HP max. motor load; 277VAC; 1800VA max. ballast load
Temperature	0° to 50°C (32° to 122°F)
Humidity	Max. 90% RH noncondensing

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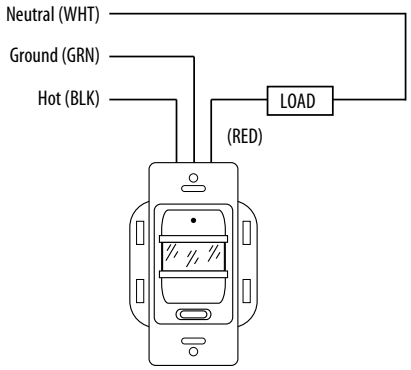
HQ0001802.B 01131

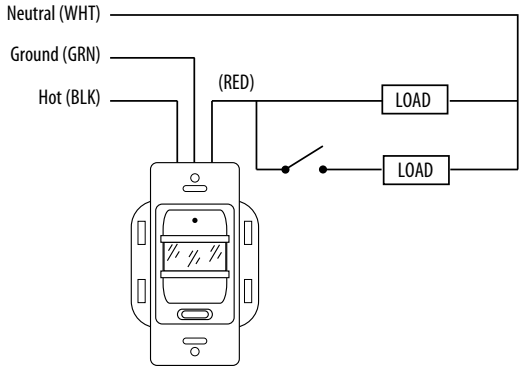
VERIS INDUSTRIES™

APPLICATION/WIRING DIAGRAMS

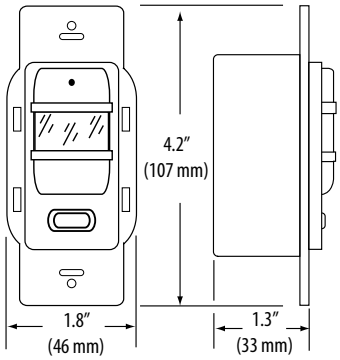
Single Level Lighting

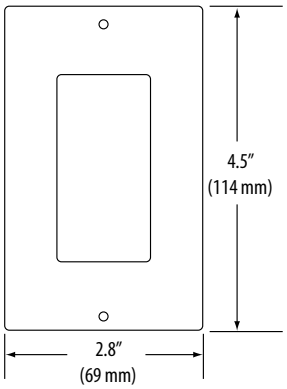


Bi-Level Lighting



DIMENSIONAL DRAWING





ORDERING INFORMATION

c UL us LISTED

Sensing Technology	Turn On	# of circuits	Color
MSB [P]	[ ]	[1]	[ ]
= Passive Infrared (PIR)	**A** = Automatic **M** = Manual		**W** = White **V** = Ivory

Example:

MSB [P] [A] [1] [V]

LIGHTING CONTROLS

Network Integration Contents

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	150
A7810/A8810	Data Acquisition Systems, For Embedded Applications	152
A8332-8F2D	Flexible I/O Module	154
A8911-23	Pulse Input Module	156
H8830	Wireless Modbus/Pulse Transceiver	158
H8920 Series	LonTalk Integration Nodes	160
H8936/H8932	Network Display	162
E8950	Modbus-to-BACnet Protocol Converter	164
U0012-0012/U0012-0013	Modbus Gateway/BACnet Router	166

Network Integration Selection Guide

FEATURES	Model	Page Number
Add Modbus TCP (Ethernet) Communication to a Modbus Meter	H8822/A8810/ U013-0012	pages 150, 152, 166
Add BACnet MS/TP (serial) Communication to a Modbus Meter	E8950	page 164
Add BACnet IP (Ethernet) Communication to a Modbus Meter	E8950	page 164
Add LON Communication to a Modbus Meter	H8920-x	page 160
Add BACnet IP (Ethernet) Communication to a BACnet MS/TP Meter	U013-0013	page 166
Log data from my Modbus devices	H8822/A8810	pages 150, 152
Access my Modbus Meter with a Web-Enabled interface	H8822/A8810	pages 150, 152
Access my Pulse Output Meters/Sensors with a Web-Enabled interface	A7810	page 152
Generate alarm notifications from my Modbus devices	H8822/A8810	pages 150, 152
GSM-Enabled Output	H8822GSM	page 150
Convert Pulse/Analog outputs to Modbus	A8332-8F2D, A8911-23	pages 154, 156
Wirelessly connect Modbus or Pulse devices	H8830	page 158
Add a Local Display to my Modbus (serial) Meter	H8936	page 162
Add a Local Control of Alarms to my Modbus Multi-Circuit Meter	H8936	page 162

ACCURATELY COLLECT, STORE, TRANSMIT, & DISPLAY POWER MONITORING DATA

E8950

The E8950 Modbus to BACnet converter allows you to easily integrate Veris meters into your BACnet communicating building automation system. The converter detects supported Modbus meters, giving them a unique BACnet device ID with a full set of measurement data and configuration objects.

- Enables Veris Meter access via BACnet MS/TP and/or BACnet IP
- Automatic Baud rate detection of BACnet MS/TP
- Each E8950 can support up to 1000 BACnet measurement points (or 32 meters max, if <1,000 total points)
- Supports Veris meters: H8035, H8036, H8163 with H8163-CB, H8238, H8436, H8437, E50C2, E51C2, E50C3, E51C3, E30Bxxx, E30Cxxx, E31Bxxx, E31Cxxx

E5x Series

H81xx/H80xx Series

H84xx Series

E3x Series

H8238 Series

NETWORK INTEGRATION

VERIS INDUSTRIES

Data Acquisition Systems

Modbus Protocols, Data Logging and Server Capabilities

H8822

DESCRIPTION

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 the lowest total installed cost on the market. It is the 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).

APPLICATIONS

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

FEATURES

- Simple plug-and-play connectivity...install and configure in minutes
- Hardware and software provide data in flexible, industry-standard formats for databases, spreadsheets, etc.
- LCD display for easy installation and troubleshooting
- Integrated web server provides setup and configuration using any standard web browser (e.g. Safari™ or Internet Explorer™)

NETWORK INTEGRATION

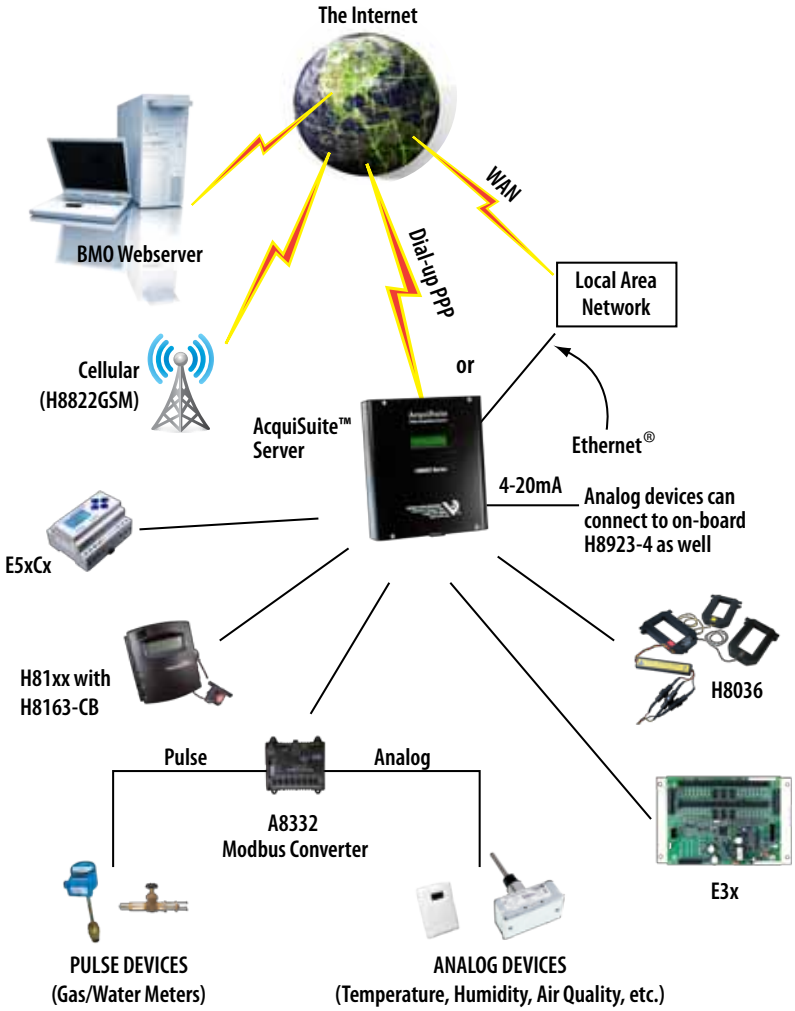
SPECIFICATIONS

2 Year Warranty

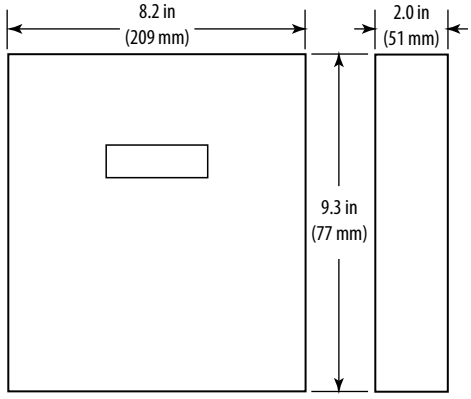
Input Power	120-240V 50/60 Hz transformer to 24VDC, included
Processors:	
Main Processor	ARM 9
I/O Co-Processor	ARM 7
Operating System	Linux
Flash ROM	16MB NOR Flash (expandable with USB memory device)
Memory	32MB RAM
LEDs	8x pulse input, 4 modem activity, Modbus TX/RX, power status
LCD	2 x 16 LCD Character, two buttons
LAN	10/100, Auto crossover detection
Modem:	
Phone	V.34 bis, 33,600 bps (H8822)
Cellular	GSM/GPRS Class 10, 85 kbps (H8822GSM)
Protocols	Modbus/RTU, Modbus/TCP, TCP/IP, PPP, HTTP/HTML, FTP, SNMP, SMTP, XML
Serial Port	RS-485 Modbus
Interval Recording	User selectable 1-60 minutes. Default 15 minute interval
Inputs	8x, user selectable: 0-10V - Min/Max/Ave/Instantaneous; 4-20mA- Min/Max/Ave/Instantaneous; Pulse - Consumption, Rate; Resistance - Min/Max/Ave/Instantaneous; Runtime - Runtime, Status
Outputs	2x, Dry contact 30VDC, 150mA max.
Agency Approvals	FCC Part 15, Class A

VERIS INDUSTRIES™

APPLICATION/WIRING EXAMPLES



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 nonvolatile 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

Data Acquisition Server

Flexible Data Server for Embedded Applications

A8810

A7810

DESCRIPTION

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 ising 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 suppports 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.

FEATURES

- Tracks data in real time...providing 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
- Compatible with multiple communication protocols...push or pull data to energy dashboards and software applications for easy system integration
- Industrial temperature range (-30° to 70°C), perfect for embedded applications...speeds up development and integration of energy data
- DIN rail mounting...easy installation

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

NETWORK INTEGRATION

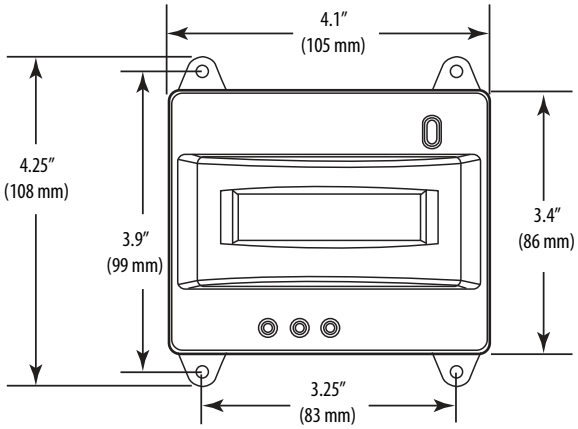
SPECIFICATIONS

2 Year Warranty

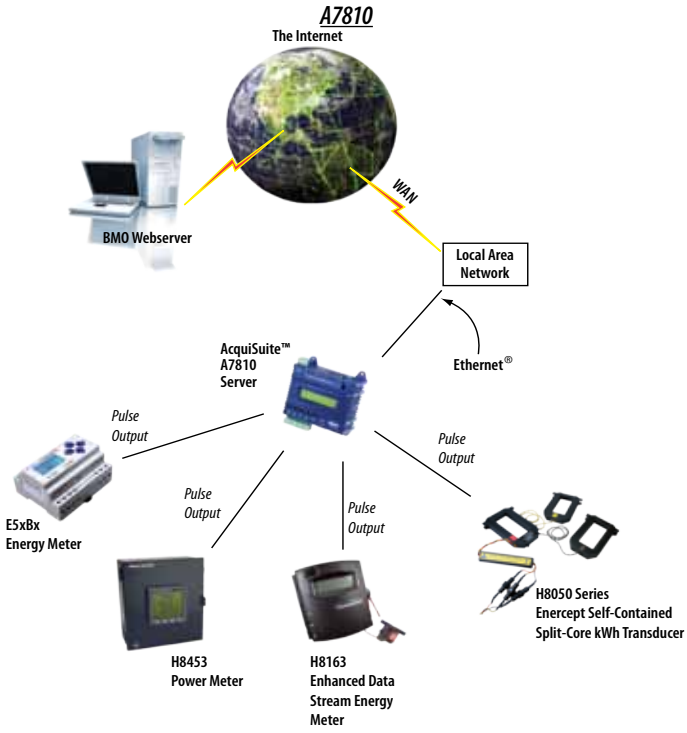
Input Power	24VDC, 500mA*
Isolation	**A7810:** RJ45 Ethernet isolated to 1500VDC from main board (power and pulse inputs not isolated) **A8810:** RJ45 Ethernet and RS-485 port isolated to 1500VDC from main board (power and USB not isolated)
Main Processor	ARM 9 embedded CPU
Operating System	Linux 2.6
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 100Ω to 2.5kΩ user selectable; max. rate 10 Hz; min. width 50 msec
Serial Port Input (A8810)	RS-485 Modbus, supports up to 32 external devices (expandable)
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, full half duplex, auto polarity
Environmental:	
Operating Temperature Range	-30° to 70°C (-22° to 158°F)
Operating Humidity Range	0-95% RH noncondensing
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

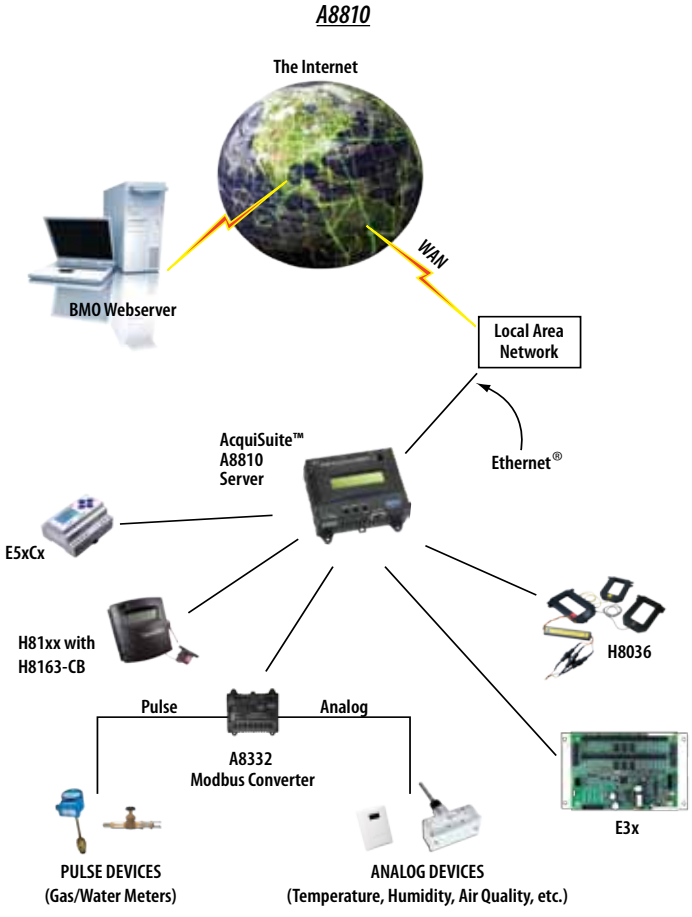
** This unit is to be sourced by a Class 2 power supply with the following output: 24VDC, 500mA min. not to exceed 8A.*

DIMENSIONAL DRAWING



APPLICATION/WIRING EXAMPLES





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 nonvolatile 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)

ORDERING INFORMATION

c UL us

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

Flexible I/O Module

Pulse/Analog To Modbus® Converter

A8332-8F2D

DESCRIPTION

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.

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)

FEATURES

- Network up to 8 industry-standard sensors to the AcquiSuite data acquisition network
- Universal inputs simplify setup...just connect sensors and select device output type via the AcquiSuite or using Obvius configuration software
- Check device status at a glance...LED indicators allow for fast recognition of on/off status, TX/RX communications, and 8 input notifications
- Field-selectable address DIP switch...no software or PC configuration required
- High reliability...nonvolatile memory retains configuration and pulse data during power failures
- All configuration information and input data is stored in non-volatile memory to prevent data loss in the event of power failure
- 8 user selectable universal inputs to aggregate analog, pulse, and resistance sensors/meters

SPECIFICATIONS

5 Year Warranty

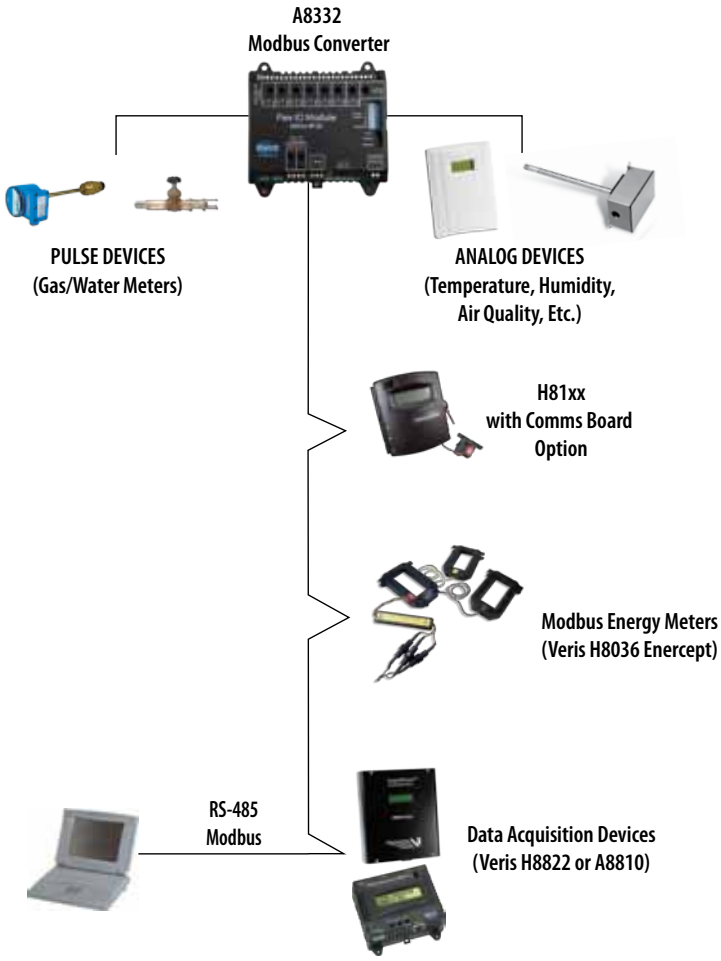
Processor	ARM 7, field upgradable firmware
LED	8 input status LEDs (red), 2 Modbus TX/RX (yellow), 1 power/alive status (green)
Protocols	Modbus/ RTU
Power Supply	24VDC, 200mA (not included)
Serial Port	RS-485 Modbus, 19200 or 9600 baud. N81
Inputs	8x, user selectable; 0-10V: Min/Max/Ave/Instantaneous; 4-20mA: Min/Max/Ave/Instantaneous; Pulse: Consumption, Rate; Resistance: 0-10V: Min/Max/Ave/Instantaneous
Maximum Pulse Rate	10 Hz
Contact Closure Threshold	1 kΩ
Isolation	RS-485 port is optically isolated

Operating Environment:

North America	Indoor, -30° to 70°C (32° to 122°F), 0-95% RH noncondensing

A8332-8F2D is 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.

APPLICATION/WIRING EXAMPLE



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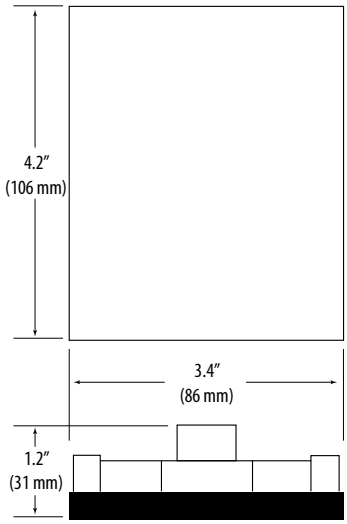


NETWORK INTEGRATION

ORDERING INFORMATION

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

Pulse Input Module

Up to 23 Separate Pulse Inputs

A8911-23

DESCRIPTION

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.

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)

FEATURES

- External communications via shielded twisted pair 18-22 gauge wire...allows communication up to 4000 feet
- Pulse input communication up to 200 feet using 18-24 gauge control wire
- DIN rail mounting...quick and easy installation
- Onboard DIP switches for Modbus addressing
- Industry standard pulse inputs connect to most pulse output meters
- LED verification of RS-485 Modbus TX/RX communications
- LED indicators for each pulse input...fast indication and verification of pulses
- Non-volatile memory retains configuration and pulse count totals during power failures

NETWORK INTEGRATION

SPECIFICATIONS

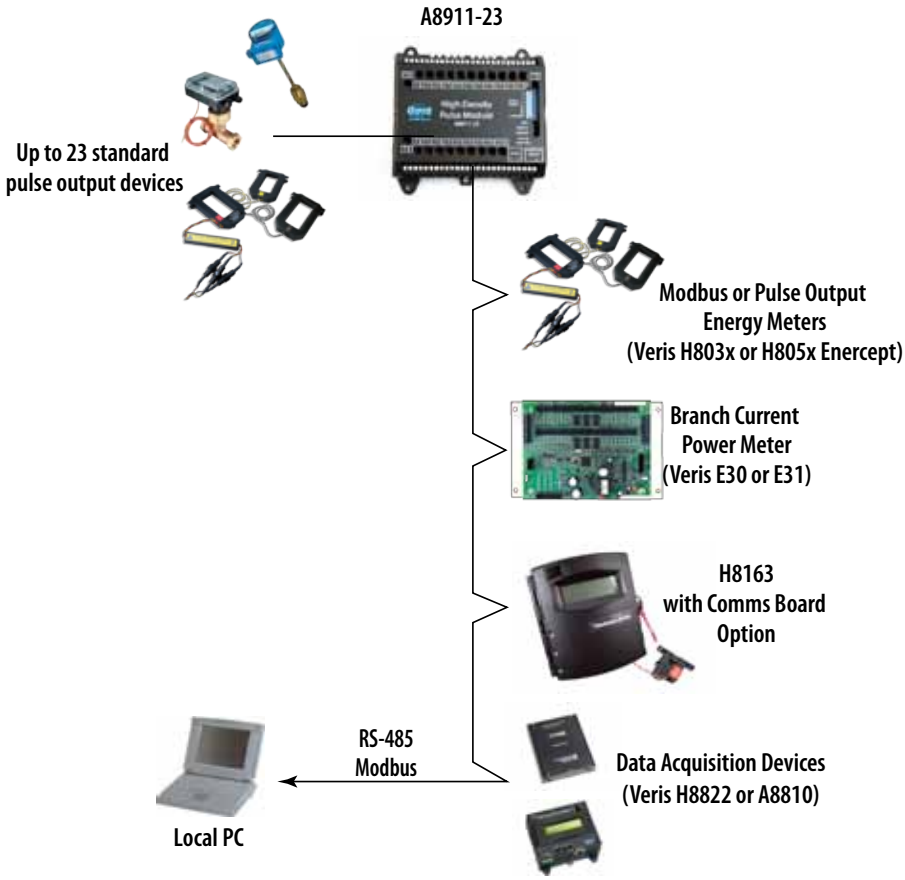
2 Year Warranty

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	9VDC to 30VDC, 200mA (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:	
North America	Indoor, 0° to 50°C (32° to 122°F), 0-95% RH noncondensing
Agency Approvals	FCC CFR 47 Part 15, Class A

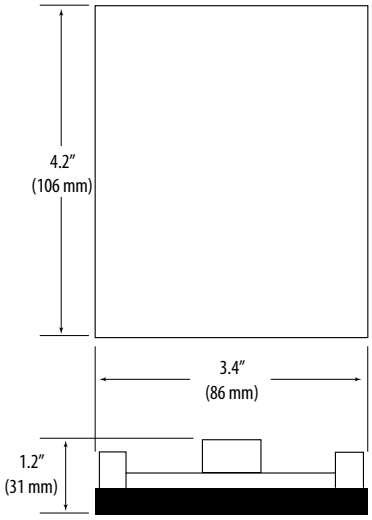
A8911-23 is sold as an open device.
Observe handling precautions for static sensitive devices to avoid damage to the circuitry which would not be covered under the factory warranty.

VERIS INDUSTRIES

APPLICATION/WIRING EXAMPLE



DIMENSIONAL DRAWING



ORDERING INFORMATION

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

Wireless Modbus/ Pulse Transceiver

Eliminate Costly Wiring

H8830

DESCRIPTION

The **H8830** wireless Modbus®/pulse transceiver from Veris Industries is perfect for submetering commercial and industrial facilities and adding Modbus devices to any network without the need for costly communications wiring.

The input port on the H8830 easily connects to new or existing devices (up to 32 Modbus and 2 pulse devices, e.g. meters, sensors, etc.) to automatically detect the optimum route for reliable and timely data communications. If additional data points are needed, use an expansion module, available from Veris as the A8911-23 or the A8332-8F2D.

Data from each H8830 passes from one transceiver to another to reach its ultimate destination. This self-managed mesh network allows the system to function with high reliability where other wireless systems fail due to short- or long-term interference from radio signals.

APPLICATIONS

- Tenant submetering
- Allocating costs
- Adding Modbus devices to existing networks
- Gathering energy information from remote buildings
- Monitoring performance of building systems (e.g., chillers, boilers, fans)
- Retrofits

FEATURES

- Self-optimizing wireless interface between multiple Modbus devices and networks
- Intelligent H8830 transceivers eliminate the need for costly PCs and software
- Customized for Modbus device interface...optimize performance with minimal overhead
- Pulse inputs allow connection to existing meters for electricity, gas, water, steam, or BTUs
- Wireless communications (up to 1500 ft/457 m per hop) allow monitoring of remote transformers and meters without expensive trenching
- Rugged wall-mount design makes installation a snap and assures high reliability
- Intelligent H8830 nodes continuously monitor wireless traffic to optimize routing
- H8830 nodes and devices can be added at any time and fit seamlessly into the routing network
- Scalable design means that projects can be completed in stages as resources become available

The H8822 AcquiSuite Data Acquisition System combines with the H8830 to provide a complete system solution

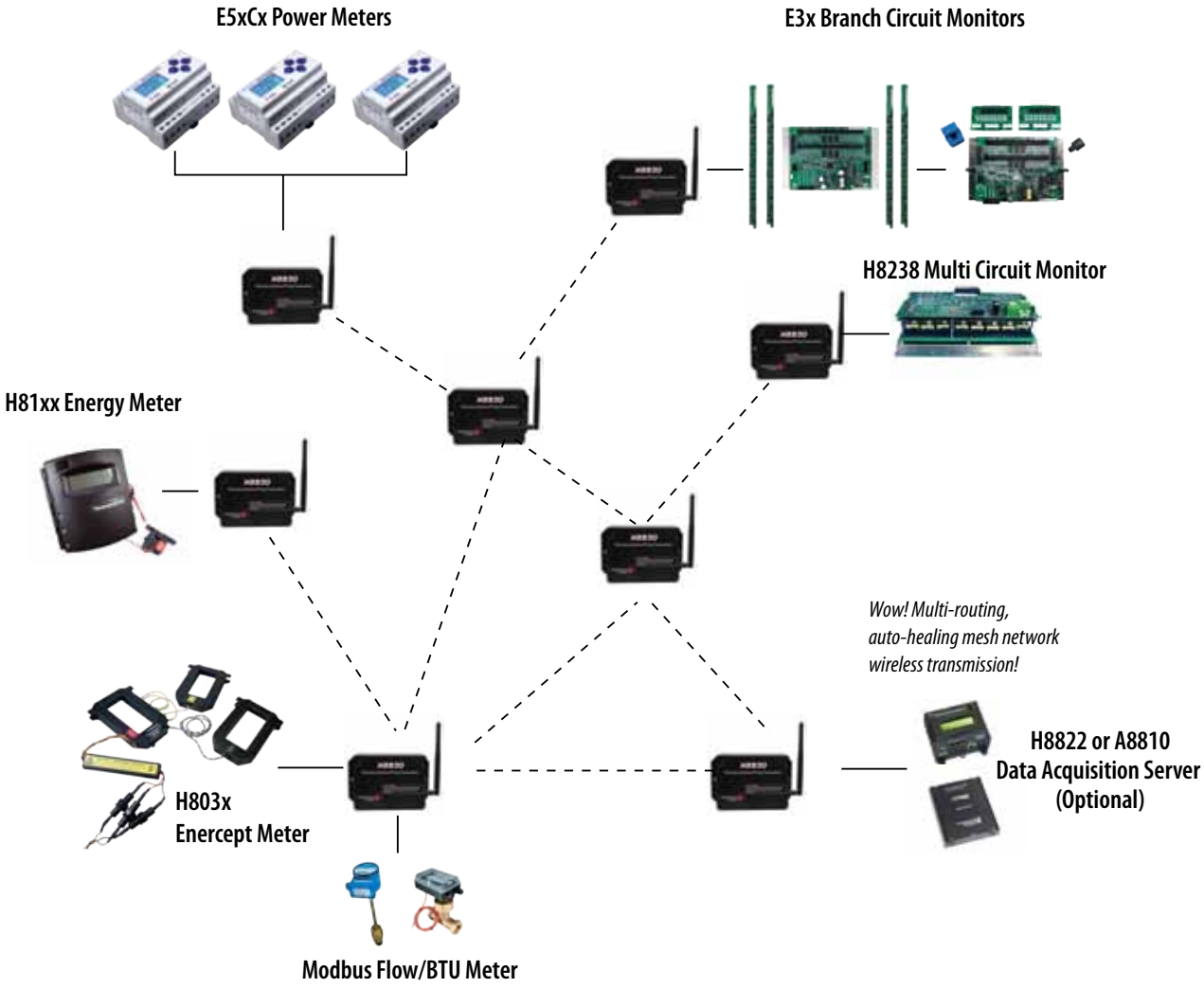
- The H8822 data acquisition system from Veris provides plug-and-play connectivity to Veris meters
- Meters or sensors added to the H8830 network (or hard-wired to the H8822) are immediately recognized, and interval data is stored in the H8822
- Industry-standard protocols provide flexible communications using either existing LANs or phone lines

SPECIFICATIONS

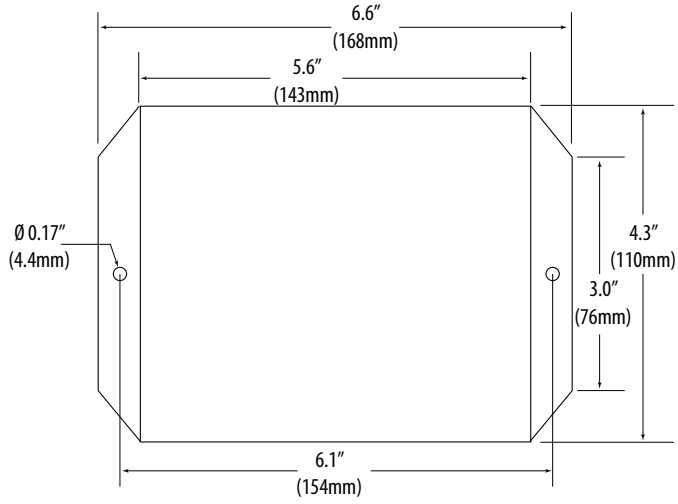
2 Year Warranty

Input Power	110 to 120VAC
Processor	ARM
Firmware	Field-upgradeable
Inputs	Pulse (2x dry contact), Modbus RS-485
Modbus Input	2-wire RS-485 (9600 or 19200 baud)
LED	2x RF, 2x RS-485, 2x pulse, Alive, Alarm
Radio Frequency	900MHz ISM band
Radio Output Power	100mW (optional 150mW, consult factory)
Radio Max Range	1500 ft. (457 m) per hop

APPLICATION/WIRING EXAMPLE



DIMENSIONAL DRAWING



ORDERING INFORMATION

MODEL	DESCRIPTION
H8830	Wireless Modbus/Pulse Transceiver

NETWORK INTEGRATION

LonTalk® Integration Nodes

Convert Modbus Data To Lontalk® Protocol

H8920-x

DESCRIPTION

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, the 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.

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

FEATURES

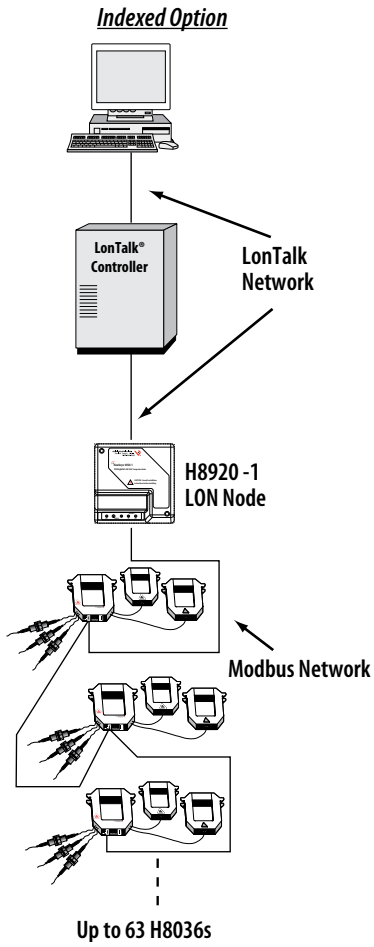
- Pre-configured to pass points acquired by Veris transducers to a Lon controller
- Easy cost-effective connectivity to LonWorks systems...makes open connectivity possible
- Flexible mounting and wiring options save time and money

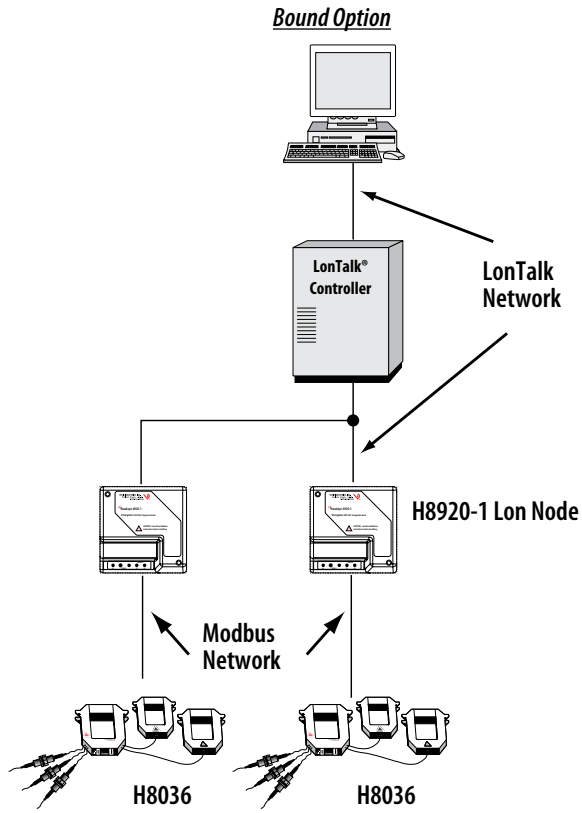
SPECIFICATIONS

5 Year Warranty

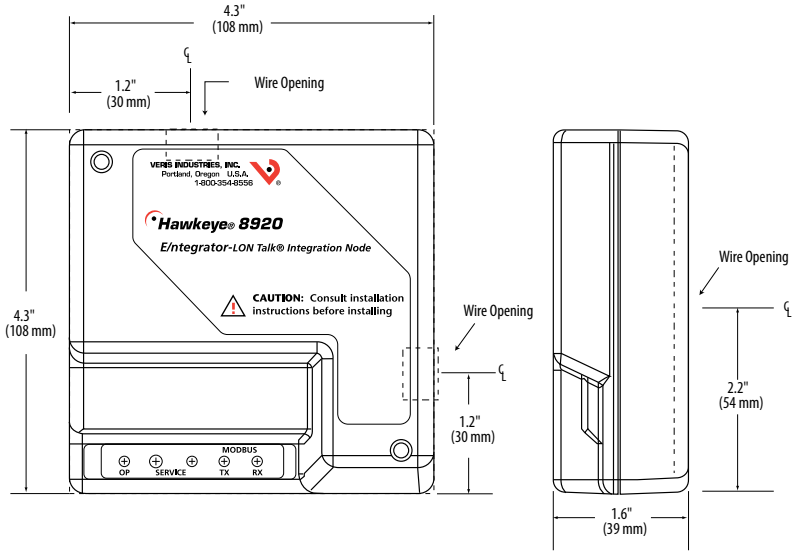
LonWorks Network	Free topology transceiver, 78 kbps
Modbus Network	RTU 9600 BAUD, 8N1 format
Input Power	16-24VAC/DC, 100mA (max.)
Temperature Range	0° to 60°C (32° to 140°F)
Humidity Range	0 - 95% noncondensing

APPLICATION/WIRING EXAMPLES





DIMENSIONAL DRAWING



ORDERING INFORMATION

MODEL	DESCRIPTION
H8920-1	Enercept® H8036 to LonTalk® integration node
H8920-3	H81xx Energy Meter to LonTalk® integration node
H8920-4	H704/H663 to LonTalk® integration node
H8920-5	Enercept® H8035 to LonTalk® integration node

Network Display

Modbus Bridgepoint

DESCRIPTION

The **H8932/H8936** serves as a display for Modbus data. The product sits in series between downstream metering devices and the upstream master, providing a display of the data passing through it. Each register of the H704, H663, H8238, H8035, H8036, E50Cx, and E51Cx energy monitors is 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.

APPLICATIONS

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

FEATURES

- Large 1" x 4" backlit LCD with adjustable brightness control for easy viewing
- Multi-color LED shows alarm status at a glance
- Pass-through communications to other Modbus® devices*
- Easy keypad setup
- Monitor a variety of Veris power transducers from a single location

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

NETWORK INTEGRATION

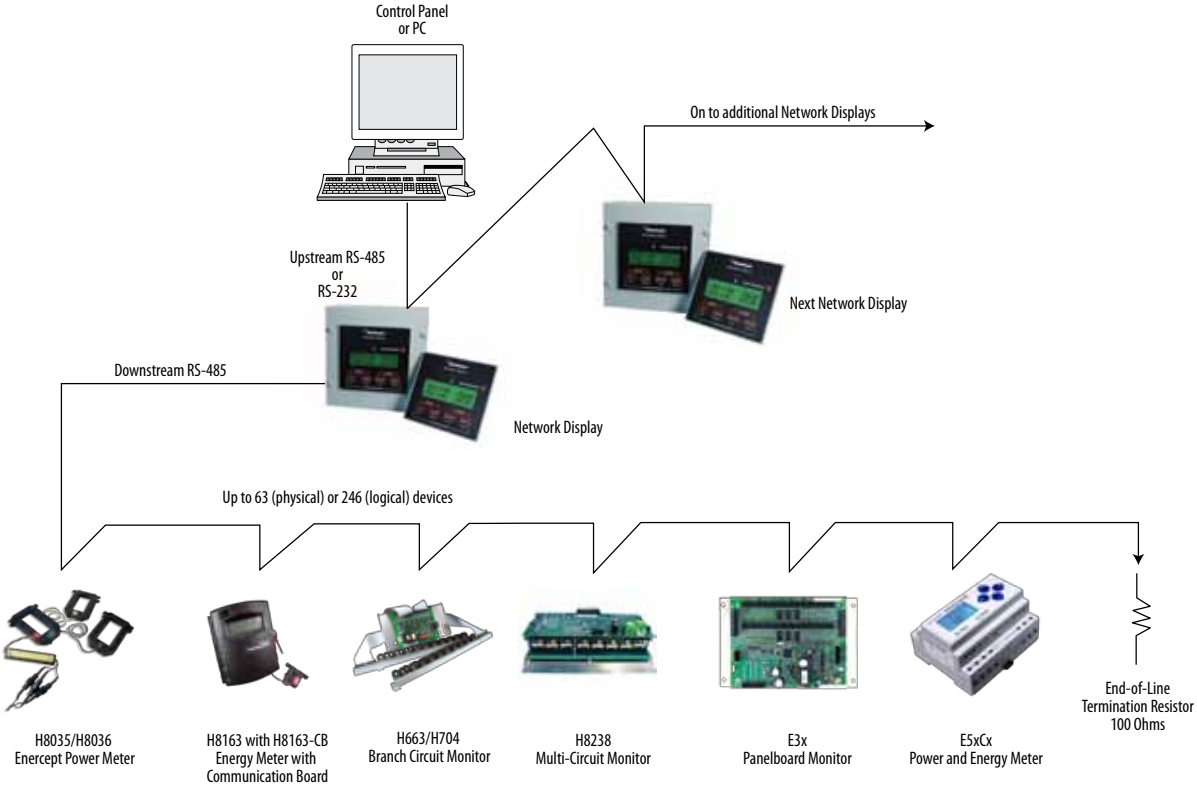
SPECIFICATIONS

5 Year Warranty

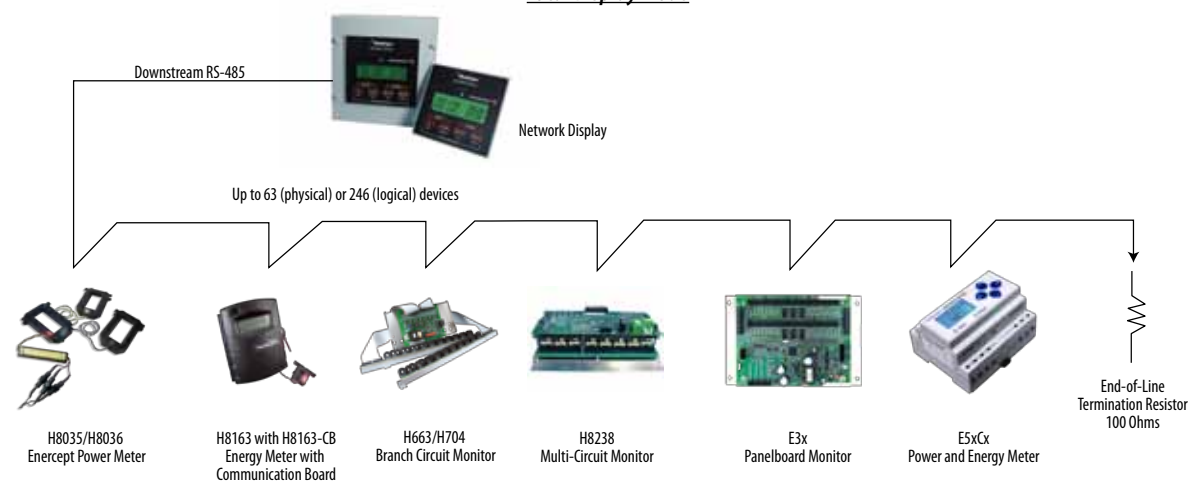
AC Power Source	Dedicated 120VAC, line-to-neutral; fused
Fuse Ratings	200mA@250 5x20 mm Fast-Blo
AC Power Voltage Tolerance	(90-132VAC) for 120V
AC Power Frequency	50/60 Hz
AC Power Termination	2-position Euro-style pluggable connector (max. wire size 12 gauge)
Terminal Block Torque	4.9 in-lb (0.56 N-m)
Alternate DC Power Source	12VDC, 300mA unfused (auxiliary input disabled if line connected)
Operating Temperature Range	0° to 50°C (32° to 122°F); <95% RH noncondensing
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)
UI-Switch Inputs:	
Number/Function	Four (METER, UP, DOWN, SELECT)
Auxiliary Input (Remote Alarm):	
Type	Contact closure or pull-to-ground (10 mA max.)
Isolation	Optical to 2500VAC
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

APPLICATION/WIRING EXAMPLES

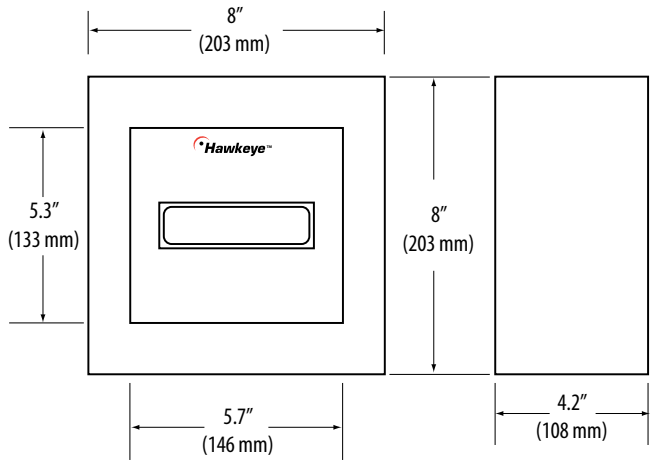
Network Host Mode



Local Display Mode



DIMENSIONAL DRAWING



ORDERING INFORMATION

c UL us LISTED

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

Other protocols are available. Consult factory.

Modbus-to-BACnet Protocol Converter

Integrate Multiple Modbus Meters into a BACnet Network

E8950

DESCRIPTION

E8950 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 E8950 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 MS/TP baud rate using DIP switches or configure the IP interface using the integral web server, and the supported Veris Modbus meters are available as fully-supported BACnet devices.

APPLICATIONS

- Energy Management with Building Automation Systems
- Integrated metering of HVAC systems and chillers

FEATURES

- Enables Veris meter access via BACnet MS/TP and/or BACnet IP...compatible with standard building protocols
- Supports a broad range of Veris meters: H8035, H8036, H8163 with H8163-CB, H8238, H8436, H8437, E50C2, E51C2, E50C3*, E51C3*, E30Ax42, E30Bxxx, E30Cxxx, E31Bxxx, E31Cxxx...application flexibility
- Each E8950 can support up to 1000 BACnet measurement points (or 32 meters max., if <1000 total points)...extensive data collection
- Simultaneously supports mixed meter types (with common baud rate)... versatility in the field
- Simple to set up...automatically detects supported meters and configures BACnet objects...no manual mapping of Modbus points required
- Presents a separate device object for each meter attached...easy to program
- Can be mounted on DIN rail or wall...installation flexibility

** The logging functionality of these meters is not supported.*

NETWORK INTEGRATION

SPECIFICATIONS

2 Year Warranty

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	up to 32 devices (not to exceed 1000 total BACnet data objects)

Upstream (Controller) Ethernet Interface:

Physical Layer	10/100 Mb Ethernet
Protocol	BACnet IP

Upstream (Controller) Serial Interface:

Physical Layer	2-wire RS-485
Protocol	BACnet MS/TP
Baud Rate	9600, 19200, 38400, 76800

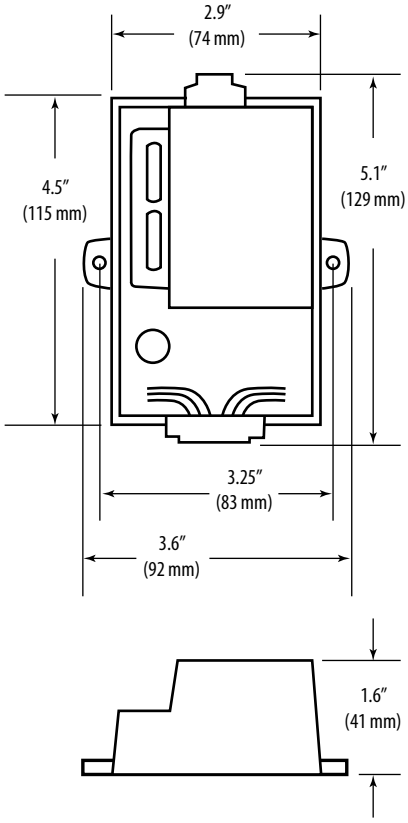
Input Power Requirements:

Supply Voltage	Class 2 9-30VDC or 12-24VAC
Nominal Current Draw @ 12V	240mA

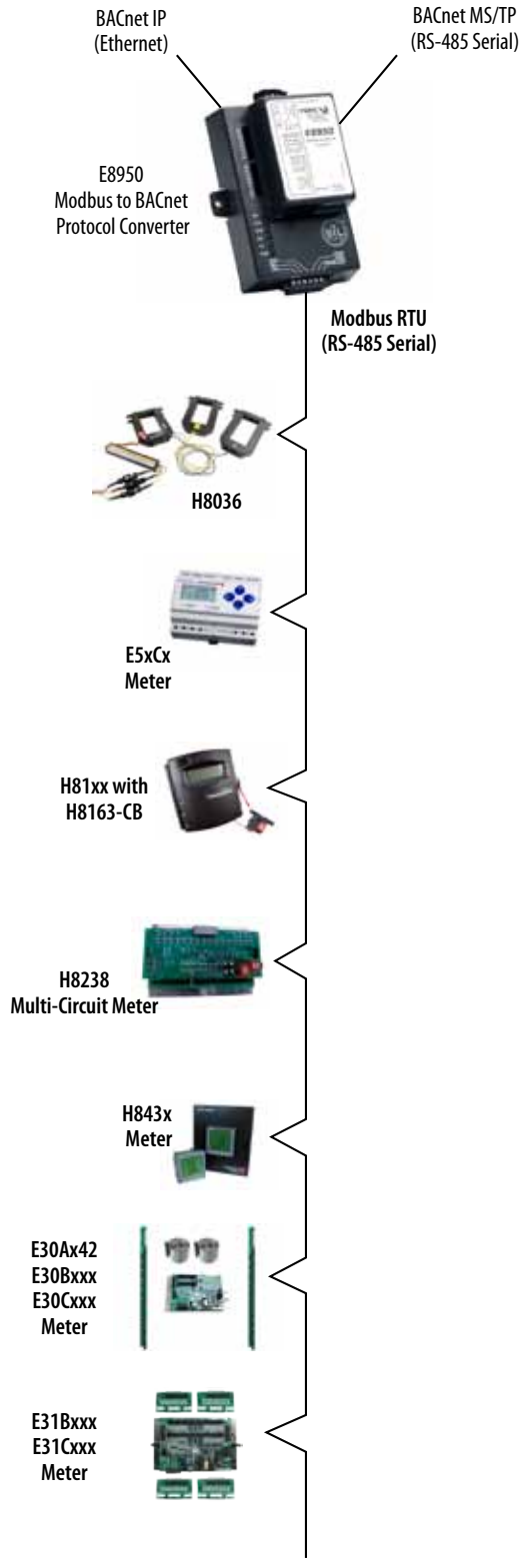
Environmental:

Operating Temperature Range	-40°C to 122°C (-40°F to 50°F)
Operating Humidity Range	5-90% RH noncondensing
Agency Approvals	CE; TUV approved to UL916

DIMENSIONAL DRAWING



APPLICATION/WIRING EXAMPLE



ORDERING INFORMATION

MODEL	DESCRIPTION
E8950	Modbus to BACnet Converter

Serial-toEthernet Protocol Converter

Easy Translation of Protocols to Integrate into a Network

DESCRIPTION

U013-0012 Modbus Gateway provides access to all Veris Modbus RTU products over a network using Modbus TCP protocol. **U013-0013** BACnet router provides access to all Veris BACnet MS/TP products over a network using BACnet IP protocol.

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

FEATURES

- U013-0012 enables control of Modbus RTU meters and sensors over Ethernet networks via Modbus TCP
- U013-0013 enables control of BACnet MS/TP meters and sensors over Ethernet networks via BACnet IP
- Connect multiple devices to one network drop
- Simple to set up...requires no product-specific configuration
- DIN-rail mount...easy installation

APPLICATIONS

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

SPECIFICATIONS (U013-0012)

5 Year Warranty

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	12-48VDC
Nominal Current	400mA@12VDC, 130mA@48VDC

Environmental:

Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Operating Temperature	0°C to 55°C (32°F to 131°F)
Relative Humidity	5-95% RH noncondensing
Agency Approvals	UL; CE; FCC Part 15 Class A; RoHS

SPECIFICATIONS (U013-0013)

2 Year Warranty

Downstream (Device) Interfaces:

Physical Layer	2-wire RS-485
Protocol	BACnet MS/TP
Baud Rate	9600 to 78,600

Upstream (Controller) Ethernet Interface:

Physical Layer	10/100 Mb Ethernet, Fixed IP
Protocol	BACnet IP

Input Power Requirements:

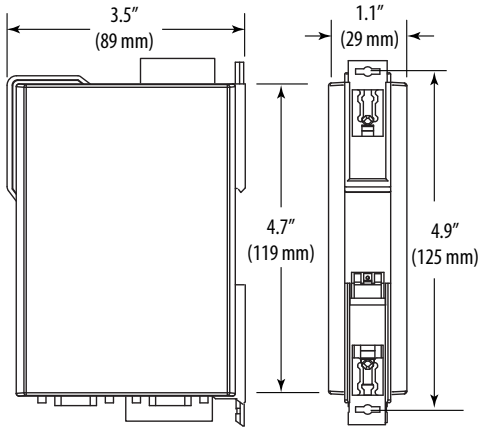
Supply Voltage	24VDC +/- 10%, 2W or 24VAC +/-10% 4VA 47 to 63 Hz

Environmental:

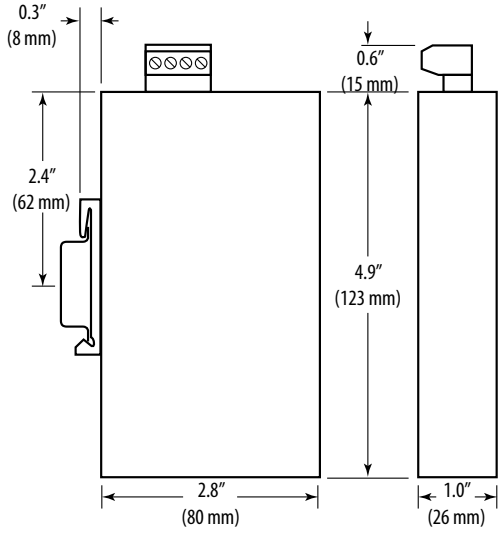
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Operating Temperature	0°C to 60°C (32°F to 140°F)
Relative Humidity	10-95% RH noncondensing
Agency Approvals	CE; FCC Part 15 Class A; RoHS

DIMENSIONAL DRAWINGS

U013-0012

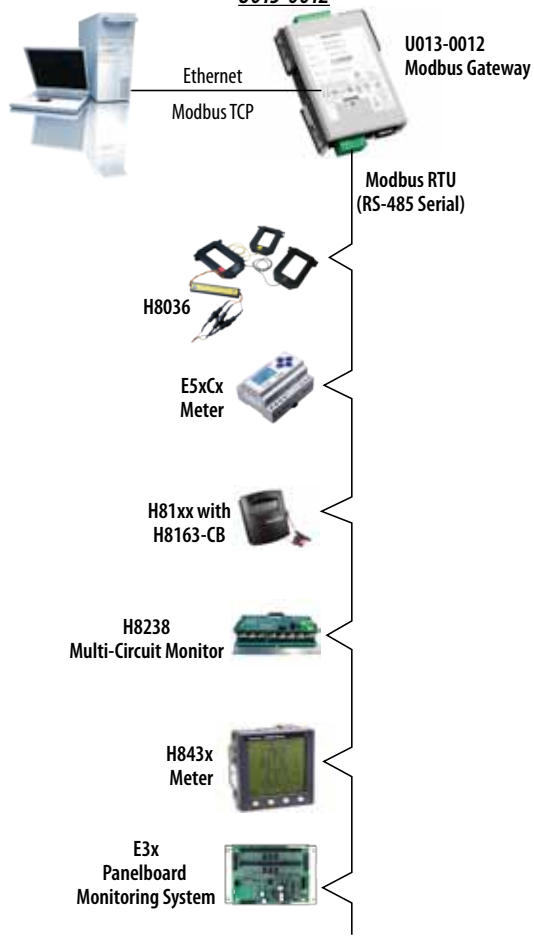


U013-0013

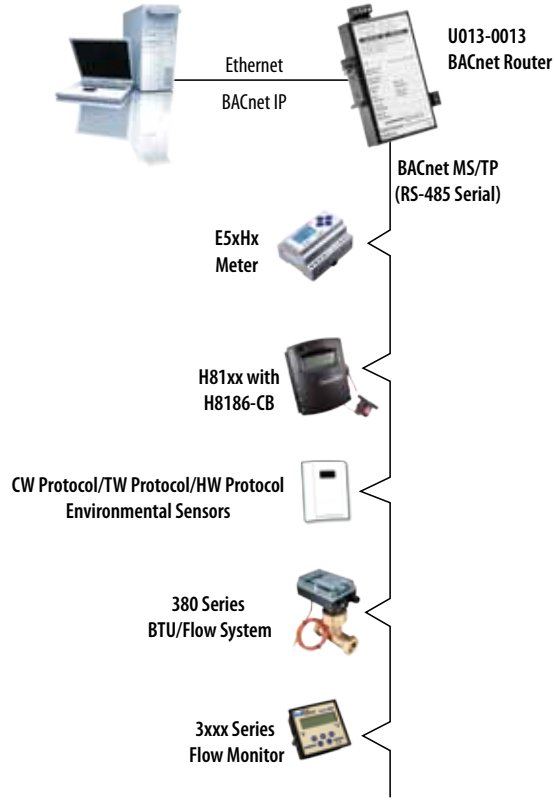


APPLICATION/WIRING EXAMPLES

U013-0012



U013-0013



ORDERING INFORMATION

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

Power Monitoring Contents

Veris Industries leads the way with a complete line of innovative power monitoring solutions that save time and money. From three-phase main service/sub-panel monitoring to single phase branch circuits, Veris power monitors provide multiple points of data for a vast aray of electrical systems. 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
E5x	Compact Power and Energy Meter	174
H8035/H8036	Enercept Networked Power Meters (Modbus RTU)	176
H804x/H805x	Enercept Self-Contained Split-Core kW/kWh Transducers	178
H81xx Series	Commercial Energy Consumption Meters	180
H81xx-CB	Communications Board for the H81xx Series Energy Meters	183
H84xx Series	Revenue Grade Power Meter, for Voltage-Mode CTs	184
E3x	Panel Board Monitoring System	186
H8238	Multi-Circuit Monitor	190
Accessories		328

See following pages for multi-circuit and single circuit selection guides.

RELIABLE ENERGY AND POWER METERING FOR OPTIMAL ENERGY CONSERVATION

POWER/ENERGY MONITORING

Ultimate Visibility - E3x Panelboard Monitoring System

E31

The E3x family of Panelboard Monitors allows you to monitor current, voltage, and energy consumption with one device, ensuring educated decisions about a facility's power usage. The E3x Series monitors power at the branch level quickly directing you to energy hogging equipment, letting you make adjustments that will have the greatest impact on your energy bill, saving time and money.

- Ideal solution for retro-fit or new construction applications with solid and split-core versions
- Reduce labor costs and units to stock, one unit monitors up to 92 circuits (84 branch circuits +2 three-phase mains and 2 neutrals).
- Easy control system integration and lower total project costs with RS-485, Modbus RTU Communications compatibility, allows up to 126 panelboards to be monitored.

E50

Ultimate Versatility - E5x Series Power & Energy Meter

Save costs while addressing a broad range of applications from submetering to full bi-directional monitoring of renewable energy installations with a meter that has comprehensive measurement capabilities. The E5x can be panel, DIN rail, or wall mounted, and offers a wide choice of inputs, outputs and communication protocols including BACnet, LON, and Modbus.

- Decrease inventory to stock: One model covers 90-600 VAC and 5-32,000 Amps (use a PT for higher voltage applications).
- Versatile mounting options in panel, DIN rail, or wall mount with optional enclosure.
- Simplify BAS integration with pulse contact accumulators for water, gas, or flow sensors on BACnet & LON models
- Easy system integration with embedded BACnet, LON, or Modbus communication.

VERIS INDUSTRIES™

VERIS SINGLE-CIRCUIT ENERGY/POWER METERS GUIDE

Retrofit	*Simplicity & Public Accessibility*	*Power Quality*	*Versatility*
Enercept H80xx Series (see pages 176, 178)	H81xx Series (see page 180)	H84xx Series (see page 184)	E50 Series (see page 174)

		OUTPUT/PROTOCOL						
Service Type	**Voltage**	4-20 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* E8950 *4	H8436V/VB *or* H8437V/VB *and* E8950 *4		
			E50B1	E5xCx *3	E5xHx	E5xHx *and* U013-0013 *5	E50Fx	
Split-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* H8437VB *and* E8950 *4	H8436V/VB *or* H8437V/VB *and* E8950 *4		
			E50B1	E5xCx *3	E5xHx	E5xHx *and* U013-0013 *5	E50Fx	
3-phase Wye	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	H8163-xxxx-x-3 *and* H8163-CB *3	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
			H8453V/VB *or* H8463V/VB	H8436V/VB *3 *or* H8437V/VB *3	H8436V/VB *or* H8437V/VB *and* E8950 *4	H8436V/VB *or* H8437V/VB *and* E8950 *4		
	240-600V		H8453VBS H8463VBS	H8436VBS *3 *or* H8437VBS *3	H8436VBS *or* H8437VBS *and* E8950 *4	H8436VBS *or* H8437VBS *and* E8950 *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* E8950 *4	H8035/8036 *1 *and* E8950 *4	H8035 *and* H8920-5 *1 H8036 *and* H8920-1 *1	H8025/H8026 *1
	120-600V		E50B1	E5xCx *3	E5xHx	E5xHx *and* U013-0013 *5	E50Fx	
3-phase Delta *(no neutral)*	120-480V		H8453V/VB *or* H8463V/VB	H8436V/VB *3 *or* H8437V/VB *3	H8436V/VB *or* H8437V/VB *and* E8950 *4	H8436V/VB *or* H8437V/VB *and* E8950 *4		
	240-600V		H8453VBS H8463VBS	H8436VBS *3 *or* H8437VBS *3	H8436VBS *or* H8437VBS *and* E8950 *4	H8436VBS *or* H8437VBS *and* E8950 *4		
	208-480V	H8043/8041 *2*6 H8044/8042 *2*7	H8053/8051*2	H8035/8036 *3	H8035/8036 *and* E8950 *4	H8035/8036 *and* E8950 *4	H8035 *and* H8920-5, H8036 *and* H8920-1	H8025/H8026
	120-600V		E50B1	E5xCx *3	E5xHx	E5xHx *and* U013-0013 *5	E50Fx	

**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 models that use a single CT tomonitor 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 E8950 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 AND CONSUMPTION WITH VISIBILITY OF POWER USE

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.

page 184

Ultimate Retrofit - H80xx Series Meters

Reduce installation time and costs with a transducer that incorporates measurement electronics and split-core CTs in one package, and provides full remote access to power measurements. These meters are self-contained, self-powered, easy to install and, easy to integrate via pulse, analog or Modbus RTU outputs.

pages 176, 178

Ultimate Simplicity - H81xx Series Meters

page 183

Meet requirements and get quick access to the information needed for subtenant 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 submetering 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, and communication protocols. Bi-directional models monitor alternative energy sources or loads with regenerative braking.

page 174

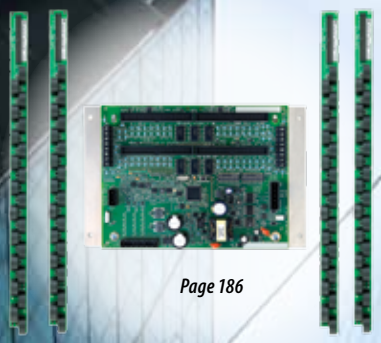
VERIS MULTI-CIRCUIT ENERGY/POWER METERS GUIDE

Branch Circuit Power Monitoring for New Panels	*Branch Circuit Power Monitoring for Existing Panel Retrofits*	*Power Monitoring up to 8 panels*
E30 (see page 186)	*E31 (see page 186)*	*H8238 (see page 190)*

		NUMBER OF CIRCUITS (Modbus / BACnet* Communication)				
Service Type	**Voltage**	1 - 24 Poles 4 three-pole breakers 3 three-pole breakers ***and*** neutral	1 - 42 Poles	42 Poles	42 - 84 Poles	84 Poles
Single-phase	120-240V	**H8238**†	E31	**E30**	E31	**E30**
3-phase Wye	120-208V	**H8238**†	E31	**E30**	E31	**E30**
	90-480V	**H8238**†	E31†	**E30**†	E31†	**E30**†
	277 / 480V	**H8238**†	E31	**E30**	E31	**E30**
3-phase Delta ***(no neutral)***	90-480V	**H8238**†	E31†	**E30**†	E31†	**E30**†

** For BACnet IP ot MS/TP, ass the E8950 Modbus-to-BACnet converter (E30Ax84 and E31Axxx are not supported; see Network Integration section for more information).*
† Use a control power transformer to limit the control power to 90 - 277VAC for E3x products, 90-130VAC for the H8238, 240VAC for the H8238E.
All E3x products support phase rotation.
Please Note: Using the free E3x Configuration Tool, set the phase per channel on any E30 / E31 product.

FLEXIBLE POWER MONITORING



Page 186

Power at Branch Circuit Level : New Panels
E30 Solid-Core Panelboard Monitoring System

Monitor up to 84 branch circuits, 2 three-phase mains, and 2 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 186

Power at Branch Circuit Level: Retrofit Panels
E31 Split-Core Panelboard Monitoring System

Monitor up to 84 branch circuits, 2 three-phase mains, and 2 neutrals in one, flexible meter. Designed to be field installed into existing panels, the E31 offers a main board and 2 or 4 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.

Page 190

Multi-Circuit Meter: Large Amperage Branch Circuits in Panelboards, Switchboards, Motor Control Centers, and LV Switchgear – H8238

Monitor 1-24 poles, 8 three-pole breakers, or 6 three-pole breakers plus a neutral in this centralized solution for multiple electrical services. Using 5A output CTs, observe data for circuits ranging in size from 1A to 9999A. Perfect for monitoring large power distribution panelboards, switchboards, low-voltage switchgear, and motor control centers.

Enhanced Power and Energy Meter

E50/E51

Versatile Energy Monitoring Solution

POWER/ENERGY MONITORING

DESCRIPTION

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 power failure. 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.

APPLICATIONS

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

FEATURES

- Revenue Grade measurements
- ANSI 12.20 0.5% accuracy, IEC 62053-22 Class 0.5S on E50xx...great for cost allocation
- DIN rail or screw mounting options...easy installation
- Real energy output and phase loss alarm output on E50Bx and E5xCx models... one device serves multiple applications
- 90-600VAC...application versatility with fewer models to stock
- Data logging capability (E5xC3 and E5xx5)... ensures long term data retrieval and safeguards during power failures
- Compatible with CTs from 5A to 32000A...wide range of service types
- User-enabled password protection...protect from tampering
- System integration via Modbus (E5xCx), BACnet MS/TP (E5xHx), or Lonmark-certified LON FT (E50Fx)...convenient compatibility with existing systems
- Native BACnet MS/TP support (no gateway) with serial rates up to 115.2 kbaud (E5xHx)
- BTL-certified (E5xH2)
- E51 models: Bi-directional metering (4-quadrant), an essential solution for solar and other renewable energy applications, measures Import, Export and net energy transfer
- CSI approved...eases submission process for California Solar Initiative
- E51Cx includes SunSpec compliant common and meter register blocks

SPECIFICATIONS

5 Year Warranty

Inputs:

Control Power, AC	50/60 Hz; 5VA max.; 90V min.; UL Maximums: 600V$_{L-L}$ (347V$_{L-N}$); CE Maximums: 300V$_{L-N}$ (520V$_{L-L}$)
Control Power, DC	3W max.; UL and CE: 125 to 300VDC (external DC current limiting required)
Voltage Input	UL: 90V$_{L-N}$ to 600V$_{L-L}$; CE: 90V$_{L-N}$ to 300V$_{L-L}$
Current Input	
Scaling	5A to 32,000A
Input Range	0 to 0.333V or 0 to 1V (selectable)
Pulse Inputs (E5xHx and E50Fx only)	Contact inputs to pulse accumulators (one set with E5xH2 and E50F2; two sets with E5xH5 and E51F5)

Accuracy:

Real Power and Energy	0.5% (ANSI C12.20, IEC 62053-22 Class 0.5S)

Outputs:

All Models (except E5xHx and E50Fx)	Real Energy Pulse: N.O. static; Alarm contacts: N.C. static
E50Bx	Reactive energy pulse 30VAC/DC
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

Environmental:

Operating Temperature Range	-30° to 70°C (-22° to 158°F)
Storage Temperature Range	-40° to 85°C (-40° to 185°F)
Humidity Range	<95% RH noncondensing
Agency Approvals	UL508, EN61010, California CSI Solar, ANSI C12.20

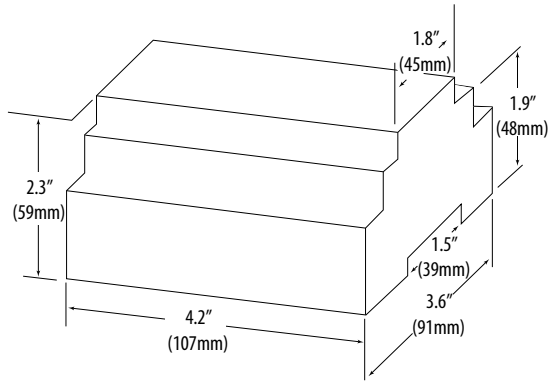
VERIS INDUSTRIES

ORDERING INFORMATION

E51Cx only | E5xH2 only | E50Fx only

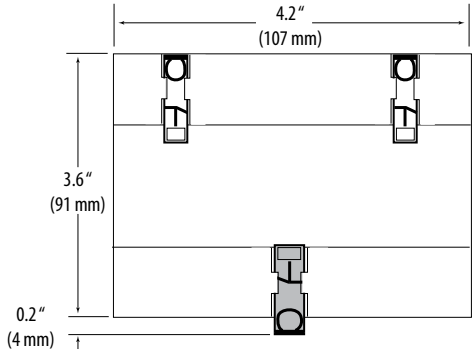
	E50B1	E50C2	E50C3	E50F2 NEW	E50F5	E50H2 NEW	E50H5	E51C2	E51C3	E51H2 NEW	E51H5
MEASUREMENT CAPABILITY - FULL DATA SET											
Bi-directional Energy Measurements								●	●	●	●
Power (3-phase total and per phase): Real (kW) Reactive (kVAR), and Apparent (kVA)	●	●	●	●	●	●	●	●	●	●	●
Power Factor: 3-phase average 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 12.20 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)						●	●			●	●
LON FT Serial (LonTalk Protocol)				●	●						
INPUTS:											
2 Pulse Contact Accumulator Inputs					●		●				●
1 Pulse Contact Accumulator Input				●		●				●	

DIMENSIONAL DRAWING

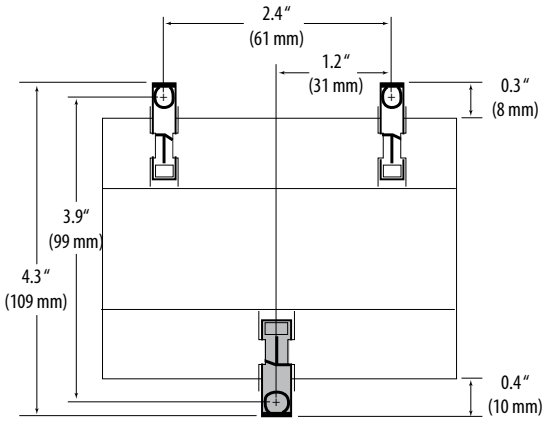


MOUNTING DIAGRAMS

DIN Mount Configuration



Screw Mount Configuration



U013-0012

U013-0013

AH04

AE010

H8932/H8936

AV01/AV02
(clip styles may vary)

ACCESSORIES

NEMA4 enclosure (AE010) and locking mechanism (AE011)
Fuse Kits with hi-interrupt capability AC Fuses (AH02, AH03, AH04)
Split-core and solid-core CTs (H681x, SCT)
Replacement mounting clips (AE004)
DIN Rail (AV01), DIN Rail Stop Clips (AV02)
Modbus TCP Gateway (U013-0012)
BACnet IP Router (U013-0013)
Network Display (H8932, H8936)

POWER/ENERGY MONITORING

Enercept® Networked Power Transducers (Modbus® RTU)

Integral Monitoring Solution Eliminates the Need for Separate Enclosures

H8035/H8036

BACNET CONNECTIVITY VIA NEW E8950 GATEWAY

U.S. Patent No. 6,373,238

DESCRIPTION

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, eliminating the concern of CT load orientation. Up to 63 Enercepts can be daisy-chained on a single RS-485 network.

FEATURES

- Revenue Grade measurements
- Precision electronics and current transformers in a single package...reduces the number of installed components...creating significant labor savings
- Monitor energy parameters (kW, kWh, kVAR, PF, Amps, Volts) at up to 63 locations on a single RS-485 network...greatly reduces wiring time and cost
- Fast split-core installation eliminates the need to remove conductors...saves time and labor
- Smart electronics eliminate CT orientation concerns...fast trouble-free installation
- CSI approved...eases submission process for California Solar Initiative

APPLICATIONS

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

SPECIFICATIONS

5 Year Warranty

Inputs:	
Voltage Input	208 to 480VAC, 50/60 Hz RMS [1 2 3]
Current Input	Up to 2400A 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 Temperature Range	0° to 60°C (32° F to 140°F), 50°C (122°F) for 2400A
Humidity Range	0 - 95% noncondensing
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 480VAC or current above 2400 Amps.

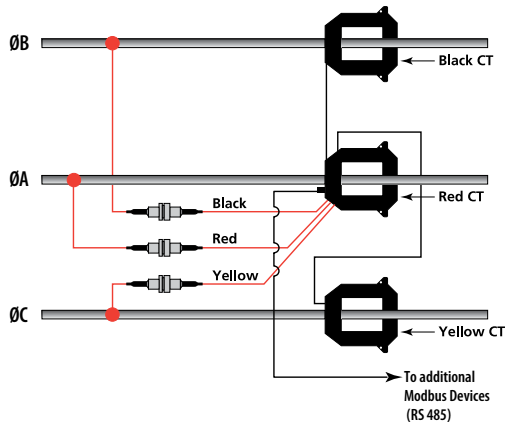
[3] Do not apply 600 V Class current transformers to circuits having a phase-to-phase voltage greater than 600 V, unless adequate additional insulation is applied between the primary conductor and the current transformers. Veris assumes no responsibility for damage of equipment or personal injury caused by products operated on circuits above their published ratings.

[4] Detailed protocol specifications are available at: http://www.veris.com/modbus

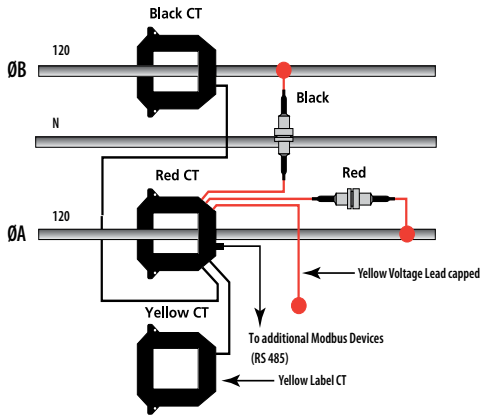
[5] Other protocols available. Please consult factory.

APPLICATION/WIRING EXAMPLES

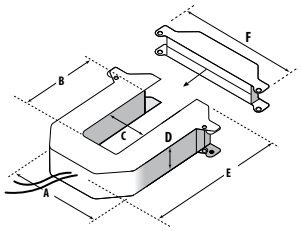
208 or 480VAC 3Ø, Installation



240VAC 1Ø, 3-Wire Installation

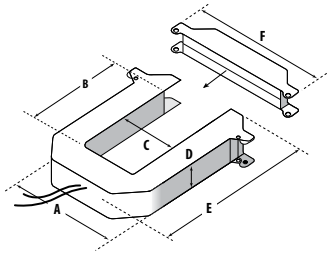


DIMENSIONAL DRAWINGS



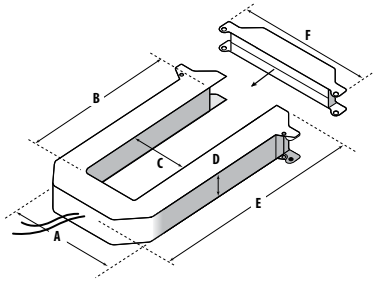
SMALL
100/300 Amp

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)

DATA OUTPUTS

H8035
kWh
kW

H8036
kWh, Consumption
kW, Real Power
kVAR, Reactive Power
kVA, Apparent Power
Power Factor
Average Real Power
Minimum Real Power
Maximum Real Power
Voltage, L-L
Voltage, L-N*
Amps, Average Current

** Based on derived neutral voltage.*

POWER/ENERGY MONITORING

ORDERING INFORMATION

c UL us LISTED

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*

ACCESSORIES

LON nodes (H8920)
CT Mounting brackets (AH06)
Modbus-to-BACnet Converter (E8950)
Modbus TCP Converter (U013-0013)

H8920 Series

U013-0012

AH06

E8950

Enercept® kW/kWh Transducers (4-20mA or Pulse Output)

Integral Submetering Solution Eliminates the Need for Separate Enclosures

H804x/H805x

Patent #6,373,238

DESCRIPTION

The **Enercept H804x and H805x Series** kW (real power)/kWh (consumption) transducers combine processing electronics and 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.

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 4-20mA 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.

FEATURES

- Revenue Grade measurements
- Fast split-core installation eliminates the need to remove conductors... perfect for retrofits
- Precision meter electronics and current transformers in a single package... reduces the number of installed components...creating significant labor savings
- Smart electronics eliminate the need to be concerned with CT orientation... fast trouble-free installation

APPLICATIONS

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

SPECIFICATIONS

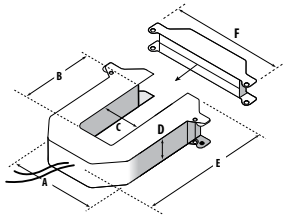
5 Year Warranty

Inputs:	
Voltage Input	208/240 or 480VAC, 50/60 Hz RMS [1 2 3]
Current Input	Up to 2400A 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:	
H804x	
Output	4-20mA
Supply Power (current loop)	9-30VDC, 30mA max.
H805x	
Pulsed Output	Field selectable; 1, 0.5, 0.25, 0.1kWh/pulse [4]
Pulsed Output Type	Normally Open, Opto-FET, 100mA@24VDC
Environmental:	
Operating Temperature Range	0° to 60°C (32° F to 140°F), 50°C (122°F) for 2400A
Humidity Range	0 - 95% noncondensing
Agency Approvals	UL508

[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 480VAC or current above 2400 Amps.*
[3] *Do not apply 600V Class current transformers to circuits having a phase-to-phase voltage greater than 600V, 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.*

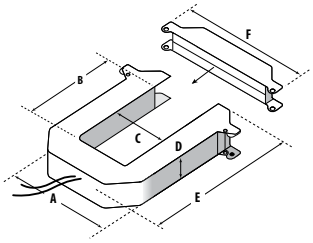
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS



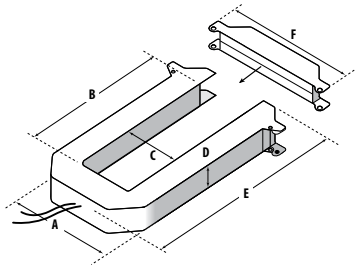
SMALL
100/300 Amp

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)

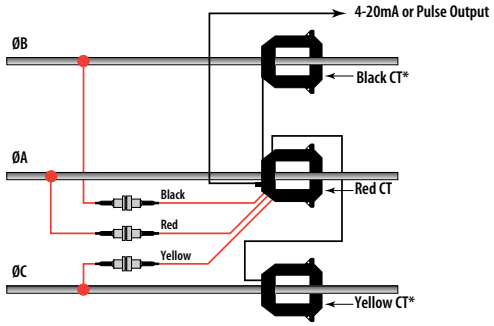


LARGE
800/1600/2400 Amp

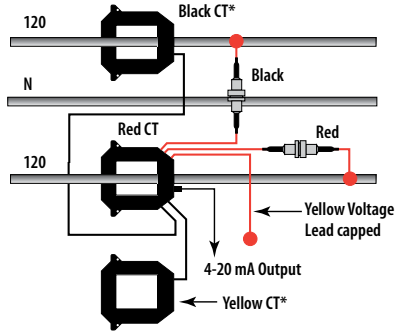
A =	4.9"	(125 mm)
B =	5.5"	(139 mm)
C =	2.5"	(62 mm)
D =	1.2"	(30 mm)
E =	7.9"	(201 mm)
F =	6.0"	(151 mm)

APPLICATION/WIRING EXAMPLES

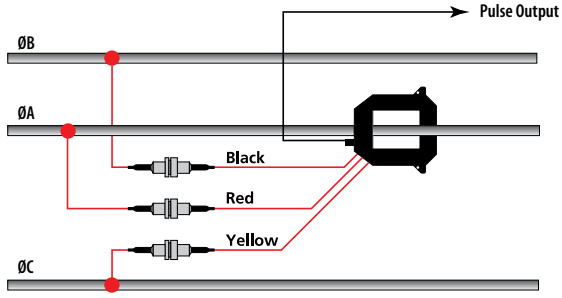
H804x/H805x 208 or 480VAC 3Ø, 3/4 Wire



H804x 240VAC 1Ø, 3-Wire



H805x 208 or 480VAC 3Ø, 3/4-Wire



ORDERING INFORMATION

c UL us LISTED

4-20 mA Output Power Transducers

Single CT Models for Use with Balanced 3Ø Loads
Three CT Models for Use with Unbalanced 3Ø Loads

MODEL	VOLTAGE	MAX. AMPS	OUTPUT	CT SIZE	CT TYPE
H8041-0100-2	208/240	100	4-20mA	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	
H8042-0100-2	480	100		SMALL	Single CT Model
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	
H8043-0100-2	208/240	100		SMALL	Three CT Model
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	
H8044-0100-2	480	100		SMALL	Three CT Model
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	

Pulse Output Power Transducers

Single CT Models for Use with Balanced 3Ø Loads
Three CT Models for Use with Unbalanced 3Ø Loads

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	
H8053-0100-2		100		SMALL	Three CT Model
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	

ACCESSORIES

CT Mounting brackets (AH06)

AH06

POWER/ENERGY MONITORING

Energy Meters

Simple System Integration with a Variety of Protocol Options Available

H81xx

DESCRIPTION

The **H81xx Series Energy Meters** are easy to install and provide exceptional system accuracy, making them ideal for all submetering 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., 2-100 amps with 100 amp CTs). Matching serial numbers assure that the meter and CT were calibrated together (matching does not apply if using 100A CTs).

The H81xx is easy to install. The split-core CTs 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.

APPLICATIONS

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

FEATURES

- Revenue Grade measurements
- High resolution backlit LCD display provides clear readings at a distance... reduces the risk of misinterpretation of the data. Back-lighting can be disabled if desired
- H8163 provides a pulse output from 1/10 to 1 pulse per kWh for easy connection to existing control or data acquisition systems
- Provides a phase-loss alarm...protects equipment (H8163)
- 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

SPECIFICATIONS

5 Year Warranty

Inputs:

Voltage Input	
H8150	90-132VAC line-to-neutral
H8163	90-300VAC 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:

All Models	
LCD Display	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, 100mA@24VAC/DC
Pulse Rate	0.10*, 0.25**, 0.50, or 1.00kWh 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

Mechanical:

Protection Class	NEMA 1

Environmental:

Operating Temperature Range	0° to 50°C (32° to 122°F)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Humidity Range	0-95% noncondensing
Agency Approvals	UL61010

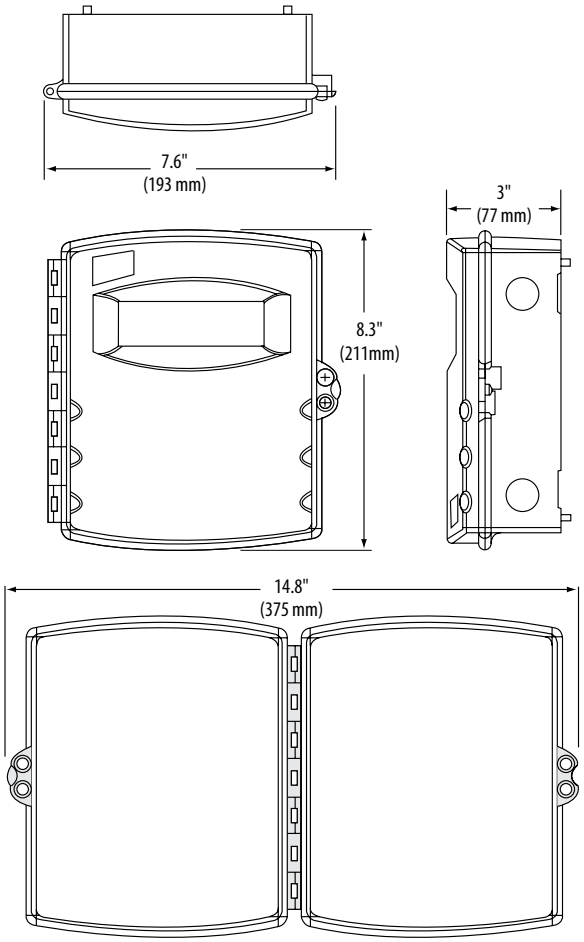
Approved for California CSI Solar applications (check the CSI website for model numbers).
**not supported at >1600A*
***not supported at >2400A*
Note: Meter and CTs serial numbers must match, except for 100A CTs. Neutral voltage connection is required.

POWER/ENERGY MONITORING

VERIS INDUSTRIES

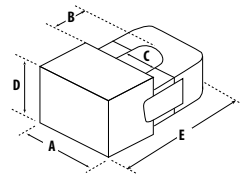
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS



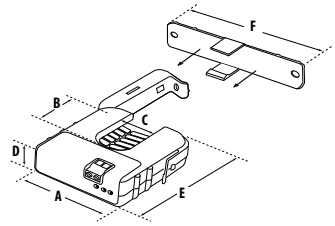
MICRO
100 Amp

A = 1.6" (40 mm)
B = 0.7" (16 mm)
C = 0.7" (16 mm)
D = 1.2" (29 mm)
E = 2.1" (53 mm)



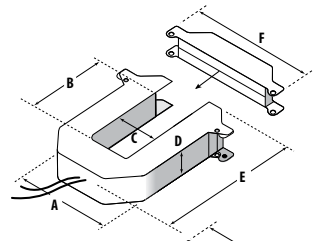
MINI
200 Amp

A = 2.6" (66 mm)
B = 1.1" (28 mm)
C = 0.8" (19 mm)
D = 1" (27 mm)
E = 2.9" (74 mm)
F = 3.5" (90 mm)



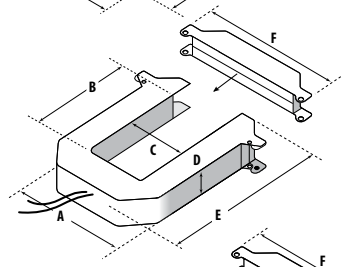
SMALL
300 Amp

A = 3.8" (95 mm)
B = 1.5" (38 mm)
C = 1.3" (32 mm)
D = 1.1" (29 mm)
E = 4.2" (107 mm)
F = 4.8" (121 mm)



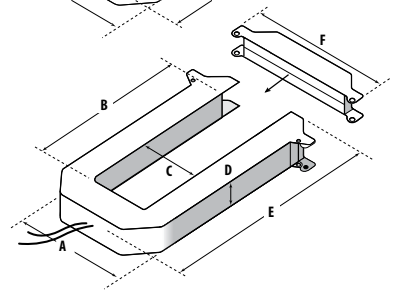
MEDIUM
400/800 Amp

A = 4.9" (124 mm)
B = 2.9" (73 mm)
C = 2.5" (62 mm)
D = 1.1" (29 mm)
E = 5.6" (141 mm)
F = 5.9" (150 mm)



LARGE
800/1600/2400 Amp

A = 4.9" (124 mm)
B = 5.5" (140 mm)
C = 2.5" (62 mm)
D = 1.1" (29 mm)
E = 8.1" (207 mm)
F = 5.9" (150 mm)



ORDERING INFORMATION

c UL us LISTED

120VAC-240VAC (nom.)

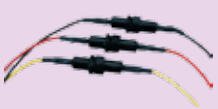
AMPS	ONE CT	TWO CTs	THREE CTs	VOLTAGE	OUTPUT
100 Micro	H8150-0100-0-1	H8150-0100-0-2	H8150-0100-0-3	120VAC L-N	Display Only
200 Mini	H8150-0200-1-1	H8150-0200-1-2	H8150-0200-1-3		
300 Small	H8150-0300-2-1	H8150-0300-2-2	H8150-0300-2-3		
400 Med		H8150-0400-3-2	H8150-0400-3-3		
800 Med		H8150-0800-3-2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

120VAC-480VAC (nom.) with Pulse and Phase Loss Outputs

AMPS	ONE CT	TWO CTs	THREE CTs	VOLTAGE	OUTPUT
100 Micro	H8163-0100-0-1	H8163-0100-0-2	H8163-0100-0-3	120-480VAC	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		

ACCESSORIES

Fuse and Fuseholders (AH02, AH03, AH04)
Comms board (H81xx-CB)
Modbus TCP Gateway (U013-0012)
BACnet IP Router (U013-0013)


AH04

H81xx-CB

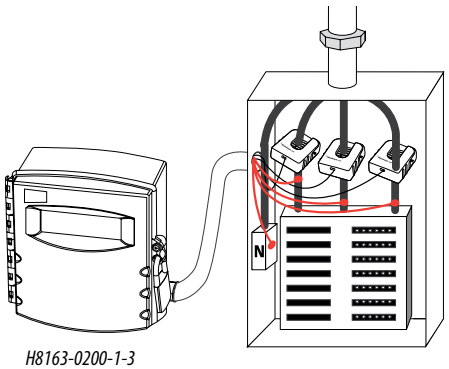
U013-0012

U013-0013

POWER/ENERGY MONITORING

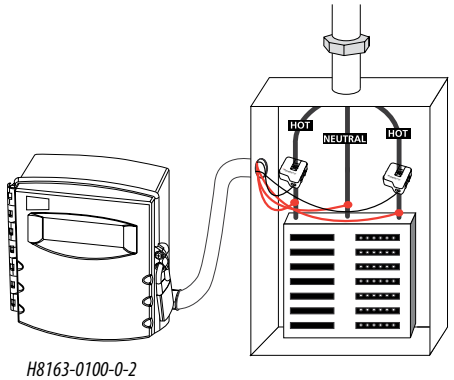
APPLICATION/WIRING EXAMPLES

208/120VAC, 4-wire, 3Ø, 200 Amp Service



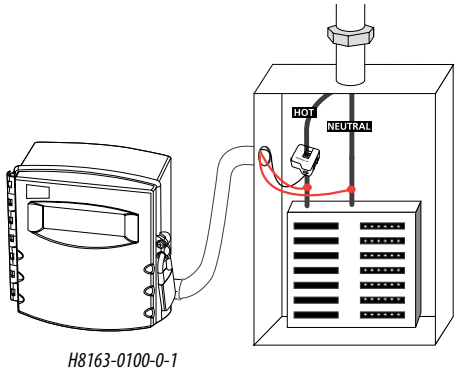
H8163-0200-1-3

240VAC, 3-wire, Single Phase, 100 Amp Service



H8163-0100-0-2

120VAC, 2-wire, Single Phase, 100 Amp Service



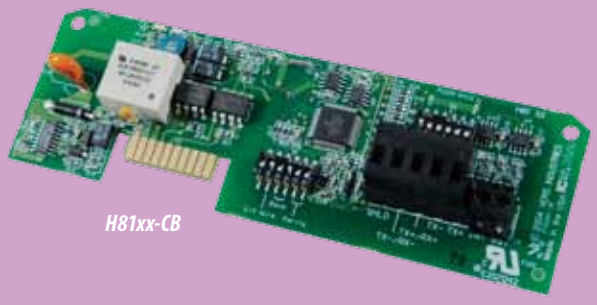
H8163-0100-0-1

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*

Communications Boards for H81xx Series Energy Meters


H81xx-CB

Available with Modbus, BACnet, or N2 Protocols

DESCRIPTION

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.

** Does not apply to H8126-CB*

FEATURES

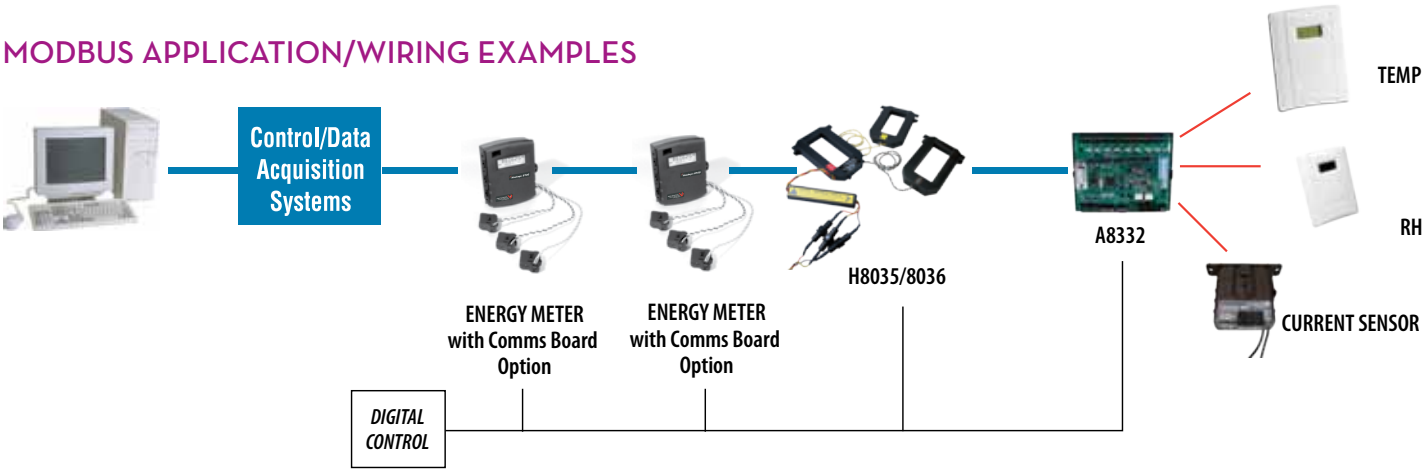
- Easily network to existing systems via RS-485 connection
- Field-selectable parity: odd/even/none*
- Works with 2-wire and 4-wire systems*
- Field-selectable baud rate: 2400, 4800, 9600, or 19200 (9600, 19200, or 38400 for H8186-CB)
- Measure interval demand and sub-interval demand*

** H8163-CB only*

APPLICATIONS

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

MODBUS APPLICATION/WIRING EXAMPLES



ORDERING INFORMATION

c UL us UL 3111-1 E207042

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.

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.

ACCESSORIES

Modbus TCP Gateway (U013-0012)
BACnet IP Router (U013-0013)
Lon Node (H8920)

U013-0012

U013-0013

H8920 Series

POWER/ENERGY MONITORING

VERIS INDUSTRIES

Power Meter for Voltage-Mode CTs

Maximize System Efficiency and Gain Precise Power Quality with 1% Energy and Power Accuracy

BACNET CONNECTIVITY VIA NEW E8950 GATEWAY

DESCRIPTION

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.

FEATURES

- Revenue Grade measurements
- Intuitive navigation with context-sensitive menus for easy use
- Panel, wall, DIN rail mount...provide mounting flexibility
- Digital power meters automatically detect and correct phase reversal, eliminating the need to be concerned with CT load orientation...fast, trouble-free installation
- Real-time power monitoring via local display or through control/data acquisition systems
- Large, easy-to-read display
- Multiple values displayed at the same time on an anti-glare display featuring a green back-light

APPLICATIONS

- Energy management and performance contracting
- Submetering for commercial tenants
- Activity-based costing in commercial and industrial facilities

SPECIFICATIONS

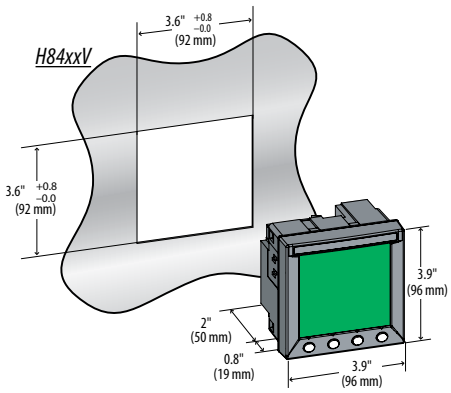
5 Year Warranty

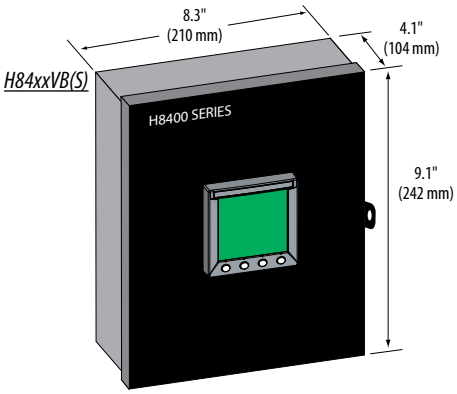
Inputs:	
Control Power	100 to 415 ± 10%VAC, 5VA, 45-60 Hz
DC	125 to 250VDC ± 20%VDC, 3W *
Voltage Input	UL: 600VAC; CE: 300VAC (L-N)
Current Input	
CT Scaling	Primary: Adjustable from 5A to 32,767A
Measurement Input Range	1V RMS full scale (+20% over-range)
Accuracy:	
Current and Voltage	0.5%
Power	ANSI 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 (240VAC or 300VDC, 100mA max. @ 25˚C, derate 0.56mA per˚C above 25˚C) 2.41kV RMS isolation
Pulse Output #2 (H8463V/VB/VBS)	(Phase Loss or kVARh) N.C. Static Output(240VAC or 300VDC, 100mA max. @ 25˚C, derate 0.56mA per˚C above 25˚C) 2.41kV 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:	
Operating Temperature Range	Meter: 0° to 60°C (32° to 140°F); Display: -10° to 50°C (14° to 122°F)
Storage Temperature Range	Meter and Display: -40°C to 85°C (-40° to 185°F)
Humidity Range	0-95% noncondensing
Agency Approvals	UL508; ANSI C22.2, Cat. III, Pollution Degree 2, for distribution systems up to 347VAC (L-N)/600VAC (L-L); CE per IEC61010, Cat. III, Pollution Degree 2, for distribution systems up to 300VAC (L-N)/480VAC (L-L)

**For control voltages >415VAC to 600VAC order H84xxVBS*

VERIS INDUSTRIES

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

ORDERING INFORMATION

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

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).

COMPANION CURRENT TRANSFORMERS

(Model/Amps) **(Output Type)**

H681 [ ] – [1V]

Small:
0-100 = 100A
0-200 = 200A
0-300 = 300A
Medium:
1-400 = 400A
1-600 = 600A
1-800 = 800A
Large:
2-800 = 800A
2-1600 = 1600A
2-2000 = 2000A
2-2400 = 2400A

= 0-1VAC

Example:
H681 [2-800] – [1V]

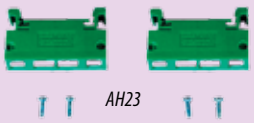
ACCESSORIES

Fuse Kits (AH02, AH03, AH04)
DIN Rail Mounting Kit (AH23)
Modbus-to-BACnet Converter (E8950)
Modbus TCP Gateway (U013-0012)

E8950

U013-0012

AH04


AH23

Panelboard Monitoring System

Monitor Current, Voltage, and Energy Consumption with One Device

BACNET CONNECTIVITY VIA NEW E8950 GATEWAY

E3x Main Board

POWER AT BRANCH LEVEL

POWER/ENERGY MONITORING

DESCRIPTION

The **E3x 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 E3x series monitors the current, voltage, and energy consumption of each circuit in a panelboard including the main breaker. The accumulated information can be transmitted through the communications interface. Data updates occur roughly every two seconds to provide timely preventative maintenance information. 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)

APPLICATIONS

- Load based cost allocation
- Overload protection
- Load management
- Load balancing
- Lighting circuits

FEATURES

- Revenue Grade measurements
- IEC Class 1 metering accuracy
- Up to 126 panelboards can be monitored on one RS-485 drop...simplifies wiring
- Reports volts, amps, power, and energy for each circuit...one product covers the whole panelboard
- 92 circuits with one product (84 branch circuits, 2 3-phase mains, 2 neutrals)... saves space
- 3/4", or 1", or 18 mm spaced solid-core current sensors...flexible installation
- Split-core version has two mounting options (DIN Rail or Snaptrack)... installation flexibility
- 4 user-configurable alarm threshold registers...improved load management
- Built-in ability to set the orientation and numbering of the circuits
- 1/4 amp to 100 amp solid-core monitoring...widest dynamic range in the industry
- 1, 2, 3 pole breaker support
- Applications for new construction (solid-core version) and retrofits (split-core version)
- Modbus RTU standard

NEW

- Modbus TCP over Ethernet available with addition of U013-0012...page 166
- BACnet IP or MS/TP available with addition of E8950...see page 164 (E30Ax84 and E31Axxx not supported)

SPECIFICATIONS

5 Year Warranty

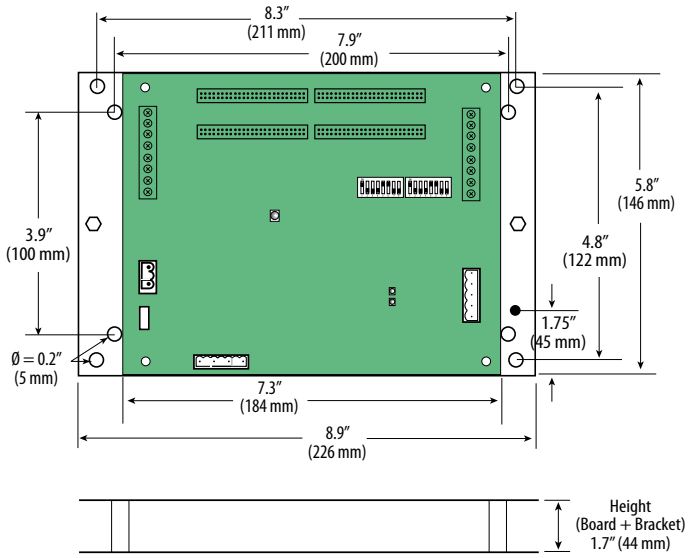
Inputs:	
Input Power	90-277VAC, 50/60 Hz
Accuracy:	
Power/Energy	IEC 62053-21 Class 1, ANSI C12.1-2008
Voltage	±0.5% of reading 90-277V line-to-neutral
Operation:	
Sampling Frequency	2560 Hz
Update Rate	1.8 seconds (both panels)
Outputs:	
Type	Modbus RTU
Connection	DIP switch-selectable 2-wire or 4-wire, RS-485
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
Communication Format	8-data-bits, 1-start-bit, 1-stop-bit
Termination	5-position depluggable connector (TX+ TX- SHIELD TX+/RX+ TX-/RX-)
Terminal Block Torque	4.4 to 5.3 in-lb (0.5 to 0.6 N-m)
Mechanical:	
Ribbon Cable Support	4 ft. (0.9 m) ribbon cable ships standard; up to 20 ft. (6 m) flat and round cables available
Environmental:	
Operating Temperature Range	0° to 60°C (32° to 140°F) (<95% RH noncondensing)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Altitude of Operation	3000 m
Agency Approvals	UL508, EN61010

DATA OUTPUT

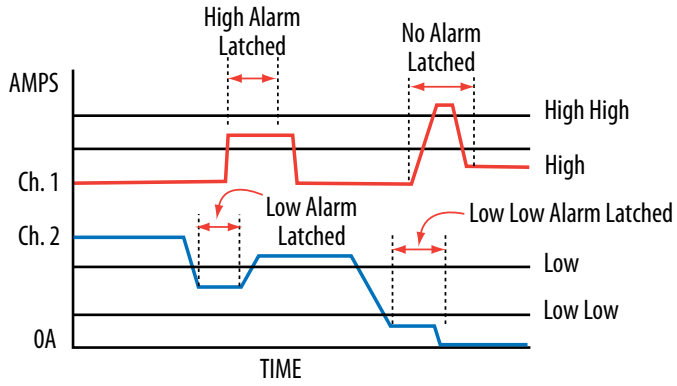
Monitoring at Mains	E3xA	E3xB	E3xC
Current per phase	●	●	●
Max. current per phase	●	●	●
Current demand per phase	●	●	●
Max. current demand per phase	●	●	●
Energy (kWh) per phase	●	●	
Real Power (kW) per phase	●	●	
Apparent Power (kVA)	●	●	
Power factor total *	●	●	
Power factor per phase	●	●	
Voltage, 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	●	●	●
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	●	●	●

** Based on a 3-phase breaker rotation.*

DIMENSIONAL DRAWINGS



OPERATION EXAMPLE



POWER/ENERGY MONITORING

ACCESSORIES

Ribbon Cables, round or flat (CBLxxx)
E3x cover (AE001)
Modbus TCP Gateway (U013-0012)
Modbus-to-BACnet Converter (E8950)
Network Display (H8932, H8936)
CTs (E31CT0, E31CT1, E31CT3)
CTs for auxiliary inputs (H681x)
Repair kit for E30 (AE006)

CBL022

AE001

U013-0012

E8950

H8932/H8936

E31CT0

E31CT1

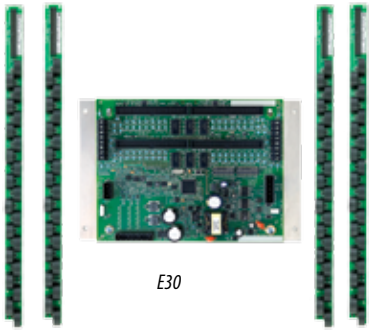
E31CT3

H681x

AE006

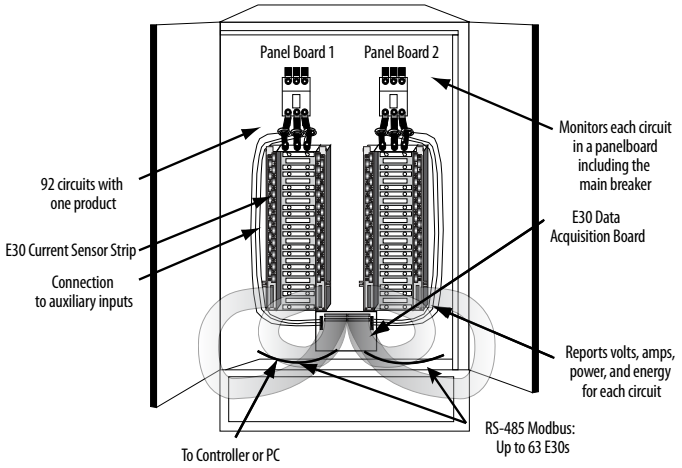
VERIS INDUSTRIES

Panelboard Monitoring System – Solid-Core



E30

APPLICATION/WIRING EXAMPLE



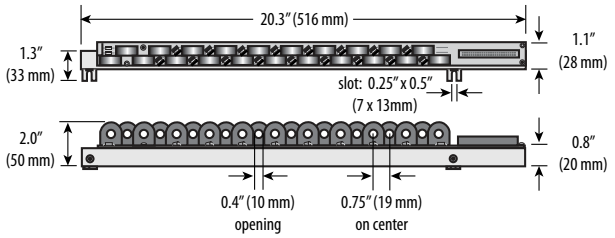
SOLID-CORE CT SPECIFICATIONS

	100A Solid-Core CT
Voltage Rating	300VAC
Accuracy	±0.5%
Temperature	0° to 60°C
Agency	UL508 recognized, EN61010

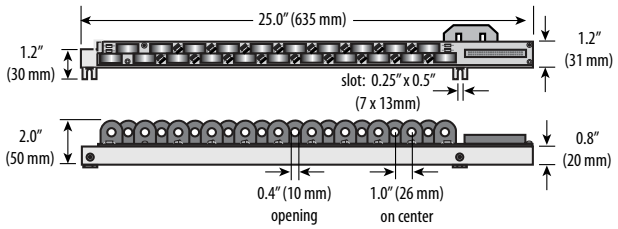
DIMENSIONAL DRAWINGS

Current Sensor Strips

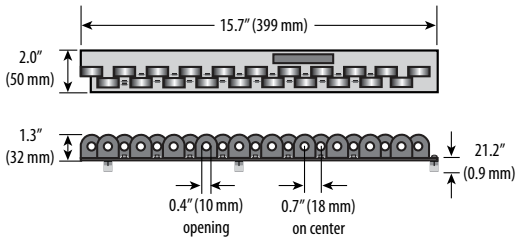
3/4" option, 21 CTs



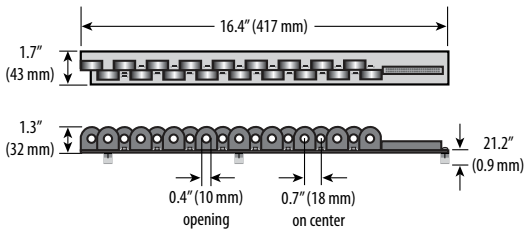
1" option, 21 CTs



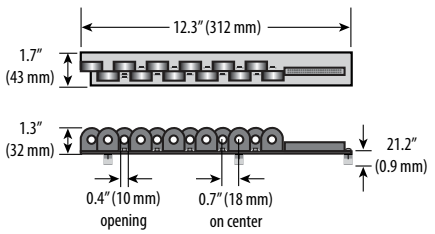
18 mm option, 21 CTs



18 mm option, 18 CTs



18 mm option, 12 CTs



ORDERING INFORMATION

CE cULus LISTED

	Description	CT Option	# of CTs and Ribbon Cables
E30	☐	☐	☐
	A = Advanced	**0** = 100A, ¾" spacing	**24** = 2 strips of 12 CTs (18 mm only)
	B = Intermediate	**1** = 100A, 1" spacing	**36** = 2 strips of 18 CTs (18 mm only)
	C = Basic	**2** = 100A, 18 mm spacing	**42** = 2 strips of 21 CTs (¾", 1", or 18 mm) with two 4 -ft. flat ribbon cables
			48 = 4 strips of 12 CTs (18 mm only)
			72 = 4 strips of 18 CTs (18 mm only)
			84 = 4 strips of 21 CTs (¾", 1", or 18 mm) with four 4 -ft. flat ribbon cables

Example:

E30 | A | 0 | 42

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

POWER/ENERGY MONITORING

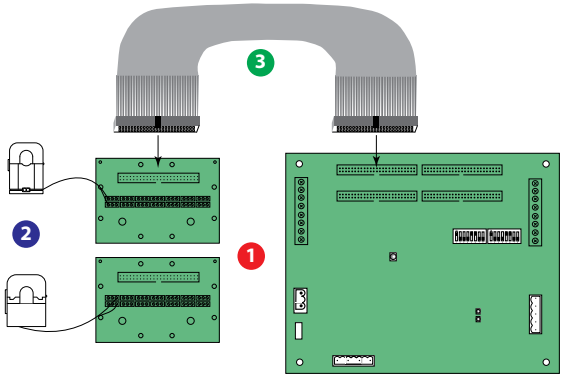
VERIS INDUSTRIES

Panelboard Monitoring System – Split-Core

E31

E31xY63*

APPLICATION/WIRING DIAGRAM



ORDERING INFORMATION

c UL us LISTED

1 Boards

	Description	# of CTs
E31	☐	☐

A = Advanced board
B = Intermediate board
C = Basic board

002 = 2 adapter boards, no CTs, no cables
004 = 4 adapter boards, no CTs, no cables
42 = 2 adapter boards, 42 50A CTs, 2 4 ft. round ribbon cables
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

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

E31CT0	Six-pack, 50A CT, 6 ft. (1.8 m) lead
E31CT0R20	Six-pack, 50A CT, 20 ft. (6 m) lead
E31CT1	Six-pack, 100A CT, 6 ft. (1.8 m) lead
E31CT1R20	Six-pack, 100 CT, 20 ft. (6 m) lead
E31CT3	Single CT, 200A CT, 6 ft. (1.8 m) lead
E31CT3R20	Single CT, 200A CT, 20 ft. (6 m) lead

3 Ribbon Cable *(order 1 cable per adapter board)*

CBL022	Round Ribbon Cable, 4 ft. (1.2 m)	CBL016	Flat Ribbon Cable, 4 ft. (1.2 m)
CBL033	Round Ribbon Cable, 8 ft. (2.4 m)	CBL018	Flat Ribbon Cable, 6 ft. (1.8 m)
CBL023	Round Ribbon Cable, 10 ft. (3 m)	CBL020	Flat Ribbon Cable, 10 ft. (3 m)
CBL024	Round Ribbon Cable, 20 ft. (6 m)	CBL021	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:

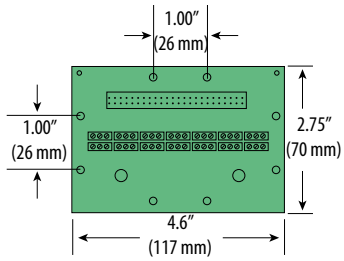
1 E31A002 - Advanced board, 2 adapter boards (1 unit)

2 E31CT0 - 50A CT six-pack (3 units)

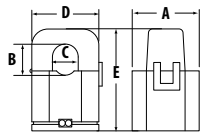
3 CBL023 - 10 ft. round ribbon cable (2 units)

DIMENSIONAL DRAWINGS

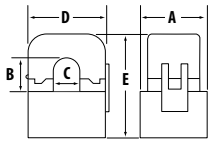
Adapter Board



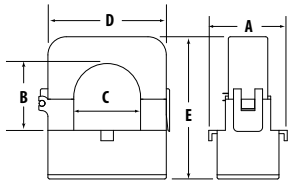
CTs



E31CT0 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)

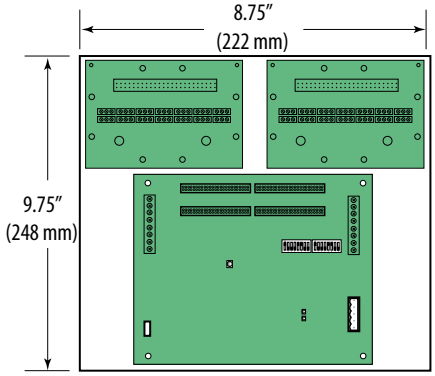


E31CT1 100 Amp
A = 1.5″ (39 mm)
B = 0.8″ (20 mm)
C = 0.7″ (16 mm)
D = 1.6″ (40 mm)
E = 2.1″ (53 mm)



E31CT3 200 Amp
A = 1.5″ (39 mm)
B = 1.25″ (32 mm)
C = 1.25″ (32 mm)
D = 2.5″ (64 mm)
E = 2.8″ (71 mm)

E31xY63 Boards with Bracket*



SPLIT-CORE CT SPECIFICATIONS

	50A Split-Core CT	100A Split-Core CT	200A Split-Core CT
Voltage Rating	300VAC	600VAC	600VAC
Accuracy	±1%	±0.5%	±1%
Temperature	0° to 60°C	0° to 60°C	0° to 60°C
Agency	UL508 recognized, EN61010	UL508 recognized, EN61010	UL508 recognized, EN61010

POWER/ENERGY MONITORING

VERIS INDUSTRIES

Multi-Circuit Monitor

Monitor Eight 3-Phase Circuits with One Device

H8238

BACNET CONNECTIVITY VIA NEW E8950 GATEWAY

DESCRIPTION

The **H8238** Multi-Circuit Monitor power monitoring system provides a convenient solution for monitoring multiple electrical services that share a common voltage source. It also reports diagnostic information such as power factor, volts, amps, and kVAR, over an RS-485 network using the industry standard Modbus communication protocol. To protect valuable equipment, it has built-in alarm registers for over- and under-voltage, current, and kVA.

The monitoring capabilities and open systems compatibility of the H8238 make it the ideal power monitoring solution for OEM, tenant submetering applications, and load management of power distribution units commonly used in internet data centers.

APPLICATIONS

- Tenant submetering
- Real-time power monitoring
- Activity-based costing
- Managing loads

FEATURES

- Revenue Grade measurements
- Save labor and installation costs by monitoring up to eight 3Ø, (or six 3Ø plus neutral current) loads from a single service with common voltage connections
- Eliminates the need to install multiple transducers – fewer components to install...saves time and space
- Easily connect up to 24 industry standard 5A CTs (solid-core and/or split-core)
- Modbus communication for efficient data collection
- Improve monitoring system efficiencies by accessing 26 data points per circuit, plus alarms, with one RS-485 drop
- Daisy chain up to 30 units on a single drop...easy wiring
- Field-selectable address, baud rate, parity and wiring connections... simple configuration
- Use with E8950 gateway for BACnet connectivity...expanded system compatibility
- Use with U013-0012 serial to ethernet protocol converter...easy system integration

SPECIFICATIONS

5 Year Warranty

Inputs:	
Control Power	+10/-25 % (90-132VAC); (180-264VAC for H8238E), 50/60 Hz
Voltage Input	
Maximum Voltage	480VAC+10% = 528VAC
Frequency	60 Hz
Current Input	
Number of Channels	24 (8 meters x 3 phases/meter), 6 meters if neutral monitored
CT Input Type	5 Amp (customer supplied)
CT Range	Each 3-phase circuit is independently configurable from 1 A to 9999A (using 5A output CTs)
Accuracy:	
Accuracy	±1% when amperage is at 10% to 100% of range (exclusive of user-supplied CTs)
Sample Rate	1280 Hz
Variable Update Rate	200 msec for voltages, 1.6 secs for all other
Outputs:	
Type	RS-485 Modbus RTU
Connection	DIP-switch selectable 2-wire or 4-wire
Address	DIP-switch selectable base address (1 to 233 in steps of 8)
Baud Rate	DIP-switch selectable 2400, 4800, 9600, or 19200
Parity	DIP-switch selectable NONE/ODD/EVEN
Communication Format	8 data-bits, 1 start-bit, 1 stop-bit
Termination	5-position pluggable connector
Environmental:	
Operating Temperature Range	0° to 60°C (32° to 140°F)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Humidity Range	0-95% noncondensing
Agency Approvals	UL508, EN61010

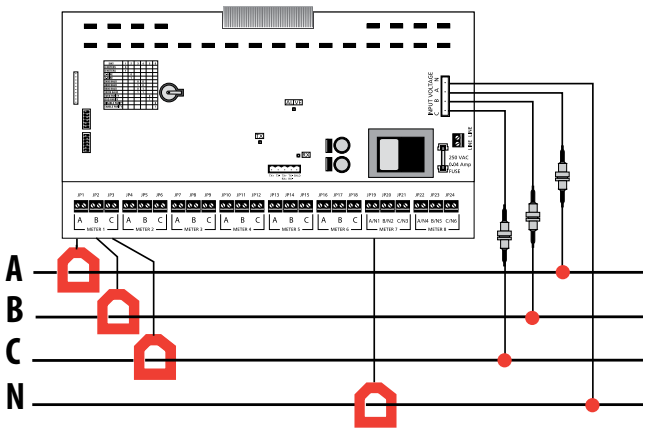
POWER/ENERGY MONITORING

VERIS INDUSTRIES

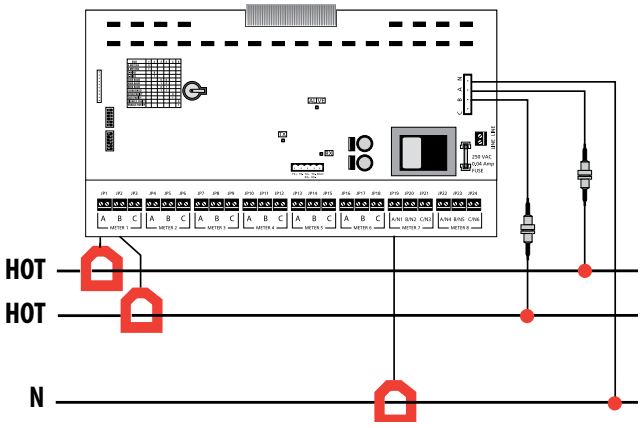
VERIS INDUSTRIES

APPLICATION/WIRING EXAMPLES

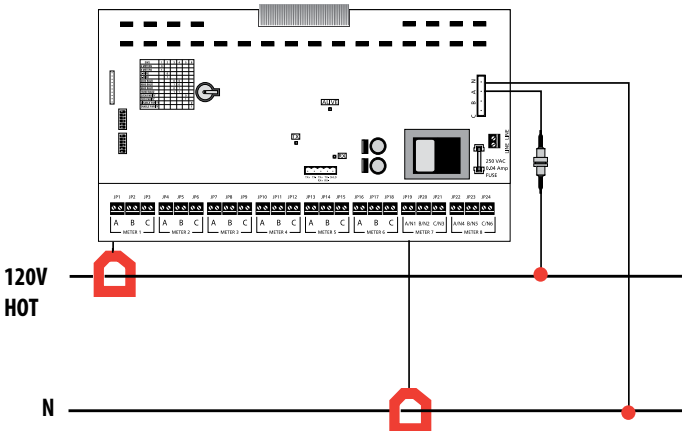
3-Phase 4-Wire Installation



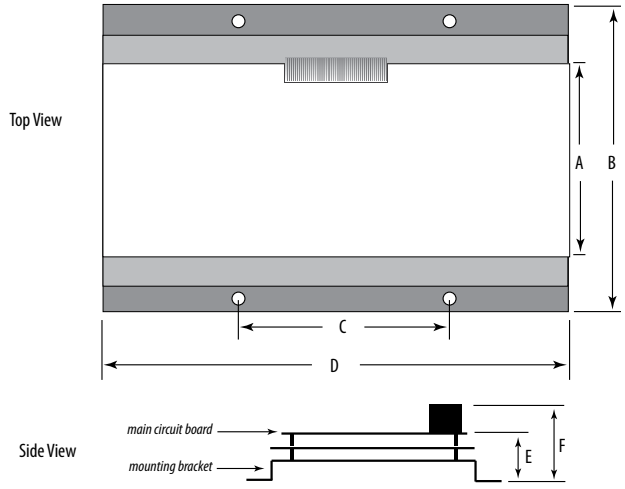
1-Phase 3-Wire Installation



1-Phase 2-Wire Installation



DIMENSIONAL DRAWING



WIDTH:
A = 5.3" (135mm) board
B = 8.9" (226mm) mounting bracket base

LENGTH:
C = 6.0" (153mm)
D = 12.8" (325mm)

HEIGHT:
E = 2.9" (74mm)
F = 4.0" (101mm)

DATA OUTPUTS

kWh Energy Consumption
kW Real Power
kVAR Reactive Power
kVA Apparent Power
Power Factor Total
Voltage, L-L, avg. of 3 phases
Voltage, L-N, avg. of 3 phases
Current, average of 3 phases
kW Real Power, phase A
kW Real Power, phase B
kW Real Power, phase C
Power Factor, phase A
Power Factor, phase B
Power Factor, phase C
Line to Line Voltage, phase A-B
Line to Line Voltage, phase B-C
Line to Line Voltage, phase A-C
Line to Neutral Voltage, phase A-N
Line to Neutral Voltage, phase B-N
Line to Neutral Voltage, phase C-N
Current, phase A
Current, phase B
Current, phase C
kW Average
kW Minimum
Frequency (measured from phase A)

Modbus® Alarms:
Over Voltage
Under Voltage
Over Current
Under Current
Over kVA
Under kVA
Phase Loss A
Phase Loss B
Phase Loss C

ORDERING INFORMATION

CE cULus LISTED

MODEL	DESCRIPTION
H8238	Multi-Circuit Monitor, 90-130VAC supply voltage
H8238E	Multi-Circuit Monitor, 240VAC supply voltage

**For 240VAC supply voltage version, order H8238E*

H8238 Series transducers 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.

ACCESSORIES

AL, BL, CL 5AAC Solid-Core Current Transformers
H681x-5A Split-Core Current Transformers
Modbus-to-BACnet Converter (E8950)
Modbus TCP Gateway (U013-0012)

POWER/ENERGY MONITORING

Power Metering CTs Contents

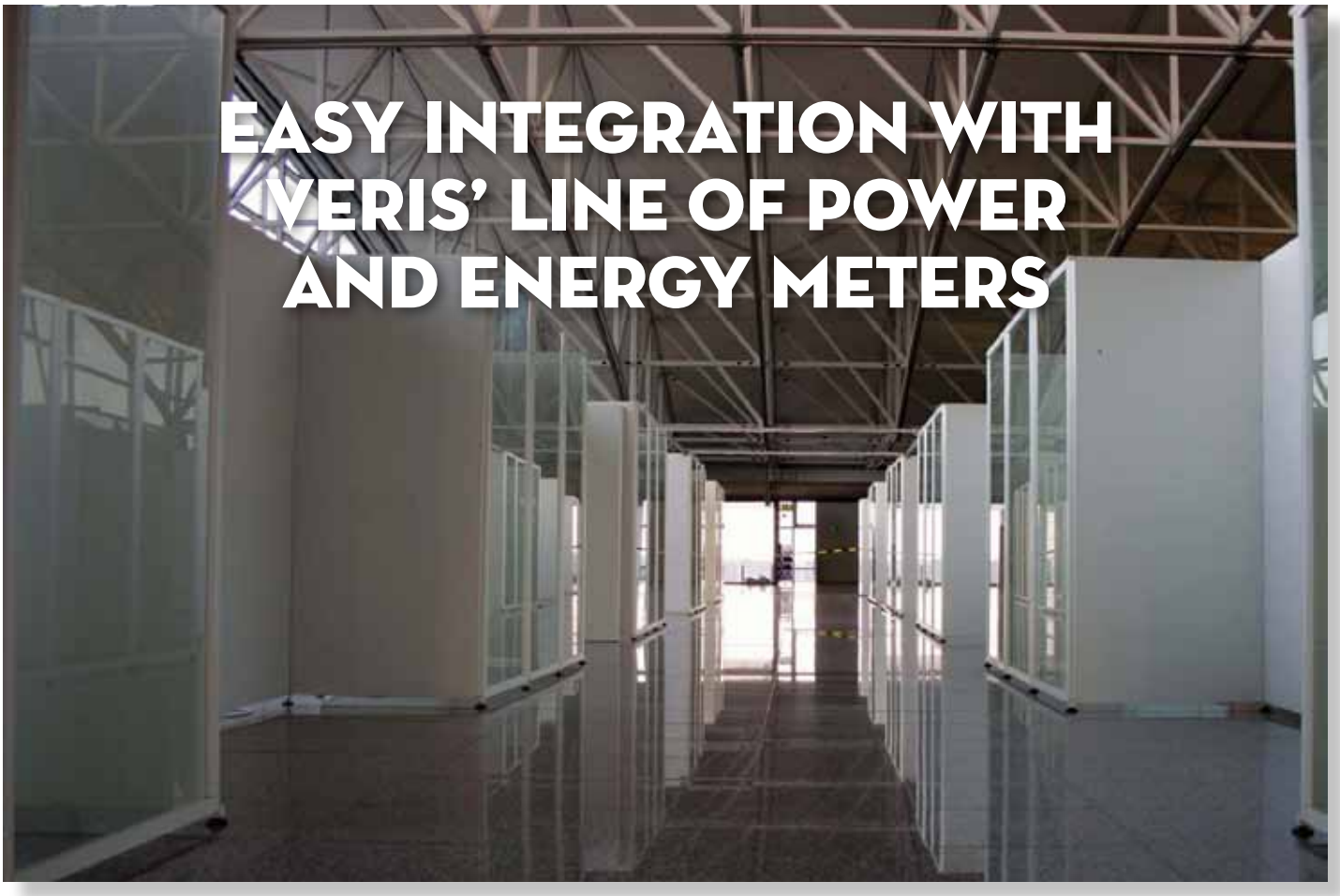
Veris Industries provides a full line of current transformers/transducers to suit any application. We offer both voltage and amperage outputs for compatibility with other devices and systems, as well as a variety of core sizes and styles for a perfect fit into tight spaces. Browse our extensive offering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

MODEL	DESCRIPTION	PAGE
H681x-5A/ALx/BLx/CLx	5A Output, Solid-Core and Split-Core	194
E682x/H681x-V	1V and 0.333V Output, Medium Current Rating, Solid-Core and Split-Core	196
SCT Series	0.333V Output, Low Current Rating, Split-Core	198
FCL Series	5A, 1V, or 0.333V Output, Flexible Core, Split-Core	200
RCT Series	1V and 0.333V Output, Sensing Rope Coil, Split-Core	202
Accessories		328

Metering CT Selection Guide

FEATURES

	5 Amp			1 Volt			0.333 Volt		
	Model	**Range**	**ID**	**Model**	**Range**	**ID**	**Model**	**Range**	**ID**
Solid-Core	**ALxxx** page 194	50 to 400 Amp	1.1 "				**E682Axxxx3** page 196	50 to 100 Amp	0.4"
	BLxxx page 194	60 to 1200 Amp	2.0"				**E682Cxxxx3** page 196	200 Amp	1.0"
	CLxxx page 194	1200 to 2000 Amp	3.0"				**E682Dxxxx3** page 196	400 Amp	1.25"
Split-Core	**H6810-xxxA-5A** page 194	200 to 300 Amp	1.2" x 1.3"	**H6810-xxxA-1V** page 196	100 to 300 Amp	1.2" x 1.3"	**H6810-xxxA-0.3V** page 196	100 to 300 Amp	1.2" x 1.3"
	H6811-xxxA-5A page 194	400 to 800 Amp	2.5" x 2.9"	**H6811-xxxA-1V** page 196	400 to 800 Amp	2.5" x 2.9"	**H6811-xxxA-0.3V** page 196	400 to 800 Amp	2.5" x 2.9"
	H6812-xxxA-5A page 194	800 to 1600 Amp	2.5" x 5.5"	**H6812-xxxA-1V** page 196	800 to 2400 Amp	2.5" x 5.5"	**H6812-xxxA-0.3V** page 196	800 to 2400 Amp	2.5" x 5.5"
	FCL-xxxx/5-x page 200	200 to 6000 Amp	round 4" to rect. 4" x 11"	**FCL-xxxx/1VAC-x** page 200	200 to 6000 Amp	round 4" to rect. 4" x 11"	**FCL-xxxx/0.333VAC-x** page 200	200 to 6000 Amp	round 4" to rect. 4" x 11"
							SCT-0750-xxx page 198	5 to 200 Amp	0.75"
							SCT-1250-xxx page 198	50 to 600 Amp	1.25"
Rope				**RCT-1800-xxxx-1V** page 202	500 to 5000 Amp	18"	**RCT-1800-xxxx** page 202	500 to 5000 Amp	18"
				RCT-2400-xxxx-1V page 202	500 to 5000 Amp	24"	**RCT-2400-xxxx** page 202	500 to 5000 Amp	24"



EASY INTEGRATION WITH VERIS' LINE OF POWER AND ENERGY METERS

E682x & H681x

The E682x and H681xV Series of current transducers provide a safe voltage output for use with data loggers, chart recorders, and power monitoring equipment.

- High accuracy: +/-0.5% from 5% to 120% of rated current for E682x or +/-1% from 10% to 100% of rated current for H681x
- 0.333V version available for E682x; 0.333V or 1VAC versions available for H681x
- UL recognized

Current Transfomers, 5A Output

Split-Core and Solid-Core Designs for Flexibility

DESCRIPTION

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

FEATURES

- Unique hinge design on split-cores...easy installation
- 5 Amp standard output...compatible with existing systems
- UL recognized

APPLICATIONS

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

SPECIFICATIONS (Solid-Core)

1 Year Warranty

Inputs:	
Frequency Range	50-400 Hz
Leads	2 ft (0.6 m)
Accuracy:	
Accuracy	Varies at 60 Hz (see Ordering Information)
Outputs:	
Output at Rated Current	5A
Mechanical:	
Insulation	600VAC
Environmental:	
Operating Temperature Range	-30° to 55°C (-22° to 131°F)
Storage Temperature Range	-30° to 105°C (-22° to 221°F)
Agency Approvals	UL61010

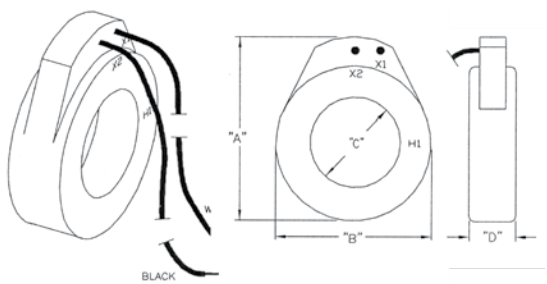
SPECIFICATIONS (Split-Core)

5 Year Warranty

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	5A
Mechanical:	
Insulation	600VAC
Environmental:	
Operating Temperature Range	2400A models only: -15° to 50°C (5° to 122°F); All other models: -15° to 60°C (5° to 140°F)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Humidity Range	0-95% noncondensing
Agency Approvals	UL61010, EN61010

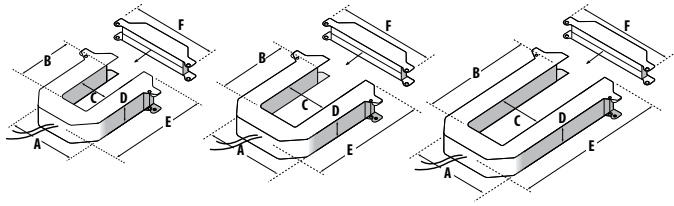
DIMENSIONAL DRAWINGS

AL/BL/CL Solid-core



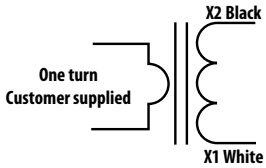
AL/SMALL	BL/MEDIUM	CL/LARGE
A = 2.7″ (70 mm)	*A = 3.7″ (90 mm)*	*A = 4.9″ (124 mm)*
B = 2.5″ (63 mm)	*B = 3.4″ (88 mm)*	*B = 4.5″ (115 mm)*
C = 1.1″ (26 mm)	*C = 2″ (52 mm)*	*C = 3″ (76 mm)*
D = 1.1″ (26 mm)	*D = 1.1″ (26 mm)*	*D = 1.1″ (26 mm)*

H681x-5A Split-core



H6810/SMALL	H6811/MEDIUM	H6812/LARGE
200 Amp	400 Amp	800 Amp/1000 Amp/
300 Amp	600 Amp	1200 Amp/1600 Amp/
	800 Amp	2000 Amp/2400 Amp
A = 3.8″ (96 mm)	*A = 4.9″ (125 mm)*	*A = 4.9″ (125 mm)*
B = 1.2″ (30 mm)	*B = 2.9″ (73 mm)*	*B = 5.5″ (139 mm)*
C = 1.3″ (32 mm)	*C = 2.5″ (62 mm)*	*C = 2.5″ (62 mm)*
D = 1.2″ (30 mm)	*D = 1.2″ (30 mm)*	*D = 1.2″ (30 mm)*
E = 4.0″ (100 mm)	*E = 5.2″ (132 mm)*	*E = 7.9″ (201 mm)*
F = 4.8″ (121 mm)	*F = 6.0″ (151 mm)*	*F = 6.0″ (151 mm)*

APPLICATION/WIRING EXAMPLE



ORDERING INFORMATION

Solid-Core

c UL us E93779

MODEL	RATIO	ACCURACY AT 60 Hz	BURDEN CAPACITY IN VA
AL500	50:5	3%	2.0
AL101	100:5	1%	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		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

Split-Core

c UL us E207042 CE

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

ACCESSORIES

Universal Mounting Bracket Kit for H681x CTs (AH06)

AH06

Current Transducers, Voltage Output

Medium Current Ranges

DESCRIPTION

The **E682x and H681x-V** Series of current transducers provide a safe voltage output for use with data loggers, chart recorders, and power monitoring equipment. E682x devices are solid-core with 0-0.333VAC output, while H681x CTs are split-core and have 0-0.333VAC and 1VAC output options.

APPLICATIONS

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

FEATURES

- High accuracy: ±0.5% from 5% to 120% of rated current for E682x or ±1% from 10% to 100% of rated current for H681x
- 0.333V and 1VAC output versions available
- UL recognized

POWER METERING CTS

SPECIFICATIONS (Solid-Core)

5 Year Warranty

Inputs:	
Frequency Range	50/60 Hz
Leads	6′ (1.8 m)
Accuracy:	
Accuracy	±0.5% of reading from 5% to 120% of rated current
Outputs:	
Output at Rated Current	0.333VAC
Mechanical:	
Insulation	600VAC
Environmental:	
Operating Temperature Range	-40° to 85°C (40° to 185°F)
Storage Temperature Range	-50° to 105°C (-58° to 221°F)
Humidity Range	0-95% noncondensing
Installation Category	Cat III, pollution degree 2
Agency Approvals	UL61010-1, EN61010-1

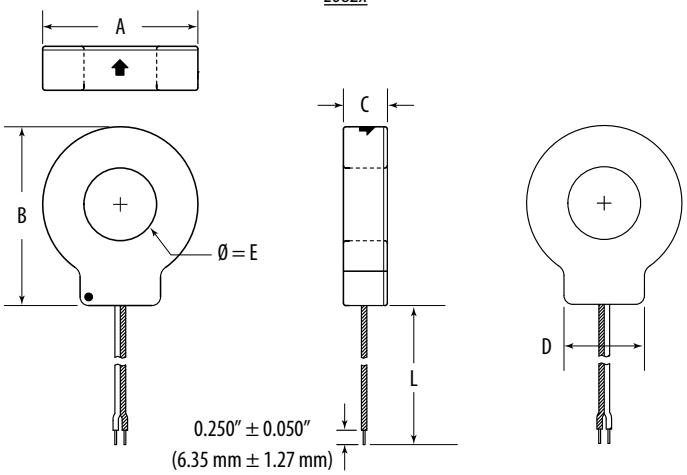
SPECIFICATIONS (Split-Core)

5 Year Warranty

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	0.333 or 1VAC
Mechanical:	
Insulation	600VAC
Environmental:	
Operating Temperature Range	2400A models only: -15° to 50°C (5° to 122°F); All other models: -15° to 60°C (5° to 140°F)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Humidity Range	0-95% noncondensing
Agency Approvals	UL61010, EN61010

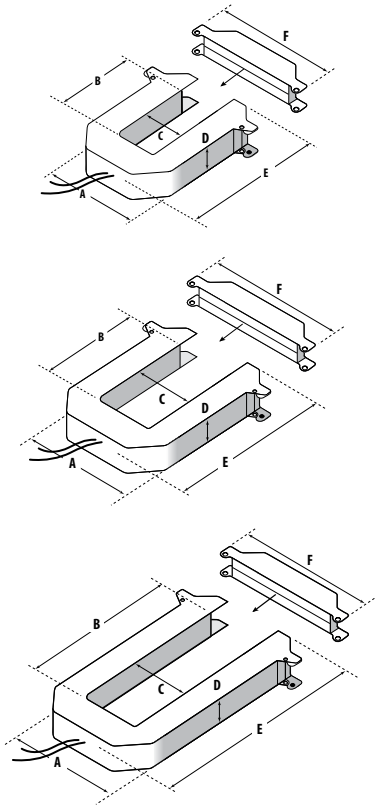
DIMENSIONAL DRAWINGS

E682x



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)

H681x



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)

ORDERING INFORMATION

Solid-Core

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

Other lead lengths are available. Consult factory.

Split-Core

E207042

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

Current Transducers, Voltage Output

Low Current Ranges

SCT

DESCRIPTION

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

APPLICATIONS

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

FEATURES

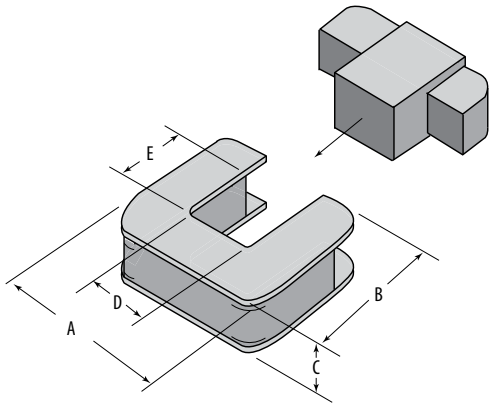
- High accuracy: ±1% from 10% to 130% of rated current
- 0.333VAC standard output...compatible with existing systems
- Interleaving joints for reliability with a self-locking mechanism and no exposed metal...safe design
- UL recognized

SPECIFICATIONS

3 Year Warranty

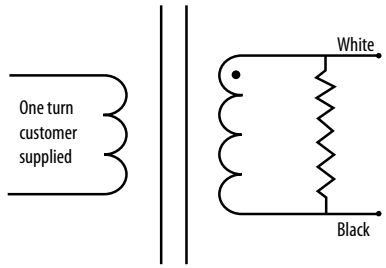
Inputs:	
Frequency Range	50-400 Hz
Leads	8 ft (204 m)
Accuracy:	
Accuracy	±1% of reading from 10% to 130% of rated current
Outputs:	
Output at Rated Current	0.333VAC
Mechanical:	
Insulation	600VAC
Environmental:	
Operating Temperature Range	-10° to 55°C (14° to 131°F)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Agency Approvals	cURus, CE, RoHS

DIMENSIONAL DRAWINGS



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)

APPLICATION/WIRING EXAMPLE



ORDERING INFORMATION

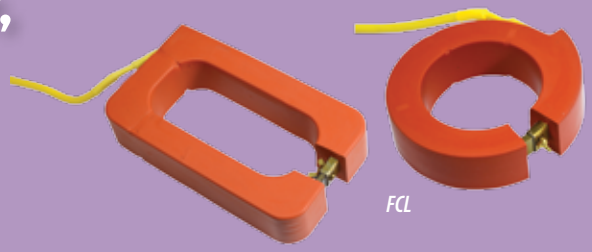
c UL us E96927 CE RoHS Compliant

Split-Core

MODEL	MANUF. PART NUMBER	RATING (A)	DESCRIPTION
U004-0030	SCT-0750-005	5	CT,SplitCore,5A:0.333VAC,0.750″ID
U004-0031	SCT-0750-010	10	CT,SplitCore,10A:0.333VAC,0.750″ID
U004-0032	SCT-0750-030	30	CT,SplitCore,30A:0.333VAC,0.750" ID
U004-0033	SCT-0750-050	50	CT,SplitCore,50A:0.333VAC,0.750" ID
U004-0034	SCT-0750-070	70	CT,SplitCore,70A:0.333VAC,0.750″ID
U004-0035	SCT-0750-100	100	CT,SplitCore,100A:0.333VAC,0.750" ID
U004-0036	SCT-0750-150	150	CT,SplitCore,150A:0.333VAC,0.750" ID
U004-0037	SCT-0750-200	200	CT,SplitCore,200A:0.333VAC,0.750" ID
U004-0038	SCT-1250-050	50	CT,SplitCore,50A:0.333VAC,1.250″ID
U004-0039	SCT-1250-070	70	CT,SplitCore,70A:0.333VAC,1.250″ID
U004-0040	SCT-1250-100	100	CT,SplitCore,100A:0.333VAC,1.250″ID
U004-0041	SCT-1250-150	150	CT,SplitCore,150A:0.333VAC,1.250″ID
U004-0042	SCT-1250-200	200	CT,SplitCore,200A:0.333VAC,1.250″ID
U004-0043	SCT-1250-250	250	CT,SplitCore,250A:0.333VAC,1.250″ID
U004-0044	SCT-1250-300	300	CT,SplitCore,300A:0.333VAC,1.250″ID
U004-0045	SCT-1250-400	400	CT,SplitCore,400A:0.333VAC,1.250″ID
U004-0046	SCT-1250-600	600	CT,SplitCore,600A:0.333VAC,1.250″ID

Flexible Current Transformer, 5 Amp or Voltage Output

Flexible Split-Core Design for Large Size Applications



FCL

DESCRIPTION

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

APPLICATIONS

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

FEATURES

- Multiple sizes to fit your applications
- Flexible core design...easy installation
- Output available in 5A, 1V, or 0.333V...compatible with existing systems

Flexible core twists open for easier fit around wires

POWER METERING CTS

SPECIFICATIONS

15 Month Warranty

Inputs:

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

Accuracy:

Accuracy	Varies at full scale (see Ordering Information)

Outputs:

Output at Rated Current	5A, 0.333VAC, or 1VAC

Mechanical:

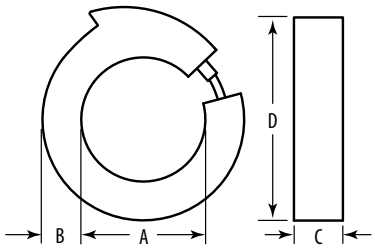
Insulation	600VAC

Environmental:

Operating Temperature Range	-45° to 55°C (-49° to 131°F)
Storage Temperature Range	-45° to 65°C (-49° to 149°F)
Agency Approvals	cURus, CE, RoHS

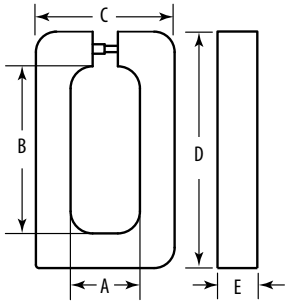
DIMENSIONAL DRAWINGS

Round Flexible Core



	-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



	-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)

ORDERING INFORMATION

E186575

RoHS Compliant

Split-Core

FCL ☐ / ☐ – ☐

Current

200 = 200A
250 = 250A
300 = 300A
400 = 400A
500 = 500A
600 = 600A
800 = 800A
1000 = 1000A
1200 = 1200A
1500 = 1500A
1600 = 1600A
2000 = 2000A
2400 = 2400A
2500 = 2500A
3000 = 3000A
3500 = 3500A
4000 = 4000A
5000 = 5000A
6000 = 6000A

Output

5 = 5A
1V = 0-1VAC
0.3V = 0-0.333VAC

I.D.

4 = 5A, Round, 4" (200A-2000A)
6 = 5A, Round, 6" (300A-3000A)
8 = 5A, Round, 8" (1000A-5000A)
11 = 5A, Round, 11" (1500A-6000A)
18 = 5A, Round, 18" (2000A-6000A)
R = 5A, Rectangular, 2.75" x 6.625" (300A-4000A)
R411 = 5A, Rectangular, 4" x 11" (1500A-6000A)
4 = 1V, Round, 4" (200A-1000A)
6 = 1V, Round, 6" (500A-2000A)
8 = 1V, Round, 8" (1000A-2000)
11 = 1V, Round, 11" (1500A-3500A)
18 = 1V, Round, 18" (2000A-6000A)
R = 1V, Rectangular, 2.75" x 6.625" (500A-1600A)
R411 = 1V, Rectangular, 4" x 11" (1000A-2500A)
4 = 0.3V, Round, 4" (200A-1500A)
6 = 0.3V, Round, 6" (500A-4000A)
8 = 0.3V, Round, 8" (1000-6000A)
11 = 0.3V, Round, 11" (1500A-6000A)
18 = 0.3V, Round, 18" (2000A-6000A)
R = 0.3V, Rectangular, 2.75" x 6.625" (500A-4000A)
R411 = 0.3V, Rectangular, 4" x 11" (1000A-6000A)

Accuracy at Full Scale

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 1VAC and 0.333VAC....1% at full scale

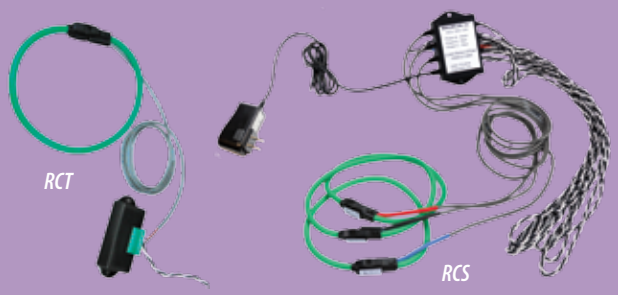
Example:

FCL [2000] / [5] – [11]

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

POWER METERING CTS

Flexible Core AC Current Transducer, Voltage Output



Adapts to Difficult Spaces

DESCRIPTION

The **RCT and RCS** flexible rope CTs measure AC current up to 5000 Amps. The coil opens at the conector junction for fast and easy installation onto an existing cable or buss-bar.

APPLICATIONS

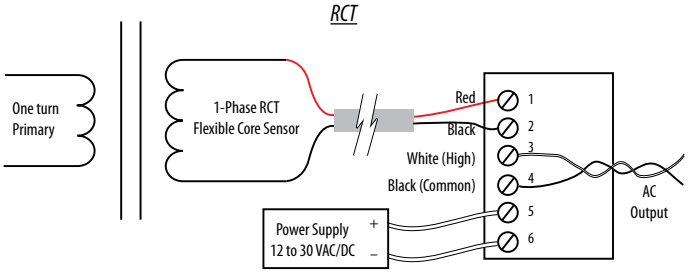
- Data logging
- Recording
- Power monitoring
- Energy management
- Alternative energy monitoring
- Cost allocation

FEATURES

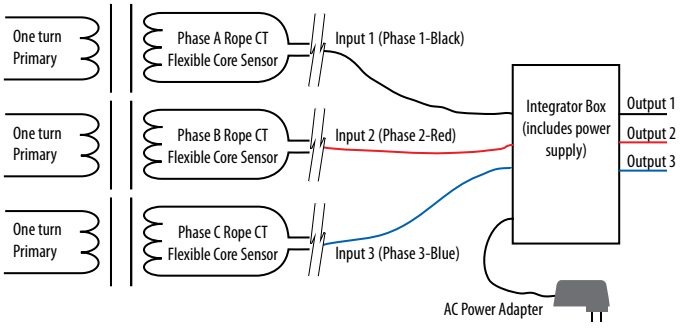
- Maximum flexibility...fits difficult spaces
- Phase angle <0.5 degrees, measured at 50% rated current...enhanced accuracy
- 1V or 0.333V output...compatible with existing systems
- 8 ft. insulated leads...installation safety
- UL recognized
- 1-phase (RCT) or 3-phase (RCS) monitoring...application flexibility

APPLICATION/WIRING EXAMPLES

RCT



RCS



SPECIFICATIONS

3 Year Warranty

Inputs:

Control Power, RCT	12 to 30VAC/DC
Control Power, RCS	Included in Integrater box
Frequency Range	50 Hz to 1.5 kHz
Leads	8 ft. (2.4 m) twisted pair

Accuracy:

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

Outputs:

Output at Rated Current	0.333VAC or 1VAC (see Ordering Information)

Mechanical:

Insulation	up to 600VAC

Environmental:

Operating Temperature Range	-10° to 55°C (14° to 131°F)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Agency Approvals	cURus, CE, RoHS

POWER METERING CTS

VERIS INDUSTRIES

ORDERING INFORMATION

CE cULus E96927 RoHS Compliant

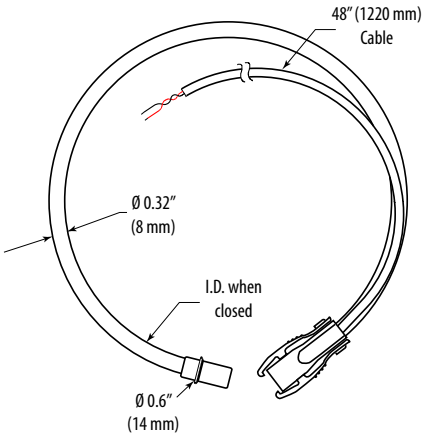
Flexible (Rope) Core

MODEL	MANUF. PART NUMBER	RATING (A)	DESCRIPTION
U004-0059	RCT-1800-0500	500	CT, Rope, 18 in, 500A:0.333VAC
U004-0060	RCT-1800-1000	1000	CT, Rope, 18 in, 1000A:0.333VAC
U004-0061	RCT-1800-2000	2000	CT, Rope, 18 in, 2000A:0.333VAC
U004-0062	RCT-1800-3000	3000	CT, Rope, 18 in, 3000A:0.333VAC
U004-0063	RCT-1800-4000	4000	CT, Rope, 18 in, 4000A:0.333VAC
U004-0064	RCT-1800-5000	5000	CT, Rope, 18 in, 5000A:0.333VAC
U004-0065	RCT-1800-0500-1V	500	CT, Rope, 18 in, 500A:1VAC
U004-0066	RCT-1800-1000-1V	1000	CT, Rope, 18 in, 1000A:1VAC
U004-0067	RCT-1800-2000-1V	2000	CT, Rope, 18 in, 2000A:1VAC
U004-0068	RCT-1800-3000-1V	3000	CT, Rope, 18 in, 3000A:1VAC
U004-0069	RCT-1800-4000-1V	4000	CT, Rope, 18 in, 4000A:1VAC
U004-0070	RCT-1800-5000-1V	5000	CT, Rope, 18 in, 5000A:1VAC
U004-0047	RCT-2400-0500	500	CT, Rope, 24 in, 500A:0.333VAC
U004-0048	RCT-2400-1000	1000	CT, Rope, 24 in, 1000A:0.333VAC
U004-0049	RCT-2400-2000	2000	CT, Rope, 24 in, 2000A:0.333VAC
U004-0050	RCT-2400-3000	3000	CT, Rope, 24 in, 3000A:0.333VAC
U004-0051	RCT-2400-4000	4000	CT, Rope, 24 in, 4000A:0.333VAC
U004-0052	RCT-2400-5000	5000	CT, Rope, 24 in, 5000A:0.333VAC
U004-0053	RCT-2400-0500-1V	500	CT, Rope, 24 in, 500A:1VAC
U004-0054	RCT-2400-1000-1V	1000	CT, Rope, 24 in, 1000A:1VAC
U004-0055	RCT-2400-2000-1V	2000	CT, Rope, 24 in, 2000A:1VAC
U004-0056	RCT-2400-3000-1V	3000	CT, Rope, 24 in, 3000A:1VAC
U004-0057	RCT-2400-4000-1V	4000	CT, Rope, 24 in, 4000A:1VAC
U004-0058	RCT-2400-5000-1V	5000	CT, Rope, 24 in, 5000A:1VAC

MODEL	MANUF. PART NUMBER	RATING (A)	DESCRIPTION
U004-0311	RCS-1800-250	250	CT, Rope, 3-phase, 18 in, 250A:0.333VAC
U004-0312	RCS-1800-400	400	CT, Rope, 3-phase, 18 in, 400A:0.333VAC
U004-0313	RCS-1800-500	500	CT, Rope, 3-phase, 18 in, 500A:0.333VAC
U004-0314	RCS-1800-800	800	CT, Rope, 3-phase, 18 in, 800A:0.333VAC
U004-0315	RCS-1800-1000	1000	CT, Rope, 3-phase, 18 in, 1000A:0.333VAC
U004-0316	RCS-1800-1500	1500	CT, Rope, 3-phase, 18 in, 1500A:0.333VAC
U004-0317	RCS-1800-2000	2000	CT, Rope, 3-phase, 18 in, 2000A:0.333VAC
U004-0318	RCS-1800-2500	2500	CT, Rope, 3-phase, 18 in, 2500A:0.333VAC
U004-0319	RCS-1800-3000	3000	CT, Rope, 3-phase, 18 in, 3000A:0.333VAC
U004-0320	RCS-1800-4000	4000	CT, Rope, 3-phase, 18 in, 4000A:0.333VAC
U004-0321	RCS-1800-5000	5000	CT, Rope, 3-phase, 18 in, 5000A:0.333VAC
U004-0322	RCS-2400-250	250	CT, Rope, 3-phase, 24 in, 250A:0.333VAC
U004-0323	RCS-2400-400	400	CT, Rope, 3-phase, 24 in, 400A:0.333VAC
U004-0324	RCS-2400-500	500	CT, Rope, 3-phase, 24 in, 500A:0.333VAC
U004-0325	RCS-2400-800	800	CT, Rope, 3-phase, 24 in, 800A:0.333VAC
U004-0326	RCS-2400-1000	1000	CT, Rope, 3-phase, 24 in, 1000A:0.333VAC
U004-0327	RCS-2400-1500	1500	CT, Rope, 3-phase, 24 in, 1500A:0.333VAC
U004-0328	RCS-2400-2000	2000	CT, Rope, 3-phase, 24 in, 2000A:0.333VAC
U004-0329	RCS-2400-2500	2500	CT, Rope, 3-phase, 24 in, 2500A:0.333VAC
U004-0330	RCS-2400-3000	3000	CT, Rope, 3-phase, 24 in, 3000A:0.333VAC
U004-0331	RCS-2400-4000	4000	CT, Rope, 3-phase, 24 in, 4000A:0.333VAC
U004-0332	RCS-2400-5000	5000	CT, Rope, 3-phase, 24 in, 5000A:0.333VAC

Note: Other sizes are available. Consult factory.

DIMENSIONAL DRAWINGS



Length	Approx. Inside Diameter With Closed Connector
12" (305 mm)	Ø 3.85" (98 mm)
18" (458 mm)	Ø 5.75" (147 mm)
24" (610 mm)	Ø 7.65" (195 mm)
36" (915 mm)	Ø 11.50" (293 mm)

POWER METERING CTS

Power Sources Contents

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 375VA. 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 24VDC outputs from 7.5 to 100 Watts in capacity.

MODEL	DESCRIPTION
PS Series	Power Supplies
X Series	Control Transformers

Power Sources Selection Guide

** Indicates a series of products.*

DC Power Supply	PS*
Control Transformers	X*

RELIABLE CONTROL TRANSFORMERS AND POWER SUPPLIES

X Series Control Transformers

The X Series is 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 Hub/Foot mounting and voltage options available
- UL listings for all models

PS Series Power Supplies

- Capable of supplying up to 100W of DC Power
- DIN rail mount

VERIS INDUSTRIES

Power Supplies

PS Series Switching Power Supplies

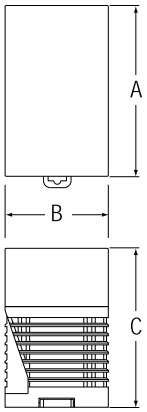
PS Series

Capable of supplying up to 100 Watts (AV01 DIN Rail not included)

FEATURES

- High efficiency switching power supply capable of supplying up to 100Watts*
- Ideal for supplying loop power to Veris power transducers and current sensors
- Universal voltage input from 100-240VAC/110-340VDC
- DIN rail housing for ease of installation
- Small size...saves panel space
- High efficiency...won't generate excessive heat in control panel
- DIN rail switching power supply provides 12 or 24VDC, up to 100Watts*
- 100MΩ minimum isolation

DIMENSIONAL DRAWING



	A	B	C
7.5W	2.3" (59 mm)	1.8" (46 mm)	2.5" (64 mm)
15W	3.0" (77 mm)	1.8" (46 mm)	3.8" (97 mm)
30W	3.0" (77 mm)	3.6" (92 mm)	3.9" (99 mm)
50W	3.0" (77 mm)	3.6" (92 mm)	3.9" (99 mm)
100W	3.0" (77 mm)	5.7" (145 mm)	3.9" (99 mm)

SPECIFICATIONS

Input Voltage (single phase, 2-wire)	100-240VAC nominal, (85-264VAC) 50/60Hz (47-63Hz); 110-340VDC nominal, (105-370VDC)
Input Current (typical@100V)	0.17A (PS-7.5W), 0.30A (PS-15W), 0.68A (PS-30W): 1.15A (PS-50W), 2.5A (PS-100W)
Internal Fuse Rating	2A (PS-7.5W), 2A (PS-15W), 3.15A (PS-30W); 3.15A (PS-50W), 4A (PS-100W)
Inrush Current	50A max. (cold start at 200V)
Leakage Current (at no load)	0.75mA max. (60 Hz measured in conformance with VDE, UL, CSA)
Output Voltage & Current Ratings@12 V	12V/0.6A (PS-7.5W), 12V/1.2A (PS-15W), 12V/2.5A (PS-30W)
Output Voltage & Current Ratings@24 V	24V/0.3A (PS-7.5W), 24V/0.6A (PS-15W), 24V/1.3A (PS-30W), 24V/4.2A (PS-100W)
Operating Temperature	-10° to 60°C (14° to 140°F)
Storage Temperature	-30° to 85°C (-22° to 185°F)
Operating Humidity	20 to 90% RH noncondensing
Weight (approx.)	150 g (PS-7.5W), 170 g (PS-15W), 360 g (PS-30W), 390 g (PS-50W), 600 g (PS-100W)
Terminal Screw	Spring-up, finger-safe terminals with captive M3.5 screws

POWER SOURCES

ORDERING INFORMATION

CE c UL us LISTED IND. CONT. EQ. UL 508

Output

PS [ ]

12 =12VDC
24 = 24VDC

Watts

[ ]

7.5W = 7.5 Watts
15W = 15 Watts
30W = 30 Watts
50W* = 50 Watts
100W* = 100 Watts
120W* = 120 Watts
240W* = 240 Watts

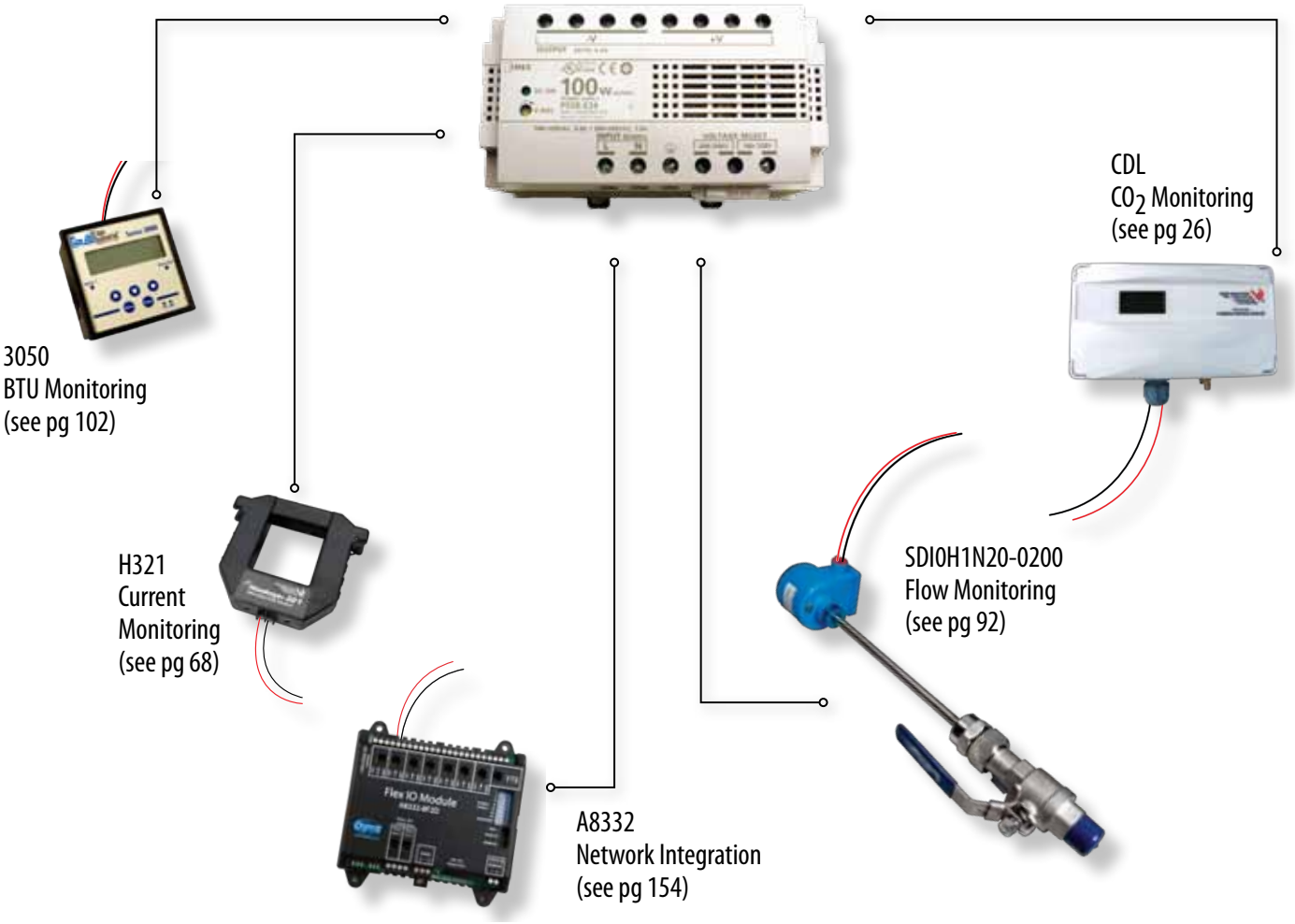
Example:

PS [12] [7.5]

** Available in 24V only.*

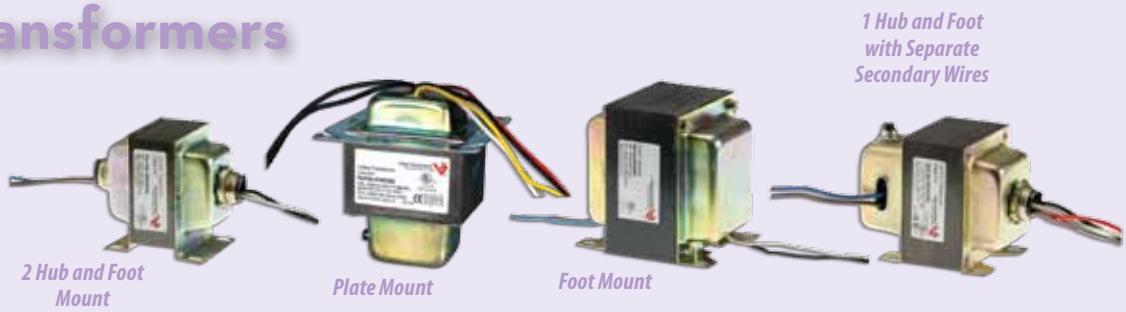
Supplying Power for All Your DC Needs

PS SERIES



	CDL (100mA)	PX 2-wire (20mA)	PX 3-wire (30mA)	PW (125mA)	HW (15mA)	HW (30mA)	SDI (20mA)	A8332 (200mA)	H321 (30mA)	3050 (280mA)
7.5W	3	15	10	2	20	10	15	1	10	1
15W	6	31	20	5	41	20	30	3	20	2
30W	12	62	41	10	83	41	60	6	41	4
50W	20	104	69	16	138	69	101	10	69	7
100W	41	208	138	33	277	138	203	20	138	14

Control Transformers



DESCRIPTION

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.

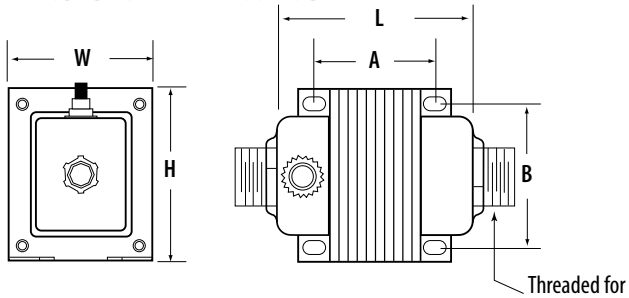
APPLICATIONS

- Controller power
- Switching relays and other digital I/O circuits
- Powering sensors

FEATURES

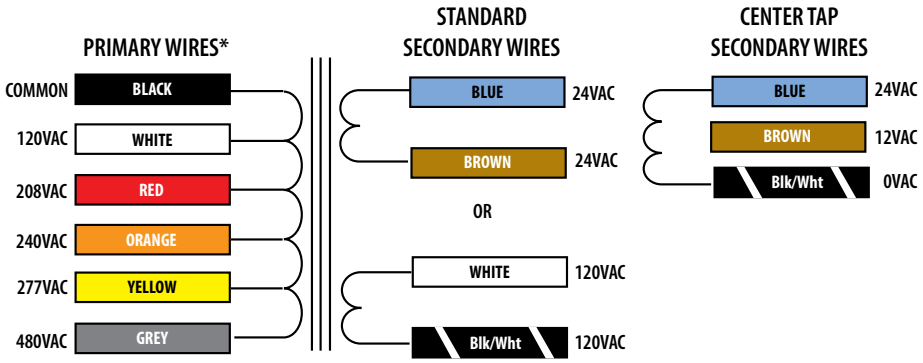
- UL Listings for all models simplify panel building requirements
- Threaded hub options maximize installation flexibility
- One stop shopping...save time by ordering along with other Veris products

DIMENSIONAL DRAWING



** See ordering table for dimensions.*

WIRE COLORS



**Primary of 24V isolation transformers= Red/Red*

SPECIFICATIONS

5 Year Warranty

Frequency	50/60Hz
Operating Temperature	-40° to 65°C (-40° to 149°F)
No Load Voltage	27-28VAC
Hub Style	Fits 1/2" electrical k.o.
Wire	UL 1015, 18 AWG*
Wire Length	8 inches

**X085AAA, X375DAC have 14AWG, Secondary wires*

VERIS INDUSTRIES

ORDERING INFORMATION

CE c UL us LISTED
UL 5085
E222742

DIMENSIONS (inches)

MODEL	VA	PRIMARY VOLTAGE (VAC)	SECONDARY VOLTAGE (VAC)	CURRENT LIMITING METHOD	CLASS	MOUNTING	SEPARATED PRIMARY & SECONDARY WIRES	UL	CE	L	W	H	A	B
STANDARD														
X020AAA	20	120	24	Inherent	II, III	1HUB+FT		●	●	2.3	1.9	2.6	1.59	1.69
X020ACA		277		Inherent	II, III	1HUB+FT		●	●	2.3	1.9	2.6	1.59	1.69
X020ADA		24		Inherent	General	1HUB+FT		●	●	2.3	1.9	2.6	1.59	1.69
X020ADB		24		Inherent	General	2HUB+FT	●	●	●	2.3	1.9	2.6	1.59	1.69
X040AAA	40	120		Inherent	II, III	1HUB+FT		●	●	2.7	2.2	2.9	1.98	1.81
X040AAB		120		Inherent	II, III	2HUB+FT	●	●	●	2.7	2.2	2.9	1.98	1.81
X040ACA		277		Inherent	II, III	1HUB+FT		●	●	2.7	2.2	2.9	1.98	1.81
X040ADA		24		Inherent	II, III	1HUB+FT		●	●	2.7	2.2	2.9	1.98	1.81
X040AMB		120/208/240/277		Fuse	II, III	2HUB+FT	●	●	●	2.7	2.2	2.9	1.98	1.81
X040BNA		120/208/240		Fuse	II, III	1HUB+FT		●	●	2.7	2.2	2.9	1.98	1.81
X040BPC		24	12/24	Fuse	II, III	Foot	●	●	●	2.7	2.2	2.9	1.98	1.81
X050BAA	50	120	24	Fuse	II, III	1HUB+FT		●	●	2.8	2.2	2.9	2.06	1.81
X050BAB		120		Fuse	II, III	2HUB+FT	●	●	●	2.8	2.2	2.9	2.06	1.81
X050BCA		277		Fuse	II, III	1HUB+FT		●	●	2.8	2.2	2.9	2.06	1.81
X050BCB		277		Fuse	II, III	2HUB+FT	●	●	●	2.8	2.2	2.9	2.06	1.81
X050BGB		208/240		Fuse	II, III	2HUB+FT	●	●	●	2.8	2.2	2.9	2.06	1.81
X050CAA		120		Circuit Breaker	II, III	1HUB+FT		●	●	3.5	2.5	3.1	1.91	2.03
X050CBA		120/240/277/480		Circuit Breaker	II, III	1HUB+FT		●	●	3.5	2.5	3.1	1.91	2.03
X050CBB		120/240/277/480		Circuit Breaker	II, III	2HUB+FT	●	●	●	3.5	2.5	3.1	1.91	2.03
X050CCA		277		Circuit Breaker	II, III	1HUB+FT		●	●	3.5	2.5	3.1	1.91	2.03
X050CEB		208/240/277/480	120	Circuit Breaker	General	2HUB+FT	●	●	●	3.5	2.5	3.1	1.91	2.03
X050CEG		208/240/277/480		Circuit Breaker	General	Plate, 90° Sec Elbow	●	●	●	3.5	4.0	4.0	3.38	3.38
X050CGG		208/240	24	Circuit Breaker	II, III	Plate, 90° Sec Elbow	●	●	●	4.0	4.0	4.0	3.38	3.38
X050CHA		120/208/240/480		Circuit Breaker	II, III	1HUB+FT		●	●	3.5	2.5	3.1	1.91	2.03
X050CHB		120/208/240/480		Circuit Breaker	II, III	2HUB+FT	●	●	●	3.5	2.5	3.1	1.91	2.03
X050CNA		120/208/240		Circuit Breaker	II, III	1HUB+FT		●	●	3.5	2.5	3.1	1.91	2.03
X050CNB		120/208/240		Circuit Breaker	II, III	2HUB+FT	●	●	●	3.5	2.5	3.1	1.91	2.03
X050COA		120/208/240/277/480		Circuit Breaker	II, III	1HUB+FT		●	●	3.5	2.5	3.1	1.91	2.03
X050COB		120/208/240/277/480		Circuit Breaker	II, III	2HUB+FT	●	●	●	4.3	2.5	3.1	2.70	2.00
X050DLB		220		None	II, III	2HUB+FT	●	●	●	2.8	2.2	2.9	2.06	1.81
X075CAA	75	120		Circuit Breaker	II, III	1HUB+FT		●	●	3.9	2.5	3.1	2.31	2.03
X075CAB		120		Circuit Breaker	II, III	2HUB+FT	●	●	●	3.9	2.5	3.1	2.31	2.03
X075CBA		120/240/277/480		Circuit Breaker	II, III	1HUB+FT		●	●	3.9	2.5	3.1	2.31	2.03
X075CCA		277		Circuit Breaker	II, III	1HUB+FT		●	●	3.9	2.5	3.1	2.31	2.03
X075CHA		120/208/240/480		Circuit Breaker	II, III	1HUB+FT		●	●	3.9	2.5	3.1	2.31	2.03
X075CHD		120/208/240/480		Circuit Breaker	II, III	1HUB+FT	●	●	●	3.9	2.5	3.1	2.31	2.03
X085AAA	85	120		Inherent	General	1HUB+FT		●	●	3.2	3.8	3.2	2.2	3.14
X100CAA	99	120		Circuit Breaker	II, III	1HUB+FT		●	●	4.1	2.5	3.1	2.51	2.03
X100CAB		120		Circuit Breaker	II, III	2HUB+FT	●	●	●	4.1	2.5	3.1	2.51	2.03
X100CBA		120/240/277/480		Circuit Breaker	II, III	1HUB+FT		●	●	4.3	2.5	3.1	2.70	2.03
X100CBB		120/240/277/480		Circuit Breaker	II, III	2HUB+FT	●	●	●	4.3	2.5	3.1	2.70	2.03
X100CBE		120/208/277/480		Circuit Breaker	II, III	Plate		●	●	4.3	4.0	4.0	3.38	3.38
X100CHB		120/208/240/480		Circuit Breaker	II, III	2HUB+FT	●	●	●	4.3	2.5	3.1	2.70	2.03
X100CKB		480	120	Circuit Breaker	General	2HUB+FT	●	●	●	4.1	2.5	3.1	2.51	2.03
X100CLB		220	24	Circuit Breaker	II, III	2HUB+FT	●	●	●	4.1	2.5	3.1	2.51	2.03
X150CAA	150	120		Circuit Breaker	General	1HUB+FT		●	●	3.5	3.8	3.2	2.08	3.26
X175BAB	175	120		Fuse	General	2HUB+FT	●	●	●	4.1	3.8	3.2	3.19	3.14
X175BLB		220		Fuse	General	Foot	●	●	●	3.8	3.8	3.2	3.05	3.14
X175CAB		120		Circuit Breaker	General	2HUB+FT	●	●	●	4.1	3.8	3.2	3.19	3.14
X175CLB		220		Circuit Breaker	General	Foot	●	●	●	3.8	3.8	3.2	3.05	3.14
X175DGC		208/240		None	General	Foot	●	●	●	4.1	3.8	3.2	3.19	3.14
X240DAA	240	120		None	General	1HUB+FT	●	●	●	3.7	3.8	4.5	3.24	3.18
X375DAC	375	120		None	General	Foot	●	●	●	4.3	3.8	4.5	3.83	3.18
CENTER TAP														
X020APC	20	24	12/24	Inherent	II, III	Foot	●	●	●	2.3	1.9	2.6	1.59	1.69
X020AQC		120/208/240		Inherent	II, III	Foot	●	●	●	2.3	1.9	2.6	1.59	1.69
X040BPC	40	24		Fuse	II, III	Foot	●	●	●	2.7	2.2	2.9	1.98	1.81
X040BQC		120/208/240		Fuse	II, III	Foot	●	●	●	2.7	2.2	2.9	1.98	1.81
X050CIA	50	120		Circuit Breaker	II, III	1HUB+FT	●	●	●	2.8	2.2	2.9	2.06	1.81
X100CRC	100	120/240		Circuit Breaker	II, III	1HUB+FT	●	●	●	4.3	2.5	3.1	2.70	2.03
X100CSC			16/32	Circuit Breaker	II, III	1HUB+FT	●	●	●	4.3	2.5	3.1	2.70	2.00

Pressure Contents

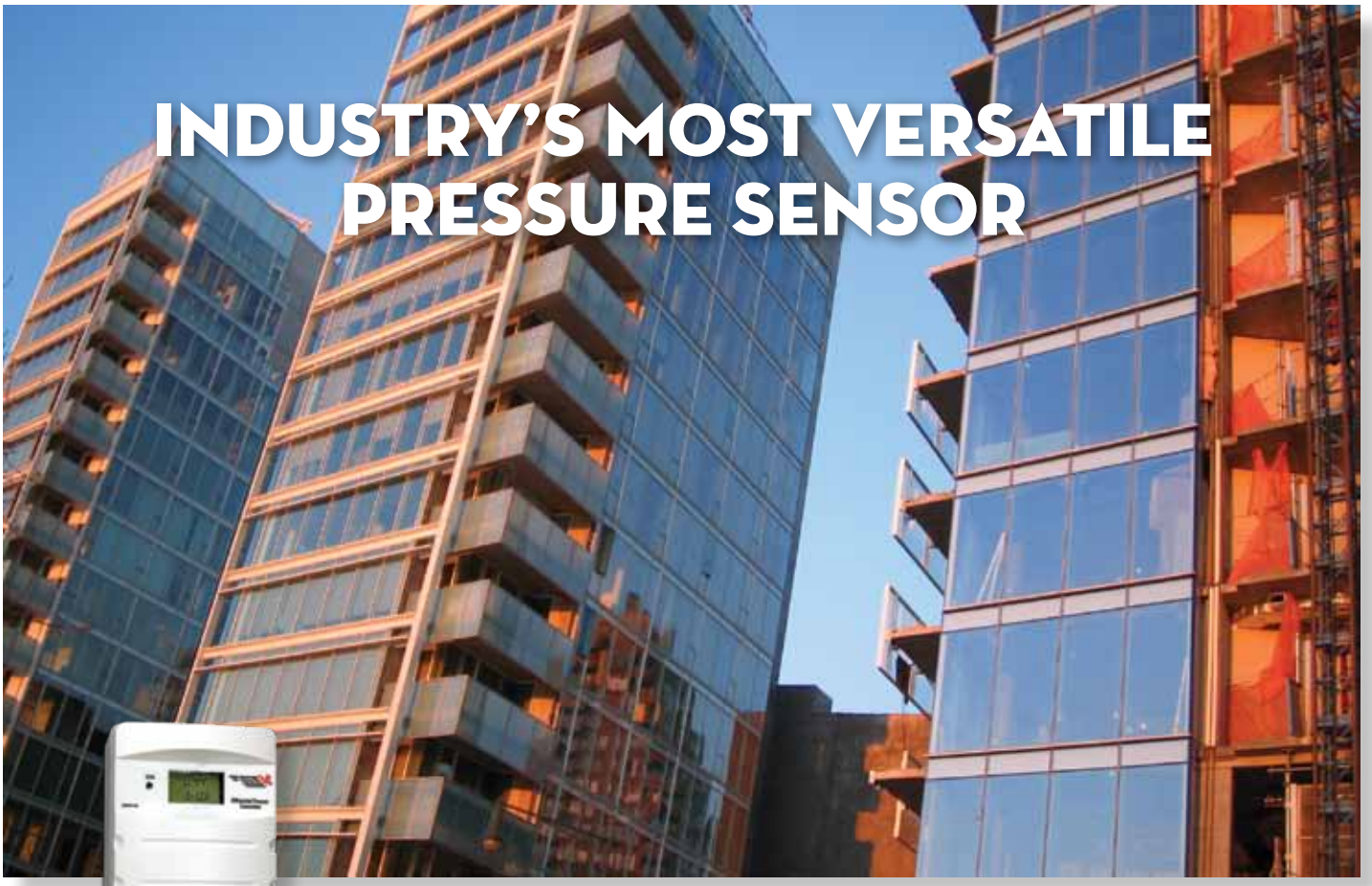
The Veris selection of pressure sensing devices includes sensors for both wet and dry media, as well as a series of electropneumatic transducers. Our products are known for their accuracy, their versatility, and the labor they save on installation.

MODEL	DESCRIPTION	PAGE
PH	Digitally Controlled Gauge Pressure Transducer	212
PD Series	Display Digital Pressure/Vacuum Gauges	214
PX Series	Dry Media Differential Pressure Transducers	216
EP2	Electropneumatic Transducers, psi Output	218
EP3	Electropneumatic Transducers, Analog Output (V or mS, Selectable)	220
PG/PV	Gauge Pressure Sensors	222
PW	Wet Media Differential Pressure Transducers (Selectable Pressure Units)	224
PW2	Wet Media Differential Pressure Transducers (Dual Pressure Units)	226
Accessories		323

Pressure Sensor Selection Guide

FEATURES/OPTIONS	Wet Media	Dry Media
Analog Output	PH, PD, PG/PV, PW, PW2 pages 212, 214, 222, 224, 226	PD, PX, PG/PV pages 214, 216, 222
Negative pressure	PD, PV pages 214, 222	PD page 214
High Pressure (Above 1000 psig)	PG/PV page 222	PG/PV page 222
Differential Pressure Sensing (Uni- and Bidirectional Operation)	PW, PW2 pages 224, 226	PXP/PXD/PXU page 216
LCD Display Option Available	PD, PW, PW2 pages 214, 224, 226	PD, PXP/PXD/PXU pages 214, 216
Duct Mount		PXD/PXU page 216
Panel Mount	PW, PW2 pages 224, 226	PXP/PXU page 216
Transmitter Only (No local display)	PH, PG/PV pages 212, 222	PXP/PXD/PXUX, PG/PV pages 216, 222
ELECTROPNEUMATIC TRANSDUCERS		
Pneumatic Systems		EP2, EP3 pages 218, 220

INDUSTRY'S MOST VERSATILE PRESSURE SENSOR



PXU

Veris Differential Pressure transducers are the ultimate for in-field versatility. Whether monitoring duct or building pressure, the PXU Series can adapt. With 7 field-selectable ranges, you will never need to carry multiple sensors again. The PXU Series can be mounted on the duct (with included attachable pick-up tube) or back at the panel making it the most versatile product on the market.

- Universal mount Dry Pressure device, configurable for panel or duct mount applications
- Excellent tolerance to overpressure and vibration, reduces field failures
- Selectable ranges & scales reduce setup time
- Monitors positive and negative pressure for application versatility
- Directional mode jumper for uni-directional or bi-directional room and building static pressure applications

Digitally Controlled Gauge Pressure Transducer

Three Switch-Selectable Ranges With Test Mode

PH

DESCRIPTION

The **PH Series** pressure transducers are designed for steam, air, gas, and liquid pressure measurement in all media compatible with 17-4 PH 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 safeguards against accidental zero adjustment during operation. The field-selectable output, offering options of 0-5V, 0–10VDC, or 4-20mA, ensures excellent systems compatibility. Jumper controlled surge damping is provided on all models to prevent false alarms.

APPLICATIONS

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

FEATURES

- Micromachined silicon sensor design...improves overpressure capacity and prevents failures
- Electronic surge damping for high stability
- Pushbutton zero calibration...no trim pots to adjust, saves installation time
- Switch-selectable pressure ranges...fewer models to order and stock
- Pushbutton and remote zero adjustment...maintain accuracy and prevent callbacks with automatic zero calibration

Microprocessor controlled signal conditioning (see graph)

- Noise rejection reduces fluctuating readings due to noise or turbulence
- Surge damping prevents false alarms by averaging fast peaks
- Output clamping protects controller input from overcurrent/overvoltage
- Test mode overrides the output to full scale...helps to diagnose wiring problems

PRESSURE

SPECIFICATIONS

5 Year Warranty

Product:

Input Power	12 to 30VDC/24VAC
Output	3-wire transmitter; user selectable 4-20mA (clipped and capped)/0-5V/0-10V*
Accuracy	±1% F.S. Combined linearity, hysteresis, and repeatability
Surge Damping	Electronic; 5-second averaging
Test Mode	Overrides output to full-scale (20mA, 5V, 10V)

Pressure Ranges:

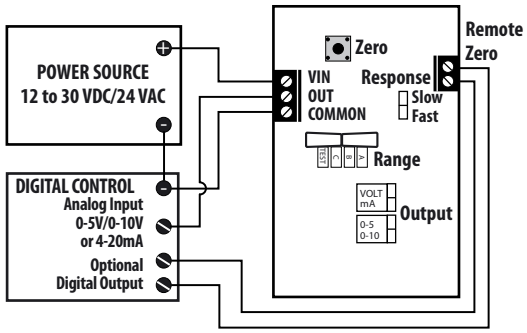
0-100 psi	25/50/100 psig switch selectable
0-250 psi	62.5/125/250 psig switch selectable
0-500 psi	125/250/500 psig switch selectable
0-1000 psi	250/500/1000 psig switch selectable
Product Operating Environment	-10° to 55°C (-4° to 130°F); 0 to 90% RH non-condensing
Long Term Stability	±0.25% per year
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

Sensor:

Media Compatibility	media compatible with 17-4 PH stainless steel
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range
Temperature Compensated Range	0° to 50°C (32° to 122°F)
Media Temperature Limits	-20° to 85°C (-4° to 185°F); 0 to 90% RH noncondensing
Fittings	1/4" NPT male thread, 17-4 PH stainless

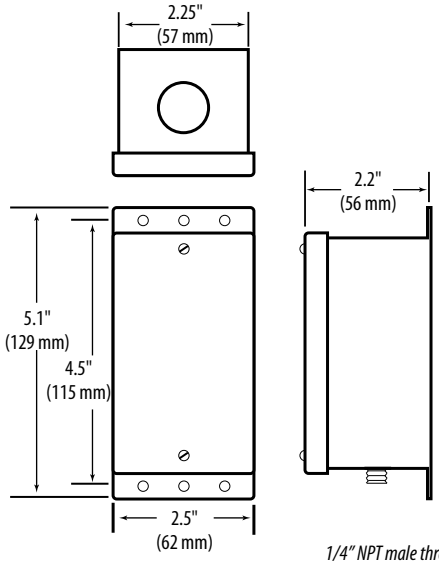
**Minimum input voltage for 4-20mA operation:*
250 Ω loop (1-5V) = 12VDC
500 Ω loop (2-10V) = 15VDC

APPLICATION/WIRING DIAGRAM



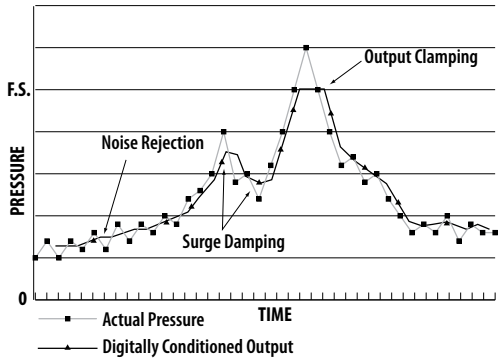
MODEL	RANGE A	B	C
07	25	50	100
08	62.5	125	250
09	125	250	500
10	250	500	1000

DIMENSIONAL DRAWING



1/4" NPT male thread, 17-4 PH stainless

SIGNAL CONDITIONING DIAGRAM



ORDERING INFORMATION

PH [ ] [ ] [S]

NIST: **N** = NIST, **X** = None

Range: **07** = 0-100 psig, **08** = 0-250 psig, **09** = 0-500 psig, **10** = 0-1000 psig

[S] = Standard

Example:

PH [X] [07] [S]

ACCESSORIES

Snubbers (AA11), steam siphon (AA13)

AA11

AA13

PRESSURE

Digital Display Pressure/ Vacuum Gauges

PD

Rugged, One Piece Construction

DESCRIPTION

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.

FEATURES

- Multiple pressure range options available...fits any application needs
- Rugged one-piece construction...provides long product life
- Large LCD display...clear readings at a distance
- Switch-selectable scales...for maximum resolution and versitility
- Pushbutton zero...maximizes accuracy and prevents callbacks
- 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

PRESSURE

SPECIFICATIONS

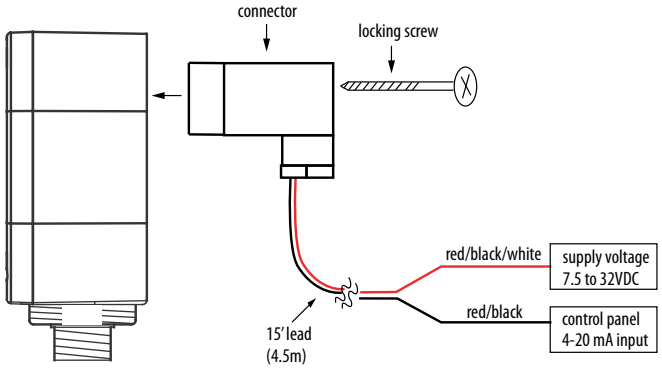
1 Year Warranty

Input Power	**Display Only Models:** 9 volt alkaline battery; **Analog Output Models:** 7.5 to 32VDC; **Voltage Output Models:** 15 to 32VDC
Pressure	See ordering table; consult factory for additional ranges
Measurement Units*	psi, bar, kg/cm2, atm, in. of Hg, in. of H_2O* (selectable)
Accuracy**	<± 0.5% BFLS
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	**Display Only Models:** -15° to 85°C (5° to 185°F); **Analog 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
Connection	¼" NPT Male
Update Rate	**Display Only Models:** 2 times per second; **Analog and Voltage Output Models:** 32 times per second
Automatic Power Off	**Display Only Models:** 1 hour
Battery Life	**Display Only Models:** 4000 Operating Hours (typical)
Housing	NEMA 4, IP65, Polycarbonate
Output	**Analog Output Models:** 4-20mA loop powered or 0-5/0-10VDC

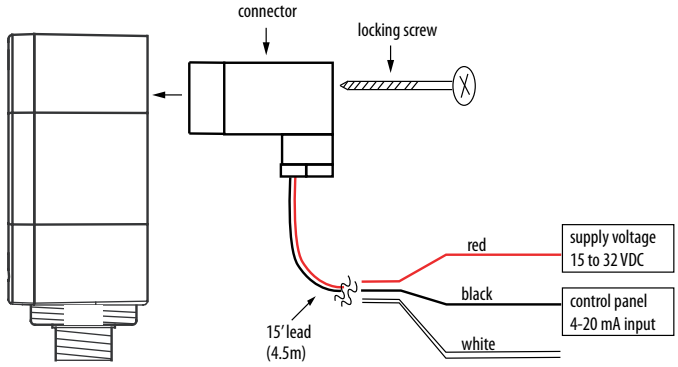
**inches H20 units available on ≤250 psi range devices only*
***Accuracy includes non-linearity, hysteresis, and non-repeatability, measured at 25°C(77°F)*
Note: Select a loop power supply and total loop resistance so that when the loop current is 20 mA, the gauge will have at least 7.5 VDC at its terminals

APPLICATION/WIRING DIAGRAM

Analog Output Version

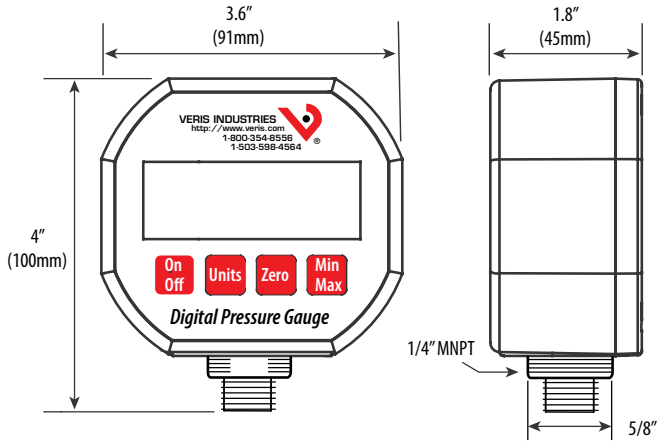


Voltage Output Version

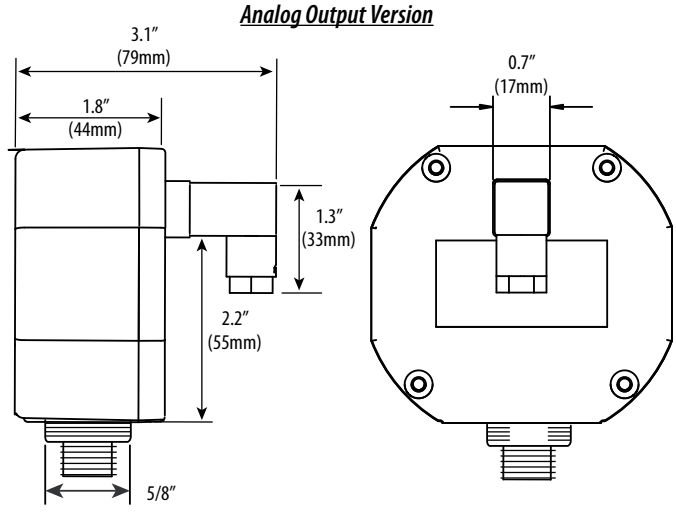


DIMENSIONAL DRAWINGS

Display Only Version



Analog Output Version



PRESSURE

ORDERING INFORMATION

Display Only Models

Pressure Range	Material	Output
PD [ ]	[A]	[X]
50 = -14.7 to 50 psig	= 17 - 4SS	= Display only
100 = -14.7 to 100 psig		
250 = -14.7 to 250 psig		
500 = -14.7 to 500 psig		
1000 = -14.7 to 1000 psig		

Analog Output Models

Pressure Range	Material	Output
PD [ ]	[A]	[ ]
50 = 0 to 50 psig	= 17 - 4SS	M = 4-20mA
100 = 0 to 100 psig		V = 0-5VDC/0-10VDC
250 = 0 to 250 psig		
500 = 0 to 500 psig		
1000 = 0 to 1000 psig		

Example:

PD [50] [A] [X]

Dry Media Differential Pressure Transducers

Selectable Ranges, LCD Display, And Automatic Zero For Easy Operation

DESCRIPTION

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. PXP and PXD models feature four field-selectable ranges. The PXU features seven field-selectable ranges, allowing just one model to cover applications for 0-0.1" to 0-10" W.C. The directional mode jumper is used to configure the transducer in unidirectional or bidirectional 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 prevent accidental zero adjustment during normal operation.

APPLICATIONS

- Static pressure in 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

FEATURES

- Excellent tolerance to overpressure and vibration reduces field failures
- High accuracy digital sensor maintains calibration and reduces callbacks
- High reliability sensor technology for long-term maintenance-free operation
- Selectable ranges and scales reduce setup time & number of models to stock
- Microprocessor-based design allows for digitally profiled sensor increasing product accuracy and reliability
- Circuit protection prevents damage due to incorrect wiring
- Monitors positive and negative pressure for application versatility
- Flexibility: standard and fast response modes
- LCD is ideal for setting up, troubleshooting, and measuring
- Ceramic capacitive sensing element...highly stable linear output, reducing offset errors

PRESSURE

SPECIFICATIONS

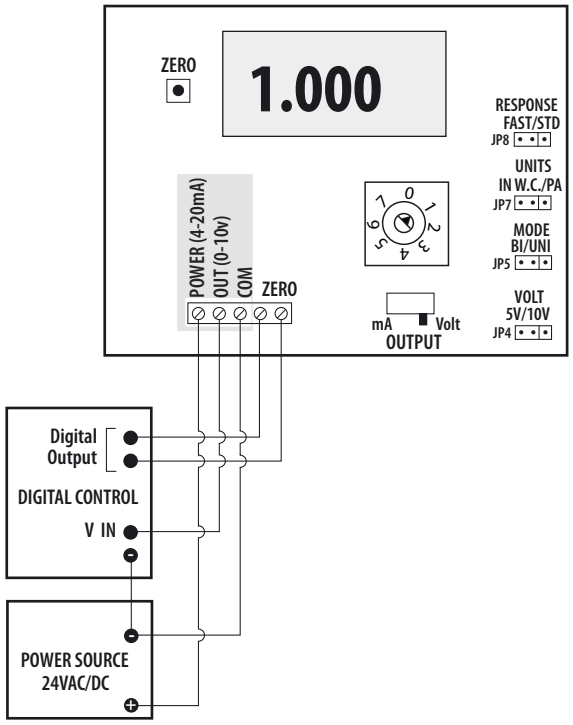
5 Year Warranty

Media Compatibility	Dry air or inert gas
Input Power	12-30VDC, or 24VAC nominal; 2-wire: 20mA max.; 3-wire: 30mA max.
Output	Field-selectable: 2-wire, loop-powered 4-20mA (DC only, clipped and capped), or 3-wire 0-5V/0-10V *
Pressure Ranges:	
PX: 01	Unidirectional: 0.1/0.25/0.5/1.0" W.C. F.S., switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1.0" W.C. F.S., switch selectable Unidirectional: 25 Pa/50 Pa/100 Pa/250 Pa, F.S., switch selectable Bidirectional: ±25 Pa/±50 Pa/±100 Pa/±250 Pa, F.S., switch selectable
PX: 02	Unidirectional: 1.0/2.5/5.0/10" W.C. F.S., switch selectable Bidirectional: ±1.0/±2.5/±5.0/±10" W.C. F.S.,switch selectable Unidirectional: 0.250 kPa/0.500 kPa/1.000 kPa/2.500 kPa, F.S., switch selectable Bidirectional: ±0.250 kPa/±0.500kPa/±1.000 kPa/±2.500 kPa, F.S., switch selectable
PXU: 05	Unidirectional: 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 Bidirectional: ±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
Response Time	Standard: T95 in 20 sec, Fast: T95 in 2 sec, switch selectable
Mode	Unidirectional or bidirectional, switch selectable
Display (option)	Signed 3-1/2 digit LCD, indicates pressure, overrange indicator
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.
Zero Adjust	Pushbutton auto-zero and digital input (2-pos terminal block)
Operating Environment	0°- 60°C (32° to 140°F); 0 to 90% RH noncondensing
Fittings	Brass barb; 0.24" (6.1 mm) o.d.
Physical	UL 94 V-O Fire Retardant ABS

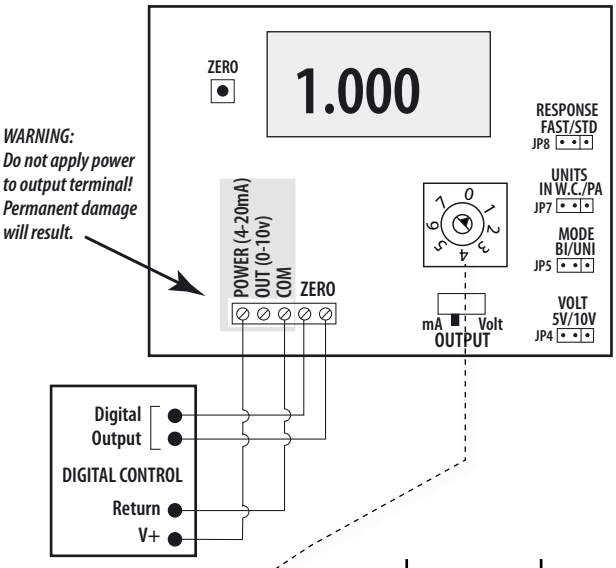
EMC Conformance: Low voltage directive 2006/95/EC; EMC directive 2004/108/EC.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper surge protection (EN 61000-6-1:2007 specification requirements).
** Minimum input voltage for 4-20mA operation: 250 Ω loop = 13VDC; 500Ω loop = 19VDC*

APPLICATION/WIRING DIAGRAMS

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

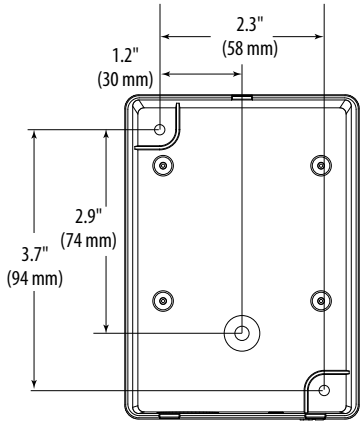


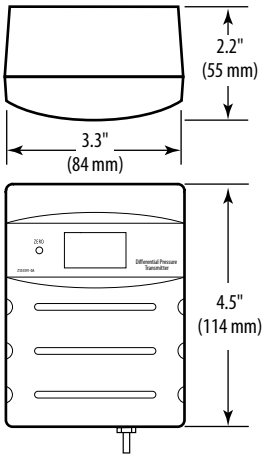
2-wire, 4-20mA

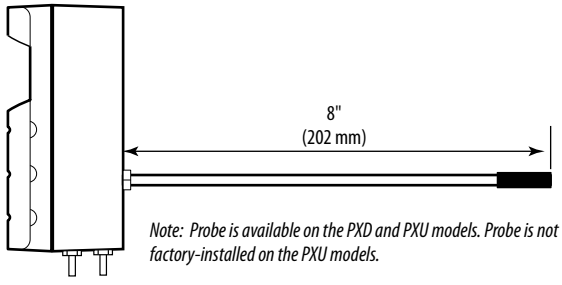


Rotary Switch Position	PX01 Inches W.C.	PX01 Pascal	PX02 Inches W.C.	PX02 Pascal	PX05 Inches W.C.	PX05 Pascal
0	0.1	25	1	250	0.1	25
1	0.25	50	1	250	0.25	50
2	0.5	100	1	250	0.5	100
3	1	250	1	250	1	250
4	1	250	2.5	0.5kPa	2.5	0.5kPa
5	1	250	5	1kPa	5	1kPa
6	1	250	10	2.5kPa	10	2.5kPa
7	1	250	10	2.5kPa	10	2.5kPa

DIMENSIONAL DRAWINGS







Note: Probe is available on the PXD and PXU models. Probe is not factory-installed on the PXU models.

ORDERING INFORMATION

PX

Enclosure	Local Display	NIST	Range	Response
D = Duct **P** = Panel	**L** = LCD Display **X** = No Display	**N** = NIST **X** = None	**01** = 0-1"wc/0-250Pa **02** = 0-10"wc/0-2.500kPa	S = Selectable

Example: PX D L X 01 S

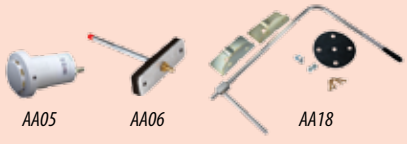
PXU

Local Display	NIST	Range	Response
L = LCD Display **X** = No Display	**N** = NIST **X** = None	05 = 0-10"wc/0-2.500kPa	S = Selectable

Example: PXU L N 05 S

ACCESSORIES

Room and duct static pickup tubes (AA05, AA06, AA07)
Pitot tube kits (AA18, AA19, AA20), wall plate remote pickup (AA56)
Replacement covers (AA62, AA63)



PRESSURE

Electropneumatic Transducers

Micro-Controlled With High-Performance, Low-Power Coil Poppet Valve Technology

EP2

DESCRIPTION

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 is 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.

APPLICATIONS

- Hospitals
- Schools
- Pneumatic dampers/actuators

FEATURES

- Field-selectable 4-20mA/0-5V/0-10VDC input for application flexibility
- Poppet valve technology for quiet operation
- Manual override with set and hold feature...great for commissioning those leaky systems
- Multi-point calibration; 3-15 psi (5 point calibration) and 0-20 psi (6 point calibration)
- Pressure loss alarm provides a contact closure if the EP2 is unable to achieve the desired output within a fixed length of time
- Failsafe vent solenoids bleed branch pressure on power failure for added safety
- Optional transparent plastic dust cover (AA43) protects units from dust and tampering (required for CE)

PRESSURE

SPECIFICATIONS

5 Year Warranty

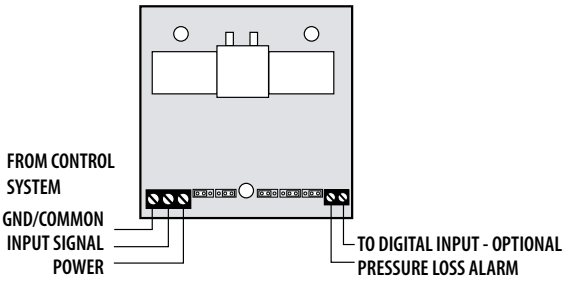
Input Power	24VAC/DC nominal, 30VAC max.; 150mA max.
Control Input	4-20mA/0-5V/0-10VDC; jumper-selectable
Input Impedance	4-20mA, 250Ω; 0-5V/0-10VDC, 10 kΩ
Manual Override	Jumper-selectable mode, digital pushbutton adjust
Alarm Contact	100mA@30VAC/DC (Pressure loss, manual mode, jumper selectable)
Accuracy	1% FS; combined linearity, hysteresis, repeatability
Compensated Temperature Range	-4° to 65°C (25° to 140°F)
Temperature Coefficient	±0.05%/°C
Operating Environment	10-90% RH noncondensing
Air Capacity	523 in^3/min @ 45 psi (8570 cm^3/min @ 310.3 kPa); 333 in^3/min @ 20 psi (5456 cm^3/min @ 137.9 kPa)
Supply Pressure	45 psig max.
Control Range	0-20 psig or 3-15 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

**For shorter tubing runs use AA45 Pneumatic Capacitor*
EMC Conformance: Low voltage directive 2006/95/EC; 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).

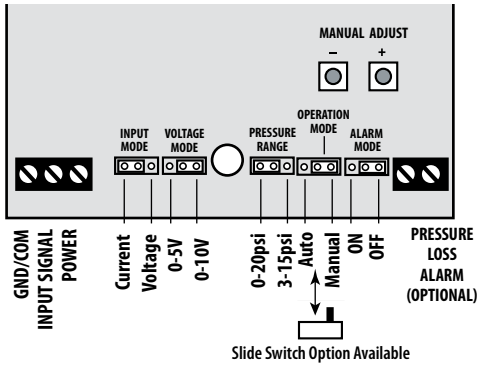
EP Series transducers are sold as an open device. Observe handling precautions for static sensitive devices to avoid damage to the circuitry which would not be covered under the factory warranty.

VERIS INDUSTRIES

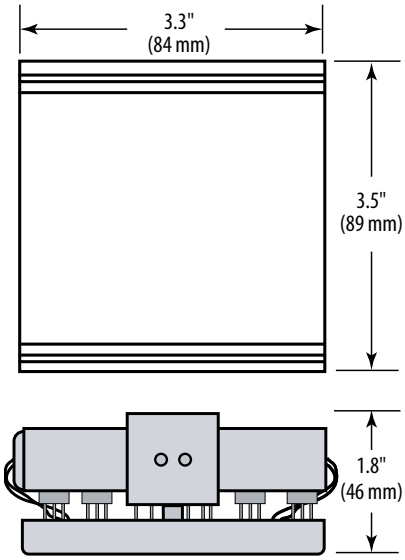
APPLICATION/WIRING DIAGRAMS



CONFIGURATION

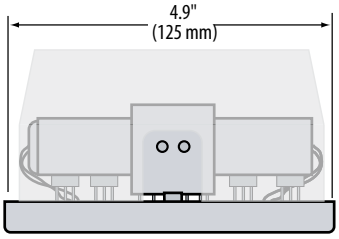


DIMENSIONAL DRAWINGS

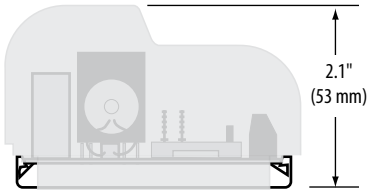


Dust Cover

FRONT VIEW



SIDE VIEW



If the dust cover is ordered, the EP2 is mounted to a longer Snaptrack.

PRESSURE

ORDERING INFORMATION

CE *Available*

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

ACCESSORIES

Steel Bracket (AA23), Dust cover (AA43)
Pneumatic Capacitor (AA45)

AA45

AA43

AA23

Electropneumatic Transducers

Micro-Controlled With High-Performance, Low-Power Coil Poppet Valve Technology

EP3

DESCRIPTION

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.

APPLICATIONS

- Hospitals
- Schools
- Pneumatic dampers/actuators

FEATURES

- Field-selectable 4-20mA/0-5V/0-10VDC input for application flexibility
- Poppet valve technology for quiet operation
- Manual override with set and hold feature...great for commissioning those leaky systems
- Multi-point calibration; 3-15 psi (5 point calibration) and 0-20 psi (6 point calibration)
- Pressure loss alarm provides a contact closure if the EP3 is unable to achieve the desired output within a fixed length of time
- Failsafe vent solenoids bleed branch pressure on power failure for added safety
- Optional transparent plastic dust cover (AA43) protects units from dust and tampering (required for CE)
- User programmable zero and full scale outputs
- Backlit LCD for local indication of readings...easy to view
- Dual-color LED...assists in trouble shooting
- Tristate and PWM inputs

SPECIFICATIONS

5 Year Warranty

Input Power	22-30VDC/20-30VAC, 47-63 Hz,150mA max. average, 350mA peak
Control Input	4-20mA/0-5V/0-10VDC; switch-selectable, Tri-State, PWM
Input Impedance	4-20mA, 250 Ω; 0-5V/0-10VDC, 10 kΩ
Manual Override	Digital pushbutton adjust, switch-selectable mode
Alarm Contact	100mA@30VAC/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 Environment	10-90% RH noncondensing -4°C to 60°C
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 0-25 psi: Full scale 0-25 psi
Pressure Differential	0.1 psig (supply to branch)
Pressure Indication	Electronic, 3-1/2 digit LCD (back-lit)
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

**For shorter tubing runs use AA45 Pneumatic Capacitor*
EMC Conformance: Low voltage directive 2006/95/EC; 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).

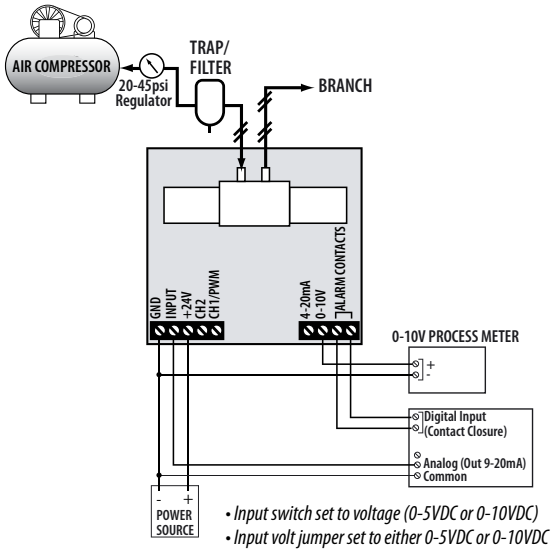
EP Series transducers are sold as an open device. Observe handling precautions for static sensitive devices to avoid damage to the circuitry which would not be covered under the factory warranty.

VERIS INDUSTRIES

VERIS INDUSTRIES

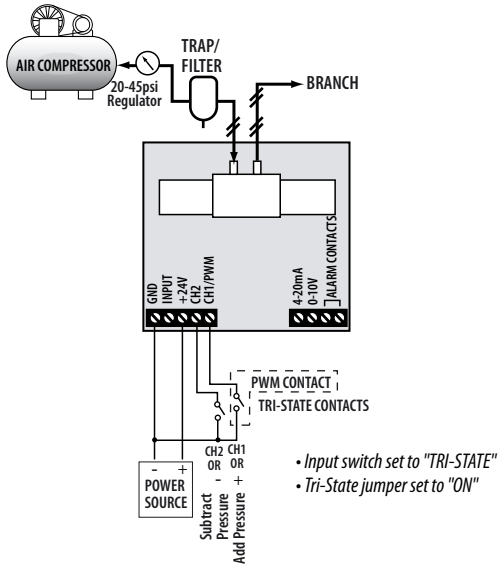
APPLICATION/WIRING DIAGRAMS

Current/Voltage Control



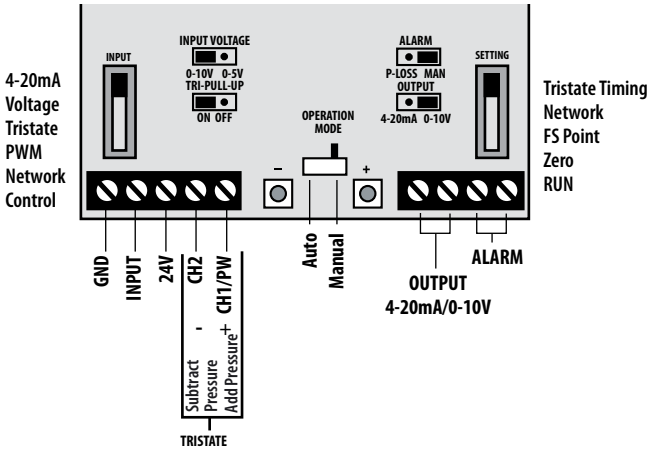
- *Input switch set to voltage (0-5VDC or 0-10VDC)*
- *Input volt jumper set to either 0-5VDC or 0-10VDC*
- *Input switch set to 4-20mA*
- *Output jumper set to 0-10VDC*

Tri-state Control

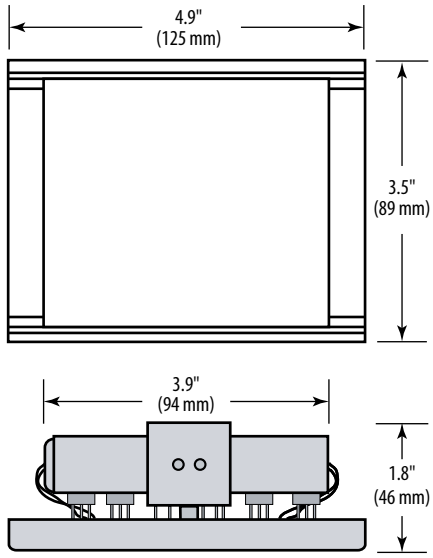


- *Input switch set to "TRI-STATE"*
- *Tri-State jumper set to "ON"*

CONFIGURATION

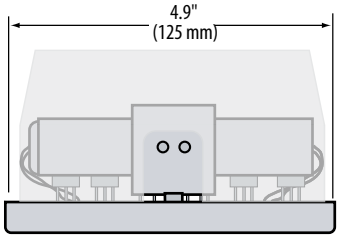


DIMENSIONAL DRAWINGS

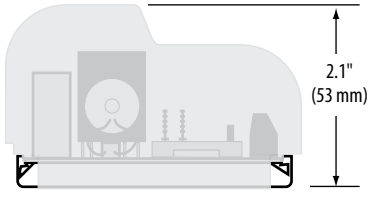


Dust Cover

FRONT VIEW



SIDE VIEW



ORDERING INFORMATION

CE *Available*

Output	Feedback	Failsafe	US or EU	Option
EP3 ☐	☐	☐	☐	☐
0 = None **3** = Analog output: 0-10VDC, or 4-20mA, selectable	3 = 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:

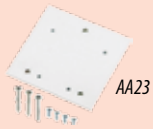
EP | 3 | 3 | 3 | 1 | S | 2 | Option = Cover Plate

ACCESSORIES

Steel Bracket (AA23), Dust cover (AA43), Pneumatic Capacitor (AA45), Triac Adapter (AA49)

AA45

AA43


AA23

AA49

PRESSURE

Gauge Pressure Sensors

Rugged Stainless Steel Construction

DESCRIPTION

The durable **PG/PV 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.

APPLICATIONS

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

FEATURES

- Rugged stainless steel construction (PG and PV)
- Stainless steel wetted connector (PGE and PVE)
- No silicon oil, no internal O-rings, no welds...fewer parts to fail
- Sturdy construction...suitable for high shock and vibration applications
- A wide operating temperature range of -40° to 85°C (-40° to 185°F) for operation versatility

SPECIFICATIONS

5 Year Warranty

Electrical:

Supply Voltage	10-28VDC
Output	Deluxe: 0-5/0-10VDC (3-wire) or 4-20mA (2-wire); Standard: 1-5VDC (3 wire) or 4-20mA (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 *	Deluxe: ±0.25% BFLS **; Standard: ±0.50% BFLS **
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:

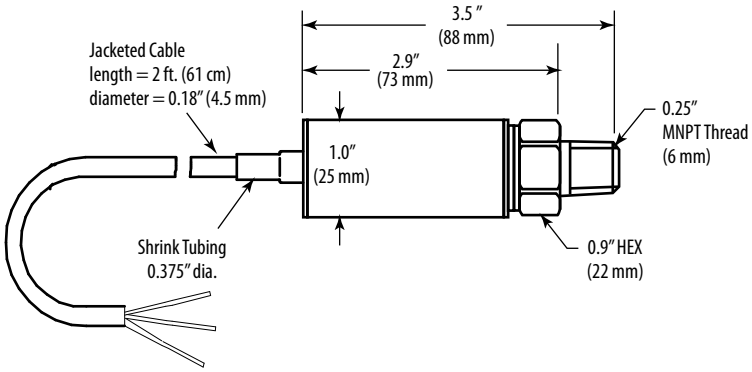
Shock	100G, 11 msec, 1/2 sine
Vibration	Deluxe: 20G peak, 20 to 2400 Hz; Standard: 10G peak, 20 to 2000 Hz
EMI/RFI Protection	Deluxe: yes; Standard: no
Rating	Deluxe: IP-66; Standard: IP-65
Operating Temperature Range	-40° to 85°C (-40° to 185°F)
Compensated Temperature Range	0° to 55°C (32° to 130°F)
Total Error Band Over Temperature	<±1% of FS
Humidity	0-95% RH noncondensing

** Accuracy includes nonlinearity and hysteresis.*
*** BFSL = Best fit straight line*

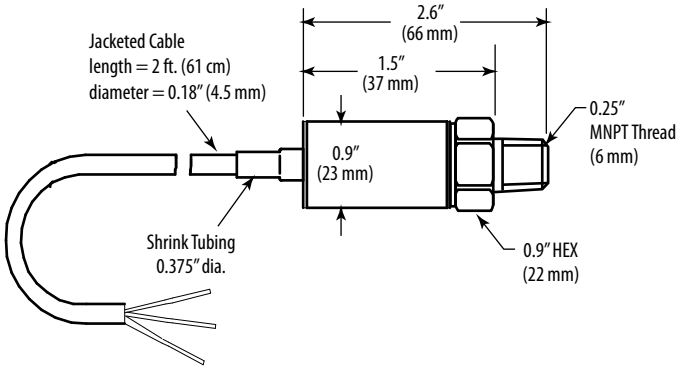
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

PG/PV

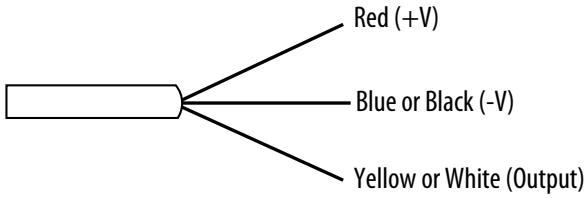


PGE/PVE

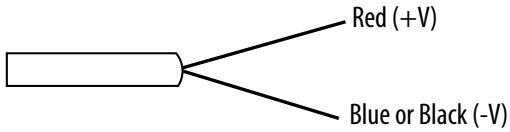


WIRE COLOR CODING

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



2-wire, 4-20mA



PRESSURE

ORDERING INFORMATION

PG

Type	Range	Wetted Material	Output
Blank = Deluxe **E** = Standard	**03** = 0 to 15 psig (Deluxe only) **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 **10** = 0 to 1000 psig **11** = 0 to 5000 psig **12** = 0 to 10000 psig	**A** = 316L stainless steel	**B** = 1-5VDC (standard only) **M** = 4-20mA **V** = 0-10VDC (deluxe only) **J** = 0-5VDC (deluxe only)

Call factory for ranges not shown.

Example: PG [ ] [07] [A] [V]

PV

Type	Range	Wetted Material	Output
Blank = Deluxe **E** = Standard	**03** = -14.7 to 15 psig (Deluxe only) **04** = -14.7 to 25 psig **05** = -14.7 to 50 psig **06** = -14.7 to 75 psig **07** = -14.7 to 100 psig **08** = -14.7 to 250 psig **09** = -14.7 to 500 psig **10** = -14.7 to 1000 psig **11** = -14.7 to 5000 psig **12** = -14.7 to 10000 psig	**A** = 316L stainless steel	**B** = 1-5VDC (standard only) **M** = 4-20mA **V** = 0-10VDC (deluxe only) **J** = 0-5VDC (deluxe only)

Call factory for ranges not shown.

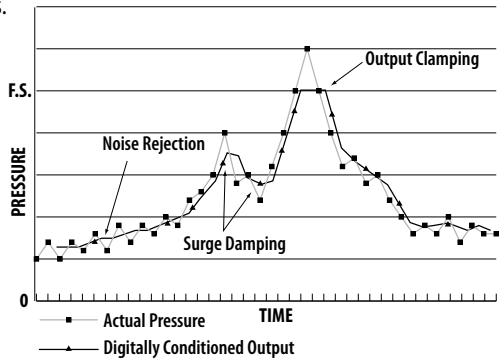
Example: PV [E] [07] [A] [M]

Wet Media Differential Pressure Transducer

Jumper-Selectable Port Swap Feature

DESCRIPTION

The **PW Series** wet/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.



Microprocessor provides digital signal conditioning

- Noise rejection reduces fluctuating readings due to noise or turbulence
- Surge damping prevents false alarms by averaging fast peaks

APPLICATIONS

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

FEATURES

- The jumper-selectable output switch for normal (4-20mA) or reverse (20-4mA) operation provides application flexibility
- Rugged, die-cast enclosure provides NEMA 4 sealing
- Jumper-selectable port swap feature eliminates costly replumbing when the high and low ports are improperly plumbed...change the jumper position from normal to swap – problem solved!
- Switch-selectable pressure ranges...fewer models to order and stock
- Pushbutton and remote zero adjustment...maintain accuracy and prevent callbacks with automatic zero calibration
- Jumper-controlled electronic surge dampening for high stability
- Pushbutton zero calibration – no trim pots to adjust

SPECIFICATIONS

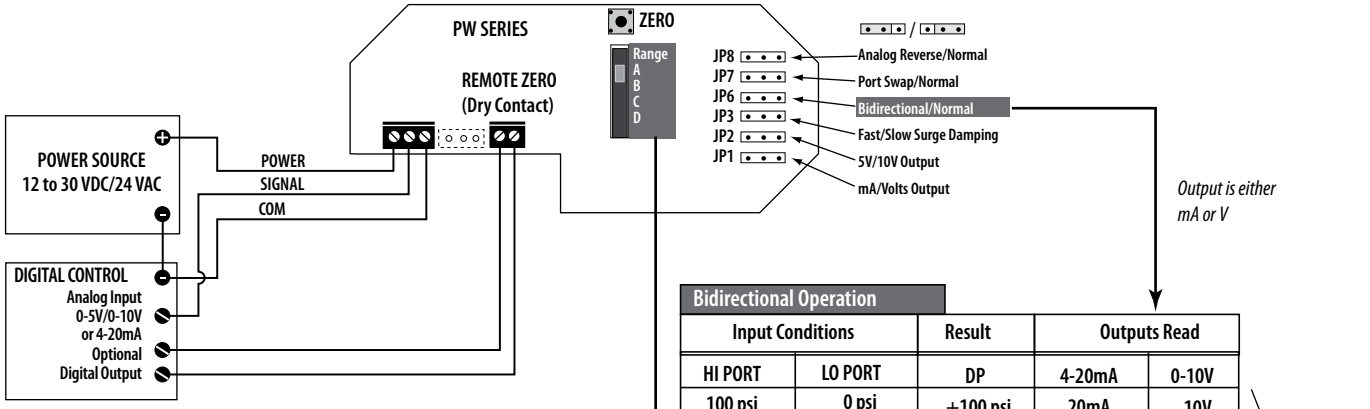
5 Year Warranty

Input Power	12 to 30VDC/24VAC nominal
Maximum Current Draw	DC: 125mA; AC: 280mA
Output	3-wire transmitter; user selectable 4-20mA (clipped and capped)/0-5V/0-10V†
Accuracy @ 25°C*	Range A, B, C: ±1% F.S.; Range D: ±2% F.S.**
Surge Damping	Electronic; 5-second averaging
Test Mode	Overrides output to full-scale (20mA, 5V, 10V)
Pressure Ranges (Selectable):	
0-50 psig	0-5/10/25/50 psid
0-100 psig	0-10/20/50/100 psid
0-250 psig	0-25/50/125/250 psid
0-3.5 barg	0.35/0.7/1.75/3.5 bard
0-7.0 barg	0.7/1.4/3.5/7.0 bard
0-17.0 barg	1.7/3.4/8.5/17.0 bard
Product Operating Environment	-10° to 55°C (14° to 130°F); 0 to 90% RH noncondensing
Long Term Stability	±0.25% per year
Zero Adjust	Pushbutton auto-zero and 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
Sensor:	
Media Compatibility	Media compatible with 17-4 PH stainless steel
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range
Temperature Compensated Range	0° to 50°C (32° to 122°F); TC Zero <±1.5% of product F.S. per sensor ; TC Span<±1.5% of product F.S. per sensor, (2 sensors per unit)
Media Temperature Limits	-20° to 85°C (-4° to 185°F); 0 to 90% RH non-condensing
Fittings	psig: 1/8" NPT female thread, 17-4 PH stainless; barg: 1/8" BSPT female thread, 17-4 PH stainless

†Minimum input voltage for 4-20mA operation: 250 Ω loop (1-5V) = 12VDC; 500 Ω loop (2-10V) = 15VDC; Minimum input voltage for volt operation: 0-5VDC output = 12VDC; 0-10VDC output = 15VDC.
**Accuracy combines linearity, hysteresis, and repeatability. **FS is defined as full span of selected range in bi-directional mode.*
EMC Conformance: Low voltage directive 2006/95/EC; 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).

800.354.8556 +1 503.598.4564 www.veris.com
HQ0001831.B 01131

APPLICATION/WIRING DIAGRAM



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
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-04

e.g. PW-08

Use the Range switch to select F.S. differeintial pressure.

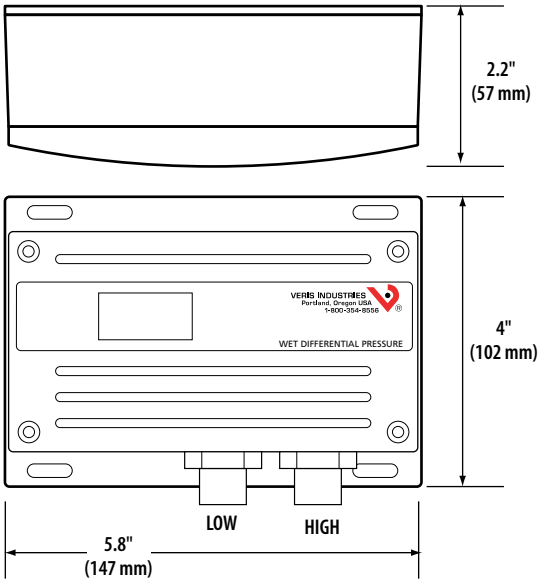
Range (psi)				
Model	A	B	C	D
PW-03	50	25	10	5
PW-04	100	50	20	10
PW-05	250	125	50	25

e.g. PW-04

Range (bar)				
Model	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

DIMENSIONAL DRAWING



ORDERING INFORMATION

CE

Local Display	NIST	Operational Range [1]	US or EU
PW ☐	☐	☐	☐
L = LCD Display **X** = No Display	**N** = NIST **X** = None	**03** = 0-50 psig **04** = 0-100 psig **05** = 0-250 psig **06** = 0-3.5 barg[2] **07** = 0-7.0 barg[2] **08** = 0-17 barg[2]	**S** = Standard[3] **C** = CE

Example:

PW | L | X | 04 | C |

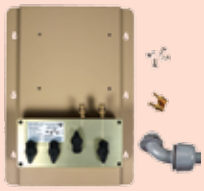
[1] Select operational range according to maximum gauge pressure, NOT differential pressure.
Example: High gauge pressure=90 psig, Select 100 psig model (04).
[2] BARG models use BSPT threads on sensor fittings.
[3] Not available with barg units

ACCESSORIES

Bypass Valve assemblies (AA14A)
PW installed on bypass valve manifold (AA16A)
Snubbers (AA11, AA12), Steam siphon (AA13)

AA11

AA13


AA14A

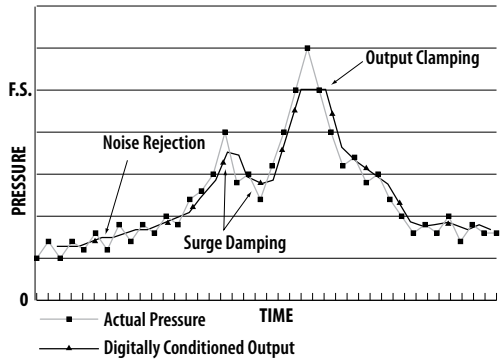
Wet Media Differential Pressure Transducer

4-20 mA, 2-Wire Device

PW2

DESCRIPTION

The **PW2 Series** 2-wire, 4-20mA wet/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.



Microprocessor provides digital signal conditioning

- Noise rejection reduces fluctuating readings due to noise or turbulence
- Surge damping prevents false alarms by averaging fast peaks

APPLICATIONS

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

FEATURES

- The jumper-selectable output switch for normal (4-20mA) or reverse (20-4mA) operation provides application flexibility
- Rugged, die-cast enclosure provides NEMA 4 sealing
- Selectable differential units: psid or bard
- Dual sensor design for improved overpressure tolerance... eliminates the requirement for a bypass valve assembly in most applications
- Jumper-controlled electronic surge dampening for high stability
- Pushbutton zero calibration – no trim pots to adjust.....maintain accuracy and prevent callbacks with automatic zero calibration
- Jumper-selectable port swap feature eliminates costly replumbing when the high and low ports are improperly plumbed...change the jumper position from normal to swap – problem solved!
- Switch-selectable pressure ranges...fewer models to order and stock
- LCD displays high pressure, low pressure, and differential pressure with easy readability

SPECIFICATIONS

5 Year Warranty

Input Power	12 to 24VDC, loop powered
Maximum Current Draw	29mA
Output	2-wire transmitter; user selectable 4-20mA (clipped and capped) †
Accuracy @ 25°C*	Range A, B, C: ±1% F.S.; Range D: ±2% F.S.**
Surge Damping	Electronic; 5-second averaging
Pressure Ranges (Selectable):	
0-50 psi (0-3.45 bar)	0-5/10/25/50 psid (0-0.34/0.69/1.72/3.45 bard)
0-100 psi (0-6.89 bar)	0-10/20/50/100 psid (0-0.69/1.38/3.45/6.89 bard)
0-250 psi (0-17.24 bar)	0-25/50/125/250 psid (0-1.72/3.45/8.62/17.24 bard)
Product Operating Environment	-10° to 55°C (14° to 130°F); 0 to 90%RH noncondensing
Long Term Stability	±0.25% per year
Zero Adjust	Pushbutton auto-zero
Housing Material	White powder-coated aluminum
Sensor:	
Media Compatibility	Media compatible with 17-4 PH stainless steel
Proof Pressure	Max. 2x F.S. range
Burst Pressure	Max. 5x F.S. range
Temperature Compensated Range	0° to 50°C (32° to 122°F); TC Zero <±1.5% of product F.S. per sensor ; TC Span<±1.5% of product F.S. per sensor, (2 sensors per unit)
Media Temperature Limits	-20° to 85°C (-4° to 185°F); 0 to 90% RH non-condensing
Fittings	1/8" NPT female thread, 17-4 PH stainless

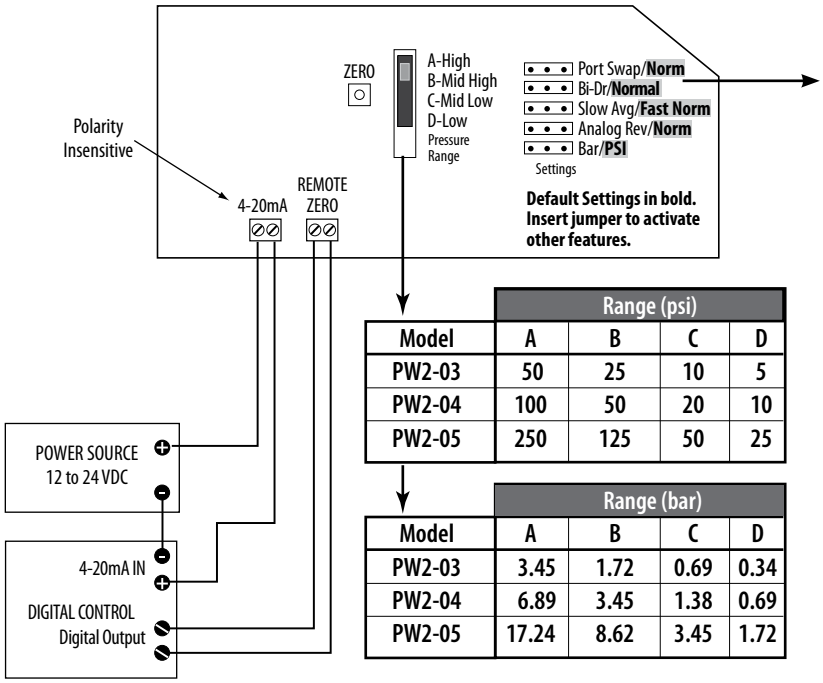
† Minimum input voltage: 250 Ω loop = 12VDC; 500 Ω loop = 17VDC

** Accuracy combines linearity, hysteresis, and repeatability. ** FS is defined as full span of selected range in bi-directional mode.*

EMC Conformance: Low voltage directive 2006/95/EC; 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).

APPLICATION/WIRING DIAGRAM



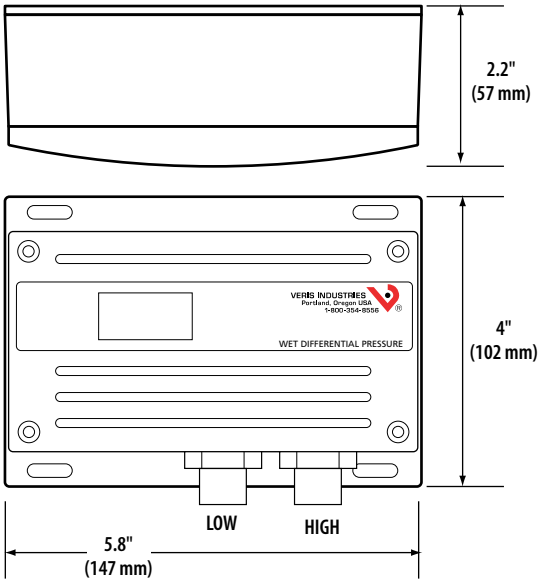
Bidirectional Operation

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

	Range (psi)			
Model	A	B	C	D
PW2-03	50	25	10	5
PW2-04	100	50	20	10
PW2-05	250	125	50	25

	Range (bar)			
Model	A	B	C	D
PW2-03	3.45	1.72	0.69	0.34
PW2-04	6.89	3.45	1.38	0.69
PW2-05	17.24	8.62	3.45	1.72

DIMENSIONAL DRAWING



ORDERING INFORMATION

CE *Available*

	Local Display	NIST	Operational Range [1]	US or EU
PW2	☐	☐	☐	☐
	L = LCD Display **X** = No Display	**N** = NIST **X** = None	**03** = 0-50 psi/3.45 bar **04** = 0-100 psi/6.89 bar **05** = 0-250 psi/17.24 bar	**S** = Standard **C** = CE

Example:

PW2	L	X	04	C

ACCESSORIES

Bypass Valve assemblies (AA14A)
PW installed on bypass valve manifold (AA16A)
Snubbers (AA11, AA12), steam siphon (AA13)

AA11

AA13

AA14A

[1] *Select operational range according to maximum gauge pressure, NOT differential pressure.*
Example: High gauge pressure=90 psig, Select 100 psig model (04).

PRESSURE

Wet Media Remote Pressure Transducer

3-Wire Device, User Selectable Analog Output

DESCRIPTION

The **PWER Series** wet/wet pressure transducers allow remote pressure sensing capability using pressure sensors attached to the main housing via 10 ft or 20 ft cables. The remote probes eliminate the need for plumbing, reducing costs for materials and labor. The PWER is compatible with applications that use 17-4 PH stainless steel.

FEATURES

- Remote probes eliminate need for plumbing or bypass assemblies...lower costs and reduced labor for installation
- Pushbutton zero calibration – no trim pots to adjust.....maintain accuracy and prevent callbacks with automatic zero calibration
- Jumper-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

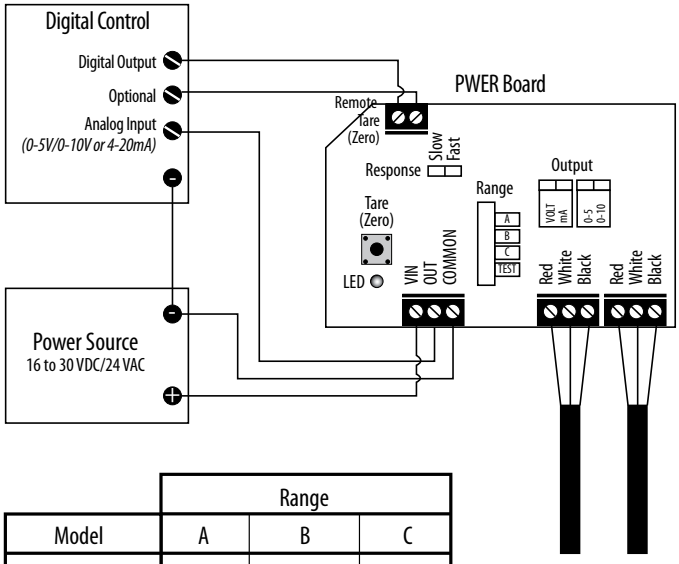
PRESSURE

SPECIFICATIONS

Media Compatibility	17-4 PH stainless steel
Input Power	16 to 30VDC, 24VAC nom.
Maximum Current Draw	DC: 125mA; AC: 280mA
Output	3-wire transmitter; user-selectable 4-20mA/0-5V/0-10V †
Pressure Ranges:	
0-50 psig	5/10/25/50 psid
0-100 psig	10/20/50/100 psid
0-250 psig	25/50/125/250 psid
Status Indication	Dual color LED: solid green = normal, blinking green = low>high, solid red = over range, blinking red = over pressure
Proof Pressure	2x max. F.S. range
Burst Pressure	5x max. F.S. range
Accuracy at 25°C*	Ranges A, B, C: ±1% F.S. typical**; Range D: ±2% F.S. typical**
Surge Damping	Electronic; 5-second averaging
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
Sensor Operating Range	-20° to 85°C (-4° to 185°F)
Long Term Stability	±0.25%
Zero Adjust	Pushbutton auto-zero and digital input (2-position terminal block)
Operating Environment	-10° to 55°C (14° to 131°F); 10-90% RH noncondensing
Fittings	1/8" NPT female thread, stainless steel 17-4 PH

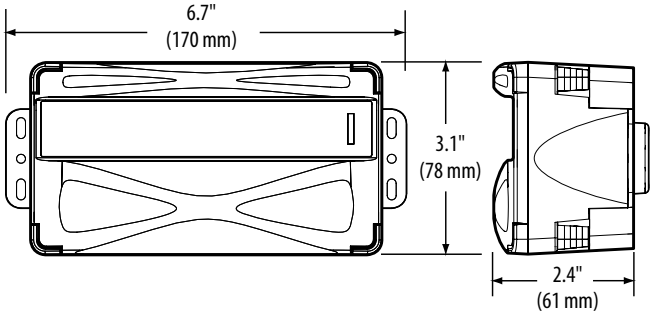
† *Minimum input voltage for 4-20 mA operation: 250 Ω loop (1-5 V) = 12 VDC; 500 Ω loop (2-10 V) = 15 VDC*
Minimum input voltage for volt operation: 0-5 VDC output = 12 VDC; 0-10 VDC output = 15 VDC
* *Accuracy combines linearity, hysteresis, and repeatability.*
** *F.S. is defined as full span of selected range.*

APPLICATION/WIRING DIAGRAM



Model	Range A	Range B	Range C
-100	25	50	100
-500	125	250	500
-1000	250	500	1000

DIMENSIONAL DRAWING



ORDERING INFORMATION

	Pressure Range		Cable Length
PWERX	☐	S	☐
	03 = 0-50 psig **04** = 0-100 psig **05** = 0-250 psig	= Standard	**010** = 10 ft (3.1 m) **020** = 20 ft (6.1 m)

Example:

PWERX 03 S 010

Relays Contents

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	10A SPDT Enclosed Relay10A@277VAC, 28VDC	232
V101/102/103 andV201/202/203	10A SPST Enclosed Relay with HOA Switch 10A@250VAC or 277VAC	234
V300/400	10A DPDT Enclosed Relay10A@277VAC, 30VDC	236
V120/V220	20A SPDT Enclosed Relay 20A@277VAC, 28VDC	238
V121/122/123 and V221/222/223	20A SPST Enclosed Relay with HOA Switch 20A@240VAC, 8A@28VDC	240
V320/V420	20A DPDT Enclosed Relay 20A@277VAC, 28VDC	242
V321/V421	20A DPST Enclosed Relay with HOA Switch 20A@240VAC or 8A@240VDC	244
V645	10A SPDT Enclosed Mini Command Relay 10A@250VAC N.O., 7A@250VAC N.C.	246
VST10/VST11/VST100/VST101	SPDT 10A Track Mount Relays	248
VST120/VST121	SPDT 20A Track Mount Relays	250
VMD1B	Socket SPDT Relays	252
VMD2B	Socket DPDT Relays	254
VMD3B	Socket 3PDT Relays	256
VMD4B	Socket 4PDT Relays	258
VS861 Series	Solid State Relays	260
VTD2P-F50/VTD1P-UNI/VTD2P-UNI	Time Delay Relays	262
Accessories		329

Relay Selection Guide

Relays And Sockets

** Indicates a series of products.*

APPLICATIONS	Nipple Mount	Snaptrack™	Socket Mount	DIN Mount
SPDT 10A	V100*/V200* page 232	VST10*/VST100* page 248	VMB1B-S* (3A) page 252	V645, VMB1B-S* (3A) pages 246, 252
SPDT 20A	V120/V220 page 238	VST120* page 250	VMD1B-C*/VMD1B-F* page 252	VMD1B-C*/VMD1B-F* page 252
DPDT 10A	V300/V400 page 236		VMD2B-S* page 254	VMD2B-S* page 254
DPDT 20A	V320/V420 page 242		VMD2B-C*/VMD2B-F* page 254	VMD2B-C*/VMD2B-F* page 254
3PDT 15A			VMD3B-C*/VMD3B-F* page 256	VMD3B-C*/VMD3B-F* page 256
4PDT 15A			VMD4B-C*/VMD4BF* page 258	VMD4B-C*/VMD4BF* page 258
Time Delay 12A			VTD2P-F50 page 262	VTD1P-UNI/VTD2P-UNI page 262
Solid State 8A				VS861* page 260

Relays With HOA Switch

APPLICATIONS	No HOA monitoring	Resistive HOA Monitoring	Digital HOA Monitoring
SPST 10A	V101*/V201* page 234	V102/V202 page 234	V103/ V203 page 234
SPST 20A	V121/V221 page 240	V122/V222 page 240	V123/V223 page 240
SPDT 10A	VST11*/VST101* page 248		
SPDT 20A	VST121* page 250		
DPST 20A	V321/V421 page 244		

VERSATILE MOTOR CONTROL

V100

The Victory 100 Series 10A enclosed relays are pilot-duty relays in an easy-to-use nipple mount enclosure. The V100 Series provide quick relay mounting without a dedicated field enclosure.

- Can be mounted to any electrical enclosure with the nipple mount feature
- Flexible tinned stranded wire
- Run low voltage to load instead of line voltage, reduces conduit in some applications

V101

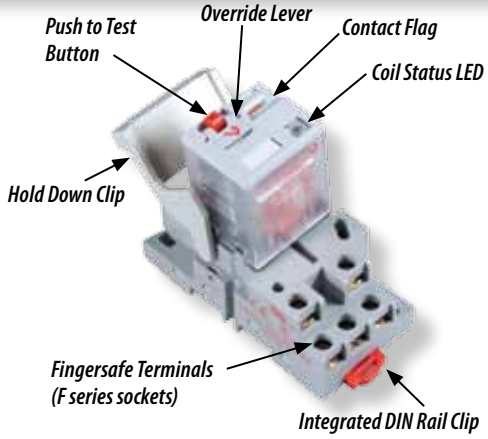
With a concealed HOA switch for local control and troubleshooting the V101 Series relays provide HOA flexibility while limiting unauthorized switch manipulation.

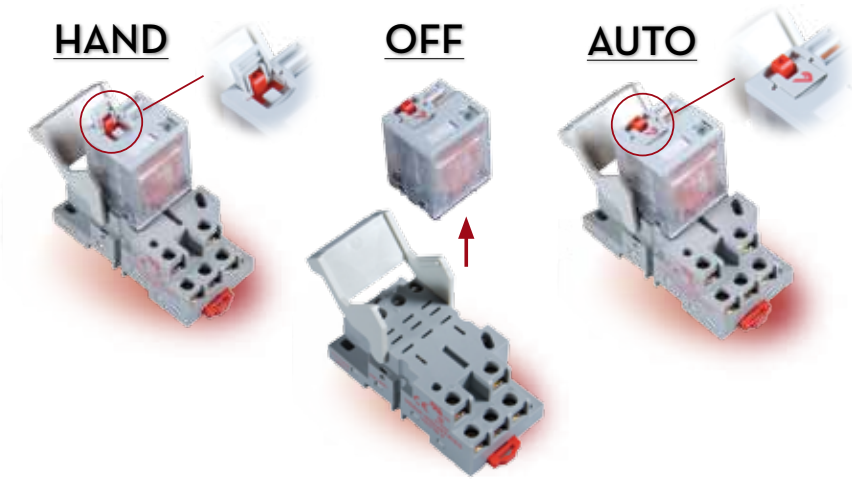
- Concealed HOA Switch
- Can be mounted to any electrical enclosure with the nipple mount feature
- Flexible tinned stranded wire

DIN RELAYS SAVE COSTS DURING INSTALLATION, COMMISSIONING, & TROUBLESHOOTING

Socket Relays

- Override lever, allows operator to manually override the relay
- Push to test button, manually activate relay to commission job
- Contact flag, easy troubleshooting
- Hold-down clip, built into F Series sockets
- DIN Rail clip, built into base for easy rail attachment and release
- Enhanced contact rating, expands range of potential applications
- High quality contacts, prevents premature oxidation





Meet Specifications for an HOA Switch

Some applications require local control of a load in three positions. Hand – locally switched on, Off – locally switched off, and Auto – controlled by the automation system.

- Available in SPDT, DPDT, and 3PDT
- F series relays provide HOA with a unique override lever

VERIS INDUSTRIES™

Enclosed Victory Relays: 10A SPDT

Great For External Mount Applications

V100

V200D

DESCRIPTION

Victory 100 and 200 Series 10A 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.

APPLICATIONS

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

FEATURES

- Sleek field enclosure reduces the need for panel space
- The nipple mount feature allows the Victory Series to be mounted to any electrical enclosure
- Flexible tinned stranded wire...fits easily in tight spaces & provides secure connections to wire nuts
- UL508 Listed...designed and approved for field installation...makes electrical inspection a snap
- Run low voltage instead of line voltage...eliminate conduit in some applications

TYPICAL COIL PERFORMANCE

Pull in Voltage	AC	DC
10-30V	8	9
120V	78	
208-277V	154	
Drop Out Voltage	**AC**	**DC**
10-30V	2	3
120V	18	
208-277V	36	
Voltage	**Coil Current**	
	AC	**DC**
10V	25mA	14mA
12V	25mA	14mA
24V	31mA	16mA
30V	39mA	18mA
120V	22mA	-
208V	19mA	
277V	25mA	

CONTACT RATINGS

Resistive	10A@277VAC, 28VDC
Motor	120VAC, 1/3HP N.O. & 1/6HP N.C.
	240VAC, 1/3HP N.O. & 1/6HP N.C.
	277VAC, 1/4HP N.O. & 1/8HP N.C.
Pilot Duty	277VAC, (1.7A), 480VA N.O.
Ballast	277VAC, 1.7A
Tungsten	120VAC, TV3 N.O. TV2 N.C.
Gold Flash	Yes

SPECIFICATIONS

5 Year Warranty

Operating Temperature Range:	
V100, V100DC, V200	-34° to 60°C (-29° to 140°F)
V100D, V200D	-40° to 55°C (-40° to 131°F)
Operating Humidity Range	10-90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG
Insulation Class	600VAC RMS
Agency Approvals	UL 508

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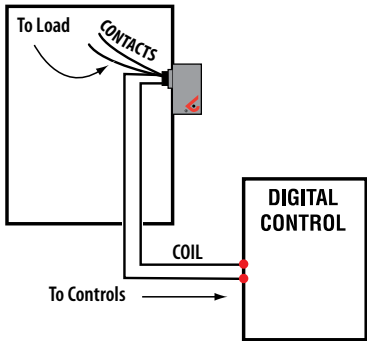
HQ0001833.B 01131

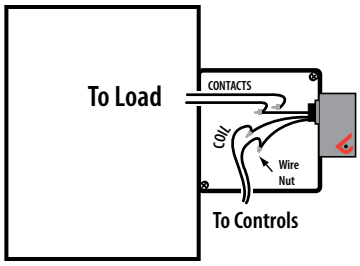
VERIS INDUSTRIES

APPLICATION/WIRING EXAMPLES

Nipple mount directly to a panel

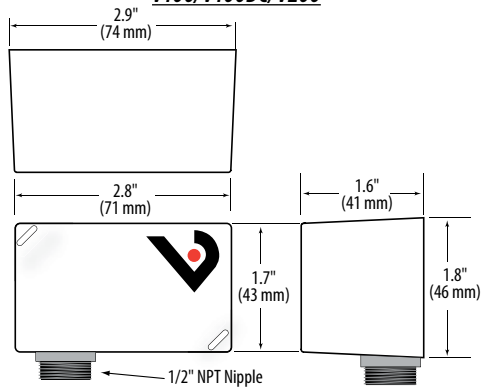


Nipple mount to any 2x or 4x electrical box

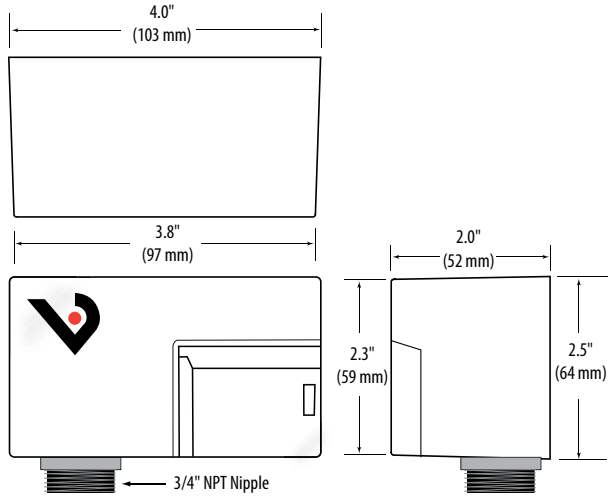


DIMENSIONAL DRAWINGS

V100/V100DC/V200

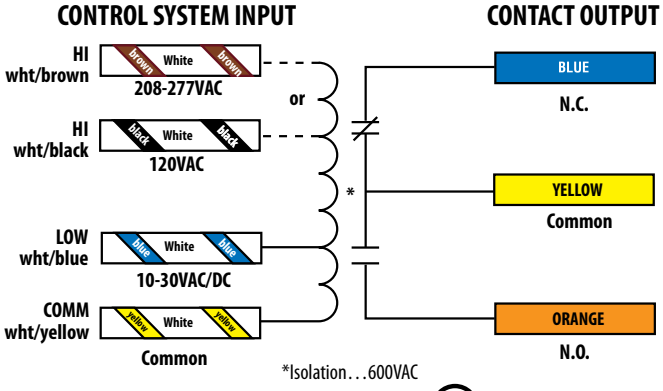


V100D/V200D

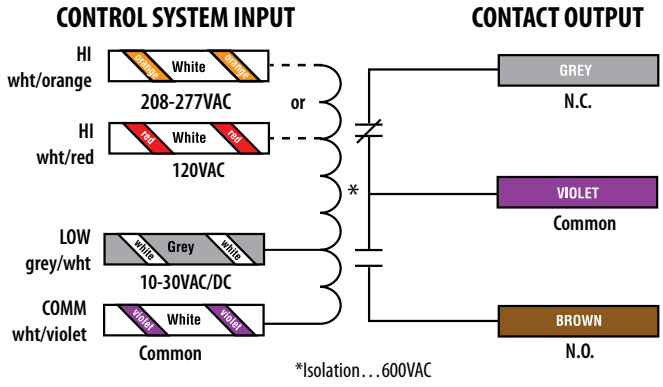


WIRE COLOR CODES

Primary



Relay 2 on V100D and V200D only



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E150462

ORDERING INFORMATION

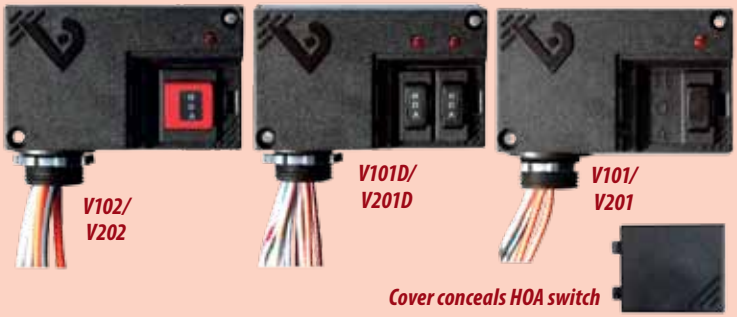
MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V100*	SPDT	10-30VAC/DC, 120VAC	10A	●	●
V100D	2x SPDT	10-30VAC/DC, 120VAC		●	●
V100DC	SPDT	10-30VDC		●	●
V200	SPDT	10-30VAC/DC, 208-277VAC		●	●
V200D	2x SPDT	10-30VAC/DC, 208-277VAC		●	●

Some devices are Plenum rated per UL 1995...see White Paper VWP01 at veris.com for details.
** Optional domestic version available.*

RELAYS

Enclosed Victory Relays: 10A SPST, with HOA Switches

Relays With HOA Switches For Local Control



DESCRIPTION

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/V202 provide a two-wire resistive output and the V103/V203 offer a three-wire digital monitor. Now your customers and technicians can enjoy the benefit of local control without the problems often caused by override.

TYPICAL COIL PERFORMANCE

Pull in Voltage	AC	DC
10-30V	8	9
120V	78	
208-277V	154	
Drop Out Voltage	**AC**	**DC**
10-30V	2	3
120V	18	
208-277V	36	
Voltage	**Coil Current**	
	AC	**DC**
10V	25mA	14mA
24V	31mA	16mA
30V	39mA	18mA
120V	22mA	-
208V	19mA	-
277V	25mA	-

CONTACT RATINGS

V101, V201, V101D*, V201D*	
Resistive	10A@250VAC
Motor	1/3HP@120VAC
Gold Flash	Yes
V102, V103, V202, V203	
Resistive	10A@277VAC
Motor	1/3HP@240VAC
Gold Flash	Yes

**each relay*

APPLICATIONS

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

FEATURES

- Sleek field enclosure reduces the need for panel space
- The nipple mount feature allows the Victory series to be mounted to any electrical enclosure
- Flexible tinned stranded wire...fits easily in tight spaces and provides secure connections to wire nuts
- UL508 Listed...designed and approved for field installation...makes electrical inspection a snap
- Concealed HOA switch reduces the likelihood of tampering
- Eliminate costly control system override and service calls
- The HOA monitors (available with the V102/V202 & V103/V203 models) allow the control system to notify the building owner when a motor is inadvertently left in ON or OFF position.

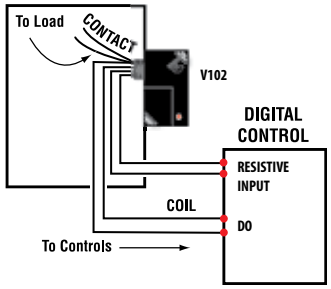
SPECIFICATIONS

5 Year Warranty

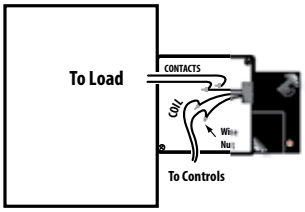
Operating Temperature Range	-40° to 55°C (-40° to 131°F)
Operating Humidity Range	10-90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG; HOA monitor wires: 16 AWG
Insulation Class	600VAC RMS
V102/V202 Resistive Monitor Maximums:	
Voltage Max.	13.4VAC/DC
Current Max.	4mA AC/DC
V103/203 Digital Monitor Maximums:	
Dry Circuit Contact Rating (Max.)	24VAC/DC@100mA
Agency Approvals	UL 508

APPLICATION/WIRING EXAMPLES

Nipple mount directly to a panel

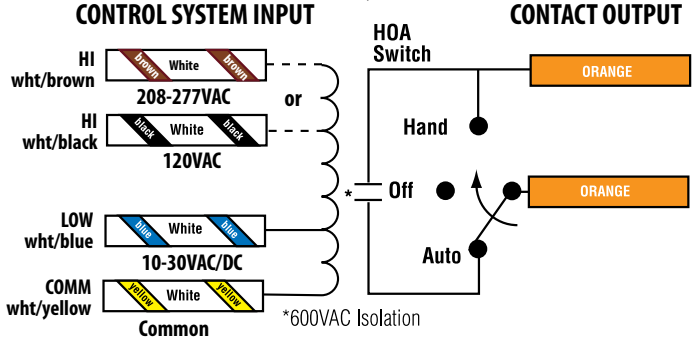


Nipple mount to any 2x or 4x electrical box

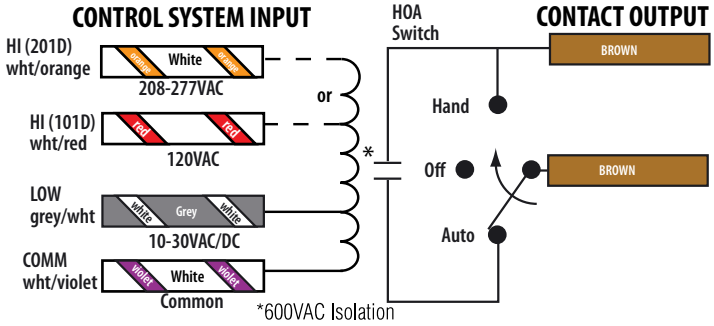


WIRE COLOR CODES

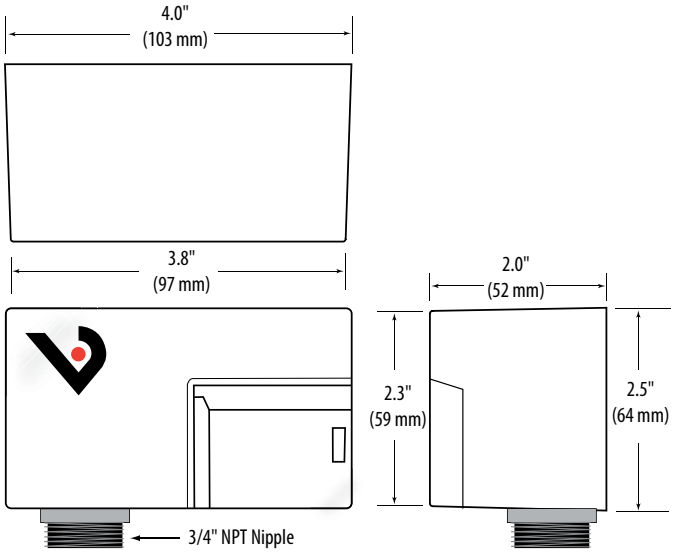
Primary



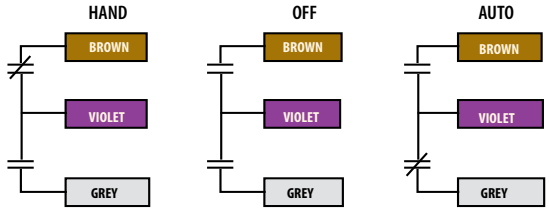
Relay #2 for V101D/V201D only



DIMENSIONAL DRAWING



V103/203 Digital HOA Position Monitor

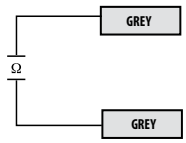


Switch Positions:
HAND = Brown wire closed to Common
OFF = Both wires open to Common
AUTO = Grey wire closed to Common
VIOLET = Common

V102/202 Resistive HOA Position Monitor

Switch Positions:
HAND ~ 1.4kΩ
OFF ~ 6.2kΩ
AUTO ~ 3.4kΩ

Cable Faults:
OPEN = Infinite Ω
SHORT ~ 0Ω



ORDERING INFORMATION

c UL us LISTED E150462

MODEL	RELAY	COIL	AMPERAGE RATING	HOA	HOA MONITOR	RELAY POWER LED	UL
V101	SPST, N.O.	10-30VAC/DC, 120VAC	10A	●	None	●	●
V101D	2x SPST, N.O.	10-30VAC/DC, 120VAC		●	None	●	●
V102	SPST, N.O.	10-30VAC/DC, 120VAC		●	Resistive	●	●
V103	SPST, N.O.	10-30VAC/DC, 120VAC		●	Digital	●	●
V201	SPST, N.O.	10-30VAC/DC, 208-277VAC		●	None	●	●
V201D	2x SPST, N.O.	10-30VAC/DC, 208-277VAC		●	None	●	●
V202	SPST, N.O.	10-30VAC/DC, 208-277VAC		●	Resistive	●	●
V203	SPST, N.O.	10-30VAC/DC, 208-277VAC		●	Digital	●	●

Some devices are plenum rated per UL 1995...see White Paper VWP01 at veris.com for details

Enclosed Victory Relays: 10A DPDT

DPDT Relays Provide Versatility

DESCRIPTION

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.

APPLICATIONS

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

FEATURES

- Sleek field enclosure reduces the need for panel space
- The nipple mount feature allows the Victory Series to be mounted to any electrical enclosure
- 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

TYPICAL COIL PERFORMANCE

Pull in Voltage	AC	DC
20-30V	18	20
120V	104	
208-277V	186	
Drop Out Voltage	**AC**	**DC**
20-30V	4	5
120V	26	
208-277V	44	
Voltage	**Coil Current**	
	AC	**DC**
24V	43mA	25mA
30V	54mA	31mA
120V	29mA	-
208V	27mA	-
277V	36mA	-

CONTACT RATINGS*

Resistive..... 10A@277VAC, 30VDC
Motor..... 120VAC, 1/8HP

*Contact ratings are for single pole operation. When operating both poles simultaneousley, the total load cannot exceed the ratings above.

SPECIFICATIONS

5 Year Warranty

Operating Temperature Range	-34° to 60°C (-29° to 140°F)
Operating Humidity Range	10-90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG
Insulation Class	600VAC RMS
Agency Approvals	UL 508

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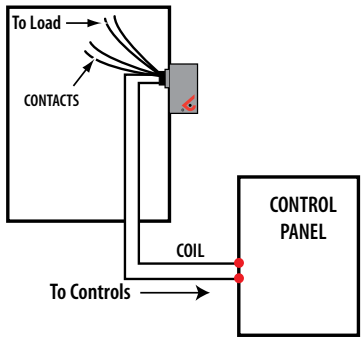
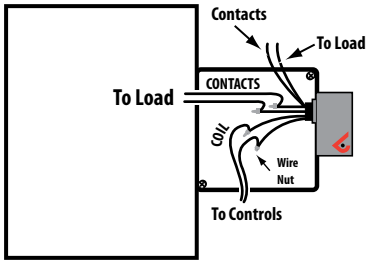
APPLICATION/WIRING EXAMPLES

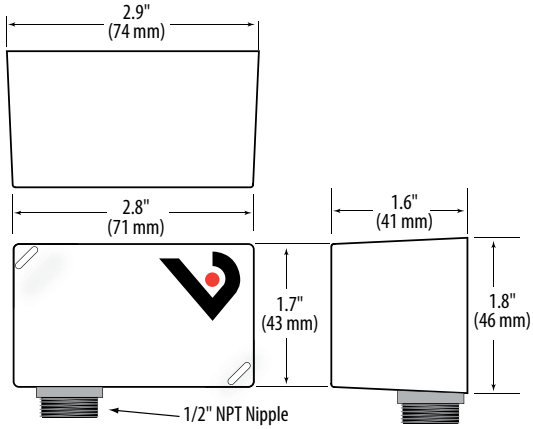
Nipple mount directly to a panel



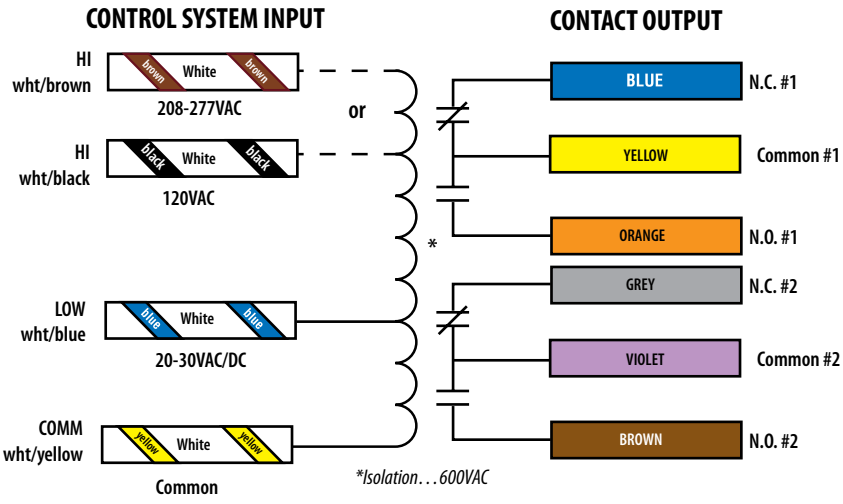
Nipple mount to any 2x or 4x electrical box



DIMENSIONAL DRAWING



WIRE COLOR CODES



ORDERING INFORMATION

c UL us LISTED E150462

MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V300	DPDT	20-30VAC/DC,120VAC	10A	●	●
V400		20-30VAC/DC, 208-277VAC		●	●

Some devices are plenum rated per UL 1995...see White Paper VWP01 at veris.com for details

RELAYS

Enclosed Victory Relays: 20A SPDT

Great For External Mount Applications

DESCRIPTION

The **Victory 120 and 220** 20A SPDT enclosed relays combine a power duty relay with a high level of field-selectability and versatility. The device is quick and easy to install using the threaded nipple mount. With no need for a dedicated field enclosure, this series is ideal for retrofit projects.

APPLICATIONS

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

FEATURES

- Sleek field enclosure reduces the need for panel space
- The nipple mount feature allows the V120/220 Series to be mounted to any electrical enclosure
- HP Ratings make the V120/V220 ideal for control of fractional HP motors
- 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

TYPICAL COIL PERFORMANCE

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

CONTACT RATINGS

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

RELAYS

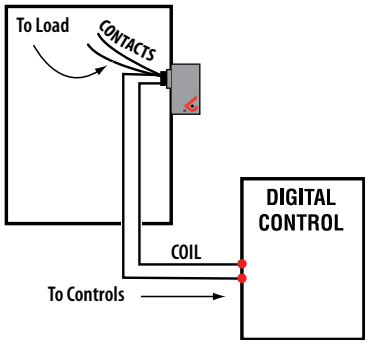
SPECIFICATIONS

5 Year Warranty

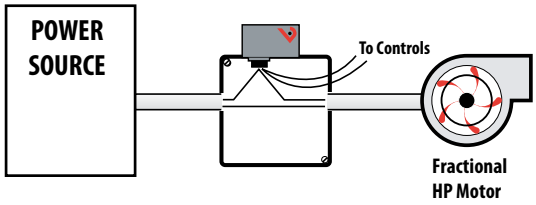
Operating Temperature Range	-34° to 55°C (-29° to 131°F)
Operating Humidity Range	10-90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG
Insulation Class	600VAC RMS
Agency Approvals	UL 508

APPLICATION/WIRING EXAMPLES

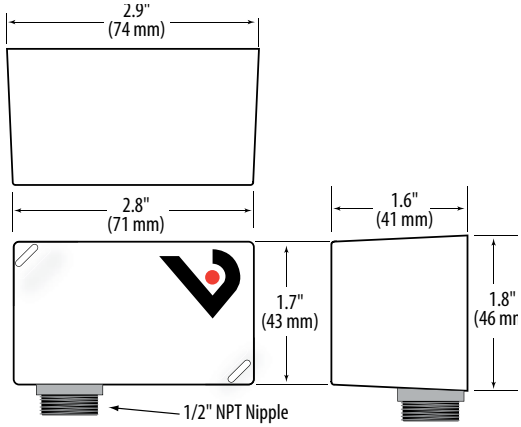
Nipple mount directly to a panel



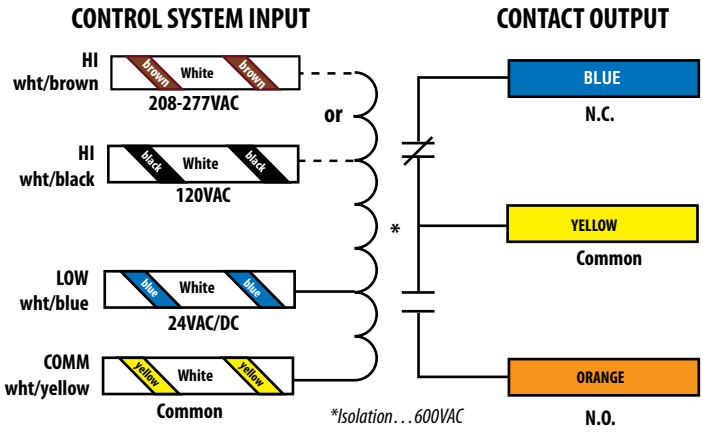
Nipple mount to 4x electrical box



DIMENSIONAL DRAWING



WIRE COLOR CODES



ORDERING INFORMATION

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MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V120	SPDT	24VAC/DC, 120VAC	20A	●	●
V220		24VAC/DC, 208-277VAC		●	●

Some devices are plenum rated per UL 1995...see White Paper VWP01 at veris.com for details

Enclosed Victory Relays: 20A SPST, with HOA Switch

HOA Switch Provides Local Control

DESCRIPTION

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.

TYPICAL COIL PERFORMANCE

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

CONTACT RATINGS

V121, V221	
Resistive	20A@240VAC
	8A@28VDC
	14A@14VDC
Motor	1HP@120VAC
V122, V123, V222, V223	
Resistive	20A@240VAC
	8A@28VDC
	14A@14VDC
Motor	1HP@250VAC

APPLICATIONS

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

FEATURES

- Sleek field enclosure reduces the need for panel space
- The nipple mount feature allows the V121 Series to be mounted to any electrical enclosure
- Flexible tinned stranded wire...fits easily in tight spaces and provides secure connections to wire nuts
- UL508 Listed...designed and approved for field installation...makes electrical inspection a snap
- Products include a cover that conceals and protects the HOA switch, reducing the likelihood of tampering
- Limit costly control system override & service calls
- The switch position monitors available with the V122/V222 & V123/V223 models allow the control system to notify the building owner when a motor is inadvertently left ON or OFF

RELAYS

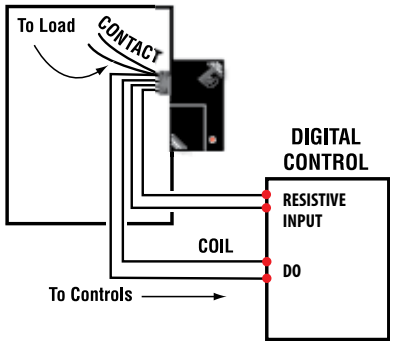
SPECIFICATIONS

5 Year Warranty

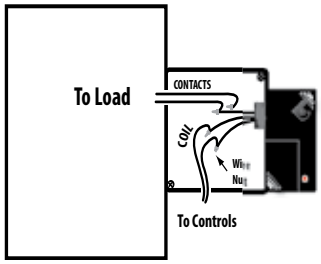
Operating Temperature Range	-40° to 60°C (-40° to 131°F)
Operating Humidity Range	10-90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; HOA monitor wires: 16 AWG
Insulation Class	277VAC RMS
V122/V222 Resistive Monitor Maximums:	
Voltage Max.	13.4VAC/DC
Current Max.	4mA AC/DC
V123/V223 Digital Monitor Maximums:	
Dry Circuit Contact Rating (Max.)	24VAC/DC@100mA
Agency Approvals	UL 508

APPLICATION/WIRING EXAMPLES

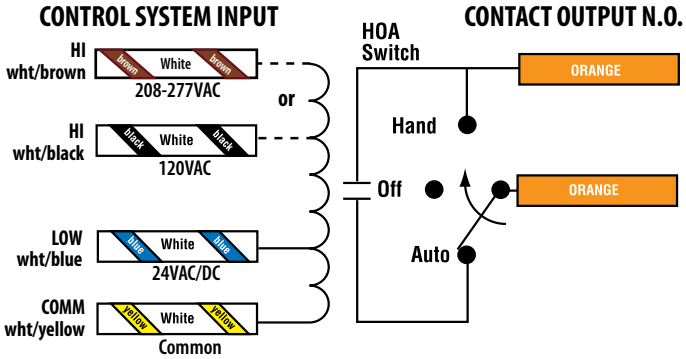
Nipple mount directly to a panel



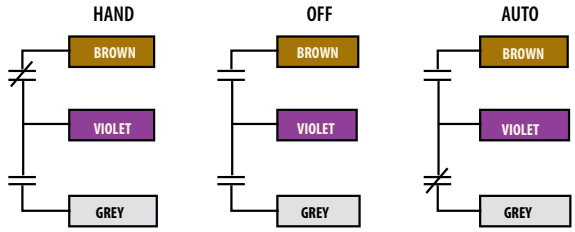
Nipple mount to any 2x or 4x electrical box



WIRE COLOR CODES



V123/V223 Digital HOA Position Monitor

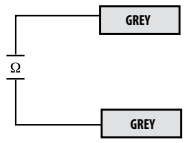


Switch Positions:
HAND = Brown wire closed to Common
OFF = Both wires open to Common
AUTO = Grey wire closed to Common
VIOLET = Common

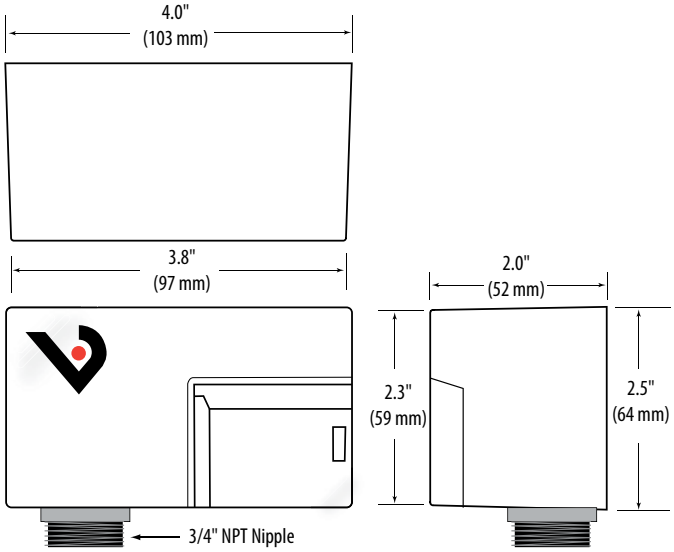
V122/V222 Resistive HOA Position Monitor

Switch Positions:
HAND ~ 1.4kΩ
OFF ~ 6.2kΩ
AUTO ~ 3.4kΩ

Cable Faults:
OPEN = Infinite Ω
SHORT ~ 0Ω



DIMENSIONAL DRAWING



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ORDERING INFORMATION

MODEL	RELAY	COIL	AMPERAGE RATING	HOA	HOA MONITOR	RELAY POWER LED	UL
V121	SPST, N.O.	24VAC/DC, 120VAC	20A	●	None	●	●
V122		24VAC/DC, 120VAC		●	Resistive	●	●
V123		24VAC/DC, 120VAC		●	Digital	●	●
V221		24VAC/DC, 208-277VAC		●	None	●	●
V222		24VAC/DC, 208-277VAC		●	Resistive	●	●
V223		24VAC/DC, 208-277VAC		●	Digital	●	●

Some devices are plenum rated per UL 1995...see White Paper VWP01 at veris.com for details

Enclosed Victory Relays: 20A DPDT

DPDT Relays Provide Versatility

V320

V420

DESCRIPTION

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.

FEATURES

- Sleek field enclosure reduces the need for panel space
- The nipple mount feature allows the Victory Series to be mounted to any electrical enclosure
- Flexible tinned stranded wire...fits easily in tight spaces and provides secure connections to wire nuts
- UL508 Listed...designed and listed for field installation... makes electrical inspection a snap

APPLICATIONS

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

RELAYS

TYPICAL COIL PERFORMANCE

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

CONTACT RATINGS

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

SPECIFICATIONS

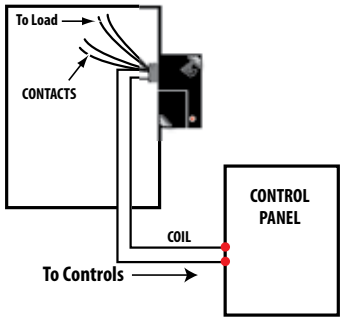
5 Year Warranty

Operating Temperature Range	-40° to 40°C (-40° to 104°F)
Operating Humidity Range	10-90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; HOA monitor wires: 16 AWG
Insulation Class	277VAC RMS
Agency Approvals	UL 508

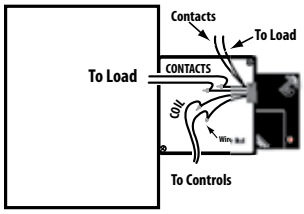
VERIS INDUSTRIES

APPLICATION/WIRING EXAMPLES

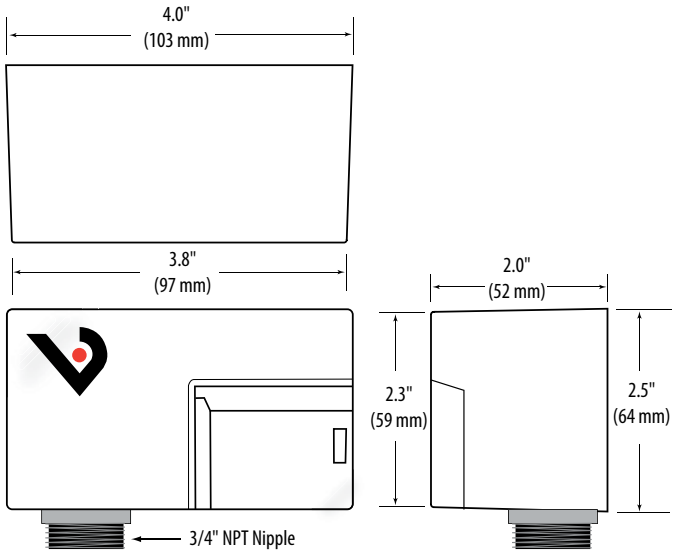
Nipple mount directly to a panel



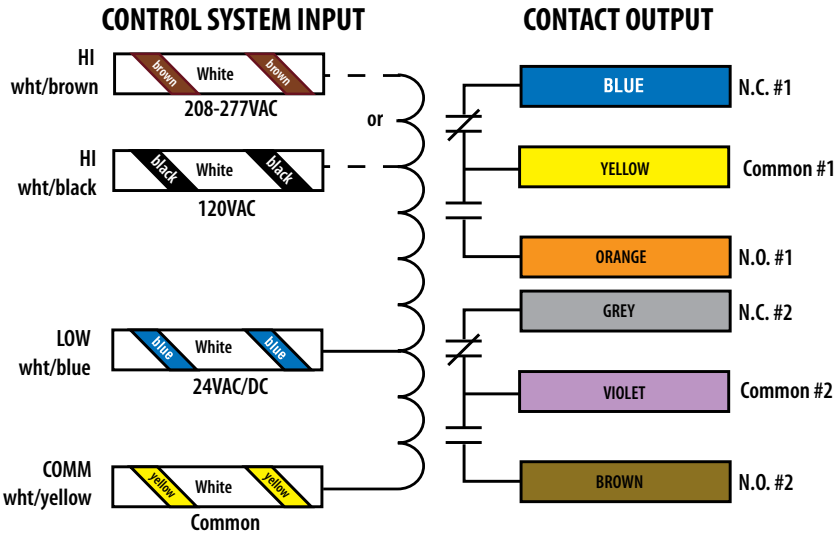
Nipple mount to any 2x or 4x electrical box



DIMENSIONAL DRAWING



WIRE COLOR CODES



ORDERING INFORMATION

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MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V320	DPDT	24VAC/DC,120VAC	20A	●	●
V420		24VAC/DC, 208-277VAC		●	●

Some devices are plenum rated per UL 1995...see White Paper VWP01 at veris.com for details

Enclosed Victory Relays: 20A DPST, with HOA Switch

HOA Switch Provides Local Control

DESCRIPTION

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.

APPLICATIONS

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

FEATURES

- Sleek field enclosure reduces the need for panel space
- Versatile coil and contact ratings minimize the number of models to choose
- The nipple mount feature allows the Victory series to be mounted to any electrical enclosure
- 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
- Products include a cover that conceals and protects the HOA switch, reducing the likelihood of tampering
- Limit costly control system override and service calls
- Separate HOA switch per output...local control of both outputs

TYPICAL COIL PERFORMANCE

Voltage	Coil Current AC	DC
24V	120mA	64mA
120V	84mA	-
277V	102mA	-

CONTACT RATINGS

Resistive	20A@240VAC 8A@28VDC 14A@14VDC
Motor	120VAC, 1HP

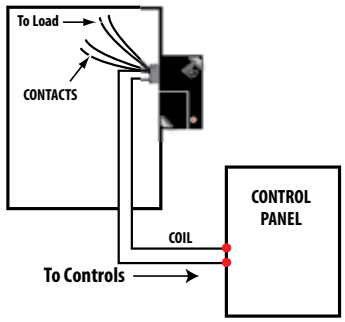
SPECIFICATIONS

5 Year Warranty

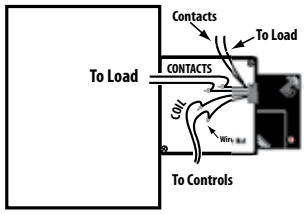
Operating Temperature Range	-40° to 40°C (-40° to 104°F)
Operating Humidity Range	10-90% RH non-condensing
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Relay Status	LED ON=energized
Wire Specifications:	
Lead Length	14" (356 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 12 AWG; HOA monitor wires: 16 AWG
Insulation Class	277VAC RMS
Agency Approvals	UL 508

APPLICATION/WIRING EXAMPLES

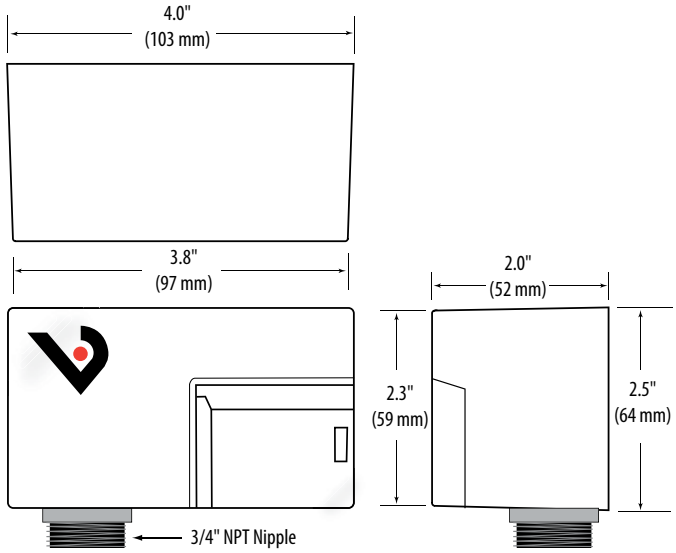
Nipple mount directly to a panel



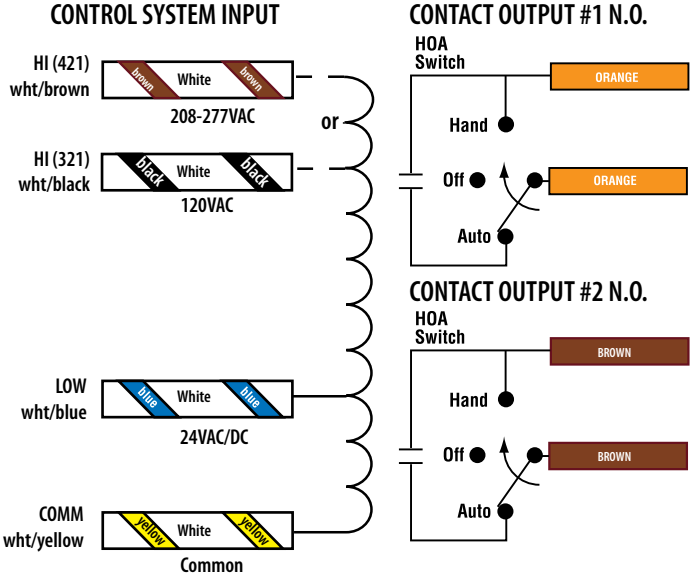
Nipple mount to any 2x or 4x electrical box



DIMENSIONAL DRAWING



WIRE COLOR CODES



ORDERING INFORMATION

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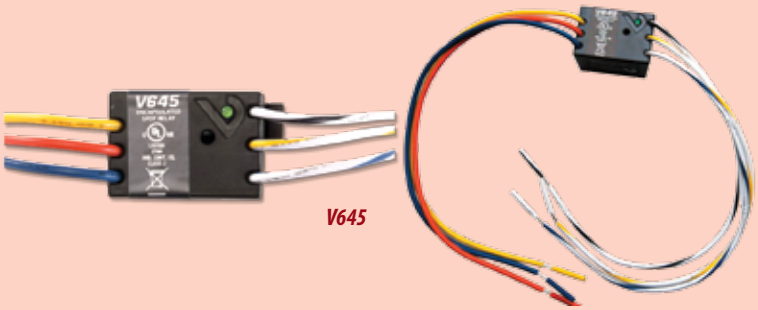
E150462

MODEL	RELAY	COIL	AMPERAGE RATING	HOA	RELAY POWER LED	UL
V321	DPST	24VAC/DC,120VAC	20A	●	●	●
V421		24VAC/DC, 208-277VAC		●	●	●

Some units are Plenum rated per UL 1995...see White Paper VWP01 at veris.com for details

Mini Command Victory Relay: 10A SPDT

10A Relay In A Small Package For Tight Spaces



V645

DESCRIPTION

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.

APPLICATIONS

- Sense voltages for alarm conditions
- Relay logic
- Isolation
- Device interlocking

FEATURES

- Economical multi-voltage relay
- 24-30VAC/DC or 120VAC coil input
- Status LED for visual indication
- For start/stop of small motors & contactors
- Switch up to 10A@250VAC
- Multiple mounting options for versatility...ships with foam tape, mounting screw, and DIN Rail clip

TYPICAL COIL PERFORMANCE

Voltage	Coil Current	
	AC	DC
24-30V.....	32mA	13mA
120V.....	17mA	—

CONTACT RATINGS

Resistive.....	10A@250VAC, N.O. 7A@250VAC, N.C. 6A@277VAC 7A@30VDC
Motor.....	125VAC, 1/4 HP, N.O.

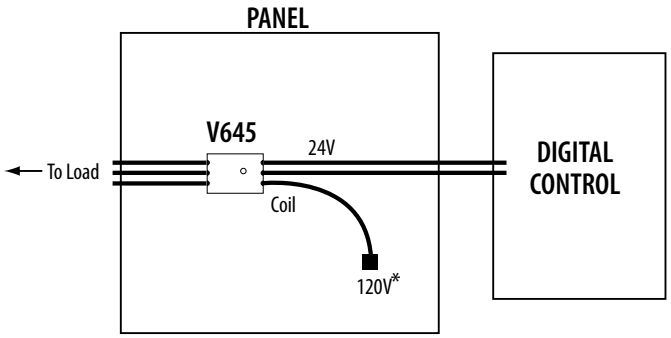
RELAYS

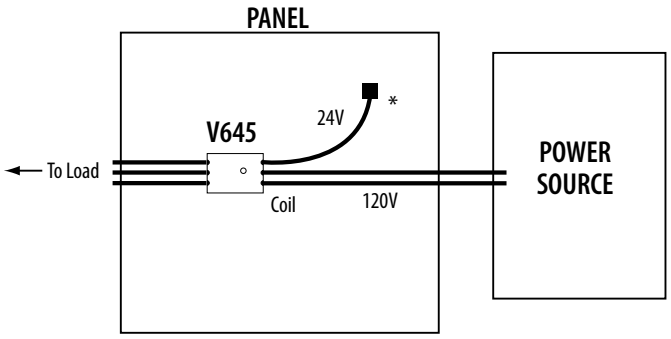
SPECIFICATIONS

5 Year Warranty

Operating Temperature Range	0° to 60° C (32° to 140°F)
Operating Humidity Range	10% - 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	1500VAC RMS
Wire Specifications:	
Lead Length	10" (254 mm) min.
Gauge	UL1015; Coil: 18 AWG; Contacts: 16 AWG
Agency Approvals	UL 508

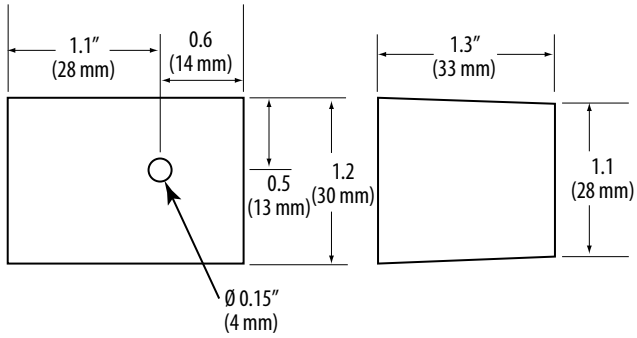
APPLICATION/ WIRING EXAMPLES



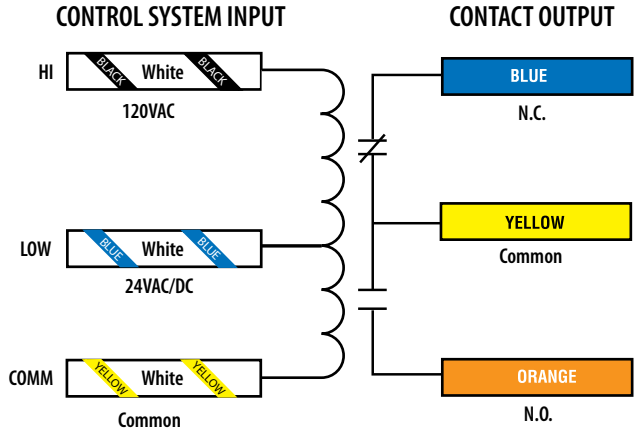


** Wire is capped on unused option.*

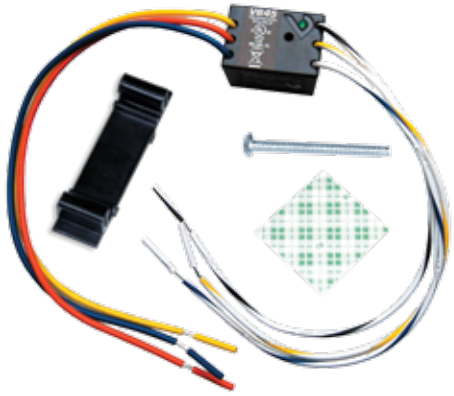
DIMENSIONAL DRAWING



WIRE COLOR CODES



APPLICATION/MOUNTING METHOD



The **V645** comes with a DIN rail clip, screw, and foam tape for a variety of mounting methods.

ORDERING INFORMATION

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E150462

MODEL	RELAY	COIL	AMPERAGE RATING	RELAY POWER LED	UL
V645	SPDT	24-30VAC/DC, 120VAC	10A	●	●

ACCESSORIES

DIN Rail, DIN Stop Clip (AV01, AV02)

AV01

AV02

RELAYS

SNAPTRACK™ 10A SPDT Relays

Space Saving Open Style Relays

VST10-4

VST100

DESCRIPTION

VST10 and VST100 Series track mount relays are industrial-strength relays that easily mount to either 2.75" or 4" SNAPTRACK™. Fit many relays in a small electrical box for easy installation and service, as well as saving space on the job site. All models are manufactured with an LED for status indication. Some models are available with an HOA switch for local control.

APPLICATIONS

- Sense voltages for alarm conditions
- Relay logic
- Isolation
- Device interlocking

FEATURES

- Mount relay right in the panel to save installation time and space on the jobsite
- HOA switch allows for easy job commissioning
- LED to prove status...saves labor costs
- 10A SPDT relay for low power applications...provides versatility
- 4" models come with pre-drilled holes for direct panel/wall mounting...one unit for multiple mounting options

TYPICAL COIL PERFORMANCE

VST10/VST11	Coil Current	
VOLTAGE	**AC**	**DC**
24V.....	32mA	15mA

VST100/VST101	Coil Current	
VOLTAGE	**AC**	**DC**
30V.....	39mA	18mA
120V.....	22mA	

CONTACT RATINGS

VST10/VST11

Resistive.....	10A@250VAC
	5A@30VDC
Motor.....	120VAC, 1/4HP N.O.
	1/8 HP N.C.

VST100/VST101

Resistive.....	10A@240VAC, 28VDC
Motor.....	120VAC, 1/3HP N.O.
	1/6 HP N.C.
	240VAC, 1/3HP N.O.
	1/6 HP N.C.

RELAYS

SPECIFICATIONS

5 Year Warranty

Operating Temperature Range	0° to 60°C (32° to 140°F)
Operating Humidity Range	10-90% RH non-condensing
Relay Status	LED ON=energized
Auxiliary Supply for HOA	24VAC/DC (supplied from a Class 2 or LVLE source)*
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Insulation Class	600VAC RMS (coil to contact); 120VAC RMS (terminal to surface)
Agency Approvals	UL 508

**Class 2 source: A source that provides a Class 2 power supply as defined by the NEC, NFPA-70.*
LVLE: Low voltage limited energy, not capable of providing more than 30VAC/42.4VDC, 8 A or 100VA
SNAPTRACK is a trademark of Tyco Electronics.

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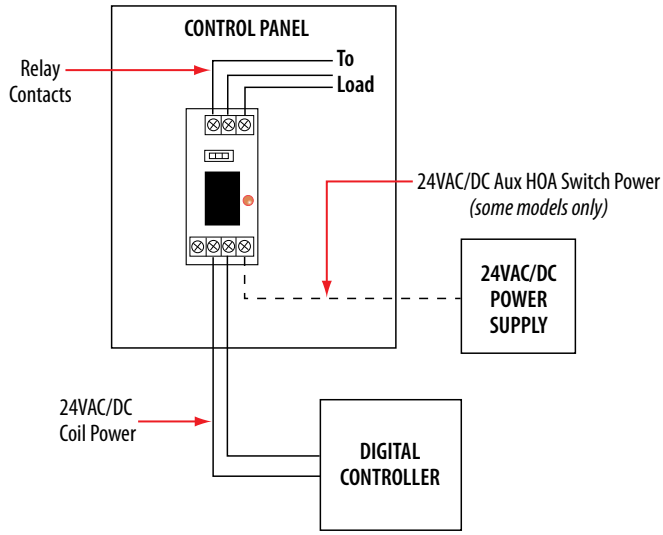
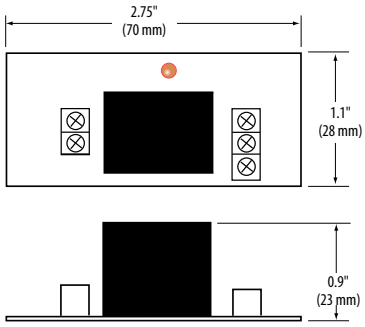
APPLICATION/WIRING EXAMPLES

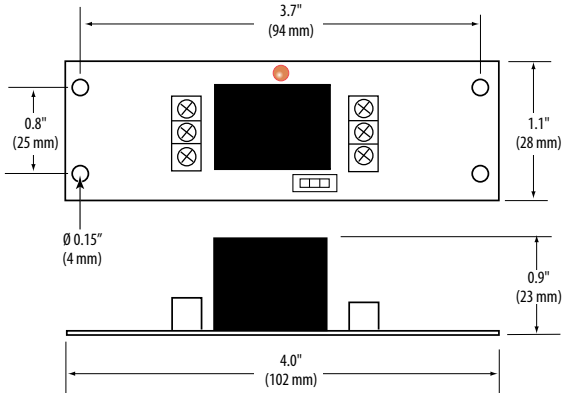


DIMENSIONAL DRAWINGS

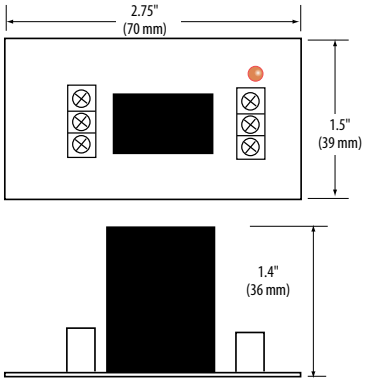
VST 10 & VST 11



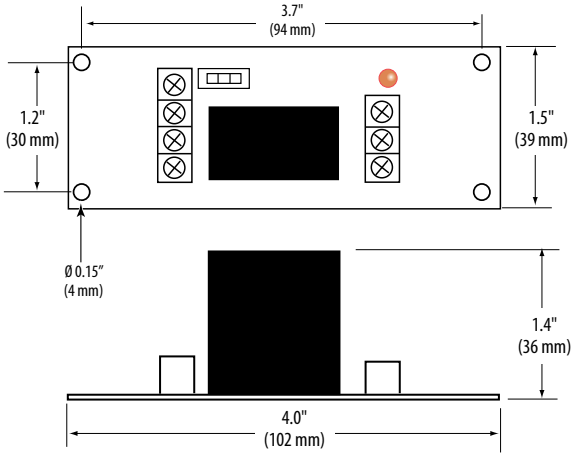
VST 10-4 & VST 11-4



VST 100 & VST 101



VST 100-4 & VST 101-4



RELAYS

ORDERING INFORMATION

cULus E150462

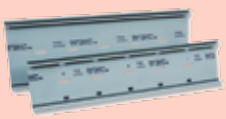
MODEL	RELAY	COIL	AMPERAGE RATING	HOA	LENGTH	RELAY POWER LED	UL
VST10	SPDT	24VAC/DC	10A	No	2.75"	●	●
VST10-4		24VAC/DC		No	4.0"	●	●
VST11		24VAC/DC		Yes*	2.75"	●	●
VST11-4		24VAC/DC		Yes*	4.0"	●	●
VST100		10-30VAC/DC, 120VAC		No	2.75"	●	●
VST100-4		10-30VAC/DC, 120VAC		No	4.0"	●	●
VST101		10-30VAC/DC, 120VAC		Yes*	2.75"	●	●
VST101-4		10-30VAC/DC, 120VAC		Yes*	4.0"	●	●

*Coil side Hand-Off-Auto switch contained in low-voltage portion of input circuit

ACCESSORIES

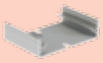
2" and 12" lengths of SNAPTRACK™ (AV03, AV04, AV05, AV06)

AV04



AV03

AV05



AV06

SNAPTRACK™ 20A SPDT Relays

VST120

VST120-4

Space Saving Open Style Relays

DESCRIPTION

The **VST120 Series** track mount industrial-strength relays will easily mount to either 2.75" or 4" SNAPTRACK™. The space-saving design allows you to fit many relays in a single electrical box for easy installation and servicing. These devices include convenience-adding features, such as an LED for status indication and an HOA switch for local control (see ordering table for models with HOA switches).

APPLICATIONS

- Lighting panels
- Control motors
- Isolation
- Device interlocking

FEATURES

- Relay logic
- Sense voltages for alarm conditions
- Mount relay right in panel to save installation time and space on the jobsite
- HOA switch allows for easy job commissioning (VST121(-4))
- LED to prove status...saving labor costs
- High power 20A relay
- 4" models come with pre-drilled holes for direct panel/wall mounting...one unit with multiple mounting options

TYPICAL COIL PERFORMANCE

Voltage	Coil Current AC	DC
24V.....	75mA	32mA
120V.....	42mA	-

CONTACT RATINGS

Resistive.....	20A@250VAC
	10A@28VDC
Motor.....	120VAC, 1HP

RELAYS

SPECIFICATIONS

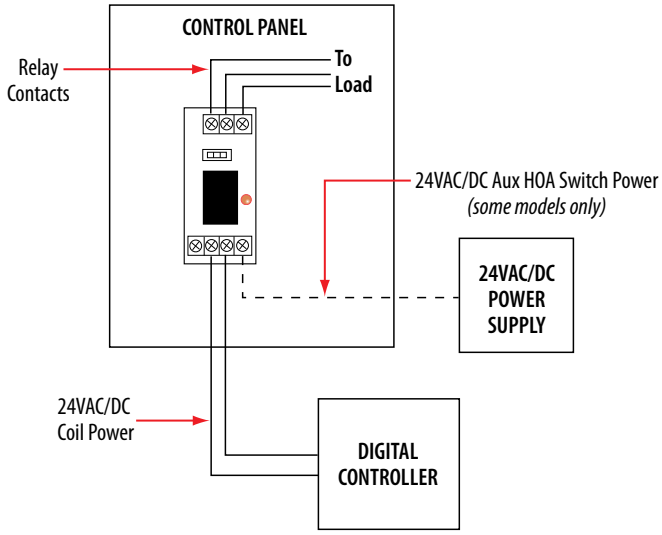
5 Year Warranty

Operating Temperature Range	0° to 60°C (32° to 140°F)
Operating Humidity Range	10-90% RH non-condensing
Relay Status	LED ON=energized
Auxiliary Supply for HOA	24VAC/DC (supplied from a Class 2 or LVLE source)*
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Insulation Class	600VAC RMS (coil to contact); 120VAC RMS (terminal to surface)

**Class 2 source: A source that provides a Class 2 power supply as defined by the NEC, NFPA70.*
LVLE: Low voltage limited energy, not capable of providing more than 30VAC/42.4VDC, 8A or 100VA
SNAPTRACK is a trademark of Tyco Electronics.

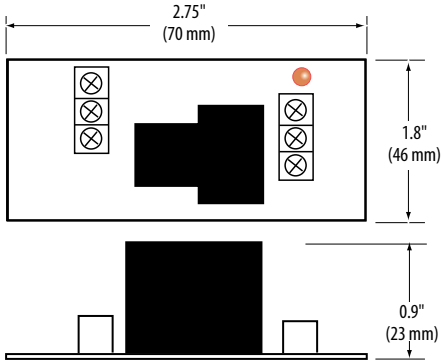
VERIS INDUSTRIES™

APPLICATION/WIRING EXAMPLE

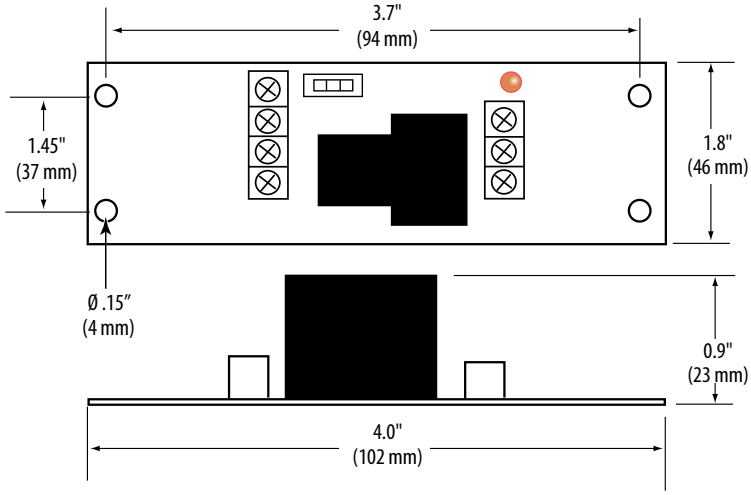


DIMENSIONAL DRAWINGS

VST 120 & VST 121



VST 120-4 & VST 121-4



RELAYS

ORDERING INFORMATION

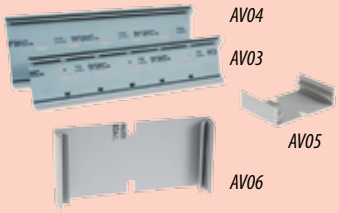
cULus E150462

MODEL	RELAY	COIL	AMPERAGE RATING	HOA	LENGTH	RELAY POWER LED	UL
VST120	SPDT	24VAC/DC, 120VAC	20A	No	2.75"	●	●
VST120-4				No	4.0"	●	●
VST121				Yes*	2.75"	●	●
VST121-4				Yes*	4.0"	●	●

**Coil side Hand-Off-Auto switch contained in low-voltage portion of input circuit*

ACCESSORIES

2" and 12" lengths of SNAPTRACK™ (AV03, AV04, AV05, AV06)



Socket SPDT Relays

Socket Relays In A Wide Range Of Coil Voltages

DESCRIPTION

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.

RELAYS

TYPICAL COIL PERFORMANCE

	Power Consumption
AC Coils	0.9VA
DC Coils	0.7W

CONTACT RATINGS

Standard (F & C Series)

Resistive	15A@120VAC
	15A@277VAC
	15A@28VDC
Motor	1/3@120VAC
	3/4@277VAC
Pilot Duty	B300

Low Level (S Series)

Resistive	3A@240VAC

CSA

Resistive	10A@277VAC

FEATURES

Full featured model:

- Color-coded push button...allows manual operation of relay. AC coils red or DC coils blue
- Removable override lever...when activated, locks push button and contacts in the powered position
- Flag indicator...shows relay status in manual or powered condition
- LED status lamp...shows coil "ON" or "OFF" status
- I.D. tag/write-on plastic label...used for identification of relays in multi-relay circuits
- 2-Way side or DIN rail mounting system...retrofits existing panel mounting and 35 mm DIN rail

Low current bifurcated model:

- All of the above full-featured benefits
- Bifurcated contacts for high reliability at extremely low current levels
- Perfect for HVAC applications when you need to switch and hold low loads for long periods of time

VMD1B-S with bifurcated contacts - perfect for low current applications!

3mA - 3 Amps
Dual (bifurcated) contacts for optimum wiping & contact performance.

SPECIFICATIONS

5 Year Warranty

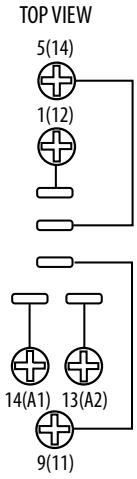
Operating Temperature Range	-40° to 55°C (-40° to 131°F)
Operating Range	85% to 110% of rated voltage
Drop-out Voltage Threshold	15% of rated voltage
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Operating Time	20 msec typical
Dielectric Strength	1500VAC RMS

APPLICATION/WIRING EXAMPLE

VBD1B Sockets

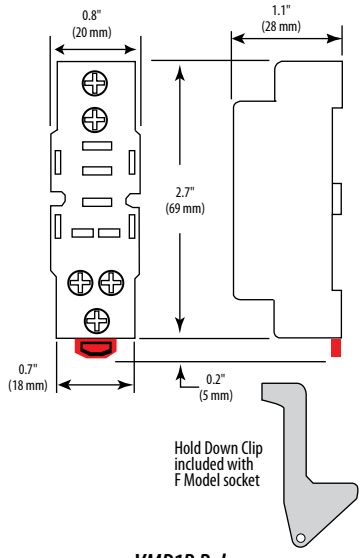
Function	NEMA (IEC)* Terminal
Coil (+)**	14 (A1)
Coil (-)**	13 (A2)
COMM	9 (11)
N.O.	5 (14)
N.C.	1 (12)

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

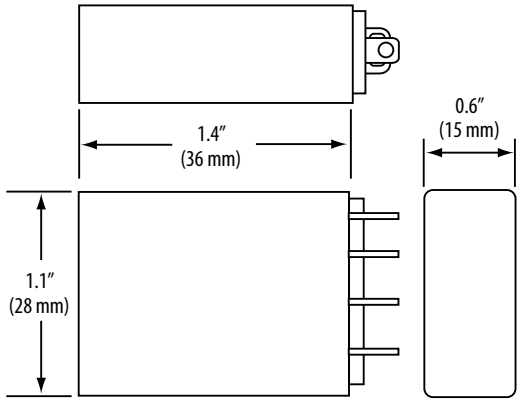


DIMENSIONAL DRAWINGS

VMD1B Sockets



VMD1B Relays



ORDERING INFORMATION

E198454

MODEL	RELAY TYPE	AMPERAGE RATING	COIL VOLTAGE	MIN. SWITCHING CURRENT	FULL FEATURED	UL	CE
VMD1B-C12D	SPDT	15A	12VDC	100mA@5VDC		●	●
VMD1B-C24D		15A	24VDC	100mA@5VDC		●	●
VMD1B-C24A		15A	24VAC	100mA@5VDC		●	●
VMD1B-C120A		15A	120VAC	100mA@5VDC		●	●
VMD1B-F12D		15A	12VDC	100mA@5VDC	●	●	●
VMD1B-F24D		15A	24VDC	100mA@5VDC	●	●	●
VMD1B-F24A		15A	24VAC	100mA@5VDC	●	●	●
VMD1B-F120A		15A	120VAC	100mA@5VDC	●	●	●
VMD1B-F240A		15A	240VAC	100mA@5VDC	●	●	●
VMD1B-24SVAC		3A	24VAC	3mA@17VDC	●	●	●
VMD1B-120SVAC		3A	120VAC	3mA@17VDC	●	●	●

These relays are UL Listed when used with the Veris sockets.

SOCKET ORDERING INFORMATION

MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD1B-C	15A	300V	●		●	●
VBD1B-F			●	●	●	●

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

ACCESSORIES

DIN Rail, DIN Stop Clip (AV01, AV02)

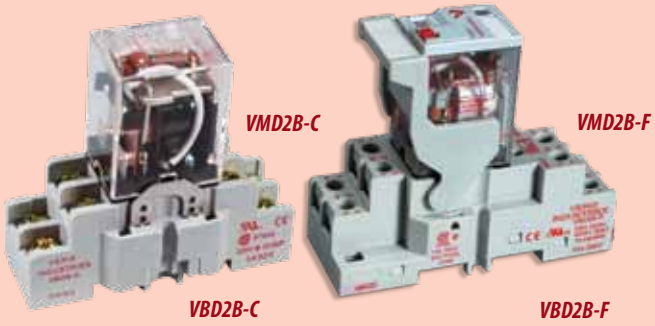
AV01

AV02

RELAYS

Socket DPDT Relays

Socket Relays In A Wide Range Of Coil Voltages



DESCRIPTION

Veris **VMD2B Series** are DPDT blade-style relays for socket/DIN mounting. Both the full-featured and standard DIN rail sockets are compatible with all VMD2B relays.

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!

TYPICAL COIL PERFORMANCE

	Power Consumption
AC Coils	1.2VA
DC Coils	0.9W

CONTACT RATINGS

Standard (F & C Series)

Resistive	10A@120VAC
	10A@277VAC
	10A@28VDC
Motor	1/4 HP@120VAC
	1/3 HP@240VAC
Pilot Duty	B300

Hybrid (S Series, Bifurcated)

	Low Side	High Side
Resistive	3A@120VAC	10A@120VAC
	3A@277VAC	8A@277VAC
	3A@30VDC	8A@28VDC
Motor	1/16 HP@120VAC	1/3 HP@120VAC
	–	1 HP@277VAC
Pilot Duty		B300

CSA

Resistive	10A@277VAC

FEATURES

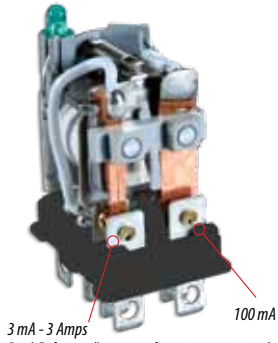
Full featured model:

- Color-coded push button...allows manual operation of relay. AC coils red or DC coils blue
- Removable override lever...when activated, locks push button and contacts in the powered position
- Flag indicator...shows contact status in manual or powered condition
- LED status lamp...shows coil "ON" or "OFF" status
- I.D. tag/write-on plastic label...used for identification of relays in multi-relay circuits
- 2-Way side or DIN rail mounting system...retrofits existing panel mounting and 35 mm DIN rail
- Mating hold-down clip...secures relay to socket (-F sockets)

Low level bifurcated model:

- All of the above full featured benefits
- Bifurcated contacts for high reliability at extremely low current levels
- Perfect for HVAC applications when you need to switch and hold low loads for long periods of time
- Hybrid relay, good for both logic switching and power switching

VMD2B-S has a hybrid design - great for installations where one pole is switching a dry circuit and the other pole is switching a motor starter!



Dual (bifurcated) contacts for optimum wiping & contact performance.

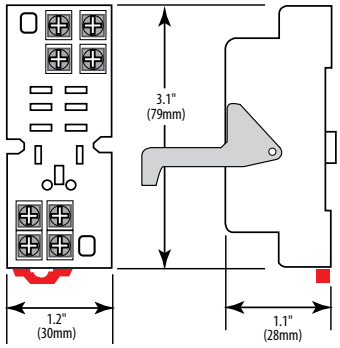
SPECIFICATIONS

5 Year Warranty

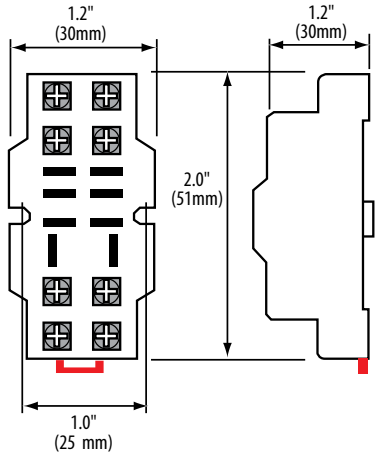
Operating Temperature Range	-40° to 55°C (-40° to 131°F)
Operating Range	85% to 110% of rated voltage
Drop-out Voltage Threshold	15% of rated voltage
Expected Relay Life	Electrical (@ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Operating Time	20 msec typical
Dielectric Strength	1500VAC (RMS)

DIMENSIONAL DRAWINGS

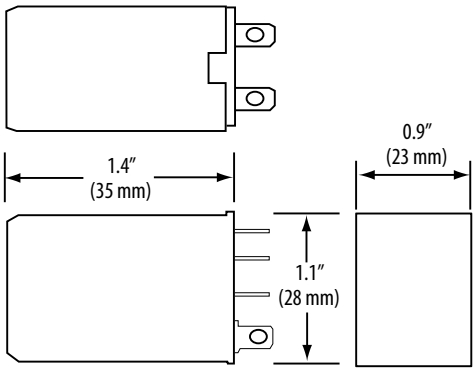
VBD2B-F Socket



VBD2B-C Socket



VMD2B Relays

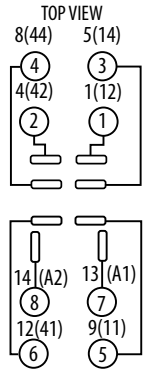


APPLICATION/WIRING EXAMPLE

VBD2B Sockets

Function	Terminal	NEMA (IEC)
Coil (+)**	8	14 (A2)
Coil (-)**	7	13 (A1)
COMM1	5	9 (11)
N.O.1	3	5 (14)
N.C.1	1	1 (12)
COMM2	6	12 (41)
NO.2	4	8 (44)
N.C.2	2	4 (42)

*** Observe polarity for relays with DC coil voltages only*



ORDERING INFORMATION

E198454

RoHS Compliant

MODEL	RELAY TYPE	AMPERAGE RANGE	COIL VOLTAGE	MIN. SWITCHING CURRENT	FULL FEATURED	UL	CE
VMD2B-C12D	DPDT	15A	12VDC	100mA@5VDC		●	●
VMD2B-C24D		15A	24VDC	100mA@5VDC		●	●
VMD2B-C24A		15A	24VAC	100mA@5VDC		●	●
VMD2B-C120A		15A	120VAC	100mA@5VDC		●	●
VMD2B-F12D		15A	12VDC	100mA@5VDC	●	●	●
VMD2B-F24D		15A	24VDC	100mA@5VDC	●	●	●
VMD2B-F24A		15A	24VAC	100mA@5VDC	●	●	●
VMD2B-F120A		15A	120VAC	100mA@5VDC	●	●	●
VMD2B-F240A		15A	240VAC	100mA@5VDC	●	●	●
VMD2B-24SVAC		3A/10A	24VAC	3mA@17VDC/100mA@5VDC	●	●	●
VMD2B-120SVAC		3A/10A	120VAC	3mA@17VDC/100mA@5VDC	●	●	●

*These relays are **UL Listed**, when used with the Veris sockets.*

ACCESSORIES

DIN Rail, Stop Clip (AV01, AV02)

SOCKET ORDERING INFORMATION

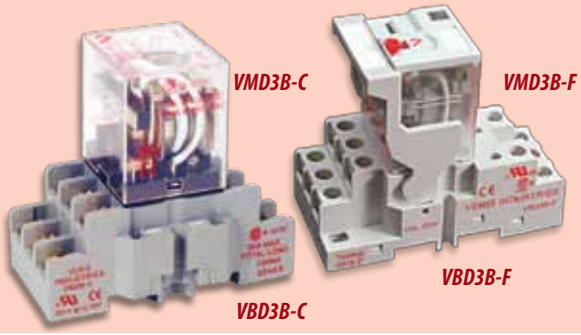
MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD2B-F	20 A	300 V	●	●	●	●

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

RELAYS

Socket 3PDT Relays

Socket Relays In A Wide Range Of Features And Coil Voltages



DESCRIPTION

The Veris **VMD3B Series** are 3PDT blade-style relays for socket/DIN mounting. Both the full-featured and standard DIN rail sockets are compatible with both the VMD3B-C and VMD3B-F relays and feature a slim, attractive design.

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. No need to worry about safety or dependability.

FEATURES

Full featured model:

- Color-coded push button...allows manual operation of relay. AC coils red, DC coils blue
- Removable override lever...when activated, locks push button and contacts in the powered position
- Flag indicator...shows relay status in manual or powered condition
- LED status lamp...shows coil "ON" or "OFF" status
- I.D. tag/write-on plastic label...used for identification of relays in multi-relay circuits
- 2-way side or DIN rail mounting system...retrofits existing panel mounting and 35 mm DIN rail
- Mating hold-down clip...secures relay to socket (-F sockets)

TYPICAL COIL PERFORMANCE

	Power Consumption
AC Coils	1.5VA
DC Coils	1.4W

CONTACT RATINGS

Resistive	15A@120VAC
	12A@277VAC
	12A@28VDC
Motor	1/2 HP@120VAC
	3/4 HP@250VAC
Pilot Duty	B300

RELAYS

SPECIFICATIONS

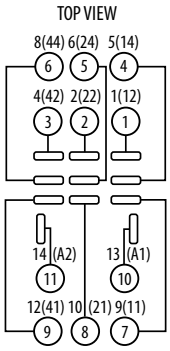
5 Year Warranty

Operating Temperature Range	-40° to 55°C (-40° to 131°F)
Operating Range	85% to 110% of rated voltage
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	1500VAC RMS

APPLICATION/WIRING EXAMPLE

VBD3B Sockets

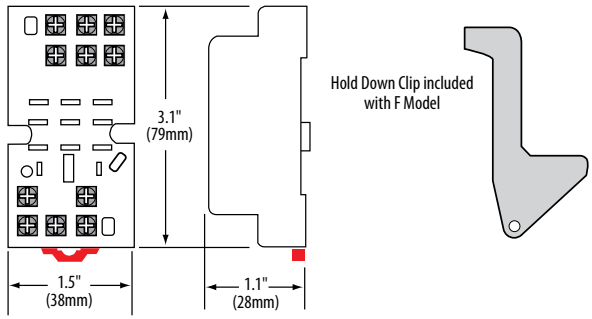
Function	Terminal	NEMA/(IEC)
Coil (+)**	11	14 (A2)
Coil (-)**	10	13 (A1)
COMM1	7	9 (11)
N.O.1	4	5 (14)
N.C.1	1	1 (12)
COMM2	8	10 (21)
N.O.2	5	6 (24)
N.C.2	2	2 (22)
COMM3	9	12 (41)
N.O.3	6	8 (44)
N.C.3	3	4 (42)



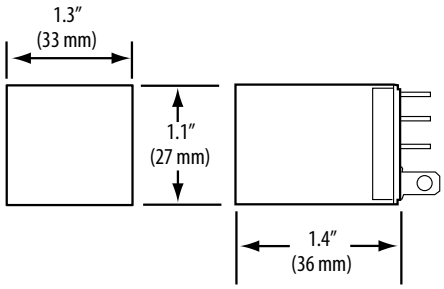
*** Observe polarity for relays with DC coil voltages only*

DIMENSIONAL DRAWINGS

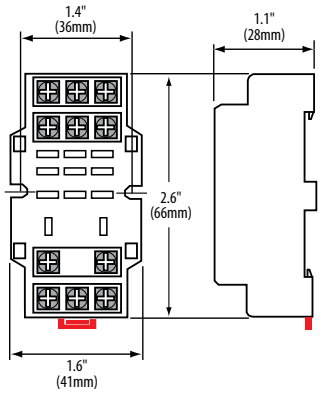
VBD3B-F Socket



VMD3B Relays



VBD3B-C Socket



ORDERING INFORMATION

MODEL	RELAY TYPE	AMPERAGE RANGE	COIL VOLTAGE	MIN. SWITCHING CURRENT	FULL FEATURED	UL	CE
VMD3B-C24D	3PDT	10A	24VDC	100mA@5VDC		●	●
VMD3B-C24A			24VAC			●	●
VMD3B-C120A			120VDC			●	●
VMD3B-F24D		15A	24VDC		●	●	●
VMD3B-F24A			24VAC		●	●	●
VMD3B-F120A			120VAC		●	●	●

*These relays are **UL Listed**, when used with the Veris sockets.*

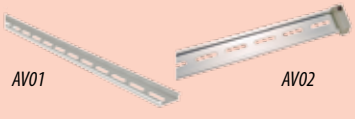
SOCKET ORDERING INFORMATION

MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD3B-F	16A	300V	●	●	●	●

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

ACCESSORIES

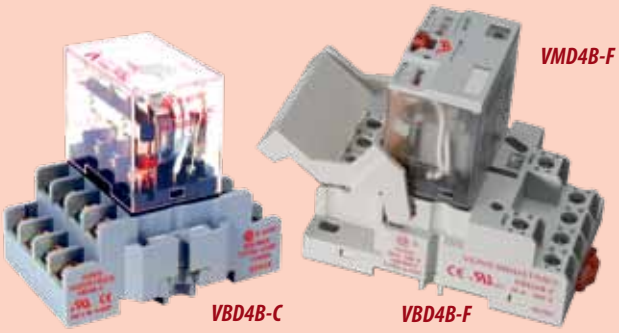
DIN Rail, Stop Clip (AV01, AV02)



RELAYS

Socket 4PDT Relays

Socket Relays In A Wide Range Of Coil Voltages



DESCRIPTION

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. No need to worry about safety or dependability.

FEATURES

Full featured model:

- Color-coded push button...allows manual operation of relay. AC coils red, DC coils blue
- Removable override lever...when activated, locks push button and contacts in the powered position
- Flag indicator...shows relay status in manual or powered condition
- LED status lamp...shows coil "ON" or "OFF" status
- I.D. tag/write-on plastic label...used for identification of relays in multi-relay circuits
- 2-Way side or DIN rail mounting system...retrofits existing panel mounting and 35 mm DIN rail
- Mating hold-down clip...secures relay to socket (-F sockets)

TYPICAL COIL PERFORMANCE

	Power Consumption
AC Coils.....	1.5VA
DC Coils.....	1.5W

CONTACT RATINGS

Resistive.....	10A@120VAC
	10A@277VAC
	10A@28VDC
Motor.....	1/3 HP@120VAC
	1/2 HP@250VAC
Pilot Duty.....	B300

RELAYS

SPECIFICATIONS

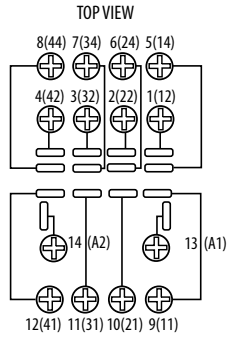
5 Year Warranty

Operating Temperature Range	-40° to 55°C (-40° to 131°F)
Operating Range	85% to 110% of rated voltage
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	1500VAC RMS

APPLICATION/WIRING EXAMPLE

VBD4B Sockets

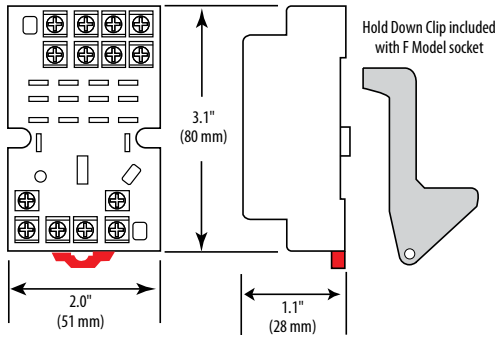
Function	NEMA (IEC)* Terminal
Coil (+)**	14 (A2)
Coil (-)**	13 (A1)
COMM1	9 (11)
N.O.1	5 (14)
N.C.1	1 (12)
COMM2	10 (21)
N.O.2	6 (24)
N.C.2	2 (22)
COMM3	11 (31)
N.O.3	7 (34)
N.C.3	3 (32)
COMM4	12 (41)
N.O.4	8 (44)
N.C.4	4 (42)



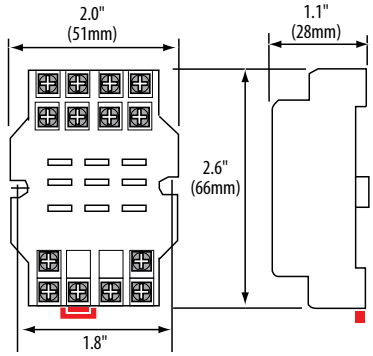
*** Observe polarity for relays with DC coil voltages only*

DIMENSIONAL DRAWINGS

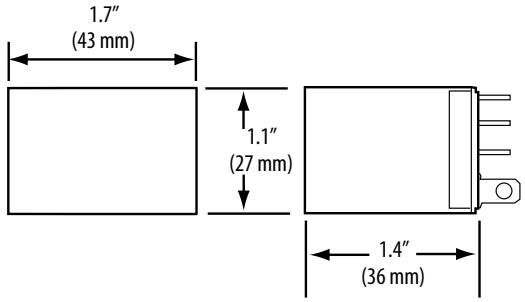
VBD4B-F Socket



VBD4B-C Socket



VMD4B Relays



ORDERING INFORMATION

MODEL	RELAY TYPE	AMPERAGE RANGE	COIL VOLTAGE	MIN. SWITCHING CURRENT	LED	UL	CE
VMD4B-C24D	4PDT	10A	24VDC	100mA@5VDC		●	●
VMD4B-C24A			24VAC			●	●
VMD4B-C120A			120VAC			●	●
VMD4B-F24D			24VDC		●	●	●
VMD4B-F24A			24VAC		●	●	●
VMD4B-F120A			120VAC		●	●	●

These relays are UL Listed, when used with the Veris sockets.

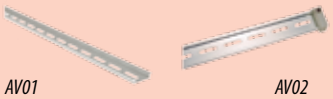
SOCKET ORDERING INFORMATION

MODEL	AMPERAGE RATING	VOLTAGE RATING	FINGER SAFE	HOLD DOWN CLIP	UL	CE
VBD4B-C	10A	300V			●	●
VBD4B-F	16A		●	●	●	●

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

ACCESSORIES

DIN Rail, Stop Clip (AV01, AV02)



AV01 *AV02*

RELAYS

Solid State Relays

Higher Reliability Than Electromagnetic Relays

VS861210DC

DESCRIPTION

The new DIN-Mountable **VS861 Series** Solid State Relay with an internal heat sink is the first complete solid state relay with no moving parts available in a modular package.

A SSR (solid state relay) can perform many of the same tasks as an EMR (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.

FEATURES

- No moving parts to wear or fail
- No contact bounce or arcing contacts
- Reduced EMI
- Longer life than electromechanical relays
- Superior performance where fast response time or high frequency of on/off cycling are required

APPLICATIONS

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

RELAYS

SPECIFICATIONS

5 Year Warranty

Output Characteristics:

Switching Voltage	VS861210DC(AC) & VS861208DC(AC): 24...280VAC , VS861208DD: 3...150VDC
Maximum Zero Turn-on Voltage (Vpk)	VS861210DC(AC) & VS861208DC(AC): 35µS
Maximum Rate of Rise off State Voltage (dv/dt)	VS861210DC(AC): 500µS, VS861208DC: 475µS, VS861208AC: 350µS
Incandescent Lamp Ampere Rating (RMS)	VS861210DC(AC): 8A, VS861208DC(AC): 5A
Motor Load Rating (RMS)	VS861210DC(AC): 4.5A, VS861208DC(AC): 3A
Min. Load Current to Maintain On	VS861210DC(AC): 50mA, VS861208DC(AC): 150mA, VS861208DD: 20mA
Non-Repetitive Surge Current (1 cycle)	VS861210DC(AC): 500A , VS861208DC(AC): 200A, VS861208DD: 35A
Max. RMS Overload Current (1 sec.)	VS861210DC(AC) & VS861208DC: 24A, VS861208(DD): 17A
Max. Off State Leakage Current (RMS)	10mA
Typical On State Voltage Drop (RMS)	1.25VAC
Max. On State Voltage Drop (RMS)	VS861210DC(AC) & VS861208DC(AC): 1.6VAC, VS861208DD: 1.6VDC

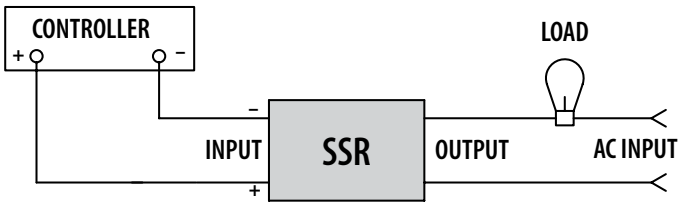
Input Characteristics:

Must Release Voltage	VS861210DC, VS861208DC, & VS861208DD: 1VDC, VS861210AC & VS861208AC: 10VAC
SP (Nominal) Input Impedance	VS861210DC, VS861208DC, & VS861208DD: Current Regulator; VS861210AC & VS861208AC: 16...25kΩ
Typical Input Current @ 5VDC or 240VAC	VS861210DC: 16mA, VS861210AC, VS861208DC(AC), & VS861208DD: 12mA
Reverse Polarity Protection	VS861210DC, VS861208DC, & VS861208DD: Yes

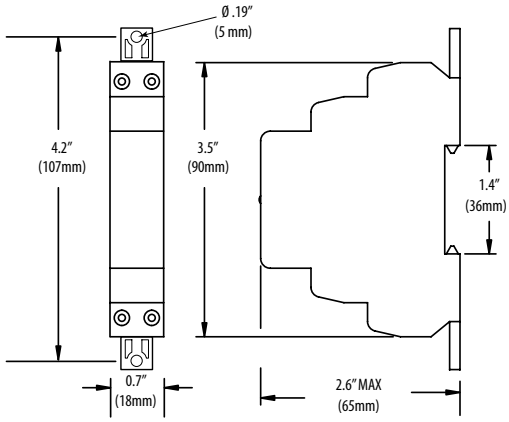
Other Characteristics:

Operating Time (Response Time)	VS861210DC & VS861208DC: 8.3msec; VS861210AC & VS861208AC: 40msec; VS861208DD: 5msec
Release Time	VS861210DC & VS861208DC: 8.3msec; VS861210AC & VS861208AC: 80msec; VS861208DD: 5msec
Rated Insulation Voltage/Dielectric Strength	2500VAC
Operating Temperature 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

APPLICATION/WIRING EXAMPLE

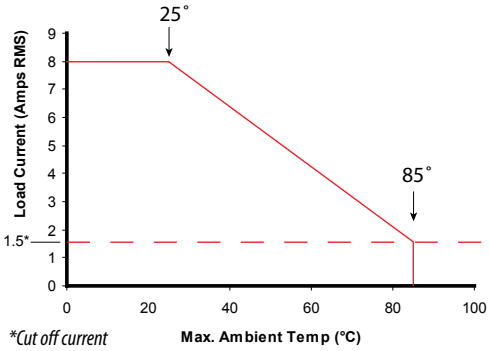


DIMENSIONAL DRAWING

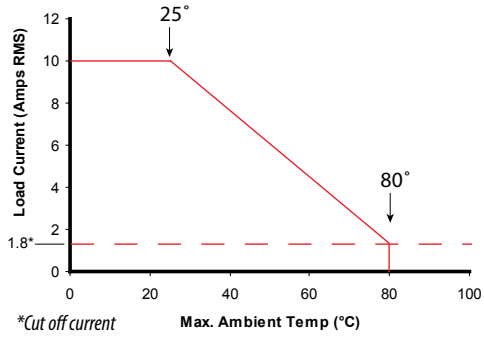


AMPERAGE DERATING FOR TEMPERATURE

8 AMP STYLE



10 AMP STYLE



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.

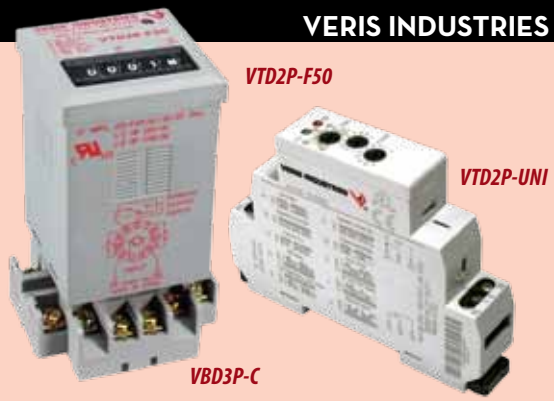
LOAD TYPE	CAUTIONARY ACTION
All load types	Verify that the inrush current does not exceed the surge specifications of the SSR.
Steady-state resistance	Follow standard thermal considerations.
DC (inductive)	Place a diode across the load to absorb surges during turnoff.
Incandescent lamp	Use a zero voltage turn-on characteristic.
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.	10A	3-32VDC	SCR	24-280VAC	Zero Cross	●	●
VS861210AC		10A	90-280VAC, 80-140VDC	SCR	24-280VAC	Zero Cross	●	●
VS861208DC		8A	3-32VDC	Triac	24-280VAC	Zero Cross	●	●
VS861208AC		8A	90-280VAC, 80-140VDC	Triac	24-280VAC	Zero Cross	●	●
VS861208DD		8A	3.5-32VDC	MOSFET	3-150VDC	DC Switching	●	●

Time Delay Relays

Multi-Function Time Delay Relays For A Variety Of Applications



VTD2P-F50

Function	Timing Chart
ON DELAY (Power On)	U, R; T, T
OFF DELAY (S Break)	U, S, R; T, T
REPEAT CYCLE (Starting Off)	U, R; T, T, T, T, T, T
INTERVAL (Power On)	U, R; T, T, T
ONE SHOT	U, S, R; T, T, T

VTD1P-UNI, VTD2P-UNI

Function	Timing Chart
RE-TRIGGERABLE ONE SHOT	U, S, R; T, T, T
PULSE GENERATOR	U, R; T, Pulse, T, Pulse
ON/OFF DELAY (S Make/Break)	U, S, R; T, T, T
REPEAT CYCLE (Starting On)	U, R; T, T, T, T, T, T
MEMORY LATCH (S Make)	U, S, R

U: Applied input voltage S: Control switch (open or closed)
R: Relay contacts (on or off) T: Time delay

DESCRIPTION

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.

FEATURES

- VTD2P-F50 has thumb wheel adjustment for function and timing...ensures accuracy and eliminates mechanical deviation
- VTD1P/2P-UNI models are made with solid state relays for greater reliability
- Two different housings provide multiple mounting options

TYPICAL COIL PERFORMANCE

	Power Consumption
AC	2.5VA
DC	2W

CONTACT RATINGS

(VTD2P-F50)
Resistive .....12A@240VAC, 30VDC
Pilot Duty.....B300

(VTD1P-UNI, VTD2P-UNI)
Resistive .....15A@240VAC, 24VDC
Motor .....1/2HP@120VAC; 1HP@240VAC
Pilot Duty B300

TIMING CHARACTERISTICS

	VTD2P-F50	VTD1P-UNI, VTD2P-UNI
Funtions Available	5	10
Time Ranges		
0.1 sec	0-999	1-10
sec	0-999	1-10
0.1 min	0-999	1-10
min	0-999	1-10
0.1 hr	0-999	1-10
hr	0-999	1-10
10 hr	0-999	---
0.1 day	---	1-10
day	---	1-10
Tolerance *(mechanical setting)*	0%	5%
Repeatability	0.1%	0.2%
Operate Time *(max)*	25ms	no spec
Reset Time *(max)*	150ms	150ms
Trigger Pulse Length *(min)*	---	50ms

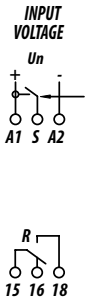
SPECIFICATIONS

5 Year Warranty

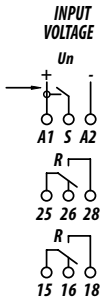
Operating Range	85% to 110% of nominal voltage
Drop-Out Voltage Threshold	15% of nominal voltage
Expected Relay Life	Electrical (resistive @ rated current) 100,000 cycles; Mechanical (unpowered) 10,000,000 cycles
Dielectric Strength	1000VAC RMS
Operating Temperature Range	-20°C to 55°C (-4 to 131°F)

APPLICATION/WIRING EXAMPLES

VTD1P-UNI



VTD2P-UNI

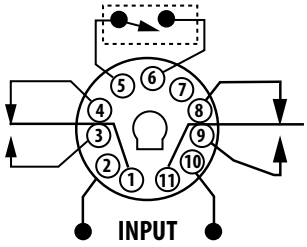


EXTERNAL CONTROL SWITCH

15 - COMMON
16 - NORMALLY CLOSED
18 - NORMALLY OPEN

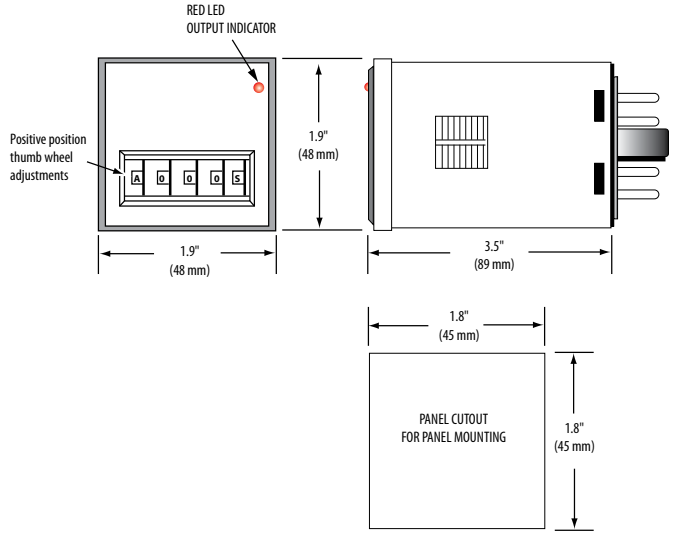
25 - COMMON
26 - NORMALLY CLOSED
28 - NORMALLY OPEN

VTD2P-F50

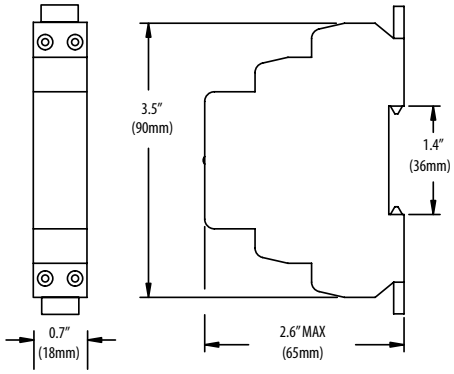


DIMENSIONAL DRAWINGS

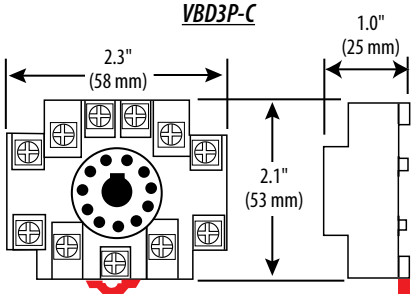
VTD2P-F50



VTD1P-UNI/VTD2P-UNI



VBD3P-C



RELAY ORDERING INFORMATION

E198454

MODEL	RELAY STYLE	No. of FUNCTIONS	AMPERAGE RANGE	COIL VOLTAGE	MIN. SWITCHING CURRENT	UL	CE
VTD2P-F50	DPDT	5	12	24-240VAC/DC	100mA@5VDC	Recognized*	●
VTD1P-UNI	SPDT	10	15	24-240VAC/DC		Listed	●
VTD2P-UNI	DPDT	10	15	24-240VAC/DC		Listed	●

Listed when used with Veris socket

SOCKET ORDERING INFORMATION

MODEL	AMPERAGE RATING	VOLTAGE RATING	UL	CE
VBD3P-C	15A	300	●	●

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

Setpoint Devices Contents

Our 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
COV	VT Series Retrofit Covers for Enabling PIR Occupancy Sensing	266
VT7200C	Zoning Thermostats with Floating Outputs	268
VT7200F	Zoning Thermostats with Analog Outputs	270
VT73xxA/VT73xxC	Fancoil Thermostats with Floating Outputs	272
VT73xxF	Fancoil Thermostats with Analog Outputs	274
VT76xxA/VT76xxC	Roof Top Unit Thermostats	276
VT7605B/VT7656B	Roof Top Unit Thermostats with Economizer Function	278
VT7607B/VT7657B	Roof Top Unit Thermostats with Humidity Control	280
VT76xxH	Heat Pump Thermostats	282
VH72xxA/VH72xxF	Communicating Humidistat Series	284
VWG	Wireless Gateway	286
HT/HWS	Wall Mount Humidity Transmitter, Thermostat Humidistat Functions	288
TWS	Deluxe Temperature Transmitter with Thermostat Functions	290

Setpoint Selection Guide

** Indicates a series of products.*

FEATURES/ APPLICATIONS	Room Control	Zone Control	Fancoil Control	Rooftop Control	Heat Pump Control
Humidistat	VH *, HT/HWS pages 284, 288			VT7607, VT7657 page 280	
Thermostat	TWS page 290	VT7200 * pages 268, 270	VT7300 * pages 272, 274	VT7600 * pages 276, 278, 280	VT76xxH * page 282
Wireless	VH * page 284	VT7200 * pages 268, 270	VT7300 * pages 272, 274	VT7600 * pages 276, 278, 280	VT76xxH * page 282
PIR	VH * page 284	VT7200 * pages 268, 270	VT7300 * pages 272, 274	VT7600 * pages 276, 278, 280	VT7600 * page 282
BACnet	VH * page 284	VT7200 * pages 268, 270	VT7300 * pages 272, 274	VT7600 * pages 276, 278, 280	VT7600 * page 282
LON	VH * page 284	VT7200 * pages 268, 270	VT7300 * pages 272, 274	VT7600 * pages 276, 278, 280	VT7600 * page 282

ACCURATE CLIMATE CONTROL

HT Wall Mount

Use the HT Series in critical applications, such as hospital operating rooms, in which the controller and the user need to be in sync. By communicating both the actual RH and temperature readings and the setpoint selected by the user (analog or relay setpoint feedback options available, the control system can better fine tune the environment to meet the users' expectations.

- Monitors and controls humidity and temperature in one device, reduces installation time
- Switch-selectable 4-20mA or 0-10V/0-5VDC analog outputs
- Offset function adjusts calibration intervals for both RH and T
- Replaceable RH sensor element supports field calibration offset

Viconics VT7600 Rooftop Unit Control

Viconics Stats directly control mechanical equipment, providing sophisticated sequences and reporting the results via BACnet, LonTalk, or wirelessly.

- Communicating thermostat provides single and multi-stage control with multiple contacts
- Occupancy control available
- BACnet, Echelon, and Wireless communication available
- PI time proportioning algorithm
- Remote room and outdoor temperature sensor

VERIS INDUSTRIES

Digital Stand-Alone and Communicating Thermostat Selection Guide

Step 1	Step 2	Step 3	Step 4	Step 5 : Network			
Application	Model	Feature	Primary Outputs	Standalone	BACnet (MS/TP)	Echelon	Wireless (ZigBee)
Zone control, Hot/Cool air dampers, valves, changeover capability, reheat contact output. No Fan control with this model.			Floating 1H/1C	VT7200C5x00	VT7200C5x00B	VT7200C5x00E	VT7200C5x00W
			Analog 1H/1C	VT7200F5x00	VT7200F5x00B	VT7200F5x00E	VT7200F5x00W
2/4 pipes fancoil control Hot/Chill water valves, 1, 2 or 3 speed fan, changeover capability, reheat contact output.	Commercial	with Humidity sensor	Floating 1H/1C	VT7350C5x00	VT7350C5x00B	VT7350C5x00E	VT7350C5x00W
			Analog 1H/1C	VT7350F5x00	VT7350F5x00B	VT7350F5x00E	VT7350F5x00W
		without Humidity sensor	ON/OFF 1H/1C	VT7300A5x00	VT7300A5x00B	VT7300A5x00E	VT7300A5x00W
			Floating 1H/1C	VT7300C5x00	VT7300C5x00B	VT7300C5x00E	VT7300C5x00W
			Analog 1H/1C	VT7300F5x00	VT7300F5x00B	VT7300F5x00E	VT7300F5x00W
	Hotels/Lodging	with Humidity sensor	Floating 1H/1C	VT7355C5x00	VT7355C5x00B	VT7355C5x00E	VT7355C5x00W
			Analog 1H/1C	VT7355F5x00	VT7355F5x00B	VT7355F5x00E	VT7355F5x00W
		without Humidity sensor	ON/OFF 1H/1C	VT7305A5x00	VT7305A5x00B	VT7305A5x00E	VT7305A5x00W
			Floating 1H/1C	VT7305C5x00	VT7305C5x00B	VT7305C5x00E	VT7305C5x00W
			Analog 1H/1C	VT7305F5x00	VT7305F5x00B	VT7305F5x00E	VT7305F5x00W
Rooftop unit control, staged heat and cool, single speed fan, frost protection, progressive recovery.	No schedule	Single stage	ON/OFF 1H/1C	VT7600A5x00	VT7600A5x00B	VT7600A5x00E	VT7600A5x00W
		Multi-stage	ON/OFF 2H/2C	VT7600B5x00	VT7600B5x00B	VT7600B5x00E	VT7600B5x00W
		Economizer	ON/OFF 2H/2C	VT7605B5x00	VT7605B5x00B	VT7605B5x00E	VT7605B5x00W
		Humidity control	ON/OFF 2H/2C	VT7607B5x00	VT7607B5x00B	VT7607B5x00E	VT7607B5x00W
	Schedule	Single stage	ON/OFF 1H/1C	VT7652A5x00	VT7652A5x00B	VT7652A5x00E	VT7652A5x00W
		Multi-stage	ON/OFF 2H/2C	VT7652B5x00	VT7652B5x00B	VT7652B5x00E	VT7652B5x00W
		Economizer	ON/OFF 2H/2C	VT7656B5x00	VT7656B5x00B	VT7656B5x00E	VT7656B5x00W
		Humidity control	ON/OFF 2H/2C	VT7657B5x00	VT7657B5x00B	VT7657B5x00E	VT7657B5x00W
Heat pump control	No schedule		ON/OFF 3H/2C	VT7600H5x00	VT7600H5x00B	VT7600H5x00E	VT7600H5x00W
	Schedule		ON/OFF 3H/2C	VT7652H5x00	VT7652H5x00B	VT7652H5x00E	VT7652H5x00W

Part numbers ending in 5000x indicate PIR-Ready models. Locate appropriate retrofit cover using table on page 258.
Part numbers ending in 5500x indicate PIR enabled at factory.

VERIS INDUSTRIES

PIR OCCUPANCY SENSING OPTION

All VT7000X5000 & VT7000X5500 PI thermostats are specifically designed for advanced occupancy applications. These thermostats are equipped with advanced active occupancy logic, which provides energy savings during occupied hours without sacrificing comfort.

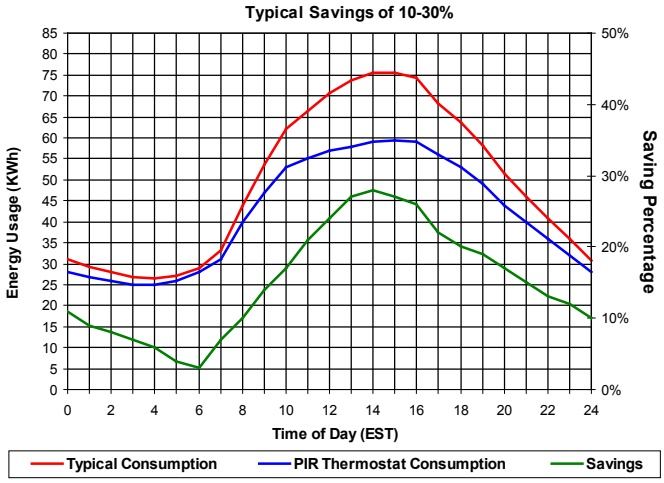
VT7000X5000 Series thermostats are field-upgradeable to active PIR control by adding a PIR cover from the ordering table below.

VT7000X5500 Series thermostats are shipped with fully active PIR control installed.

Features

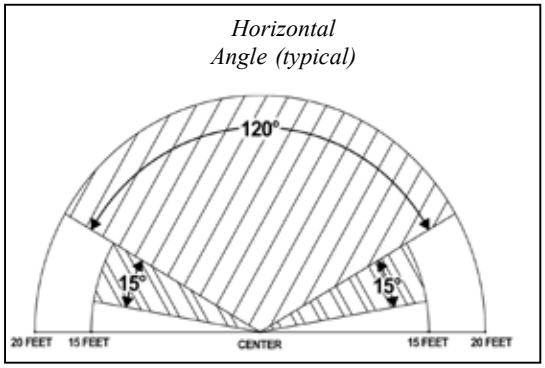
- PI time proportioning algorithm
- Maximizes energy savings (10-30%)
- Can be used in conjunction with Viconics scheduled (7 day) or open network protocol such as BACnet MS/TP, Echelon, or Zigbee thermostats.
- Compatible with VT7200, VT7300, and VT7600 Series thermostats
- Pre-programmed single device in a compact aesthetically pleasing styling
- Offers local switching control based upon occupancy
- Factory or field-installed versions available
- A diagnostic LED inside the PIR provides visual confirmation of motion during the first 30 minutes of service
- Extends equipment lifespan
- Applications include hospitality, education, office for rooftop terminal equipment

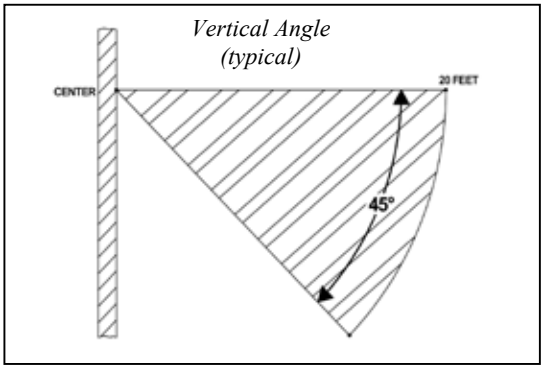
ENERGY SAVINGS OVER TIME



The COV-PIR can maximize your energy savings from 10-30% by relaxing temperature set points in unoccupied zones during scheduled periods.

PIR SENSOR ANGLE OF VISIBILITY





ORDERING INFORMATION

Field Upgrade Covers

MANUF. PART #	ORDERING #	DESCRIPTION
COV-PIR-FCU-C-5000	U012-0001	Retrofit cover for 5000 series base with connector, commercial interface
COV-PIR-FCU-L-5000	U012-0002	Retrofit cover for 5000 series base with connector, lodging interface
COV-PIR-HPUMP-5000	U012-0003	Retrofit cover for 5000 series base with connector, heat pump interface
COV-PIR-RTU-5000	U012-0004	Retrofit cover for 5000 series base with connector, roof top interface
COV-PIR-ZN-5000	U012-0005	Retrofit cover for 5000 series base with connector, zoning interface
COV-BC	U012-0006	Blank LCD cover

Communicating Thermostats: Floating Outputs, Zone Control

BACnet, Echelon, And Wireless Models Available

VT7200C5000

VT7200C5500

DESCRIPTION

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.

APPLICATIONS

- Heating/Cooling valves
- Electric duct heaters
- Changeover sensors

FEATURES

- Advanced occupancy functions through the network or smart local occupancy sensing
- 3 configurable inputs...adds functionality
- Pre-configured sequences of operation...one model meets more applications... reduces project delivery cost
- Unique local configuration utility...minimizes parameter tampering
- Lockable keypad...tamper proof, no need for thermostat guards
- Auxiliary output...can be used for lighting or reheating
- Available with various open industry standard communication adapters...adds network integration functionality for additional savings

SETPOINT DEVICES

SPECIFICATIONS

2 Year Warranty

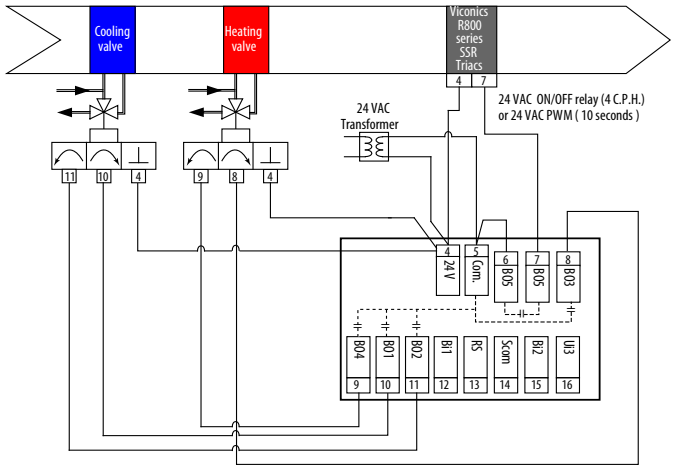
Thermostat Power Requirements	19-30VAC; 50 or 60 Hz; 2VA Class 2
Operating Conditions	0° to 50°C (32° to 122°F); 0 to 95% RH non-condensing
Storage Conditions	-30° to 50°C (-22° to 122°F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10 K NTC thermistor
Resolution	± 0.1°C (± 0.2°F)
Control Accuracy	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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

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 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

VERIS INDUSTRIES

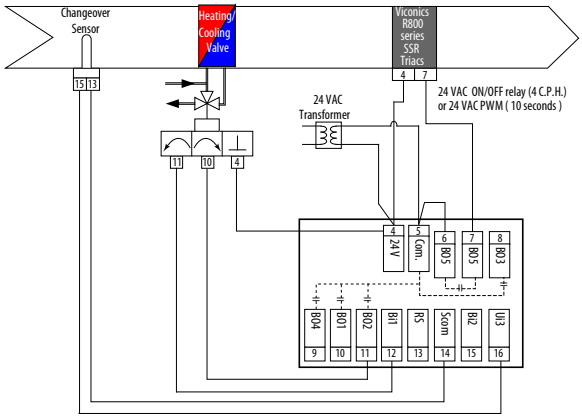
APPLICATION/WIRING EXAMPLES

Typical 4-Pipe Application



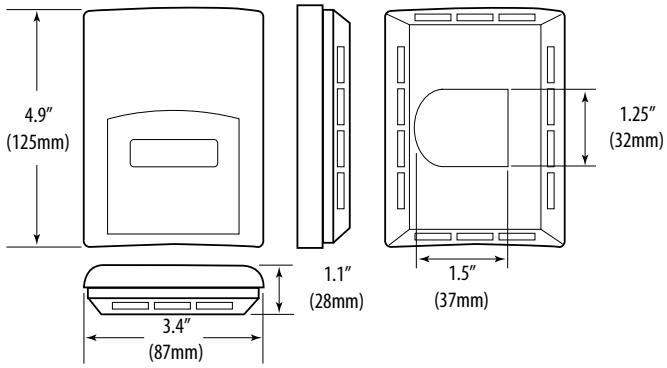
** Use for heating and cooling valves and electric duct heaters.*

Typical 2-Pipe Application



** Use for heating and cooling valves, electric duct heaters, and changeover sensors.*

DIMENSIONAL DRAWING



SETPOINT DEVICES

ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7200C5000	U008-0001	Zone Thermostat with 2 Floating + 1 Digital; PIR ready (PIR cover not included)	Stand alone
VT7200C5000B	U008-0002		BACnet (MS/TP)
VT7200C5000E	U008-0003		Echelon
VT7200C5000W	U008-0004		Wireless (Zigbee)
VT7200C5500	U008-0005	Zone Thermostat with 2 Floating + 1 Digital; PIR factory-equipped	Stand alone
VT7200C5500B	U008-0006		BACnet (MS/TP)
VT7200C5500E	U008-0007		Echelon
VT7200C5500W	U008-0008		Wireless (Zigbee)

Communicating Thermostats: Analog Outputs, Zone Control

BACnet, Echelon, And Wireless Models Available

VT7200F5000

VT7200F5500

DESCRIPTION

The **VT7200F5x00** 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 analog 0-10VDC outputs. Remote room sensing is also 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.

APPLICATIONS

- Heating/Cooling valves
- Electric duct heaters
- Changeover sensors

FEATURES

- Advanced occupancy functions through the network or smart local occupancy sensing
- 3 configurable inputs...adds functionality
- Pre-configured sequences of operation...one model meets more applications... reduces project delivery cost
- Unique local configuration utility...minimizes parameter tampering
- Lockable keypad...tamper proof, no need for thermostat guards
- Available for analog control...meet advanced applications requirements
- Auxiliary output...can be used for lighting or reheating
- Available with various open industry standard communication adapters...adds network integration functionality for additional savings

SETPOINT DEVICES

SPECIFICATIONS

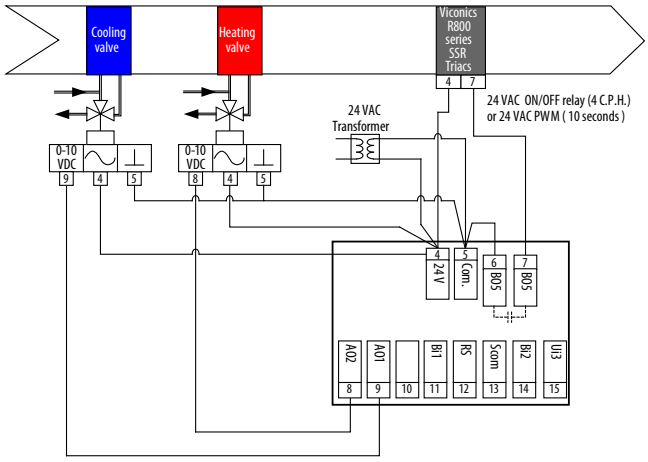
Thermostat Power Requirements	19-30VAC; 50 or 60 Hz; 2VA Class 2
Operating Conditions	0° to 50°C (32° to 122°F); 0 to 95% RH non-condensing
Storage Conditions	-30° to 50°C (-22° to 122°F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10 K NTC thermistor
Resolution	± 0.1°C (± 0.2°F)
Control Accuracy	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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

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 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

VERIS INDUSTRIES

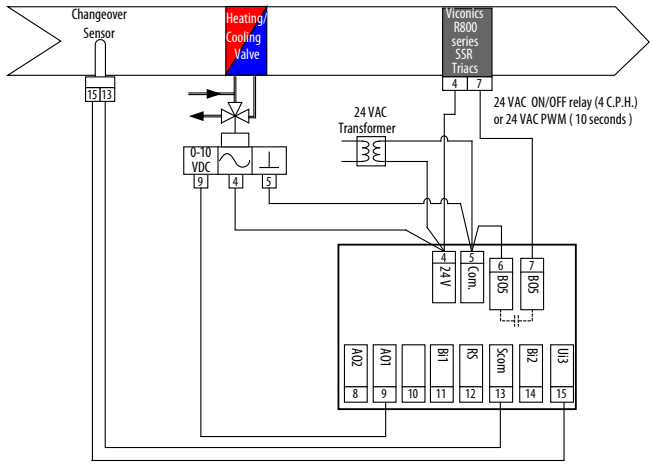
APPLICATION/WIRING EXAMPLES

Typical 4-Pipe Application



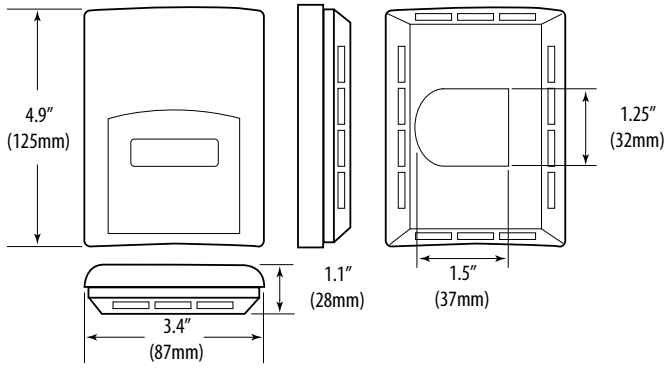
** Use for heating and cooling valves and electric duct heaters.*

Typical 2-Pipe Application



** Use for heating and cooling valves, electric duct heaters, and changeover sensors.*

DIMENSIONAL DRAWING



SETPOINT DEVICES

ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7200F5000	U008-0009	Zone Thermostat with 2 Analog + 1 Digital; PIR ready (PIR cover not included)	Stand alone
VT7200F5000B	U008-0010		BACnet (MS/TP)
VT7200F5000E	U008-0011		Echelon
VT7200F5000W	U008-0012		Wireless (Zigbee)
VT7200F5500	U008-0013	Zone Thermostat with 2 Analog + 1 Digital; PIR factory-equipped	Stand alone
VT7200F5500B	U008-0014		BACnet (MS/TP)
VT7200F5500E	U008-0015		Echelon
VT7200F5500W	U008-0016		Wireless (Zigbee)

Communicating Thermostats: Floating Outputs, Fancoil Control

BACnet, Echelon, & Wireless Models Available

VT7300A5000

VT7300A5500

DESCRIPTION

The **VT73xxC5x** 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.

APPLICATIONS

- Three-speed fans
- Heating/Cooling valves
- Electric duct heaters
- Changeover sensors

FEATURES

- Models available with internal humidity sensing...increased occupant comfort through dehumidification
- Advanced occupancy functions through the network or smart local occupancy sensing
- 3 configurable inputs...adds functionality
- Configurable sequences of operation...single model meets more applications
- Configurable fan functions button...meets more applications with a single model
- Unique local configuration utility...minimizes parameter tampering
- Multi-level lockable keypad...tamper proof, no need for thermostat guards
- Auto Fan speed mode...increased occupant comfort in cooling mode by reducing humidity and less fan noise in all modes of operation
- Auxiliary output...can be used for lighting or reheating

SETPOINT DEVICES

SPECIFICATIONS

2 Year Warranty

Thermostat Power Requirements	19-30VAC; 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 10 K NTC thermistor
Resolution	± 0.1°C (± 0.2°F)
Control Accuracy	Temp: ±0.5°C (±0.9°F) @ 21°C (70°F) typical, calibrated; Humidity: ±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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

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 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

VERIS INDUSTRIES

VERIS INDUSTRIES

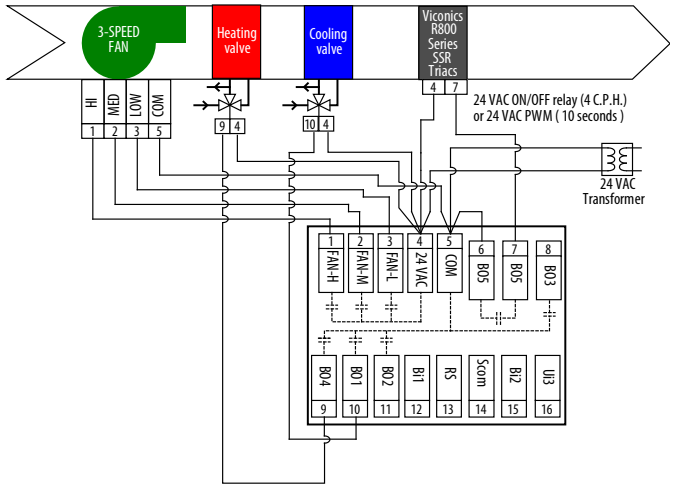
ORDERING INFORMATION

CE c UL us LISTED

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7300A5000	U009-0001	Fancoil Commercial 2 Digital + 1 Auxiliary; PIR Ready (PIR cover not included)	Stand alone
VT7300A5000B	U009-0002		BACnet (MS/TP)
VT7300A5000E	U009-0003		Echelon
VT7300A5000W	U009-0004		Wireless (Zigbee)
VT7300C5000	U009-0005	Fancoil Commercial 2 Floating + 1 Auxiliary; PIR Ready (PIR cover not included)	Stand alone
VT7300C5000B	U009-0006		BACnet (MS/TP)
VT7300C5000E	U009-0007		Echelon
VT7300C5000W	U009-0008		Wireless (Zigbee)
VT7305A5000	U009-0009	Fancoil Hotel 2 Digital + 1 Auxiliary; PIR Ready (PIR cover not included)	Stand alone
VT7305A5000B	U009-0010		BACnet (MS/TP)
VT7305A5000E	U009-0011		Echelon
VT7305A5000W	U009-0012		Wireless (Zigbee)
VT7305C5000	U009-0013	Fancoil Hotel 2 Floating + 1 Auxiliary; PIR Ready (PIR cover not included)	Stand alone
VT7305C5000B	U009-0014		BACnet (MS/TP)
VT7305C5000E	U009-0015		Echelon
VT7305C5000W	U009-0016		Wireless (Zigbee)
VT7350C5000	U009-0017	Fancoil Commercial 2 Floating + 1 Auxiliary + RH; PIR Ready (PIR cover not included)	Stand alone
VT7350C5000B	U009-0018		BACnet (MS/TP)
VT7350C5000E	U009-0019		Echelon
VT7350C5000W	U009-0020		Wireless (Zigbee)
VT7355C5000	U009-0021	Fancoil Hotel 2 Floating + 1 Auxiliary + RH; PIR Ready (PIR cover not included)	Stand alone
VT7355C5000B	U009-0022		BACnet (MS/TP)
VT7355C5000E	U009-0023		Echelon
VT7355C5000W	U009-0024		Wireless (Zigbee)
VT7300A5500	U009-0025	Fancoil Commercial 2 Digital + 1 Auxiliary; PIR factory equipped	Stand alone
VT7300A5500B	U009-0026		BACnet (MS/TP)
VT7300A5500E	U009-0027		Echelon
VT7300A5500W	U009-0028		Wireless (Zigbee)
VT7305A5500	U009-0029	Fancoil Hotel 2 Digital + 1 Auxiliary; PIR factory equipped	Stand alone
VT7305A5500B	U009-0030		BACnet (MS/TP)
VT7305A5500E	U009-0031		Echelon
VT7305A5500W	U009-0032		Wireless (Zigbee)
VT7300C5500	U009-0033	Fancoil Commercial 2 Floating + 1 Auxiliary; PIR factory equipped	Stand alone
VT7300C5500B	U009-0034		BACnet (MS/TP)
VT7300C5500E	U009-0035		Echelon
VT7300C5500W	U009-0036		Wireless (Zigbee)
VT7305C5500	U009-0037	Fancoil Hotel 2 Floating + 1 Auxiliary; PIR factory equipped	Stand alone
VT7305C5500B	U009-0038		BACnet (MS/TP)
VT7305C5500E	U009-0039		Echelon
VT7305C5500W	U009-0040		Wireless (Zigbee)
VT7350C5500	U009-0041	Fancoil Commercial 2 Floating + 1 Auxiliary + RH; PIR factory equipped	Stand alone
VT7350C5500B	U009-0042		BACnet (MS/TP)
VT7350C5500E	U009-0043		Echelon
VT7350C5500W	U009-0044		Wireless (Zigbee)
VT7355C5500	U009-0045	Fancoil Hotel 2 Floating + 1 Auxiliary + RH; PIR factory equipped	Stand alone
VT7355C5500B	U009-0046		BACnet (MS/TP)
VT7355C5500E	U009-0047		Echelon
VT7355C5500W	U009-0048		Wireless (Zigbee)

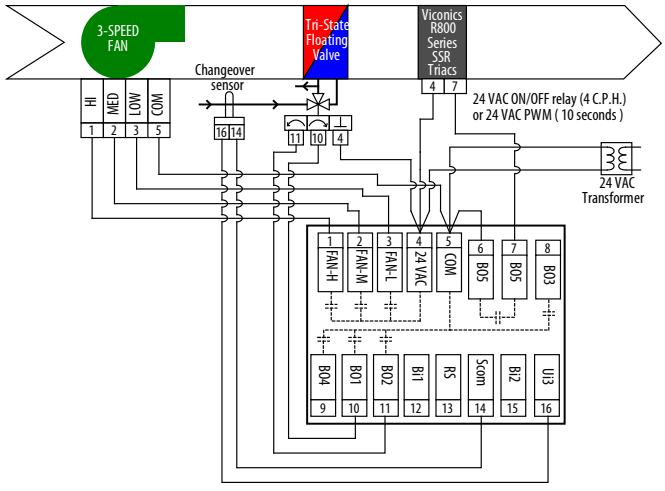
APPLICATION/WIRING EXAMPLES

Typical 4-Pipe Application, On/Off Outputs



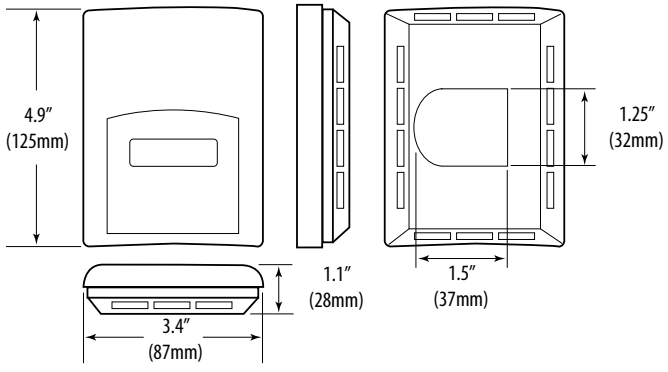
** Use for heating and cooling valves, 3-speed fans, and electric duct heaters.*

Typical 2-Pipe Application, Floating Outputs



** Use for heating and cooling valves, 3-speed fans, and electric duct heaters.*

DIMENSIONAL DRAWING



SETPOINT DEVICES

Communicating Thermostats: Analog Outputs, Fancoil Control

BACnet, Echelon, & Wireless Models Available

VT7300F5000

VT7300F5500

DESCRIPTION

The **VT73xxF5x** 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.

APPLICATIONS

- Heating/Cooling valves
- Three-speed fans
- Electric duct heaters
- Changeover sensors

FEATURES

- Models available with internal humidity sensing...increased occupant comfort through dehumidification
- Advanced occupancy functions through the network or smart local occupancy sensing
- 3 configurable inputs...adds functionality
- Configurable sequences of operation...single model meets more applications
- Configurable fan functions button...meets more applications with a single model
- Unique local configuration utility...minimizes parameter tampering
- Multi-level lockable keypad...tamper proof, no need for thermostat guards
- Auto Fan speed mode...increased occupant comfort in cooling mode by reducing humidity and less fan noise in all modes of operation
- Auxiliary output...can be used for lighting or reheating

SETPOINT DEVICES

SPECIFICATIONS

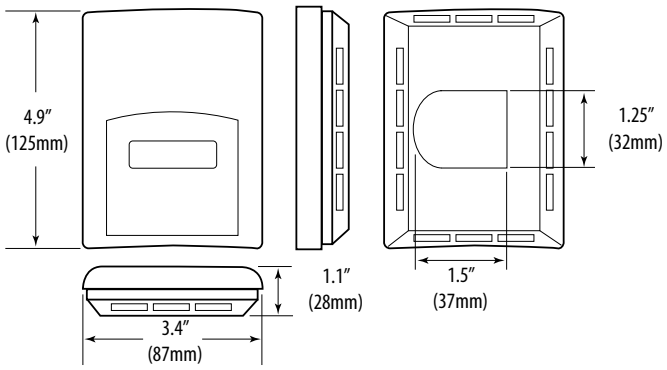
2 Year Warranty

Thermostat Power Requirements	19-30VAC; 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 10 K NTC thermistor
Resolution	± 0.1°C (± 0.2°F)
Control Accuracy	Temp: ±0.5°C (±0.9°F) @ 21°C (70°F) typical, calibrated; Humidity: ±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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

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 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

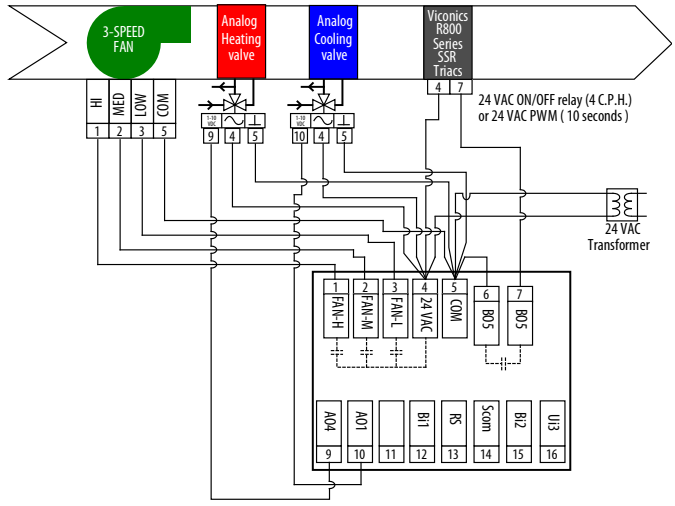
VERIS INDUSTRIES

DIMENSIONAL DRAWING



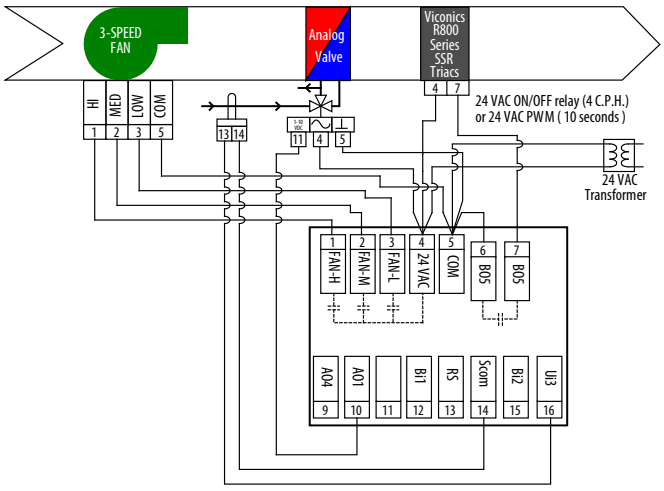
APPLICATION/WIRING EXAMPLES

Typical 4-Pipe Application



** Use for heating and cooling valves, 3-speed fans, and electric duct heaters.*

Typical 2-Pipe Application



** Use for heating and cooling valves, 3-speed fans, electric duct heaters, and changeover sensors.*

ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7300F5000	U009-0049	Fancoil Commercial 2 Analog + 1 Auxiliary; PIR Ready (PIR cover not included)	Stand alone
VT7300F5000B	U009-0050		BACnet (MS/TP)
VT7300F5000E	U009-0051		Echelon
VT7300F5000W	U009-0052		Wireless (Zigbee)
VT7305F5000	U009-0053	Fancoil Hotel 2 Analog + 1 Auxiliary; PIR Ready (PIR cover not included)	Stand alone
VT7305F5000B	U009-0054		BACnet (MS/TP)
VT7305F5000E	U009-0055		Echelon
VT7305F5000W	U009-0056		Wireless (Zigbee)
VT7350F5000	U009-0057	Fancoil Commercial 2 Analog + 1 Auxiliary + RH; PIR Ready (PIR cover not included)	Stand alone
VT7350F5000B	U009-0058		BACnet (MS/TP)
VT7350F5000E	U009-0059		Echelon
VT7350F5000W	U009-0060		Wireless (Zigbee)
VT7355F5000	U009-0061	Fancoil Hotel 2 Analog + 1 Auxiliary + RH; PIR Ready (PIR cover not included)	Stand alone
VT7355F5000B	U009-0062		BACnet (MS/TP)
VT7355F5000E	U009-0063		Echelon
VT7355F5000W	U009-0064		Wireless (Zigbee)
VT7300F5500	U009-0065	Fancoil Commercial 2 Analog + 1 Auxiliary; PIR factory equipped	Stand alone
VT7300F5500B	U009-0066		BACnet (MS/TP)
VT7300F5500E	U009-0067		Echelon
VT7300F5500W	U009-0068		Wireless (Zigbee)
VT7305F5500	U009-0069	Fancoil Hotel 2 Analog + 1 Auxiliary; PIR factory equipped	Stand alone
VT7305F5500B	U009-0070		BACnet (MS/TP)
VT7305F5500E	U009-0071		Echelon
VT7305F5500W	U009-0072		Wireless (Zigbee)
VT7350F5500	U009-0073	Fancoil Commercial 2 Analog + 1 Auxiliary + RH; PIR factory equipped	Stand alone
VT7350F5500B	U009-0074		BACnet (MS/TP)
VT7350F5500E	U009-0075		Echelon
VT7350F5500W	U009-0076		Wireless (Zigbee)
VT7355F5500	U009-0077	Fancoil Hotel 2 Analog + 1 Auxiliary + RH; PIR factory equipped	Stand alone
VT7355F5500B	U009-0078		BACnet (MS/TP)
VT7355F5500E	U009-0079		Echelon
VT7355F5500W	U009-0080		Wireless (Zigbee)

Communicating Thermostats: Rooftop Control

BACnet, Echelon, & Wireless Models Available

VT7600A5000

DESCRIPTION

The **VT76xxA and VT76xxB 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.

APPLICATIONS

- Single speed fans
- Supply air temperature sensor
- Outdoor air temperature sensor
- Differential pressure switch

FEATURES

- PI time proportioning algorithm...increased comfort, accuracy, and energy savings
- 2 digital inputs...adds functionality
- Smart fan...saves energy during night mode
- Unique local configuration utility...minimizes parameter tampering
- Lockable keypad...tamper proof, no need for thermostat guards
- Freeze protection...prevents costly freeze damage
- EEPROM memory...no loss of program
- 6 hour reserve time for clock...no need to reprogram day or time after power outage
- Remote room and outdoor temperature sensor...increased flexibility and functionality
- Auxiliary output...can be used for lighting and/or economizer override
- Discharge air sensor...can be used to monitor unit efficiency
- Intuitive, menu-driven programming...can be used for all types of establishments

SETPOINT DEVICES

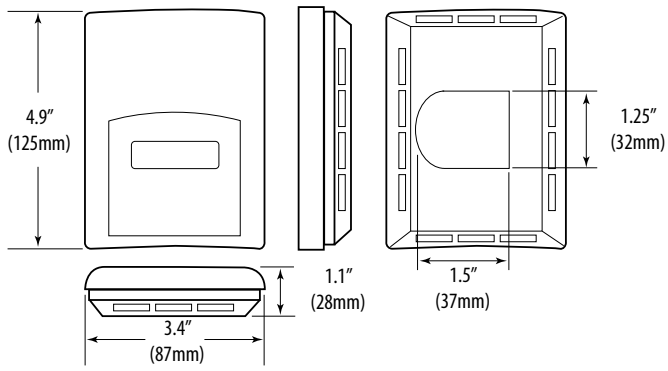
SPECIFICATIONS

2 Year Warranty

Thermostat Power Requirements	19-30VAC; 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 10 K 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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

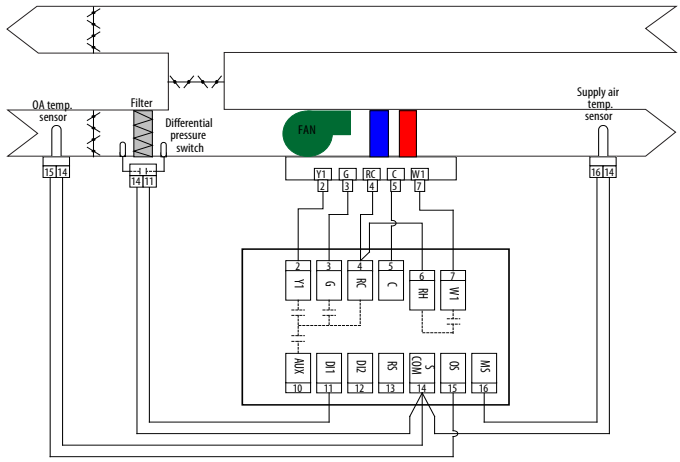
UL: 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN , XAPX (US) and XAPX7 (Canada)
FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)
Industry Canada: ICES-003 (Canada)
CE: EMC Directive 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

DIMENSIONAL DRAWING



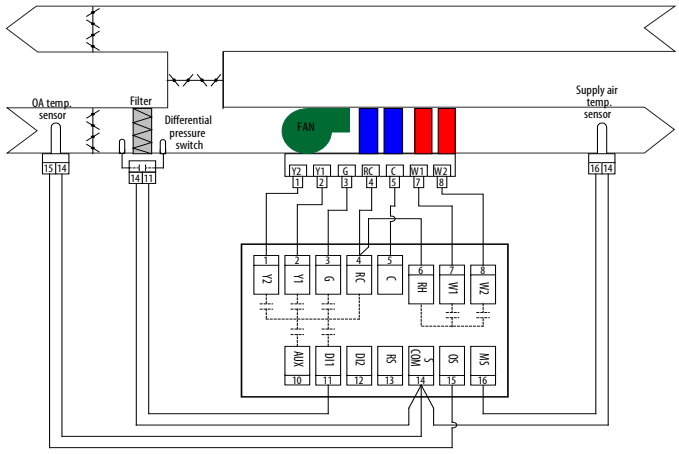
APPLICATION/WIRING EXAMPLES

Typical 1H/1C Application



** Use for single speed fans, supply air temperature sensors, outdoor air temperature sensors, and differential pressure switches.*

Typical 2H/2C Application



** Use for single speed fans, supply air temperature sensors, outdoor air temperature sensors, and differential pressure switches.*

ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7600A5000	U010-0001	1H/1C thermostat, non-programmable; PIR Ready (PIR cover not included)	Stand alone
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)	Stand alone
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)	Stand alone
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)	Stand alone
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	Stand alone
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	Stand alone
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	Stand alone
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	Stand alone
VT7652B5500B	U010-0030		BACnet (MS/TP)
VT7652B5500E	U010-0031		Echelon
VT7652B5500W	U010-0032		Wireless (Zigbee)

Communicating Thermostats: Rooftop Control, Economizer Function

BACnet, Echelon, & Wireless Models Available

VT7605B5000

DESCRIPTION

The **VT7605B and VT7656B Series** PI thermostat family provides multi-stage control of heating/cooling equipment, including rooftop and self-contained units with proportional damper economizer actuators. 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 SPST auxiliary switch, which can be used to control lighting or disable the economizer function and a discharge air sensor input. All devices are available with Echelon, BACnet, or wireless adapters.

APPLICATIONS

- Single speed fans
- Economizer damper
- Supply air temperature sensor
- Outdoor air temperature sensor
- Differential pressure switch

FEATURES

- PI time proportioning algorithm...increased comfort, accuracy, and energy savings
- 2 digital inputs...adds functionality
- Smart fan...saves energy during night mode
- Unique local configuration utility...minimizes parameter tampering
- Lockable keypad...tamper proof, no need for thermostat guards
- Freeze protection...prevents costly freeze damage
- EEPROM memory...no loss of program
- 6 hour reserve time for clock...no need to reprogram day or time after power outage
- Remote room and outdoor temperature sensor...increased flexibility and functionality
- Auxiliary output...can be used for lighting and/or economizer override
- Discharge air sensor...can be used to monitor unit efficiency
- Economizer output (0-10VDC)...excellent retrofit opportunities

SPECIFICATIONS

2 Year Warranty

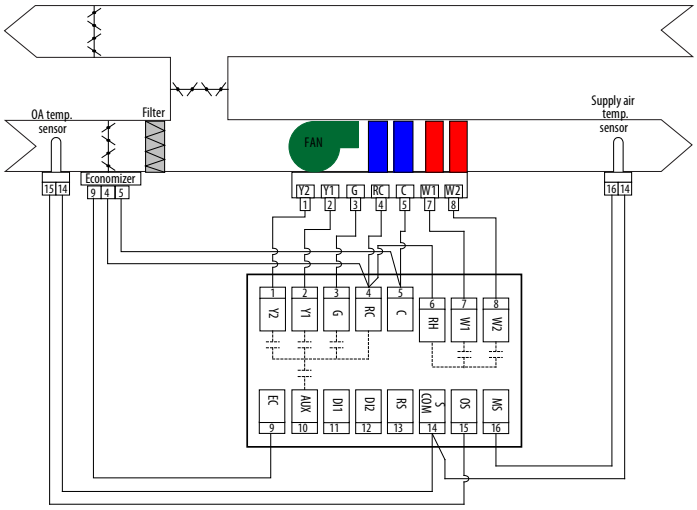
Thermostat Power Requirements	19-30VAC; 50 or 60 Hz; 2 VA Class 2
Operating Conditions	0° to 50°C (32° to 122°F); 0 to 95% RH non-condensing
Storage Conditions	-30° to 50°C (-22° to 122°F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10 K NTC thermistor
Resolution	± 0.1°C (± 0.2°F)
Control Accuracy	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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

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 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

VERIS INDUSTRIES

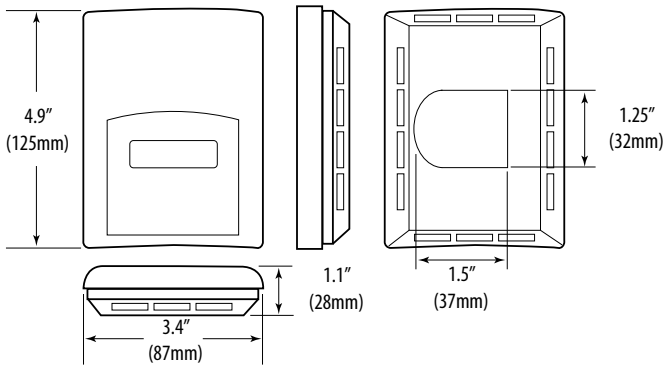
APPLICATION/WIRING EXAMPLE

Typical 1H/1C Application



** Use for single speed fans, economizer dampers, supply air temperature sensors, outdoor air temperature sensors, and differential pressure switches.*

DIMENSIONAL DRAWING



ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7605B5000	U010-0049	2H/2C + economizer thermostat, non-programmable; PIR Ready (PIR cover not included)	Stand alone
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)	Stand alone
VT7656B5000B	U010-0054		BACnet (MS/TP)
VT7656B5000E	U010-0055		Echelon
VT7656B5000W	U010-0056		Wireless (Zigbee)
VT7605B5500	U010-0057	2H/2C + economizer thermostat, non-programmable; PIR factory equipped	Stand alone
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	Stand alone
VT7656B5500B	U010-0062		BACnet (MS/TP)
VT7656B5500E	U010-0063		Echelon
VT7656B5500W	U010-0064		Wireless (Zigbee)

Communicating Thermostats: Rooftop Control, Humidistat Function

BACnet, Echelon, & Wireless Models Available

VT7607B5000

DESCRIPTION

The **VT76x7** PI thermostat family offers single stage and multi-stage control of heating/cooling equipment as well as a humidifier and/or dehumidifier. The product features an embedded complete humidity solution with an intuitive, menu-driven, backlit LCD display that walks users through the programming steps, making the process extremely simple. All models contain one user-controlled digital input to monitor filter status, change the occupancy status, and/or provide general purpose service indication. All models contain an SPST auxiliary switch, which can be used to control lighting, and a discharge air sensor input. All devices are available with Echelon, BACnet, or wireless adapters.

APPLICATIONS

- Single speed fans
- Humidifiers
- Supply air temperature sensor
- Outdoor air temperature sensor
- Differential pressure switch

FEATURES

- Embedded humidification sequence (0-10VDC output) and dehumidification sequence (dry contact)...simplifies installation and reduces installation costs
- Proportional high limit override...prevents costly damage due to over-humidification
- Humidity setpoint reset based on outdoor temperature...saves energy and prevents window condensation in colder climates
- Sensor failure protection...prevents water damage
- PI time proportioning algorithm...increased comfort, accuracy, and energy savings
- Smart fan...saves energy during night mode
- Unique local configuration utility...minimizes parameter tampering
- Lockable keypad...tamper proof, no need for thermostat guards
- Freeze protection...prevents costly freeze damage
- EEPROM memory...no loss of program
- 6 hour reserve time for clock...no need to reprogram day or time after power outage

SETPOINT DEVICES

SPECIFICATIONS

2 Year Warranty

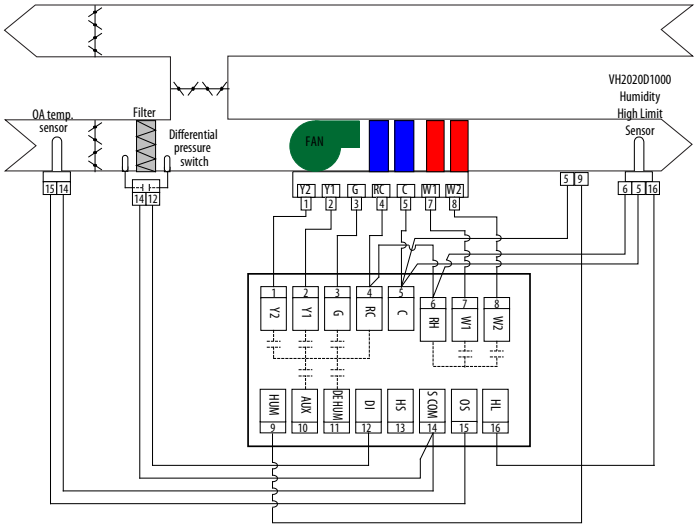
Thermostat Power Requirements	19-30VAC; 50 or 60 Hz; 2 VA Class 2
Operating Conditions	0° to 50°C (32° to 122°F); 0 to 95% RH non-condensing
Storage Conditions	-30° to 50°C (-22° to 122°F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10 K NTC thermistor
Resolution	± 0.1°C (± 0.2°F)
Control Accuracy	Temp: ±0.5°C (±0.9°F) @ 21°C (70°F) typical, calibrated; Humidity: ±3% RH from 0 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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

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 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

VERIS INDUSTRIES

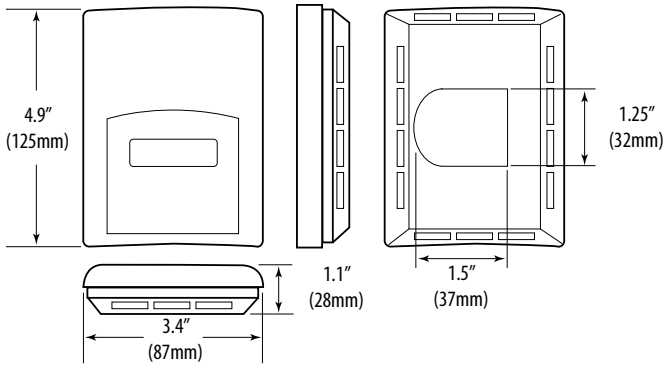
APPLICATION/WIRING EXAMPLE

Typical 2H/2C Application with Humidity Control



** Use for single speed fans, humidifiers, supply air temperature sensors, outdoor air temperature sensors, and differential pressure switches.*

DIMENSIONAL DRAWING



ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7607B5000	U010-0033	2H/2C + humidity, non-programmable; PIR Ready (PIR cover not included)	Stand alone
VT7607B5000B	U010-0034		BACnet (MS/TP)
VT7607B5000E	U010-0035		Echelon
VT7607B5000W	U010-0036		Wireless (Zigbee)
VT7657B5000	U010-0037	2H/2C + humidity, programmable; PIR Ready (PIR cover not included)	Stand alone
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	Stand alone
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	Stand alone
VT7657B5500B	U010-0046		BACnet (MS/TP)
VT7657B5500E	U010-0047		Echelon
VT7657B5500W	U010-0048		Wireless (Zigbee)

Communicating Thermostats: Heat Pump Control

BACnet, Echelon, & Wireless Models Available

VT7600H5000

DESCRIPTION

The **VT7600H** PI thermostat family is designed for multi-stage control of heating/cooling equipment such as heat pumps and self-contained units. The product features an intuitive, menu-driven, back-lit LCD display which walks users through the programming steps, making the process 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 include up to three remote sensor inputs. All devices are available with Echelon, BACnet, or wireless adapters.

APPLICATIONS

- Single speed fans
- Supply air temperature sensor
- Outdoor air temperature sensor
- Differential pressure switch

FEATURES

- PI time proportioning algorithm...increased comfort, accuracy, and energy savings
- Smart fan...saves energy during night mode
- Unique local configuration utility...minimizes parameter tampering
- Lockable keypad...tamper proof, no need for thermostat guards
- Freeze protection...prevents costly freeze damage
- EEPROM memory...no loss of program
- 6 hour reserve time for clock...no need to reprogram day or time after power outage
- Auxiliary output...can be used for lighting and/or economizer override
- Discharge air sensor...can be used to monitor unit efficiency
- Low/High balance point...protect and optimize system performance
- 3 Heat/2 Cool...support single and two stages heat pump with one auxiliary heat stage

SPECIFICATIONS

2 Year Warranty

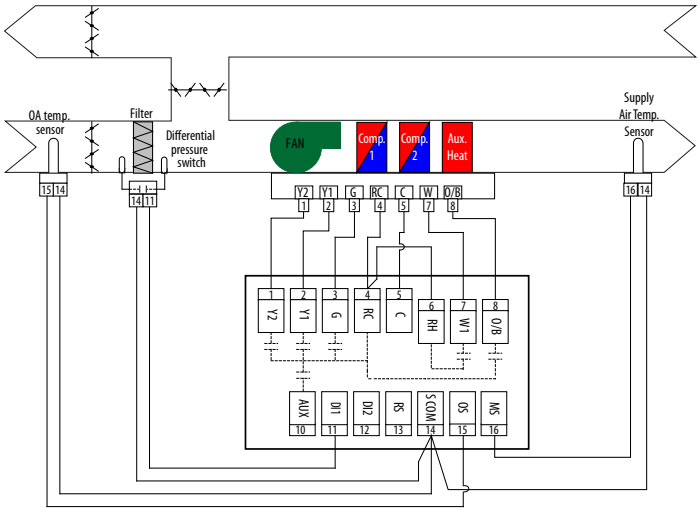
Thermostat Power Requirements	19-30VAC; 50 or 60 Hz; 2 VA Class 2
Operating Conditions	0° to 50°C (32° to 122°F); 0 to 95% RH non-condensing
Storage Conditions	-30° to 50°C (-22° to 122°F); 0 to 95% RH non-condensing
Temperature Sensor	Local 10 K NTC thermistor
Resolution	± 0.1°C (± 0.2°F)
Control Accuracy	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: 30VAC, 1A max., 3A in-rush; Analog: 0 to 10VDC into 2kΩ resistance min.
Economizer Analog Output Rating	0 to 10VDC into 2kΩ 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)

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 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

VERIS INDUSTRIES

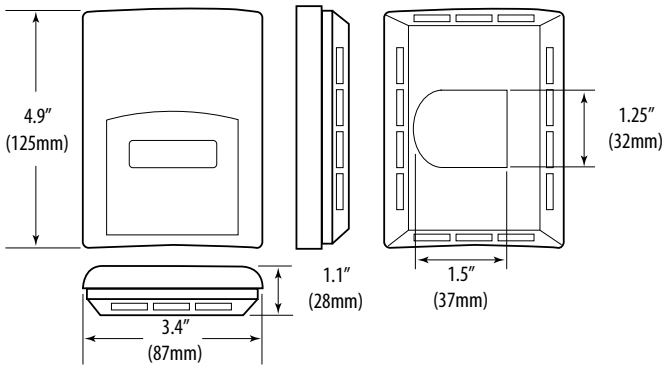
APPLICATION/WIRING EXAMPLE

Typical 3H/2C Heat Pump



** Use for single speed fans, supply air temperature sensors, outdoor air temperature sensors, and differential pressure switches.*

DIMENSIONAL DRAWING



ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VT7600H5000	U010-0065	3H/2C heat pump thermostat, non-programmable; PIR Ready (PIR cover not included)	Stand alone
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)	Stand alone
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	Stand alone
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	Stand alone
VT7652H5500B	U010-0078		BACnet (MS/TP)
VT7652H5500E	U010-0079		Echelon
VT7652H5500W	U010-0080		Wireless (Zigbee)

Communicating Humidistat Series

BACnet, Echelon, & Wireless Models Available

VH7200A1000

DESCRIPTION

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.

APPLICATIONS

- Humidifier
- Dehumidifier/air exchanger
- Humidity high limit sensor
- Outdoor air temperature sensor
- Airflow switch

FEATURES

- PI time proportioning algorithm...increased comfort, accuracy, and energy savings
- Binary input...adds functionality
- Unique local configuration utility...minimizes parameter tampering
- Lockable keypad...tamper proof, no need for thermostat guards
- EEPROM memory...no loss of program
- Optional remote humidity sensors...increased flexibility and functionality
- Embedded humidification sequence (0-10VDC output) and dehumidification sequence (dry contact)...simplifies installation and reduces costs
- Internal RH sensor embedded...eliminates components
- Proportional high limit override (VH7270 models only)...prevents costly damage due to over-humidification
- Humidity setpoint reset based on outdoor temperature (VH7270 models only)... saves energy and prevents window condensation in colder climates
- Sensor failure protection...prevents water damage

SPECIFICATIONS

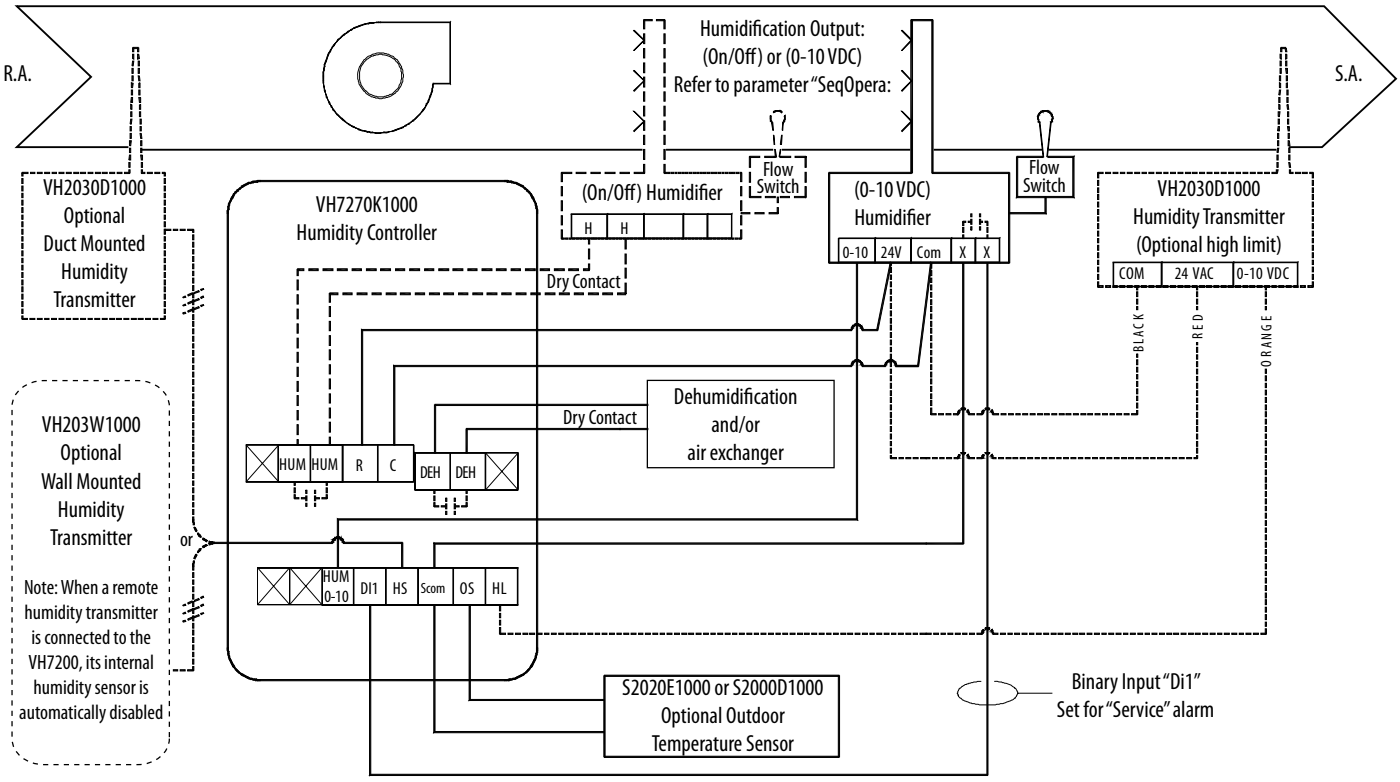
2 Year Warranty

Humidistat Power Requirements	19-30VAC; 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: ±0.1°C (±0.2°F); Humidity: ±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 Temperature Range	-40° to 50°C (-40° to 122°F)
Binary Inputs	Relay dry contact only across Scom and DI1 terminals
Contact Output Rating	Each relay output: 30VAC, 1A max.; 30VAC, 3A in-rush
Analog Output Rating	0-10VDC into 2kΩ resistance min.
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)

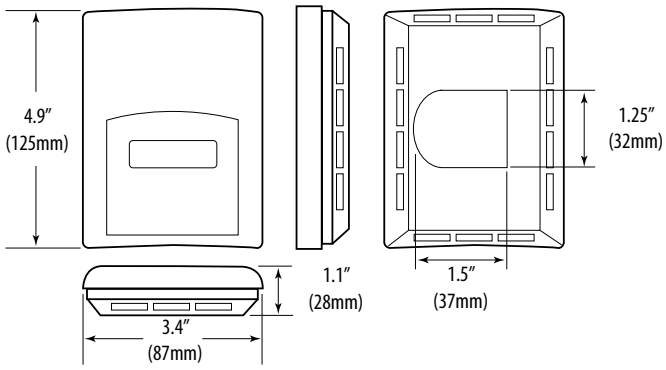
UL: 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN , XAPX (US) and XAPX7 (Canada)
FCC: Compliant to CFR 47, Part 15, Subpart B, Class A (US)
Industry Canada: ICES-003 (Canada)
CE: EMC Directive 89/336/EEC (European Union)
C-Tick: AS/NZS CISPR 22 Compliant (Australia / New Zealand); Supplier Code Number N10696

VERIS INDUSTRIES

APPLICATION/WIRING EXAMPLE



DIMENSIONAL DRAWING



ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION	COMM.
VH7200A1000	U007-0001	On/Off Hum.; On/Off Dehum.; Outdoor Reset	Stand alone
VH7200A1000B	U007-0002		BACnet (MS/TP)
VH7200A1000W	U007-0004		Wireless (Zigbee)
VH7270F1000	U007-0005	0-10V Hum.; On/ Off Dehum.; Prop HL, Outdoor Reset	Stand alone
VH7270F1000B	U007-0006		BACnet (MS/TP)
VH7270F1000E	U007-0007		Echelon
VH7270F1000W	U007-0008		Wireless (Zigbee)
VH7270K1000	U007-0009	0-10V Hum.; On/Off Hum.; On/Off Dehum.; Prop HL; Outdoor Reset	Stand alone
VH7270K1000B	U007-0010		BACnet (MS/TP)
VH7270K1000E	U007-0011		Echelon
VH7270K1000W	U007-0012		Wireless (Zigbee)

Communicating Humidistat/ Thermostat Wireless Gateway

VWG-40

DESCRIPTION

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-40-XX-1000, when used in conjunction with the VT7xxxXxxxxW Series wireless thermostats, offers simple BACnet IP, BACnet MS/TP Objects, or Lontalk SNVT interface to integrate over standard building automation systems using familiar integration toolsets. Up to 40 thermostats are supported by a single gateway.

FEATURES

- Supports up to 40 thermostats per gateway...satisfies most project requirements
- BACnet/Lon models available...integrates to a wide variety of industry automation systems
- Auto-discovery of network nodes...simple setup and operation...reduces installation costs
- Wireless network interface...eliminates need for communication wiring
- Thermostat operates separately from network connection...fully redundant automation with minimal downtime
- Uses existing equipment wiring to power thermostat...no batteries to service

SETPOINT DEVICES

SPECIFICATIONS

2 Year Warranty

Platform	PowerPC 405EP 250 MHz processor, 64MB SDRAM and 64MB serial flash, 128kB 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: VWG-PS-DC 24VAC to 15VDC panel mounted ; VWG with cord: VWG-PS-AC 120VAC to 15VDC
Chassis Construction	Plastic, DIN rail or screw mounted; Cooling: internal air convection

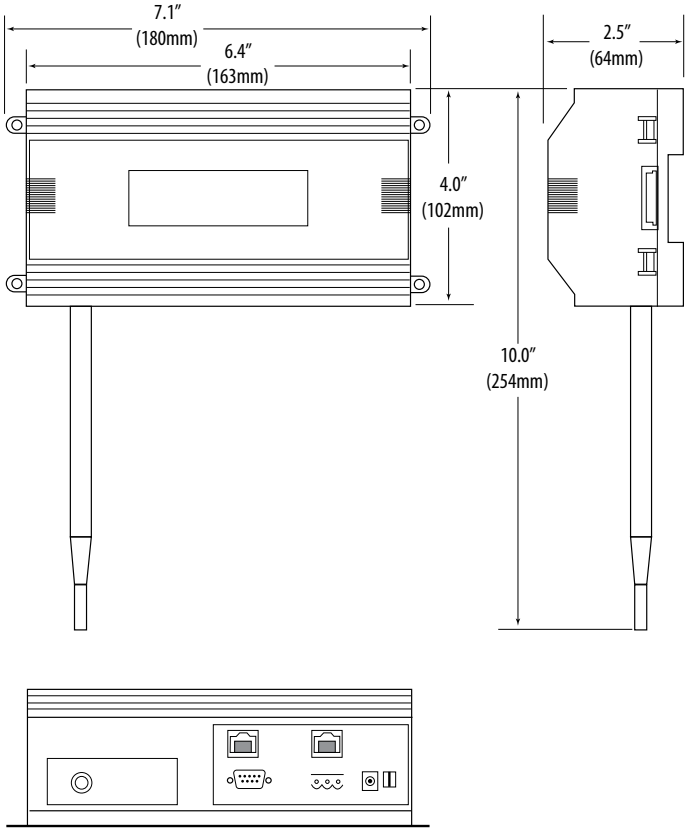
Environment:

Operating Temperature Range	0° to 50°C (32° to 122°F)
Storage Temperature Range	0° to 60°C (32° to 140°F)
Relative Humidity Range	5 to 95% non-condensing

UL: UL 916, C-UL listed to Canadian Standards Association
CSA: C22.2 No. 205-M1983 "Signal Equipment"
CE: FCC part 15 Class A
C-Tick: (Australia)

VERIS INDUSTRIES

DIMENSIONAL DRAWING



ORDERING INFORMATION

MANUF. PART #	ORDERING #	DESCRIPTION
VWG-40-IP-1000	U011-0001	Wireless Gateway - BACnet IP interface
VWG-40-MSTP-1000	U011-0002	Wireless Gateway - BACnet MS/TP interface
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	Wireless Gateway - 24VAC to 15VDC European plug mount adapter power supply (purchased separately)
VWG-PSNA-AC120-1000	U011-0008	Wireless Gateway - 120VAC to 15VDC North American plug mount adapter power supply (purchased separately)
VWG-BB-1000	U011-0009	Wireless Gateway - Replacement battery for backup (supplied with gateway)

Wall Mount Humidity Transmitter Thermostat Humidistat Functions

Independent RH, Temp, and Analog Setpoint Outputs

HT

DESCRIPTION

All **HT/HWS Series** institutional grade relative humidity/temperature 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 programing 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 4-20mA or 0-5V/0-10VDC 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.

APPLICATIONS

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

FEATURES

- Independent RH and T (HT relay) or analog setpoint outputs (HT analog) provide application flexibility
- LCD for local display of readings and setup values
- Offset function adjusts calibration intervals for both RH and T (HT models)
- Switch-selectable 4-20mA or 0-10V/0-5VDC analog outputs
- Multi-point calibration to 1% RH, traceable to NIST
- Replaceable RH sensor element supports field calibration offset...saves time
- Semiconductor temperature sensor can be field calibrated

SETPOINT DEVICES

SPECIFICATIONS

5 Year Warranty

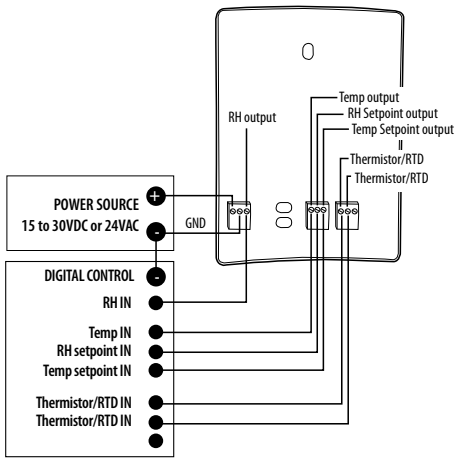
Input Power	15 to 30VDC/24VAC, 100mA max.
Outputs, Analog	Switch-selectable 4-20mA, or 0-10V/0-5VDC (switch affects both outputs)
Outputs, Relay (Relay models only)	2 Form C (SPDT), 1A 30VDC, resistive, 30W max.
HS Element	Digitally profiled thin-film capacitive (32-bit mathematics) U.S. Patent 5,844,138†
Accuracy at 25°C from 10-80% RH* (Multi-point calibration NIST traceable)	±2%, 3%, or 5% models ; ±1% at 20-50% RH on HTA models ±1% at 12-40% RH on HTR models in mA output mode; ±1% at 30% RH on HTR models in voltage output mode
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	0-100% 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)
Scaling	RH: 0-100%; 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: 10-80% in 1% increments; Temp: minimum to full scale in 1°F increments

† The HS sensing element has a 1-year warranty. The element is not a part of the 5-year product warranty.
** Specified accuracy with 24VDC 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 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.

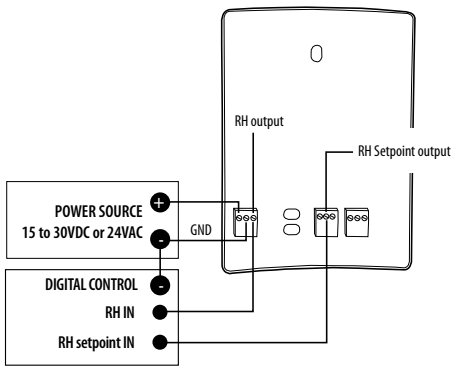
VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAMS

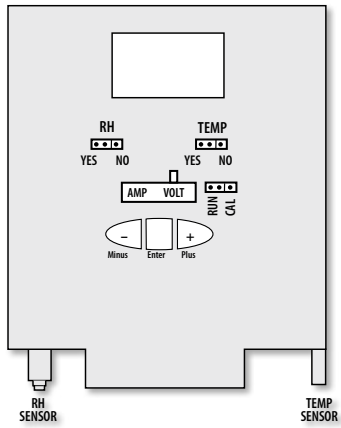
HT Analog Option



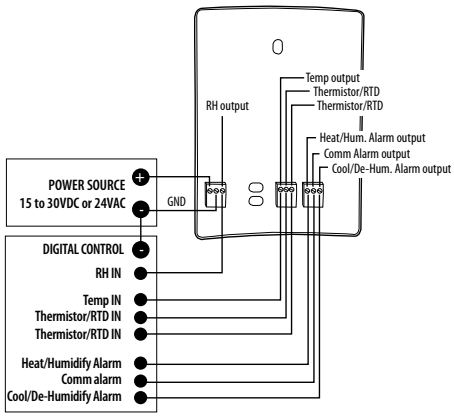
HWS Analog Option



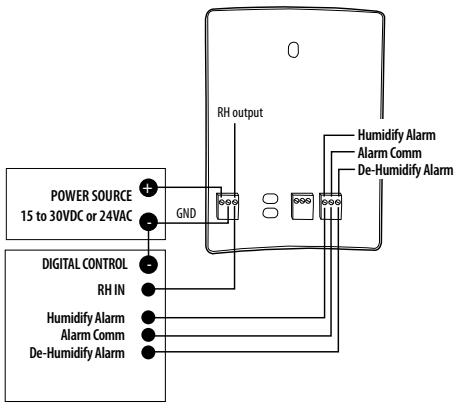
CONFIGURATION



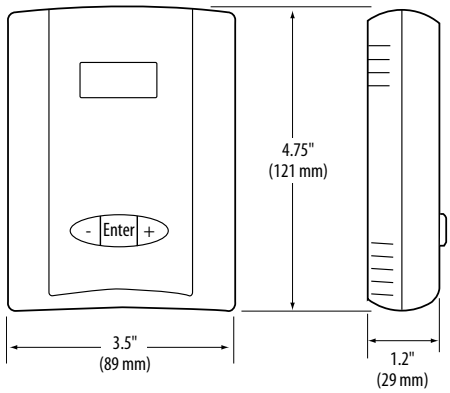
HT Relay Option



HWS Relay Option



DIMENSIONAL DRAWING



ORDERING INFORMATION

CE

RH/T Combination Device

	Accuracy	NIST	Setpoint		Temp Cal Certificate	Option
HT				S		
	1 = 1%	**N** = NIST (1 & 2% only)	**A** = Analog	= CE	**0** = None	**B** = 100R Platinum, RTD
	2 = 2%	**X** = No (2, 3, 5% only)	**R** = Relay		**1** = 1 point Cal Cert	**C** = 1k Platinum, RTD
	3 = 3%				**2** = 2 point Cal Cert	**D** = 10k T2, Thermistor
	5 = 5%					**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
						Z = 10k E1, Thermistor

Example:

HT | 2 | N | R | S | 1 | H

HT Series devices contain both humidity and temperature transmitter outputs. Optional RTDs and thermistors are available.

RH Only Device

	Accuracy	NIST	Setpoint		
HWS				S	
	1 = 1%	**N** = NIST (1 & 2% only)	**A** = Analog	= CE	
	2 = 2%	**X** = No (2, 3, 5% only)	**R** = Relay		
	3 = 3%				
	5 = 5%				

Example:

HWS | 2 | N | R | S

ACCESSORIES

Replacement humidity element (HS)
Replacement cover (AA53)
Replacement housing (AA55)

HS

AA53

AA55

SETPOINT DEVICES

Wall Mount Temperature Transmitter with Thermostat Functions

Independent Heat/Cool Or Analog Setpoint Outputs

TWS

DESCRIPTION

All **TWS Series** institutional grade temperature transmitters are field-programmable and are 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 prevented 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 4-20mA or 0-5/0-10VDC (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.

APPLICATIONS

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

FEATURES

- Independent heat/cool (TWS relay) or analog setpoint outputs (TWS analog) provide application flexibility
- LCD for local display of readings and setup values...easy visibility under any lighting conditions
- Offset function adjusts calibration offsets for temperature
- Switch selectable 4-20mA or 0-5/0-10VDC analog outputs
- Semiconductor temperature sensor can be field calibrated

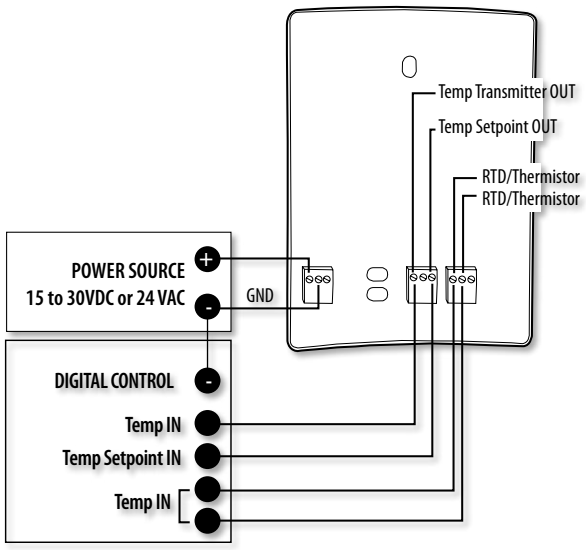
SPECIFICATIONS

5 Year Warranty

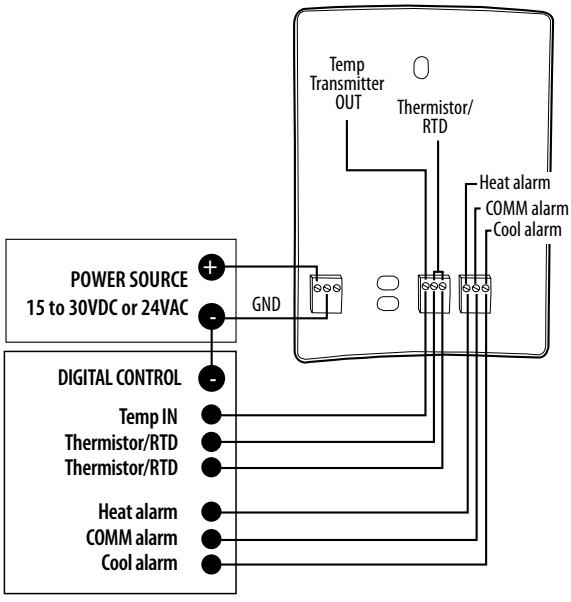
Input Power	15-30VDC/24VAC, 100mA max.
Outputs, Analog	Switch-selectable 4-20mA (clipped and capped)/0-10V/0-5VDC (switch affects all outputs)
Outputs, Relay (Relay models only)	2 Form C (SPDT), 1A 30VDC, resistive, 30W max.
Temperature:	
Accuracy	±0.5°C (±1°F)
Scaling	10° to 35°C (50° to 95°F) or 0° 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
Physical	UL 94-V-0 fire retardant ABS

APPLICATION/WIRING DIAGRAMS

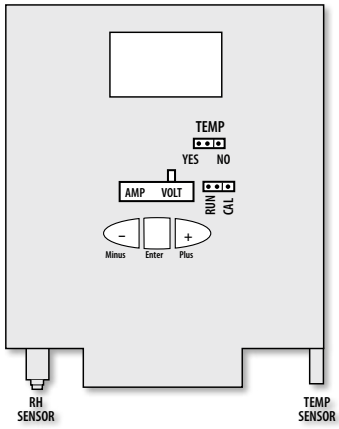
Analog Models



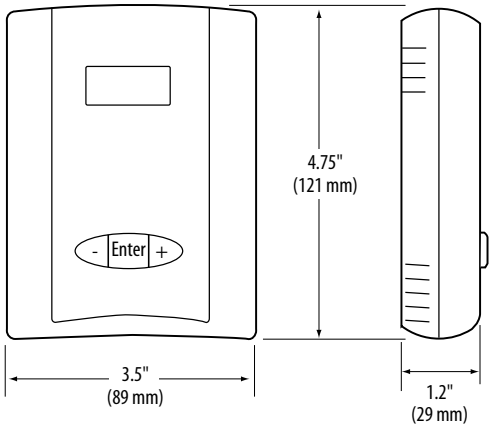
Relay Models



CONFIGURATION



DIMENSIONAL DRAWING



ORDERING INFORMATION

CE

	Setpoint		Cal Certificate	Option
TWS	[ ]	[S]	[ ]	[ ]
	A = Analog **R** = Relay	= 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 **Z** = 10k E1, Thermistor

Example:

TWS [R] [S] [1] [C]

TWS models include standard temperature transmitter outputs. Optional RTDs and thermistors are available as shown for TWSA models.

ACCESSORIES

Replacement cover (AA53)
Replacement housing (AA55)

AA53

AA55

SETPOINT DEVICES

Temperature Contents

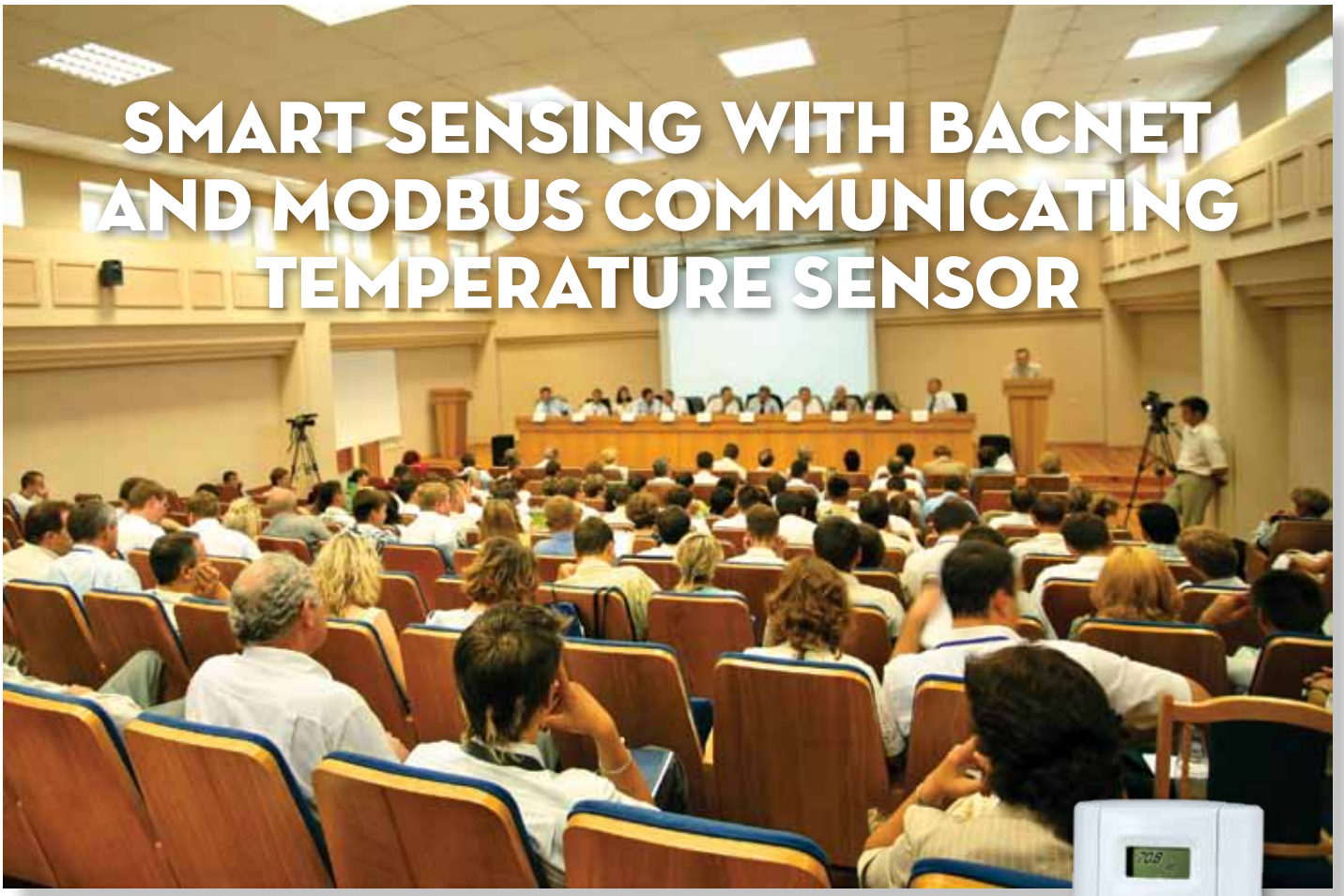
Veris offers a wide range of temperature sensing products for commercial building applications. Control and maintain a comfortable environment with our thermistor, RTD, and transmitter devices. We offer an array of mounting options for installation flexibility, including duct, wall, ceiling, pendant, 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	294
TO/TOA	Outdoor Temperature Sensors	296
TWLP	Wall Mount Temperature Sensors, Protocol Communication	298
TW/TE/TEA	Wall Mount Temperature Sensors	300
TP	Flush Mount Temperature Sensors	302
TC/TS	Ceiling and Recessed Mount Temperature Sensors	304
TI	Immersion Temperature Sensors	306
TA/TB/TRA/TAR	Specialty Temperature Sensors	308
TJ	VAV Discharge Temperature Sensors	310
Accessories		324

Temperature Sensor Selection Guide

FEATURES/ OPTIONS	Wall Mount	Duct Mount	Ceiling Mount	Outdoor Mount	Flush Mount	Remote	Strap-On	Immersion	VAV
Analog Transmitter Output	TEA page 300	TDDA page 294							
Resistive Output	TE page 300	TD/TF/TG/TK page 294	TC/TS page 304	TO page 296	TP page 302	TRA page 308	TB page 308	TI page 306	TJ page 310
Protocol Communication	TWLP page 298								
LCD Display	TWLP, TW pages 298, 300								
Averaging Sensor		TA/TAR page 308							

SMART SENSING WITH BACNET AND MODBUS COMMUNICATING TEMPERATURE SENSOR



TW Protocol

The TW Protocol is a wall mount temperature sensor that features embedded BACnet and Modbus communication. The setpoint slider and pushbutton override offer additional local input.

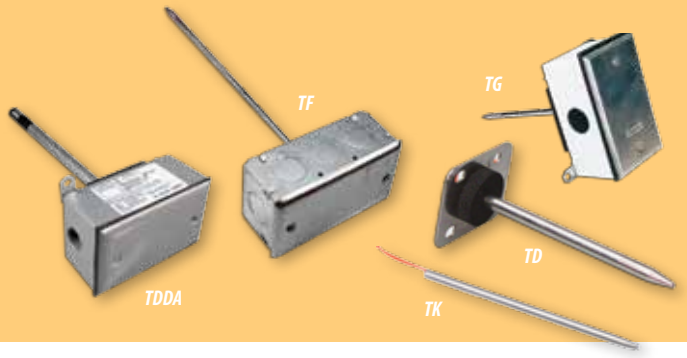
- Embedded BACnet and Modbus communication protocols...provide ease of integration
- Configurable to multiple baud rates...ensures network compatibility
- Network configuration eliminates the costs of home run wiring and analog inputs required by traditional sensors
- Setpoint and override activation represented in protocol eliminating costly wiring

Applications

- Ideal solution for integration into office buildings, schools, or other systems utilizing BACnet or Modbus controls

Duct Mount Temperature Sensors

Sensor Housed In Probe, Protects Against Corrosion



DESCRIPTION

Veris' duct mount temperature sensors are pre-calibrated and housed in sturdy stainless steel probes. The devices are easy to install, durable, and highly accurate.

FEATURES

- Cost-effective, high accuracy thermistors or RTDs available with or without a junction box
- No calibration required
- Stainless steel probe

Class	Pt RTD		THERMISTOR											
Type	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k	20k "D"	100k	10k Type 2	10k Type 3
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading 10 - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		B	C	E	F	D	H	J	S	R	M	U	T	W	Y

SPECIFICATIONS

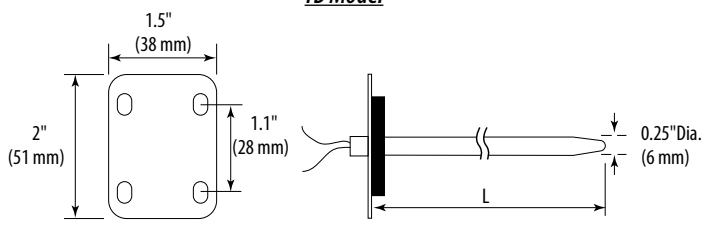
5 Year Warranty

Wiring	22 AWG; 2-wire: RTD Thermistor, 4-20mA; 3-wire: Voltage output models
Transmitter:	
Input Power	4-20mA models: Loop powered 12-30VDC only, 30mA max; 0-5/0-10V models: 12-30VDC/24VAC, 15mA max
Temp Output	2-wire, loop powered 4-20mA or 3-wire, 0-5V/0-10VDC
Sensor Type	Solid-state, integrated circuit (Transmitter)
Accuracy	±0.5°C (±1°F) typical
Ranges	0° to 50°C (32° to 122°F), -40° to 50°C (-40° to 122°F)
Linitemp:	
Input Power	5 to 30VDC
Output	1µA/°C or 10mV/°C
Operating Temperature	-25° to 105°C (-13° to 221°F)
Resistive:	
RTD/Thermistor	See table above
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)
Error 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

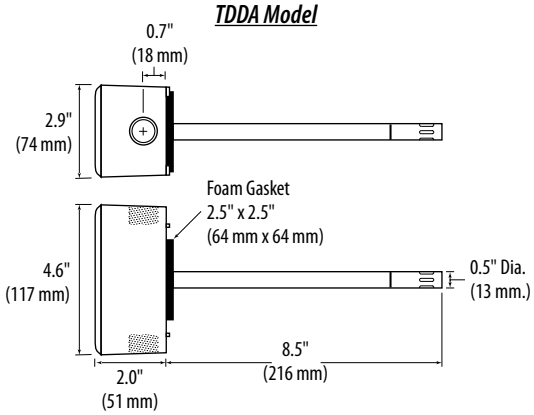
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

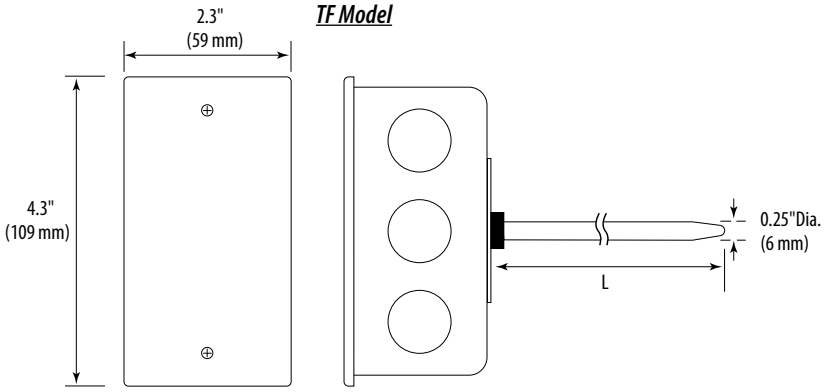
TD Model



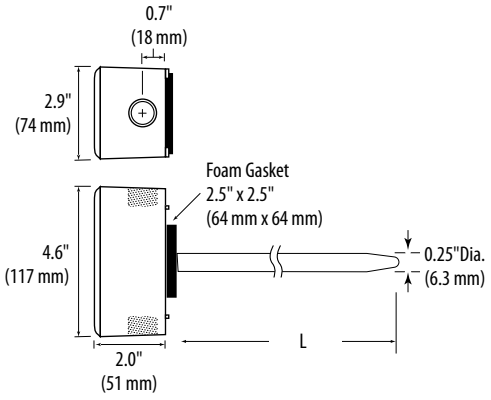
TDDA Model



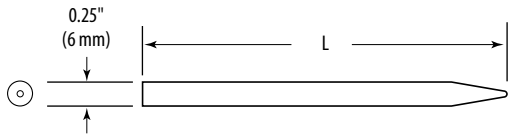
TF Model



TG Model



TK Model



ORDERING INFORMATION

CE

RTD/Thermistor Models

Enclosure

T ☐

- **D** = Duct
- **F** = Duct w/ mounting box
- **G** = Duct w/water resistant housing
- **K** = Probe only (no mounting hardware)

Immersion Probe Length "L"

- **B** = 4" (102mm)*
- **C** = 6" (152mm)
- **D** = 8" (203mm)
- **E** = 12" (305mm)**
- **F** = 18" (457mm)**
- **G** = 24" (610mm)**
- **K** = 36" (914mm)**

Sensor Type

- **B** = 100R Platinum, RTD
- **C** = 1k Platinum, RTD
- **D** = 10k T2, Thermistor
- **E** = 2.2k, Thermistor
- **F** = 3k, Thermistor
- **G** = 10k CPC, Thermistor
- **H** = 10k T3, Thermistor
- **J** = 10k Dale, Thermistor
- **K** = 10k w/11k shunt, Thermistor
- **M** = 20k NTC, Thermistor
- **N** = 1800 ohm, Thermistor
- **P** = 10mV/C, Linitemp
- **R** = 10K US, Thermistor
- **S** = 10k 3A 221B, Thermistor
- **T** = 100k, Thermistor
- **U** = 20k "D", Thermistor
- **W** = 10k T2 high accuracy, Thermistor
- **Y** = 10k T3 high accuracy, Thermistor
- **Z** = 10k E1, Thermistor

Output

RØ = Resistive out

Cal Certificate

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

Example:

T	D	B	D	RØ	2

** TK model is 4 1/2" (115 mm)*
*** Not available with TK model*

Transmitter Models

Output

TDDA ☐

- **M** = 4-20mA
- **V** = 5/10V

Range

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

Cal Certificate

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

Example:

TDDA	V	2	0

ACCESSORIES

Klipet mounting clip for TK probe (AA64)

AA64

TEMPERATURE

Outdoor Temperature Sensors

Sleek Design, Prevents Solar Heating

DESCRIPTION

The **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 prevent solar heating. Choose from a variety of RTD, thermistor, or transmitter outputs to suit any application.

FEATURES

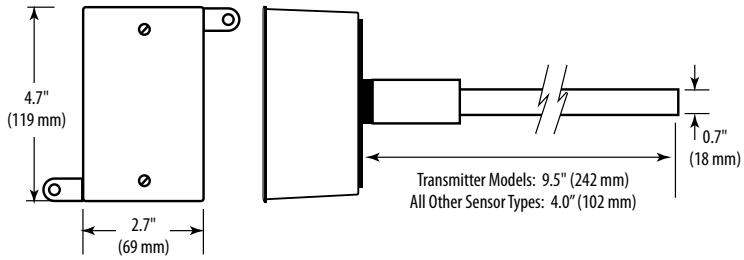
- Sleek design prevents solar heating...reliable and accurate
- Available with transmitter, linitemp, RTDs, or thermistors

SPECIFICATIONS

5 Year Warranty

Wiring	22 AWG; 2-wire: RTD/Thermistor, 4-20mA; 3-wire: Voltage output models
Junction Box	Weatherproof
Transmitter:	
Input Power	4-20mA version - Loop powered 12-30VDC only, 30mA max; 0-5/0-10V versions - 12-30VDC/24VAC, 15mA max
Temp Output	2-wire, loop powered 4-20mA; 3-wire, 0-5V/0-10VDC
Sensor Type	Solid-state, integrated circuit (Transmitter)
Accuracy	±0.5°C (±1°F) typical
Ranges	0° to 50°C (32° to 122°F), -40° to 50°C (-40° to 122°F)
Linitemp:	
Input Power	5 to 30VDC
Output	1µA/°C or 10mV/°C
Operating Temperature	-25° to 105°C (-13° to 221°F)
Resistive:	
RTD/Thermistor	See table, facing page
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)
Error 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

DIMENSIONAL DRAWING



Class	Pt RTD		THERMISTOR										
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

ORDERING INFORMATION

CE

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
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
Z = 10k E1, Thermistor

Output

[RØ]

= Resistive Output

Cal Certificate

[ ]

0 = None
1 = 1 point Cal validation
2 = 2 point Cal validation

Example:

TO [C] [RØ] [2]

NOTE: For 4-20mA transmitter output, order any TO with the 100Ω platinum RTD and accessory AA10xx.

Temperature Transmitter Models

Output

TOA [ ]

M = 4-20mA
V = 0-5/0-10VDC

Range

[ ]

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

Cal Certificate

[ ]

0 = None
1 = 1 point Cal validation
2 = 2 point Cal validation

Example:

TOA [M] [1] [0]

Deluxe Wall Temperature Sensor, Protocol Communication

Modbus and BACnet Protocol Communication

DESCRIPTION

TWLP Series features embedded BACnet and Modbus communication protocols and temperature sensing capability. The setpoint slider and pushbutton override offer additional local input.

APPLICATIONS

- Temperature control in office buildings and schools with systems utilizing BACnet or Modbus protocol

FEATURES

- Embedded BACnet and Modbus communication protocols...provides ease of integration
- Configurable to multiple baud rates...ensures network compatibility
- Network configuration eliminates the costs of home run wiring and analog inputs required by traditional sensors
- Setpoint and override activation represented in protocol...eliminates costly wiring and inputs

TEMPERATURE

SPECIFICATIONS

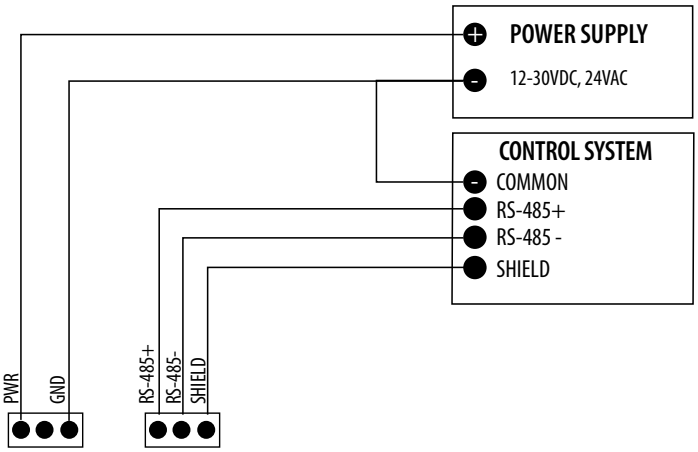
5 Year Warranty

Input Voltage	12 to 30VDC, 24VAC; 100mA max.
Operating Temperature Range	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	1-127
Temperature Transmitter:	
Sensor Type	Solid-state, integrated circuit
Accuracy	±0.5°C (±1°F) typical
Resolution	0.1°C (0.2°F)
Range	10° to 35°C (50° to 95°F)
Setpoint Slider Resolution (Optional)	1% full scale
Override Button (Optional)	Remotely readable and resettable

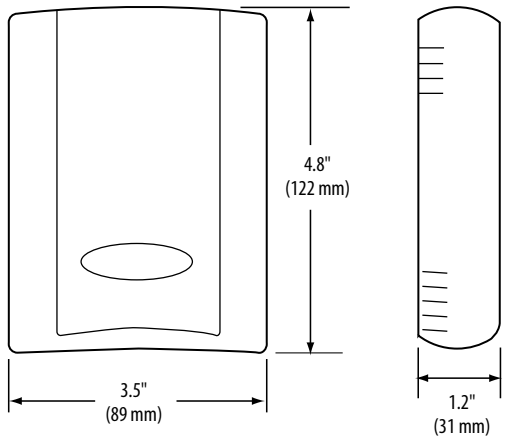
EMC Conformance: Low voltage directive 2006/95/EC and EMC directive 2004/108/EC.
EMC Special Note: Connect this product to a DC distribution network or an AC/DC power adaptor with proper SURGE PROTECTION (EN 61000-6-1:2007 specification requirements)

VERIS INDUSTRIES

APPLICATION/WIRING DIAGRAM



DIMENSIONAL DRAWING



TEMPERATURE

ORDERING INFORMATION

CE

Local Display	Protocol			Temp. Cal. Cert.	Option	Housing
TW [ ]	[P]	[X]	[X]	[ ]	[ ]	[ ]
L = LCD X = No display	= Protocol			**X** = No **1** = 1 pt. cal. cert. **2** = 2 pt. cal. cert. **3** = 3 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] [ ]

ACCESSORIES

Handheld air quality testers (1010, 1008, 571C1, 597C1)
Replacement covers for wall units (AA51, AA51B, AA52, AA52B)
Replacement cloud white wall housing (AA55)

575C1 *1008* *1010* *597C1*

AA55 *AA51/AA51B* *AA52/AA52B*

Wall Mount Temperature Sensors

Wall Mount Temperature Sensors

DESCRIPTION

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.

Class	Pt RTD		THERMISTOR											
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

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

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

SPECIFICATIONS (TE)

5 Year Warranty

Wiring	22 AWG; 2-wire: RTD Thermistor, 4-20mA; 3-wire: Voltage output models
Housing	Black or white ABS plastic

Linitemp:

Input Power	5 to 30VDC
Output	1µA/°C or 10mV/°C
Operating Temperature	-25° to 105°C (-13° to 221°F)

Accuracy:

Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)*
Error 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

**Room temperature error documented on each unit.*

SPECIFICATIONS (TW/TEA)

Input Power:

TW Model:	12 to 24VAC/DC nominal, 30VDC maximum, 30mA maximum
TEA Model:	4-20mA mode; loop powered 24VDC only; 0-10V, 3-wire, observe polarity; 12-30DC; 0-5V, 3-wire, observe polarity; 24VAC, 12-30DC
Analog Output (TEA 4-20 mA model)	2-wire, polarity insensitive (clipped and capped)
Temp Output (TW Model)	2-wire, loop powered 4-20mA or 3-wire, 0-5V/0-10VDC
Sensor Type	Solid-state, integrated circuit (transmitter)
Accuracy	±0.5°C (±1°F) typical

Ranges:

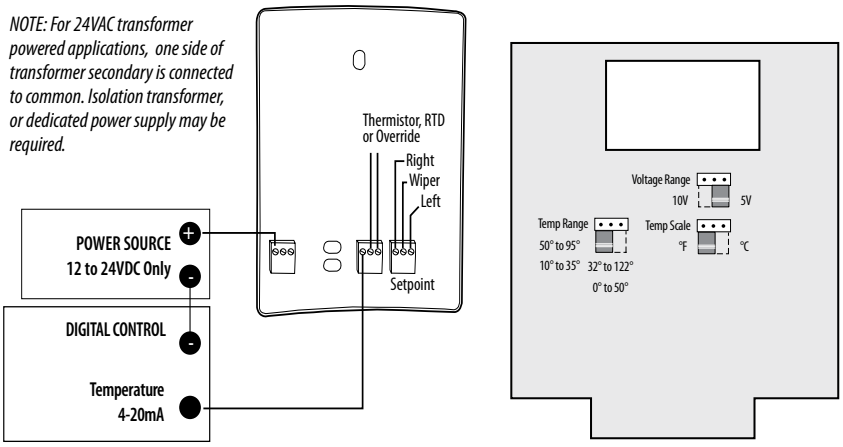
TW Model:	10° to 35°C (50° to 95°F)/0° to 50°C (32° to 122°F) jumper-selectable
TEA Model:	10° to 35°C (50° to 95°F)

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

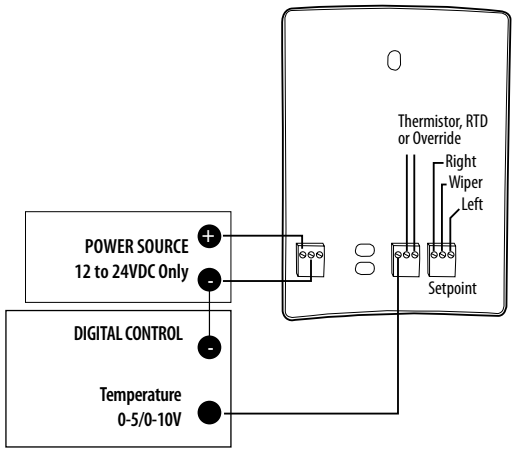
APPLICATION/WIRING DIAGRAMS

TW Series – 4-20mA

NOTE: For 24VAC transformer powered applications, one side of transformer secondary is connected to common. Isolation transformer, or dedicated power supply may be required.

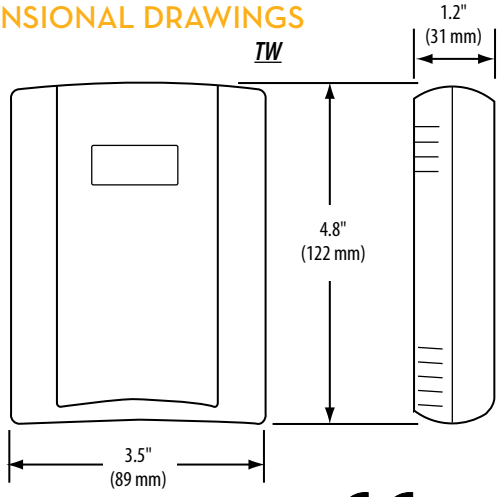


TW Series – 0-5/0-10V

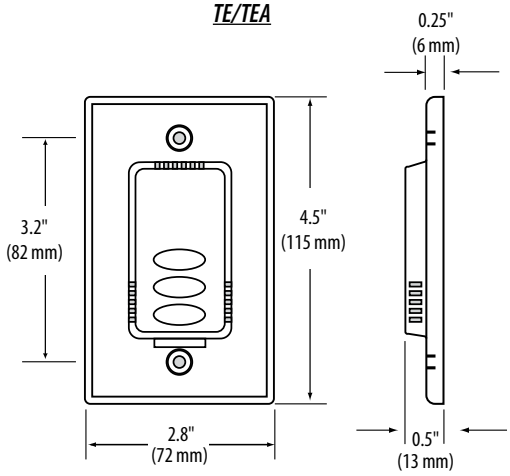


DIMENSIONAL DRAWINGS

TW



TE/TEA



ORDERING INFORMATION

CE

TW

Local Display	Sensor Type	Setpoint/Override	Cal Certificate	Housing Color
TW [ ]	[A]	[ ]	[ ]	[ ]
L = LCD **X** = No	= Transmitter selectable outputs	**0** = None **2** = 1k Setpoint **3** = 10k Setpoint **4** = 1k Setpoint w/override **5** = 10k Setpoint w/override	**0** = None **1** = 1 point Cal validation **2** = 2 point Cal validation	**None** = Cloud White **B** = Black

Example: TW [X] [A] [0] [2]

Local Display	Sensor Type	Setpoint/Override	Cal Certificate	Housing Color
TW [ ]	[ ]	[ ]	[ ]	[ ]
L = LCD **X** = No	**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 **Z** = 10k E1, Thermistor	**0** = None **1** = Override* **2** = 1k Setpoint **3** = 10k Setpoint **4** = 1k Setpoint w/override* **5** = 10k Setpoint w/override*	**0** = None **1** = 1 point Cal validation **2** = 2 point Cal validation	**None** = Cloud White **B** = Black

**NOTE: Pushbutton override short circuits RTD/thermistor output*

Example: TW [L] [C] [0] [1]

TEA

Output	US or EU	Housing Color
TEA [ ]	[S]	[ ]
M = 4-20mA **V** = 0-10VDC **J** = 0-5VDC	= Standard	**None** = Cloud White **B** = Black

Example: TEA [J] [S]

TE

Sensor Type	Setpoint/Override	Cal Certificate	Housing Color
TE [ ]	[ ]	[ ]	[ ]
B = 100R Platinum, RTD **C** = 1k Platinum, RTD **D** = 10k T2, Thermistor **E** = 2.2k, Thermistor **F** = 3k, Thermistor **G** = 10k CPC, Thermistor **H** = 10k T3, Thermistor **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 **Z** = 10k E1, Thermistor	**0** = None **1** = Override **2** = 1k Setpoint **3** = 10k Setpoint **4** = 1k Setpoint w/override **5** = 10k Setpoint w/override	**0** = None **1** = 1 point Cal validation **2** = 2 point Cal validation	**None** = Cloud White **B** = Black

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

ACCESSORIES

Replacement covers for wall units (AA51, AA51B, AA52, AA52B)

Replacement cloud white wall housing (AA55)

TEMPERATURE

Flush Mount Temperature Sensors

Durable Device for Temperature Monitoring

DESCRIPTION

TP 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 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.

FEATURES

- Wiring is potted...resistant to moisture
- Stainless steel construction...durable
- Mounts to standard duplex wall mount box...easy installation
- Easy to clean
- Available with linitemp, RTD, or thermistors...application flexibility

TEMPERATURE

SPECIFICATIONS

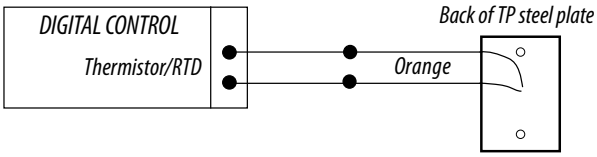
5 Year Warranty

Wiring	22 AWG; 2-wire: RTD Thermistor, 4-20mA; 3-wire: Voltage output models
Housing	Brushed 430 stainless steel
Linitemp:	
Input Power	5 to 30VDC
Output	1µA/°C or 10mV/°C
Operating Temperature	-25° to 105°C (-13° to 221°F)
Resistive:	
RTD/Thermistor	See table, facing page
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)*
Error 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

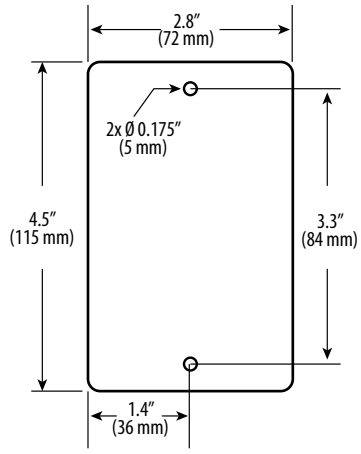
**Room temperature error documented on each unit.*

VERIS INDUSTRIES

WIRING DIAGRAM



DIMENSIONAL DRAWING



Class	Pt RTD		THERMISTOR										
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
														High Accuracy

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

ORDERING INFORMATION

Sensor Type

TP [ ]

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
Z = 10k E1, Thermistor

Cal Certificate

[ ]

0 = None
1 = 1 point Cal validation
2 = 2 point Cal validation

Example:

TP [W] [5] [1]

TEMPERATURE

Ceiling & Recessed Mount Temperature Sensors

Low Profile Housing With A Variety Of RTD And Thermistor Options

DESCRIPTION

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 setting. These sensors are highly accurate, reliable, and come with an extended five-year warranty. Choose from a variety of RTD or thermistor sensor types to suit any need.

FEATURES

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

TEMPERATURE

SPECIFICATIONS

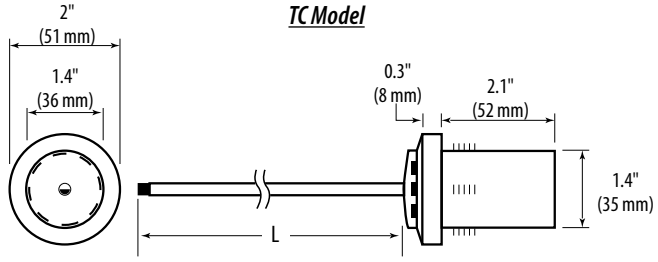
5 Year Warranty

Wiring	22 AWG; 2-wire: RTD Thermistor, 4-20mA; 3-wire: Voltage output models
Housing	White ABS Plastic (Black available for TS only)
Linitemp:	
Input Power	5 to 30VDC
Output	1µA/°C or 10mV/°C
Operating Temperature	-25° to 105°C (-13° to 221°F)
Resistive:	
RTD/Thermistor	See table, facing page
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)
Error 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

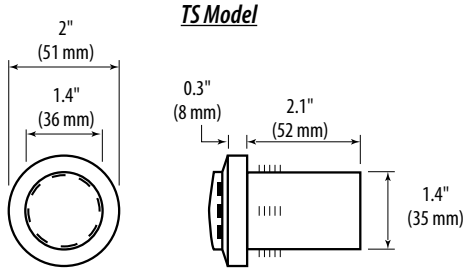
VERIS INDUSTRIES™

DIMENSIONAL DRAWINGS

TC Model



TS Model



Class	Pt RTD		THERMISTOR										
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

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

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

ORDERING INFORMATION

Probe Length

TC [ ]

- **B** = 4" (102mm)
- **C** = 6" (152mm)
- **D** = 8" (203mm)
- **E** = 12" (305mm)
- **F** = 18" (457mm)
- **G** = 24" (610mm)

Sensor Type

[ ]

- **B** = 100R platinum, RTD
- **C** = 1k platinum, 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 3A 221, Thermistor
- **T** = 100k, Thermistor
- **U** = 20k "D", Thermistor
- **W** = 10k T2 high accuracy, Thermistor
- **Y** = 10k T3 high accuracy, Thermistor
- **Z** = 10k E1, Thermistor

Cal Certificate

[ ]

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

Example:

TC [D] [D] [2]

NOTE: For 4-20mA transmitter output, order sensor with the 100 Ω platinum RTD and accessory AA10xx.

Sensor Type

TS [ ]

- **B** = 100R platinum, RTD
- **C** = 1k platinum, RTD
- **D** = 10k T2, Thermistor
- **E** = 2.2k, Thermistor
- **F** = 3k, Thermistor
- **G** = 10k CPC, Thermistor
- **H** = 10k T3, Thermistor
- **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 3A 221, Thermistor
- **T** = 100k, Thermistor
- **U** = 20k "D", Thermistor
- **W** = 10k T2 high accuracy, Thermistor
- **Y** = 10k T3 high accuracy, Thermistor
- **Z** = 10k E1, Thermistor

Cal Certificate

[ ]

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

Housing Color

[ ]

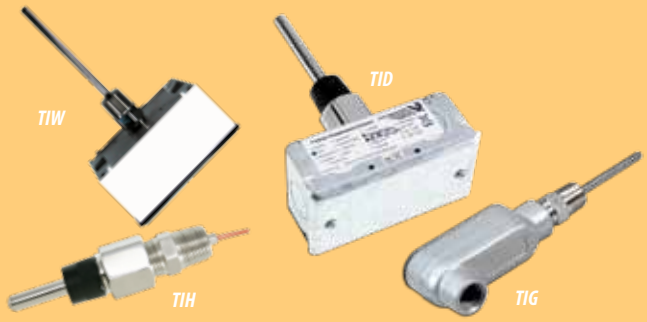
- **None** = Cloud White
- **B** = Black

Example:

TS [D] [2]

Immersion Temperature Sensors

Corrosion Resistant Stainless Steel Probe



DESCRIPTION

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.

APPLICATIONS

- Tanks
- Pipes
- Chillers

FEATURES

- Cost-effective high accuracy thermistors/RTDs
- Corrosion resistant stainless steel probe design...durable
- 1/2" NPT threads standard...ease of selection
- Variety of enclosures include duct mount, service entry body, threaded, and water resistant to fit your application
- Thermowells available...enables easy servicing

Class	Pt RTD		THERMISTOR											
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

SPECIFICATIONS

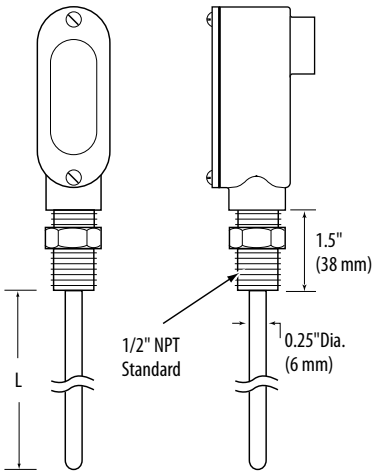
5 Year Warranty

Wiring	22 AWG; 2-wire: RTD Thermistor, 4-20mA; 3-wire: Voltage output models
Probe	Stainless Steel
Test Pressure	200 psi
Linitemp:	
Input Power	5 to 30VDC
Output	1µA/°C or 10mV/°C
Operating Temperature	-25° to 105°C (-13° to 221°F)
Resistive:	
RTD/Thermistor	See table, above
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)*
Error 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

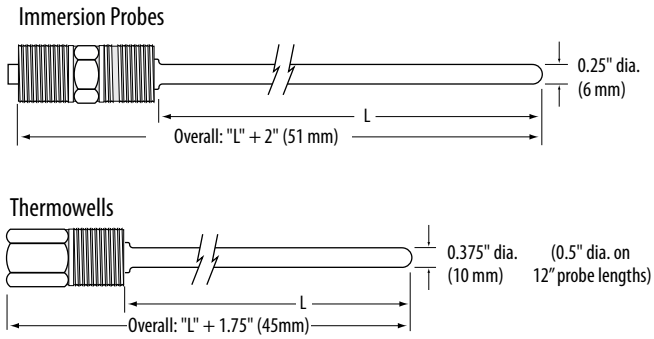
**Room temperature error documented on each unit.*

DIMENSIONAL DRAWINGS

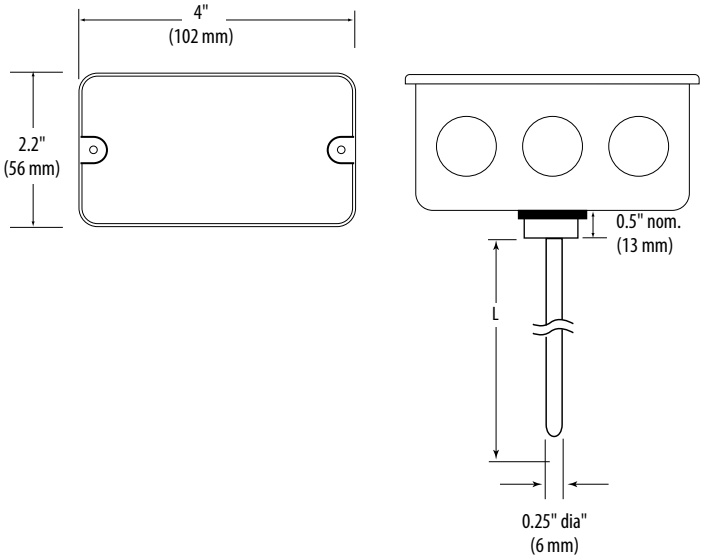
TIG Model



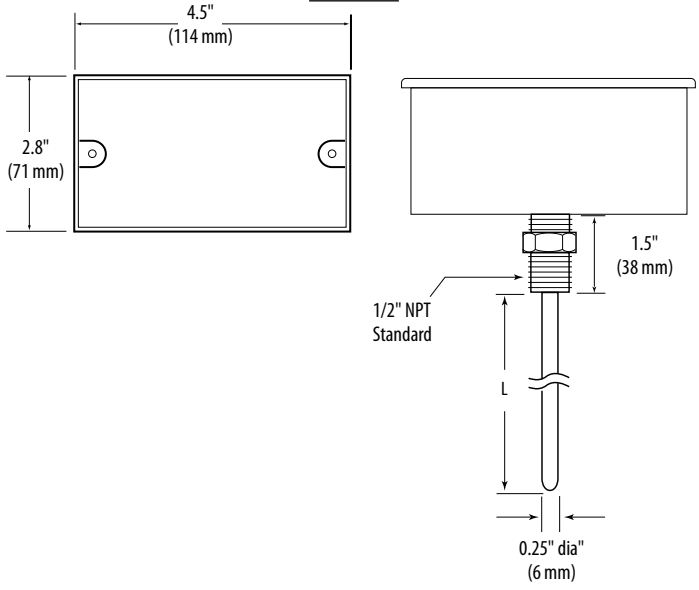
TIH Model



TID Model



TIW Model



ORDERING INFORMATION

	Enclosure	Immersion Probe Length "L"	Thermowell	Sensor Type	OPTIONS: Cal Certificate	OPTIONS: Threads
TI	☐	☐	☐	☐	☐	☐
	D = Duct **G** = Service Entry Body **H** = Threaded NPT Only **W** = Water resistant housing	**A** = 2 1/2" (64mm) **B** = 4" (102mm) **C** = 6" (152mm) **D** = 8" (203mm) **E** = 12" (305mm)	**0** = None **1** = Add Thermowell	**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 **Z** = 10k E1, Thermistor	**0** = None **1** = 1 point Cal validation **2** = 2 point Cal validation	**Blank** = NPT **A** = BSPT **B** = DIN 2999

NOTE:
For 4-20mA transmitter output, order any TI with the 100Ω platinum RTD and accessory AA10xx

Thermowell Sizing

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)

Example:

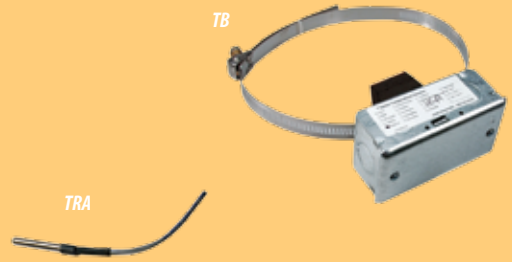
TI	D	B	1	D	2	A

ACCESSORIES

Thermowells (AA22, AA24, AA25, AA33)

AA24

Specialty Temperature Sensors



High Accuracy Specialty Sensors

DESCRIPTION

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 wire with strain relief. Multiple cable lengths are available for added flexibility.

FEATURES

TB Pipe Surface Sensor

- Secondary measurement of water temperature...ideal for retrofit applications
- Pipe clamps allow for easy installation on pipes up to 12" in diameter

TRA Probe Sensor

- Durable stainless steel sensing probe for long sensor life
- Multiple cable lengths for application flexibility

TEMPERATURE

SPECIFICATIONS

5 Year Warranty

Wiring	22 AWG; 2-wire: RTD/Thermistor
Linitemp:	
Input Power	5 to 30VDC
Output	10mV/°C
Operating Temperature	**TB:** -25° to 105°C (-13° to 221°F) **TRA:** Probe -25° to 105°C (-13° to 221°F), Wiring -20° to 80°C (-4° to 176°F)
Resistive:	
RTD/Thermistor	See table, facing page
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)*
Error 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

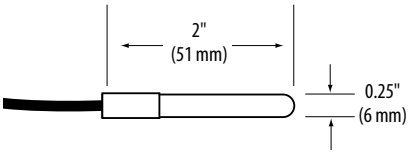
**Room temperature error documented on each unit.*

VERIS INDUSTRIES

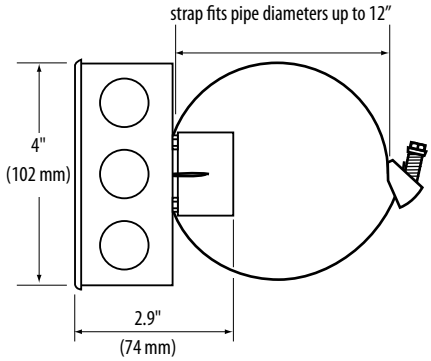
VERIS INDUSTRIES

DIMENSIONAL DRAWINGS

TRA



TB



Class	Pt RTD		THERMISTOR										
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

ORDERING INFORMATION

Strap-on Bracket

TB [ ] [ ] [ ]

Diameter

A = 2 ½" (6.4 cm) max.
D = 8" (20 cm) max.
E = 12" (31 cm) max.

Sensor Type

B = 100R platinum, RTD
C = 1k platinum, RTD
D = 10k T2, Thermistor
E = 2.2k, Thermistor
F = 3k, Thermistor
G = 10k CPC, Thermistor
H = 10k T3, Thermistor
J = 10k Dale, Thermistor
K = 10k w/11k shunt, Thermistor
M = 20k NTC, Thermistor
N = 1800 ohm, Thermistor
P = 10mV/°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
Z = 10k E1, Thermistor

Cal Certificate

0 = None
1 = 1 point Cal validation
2 = 2 point Cal validation

NOTE: For 4-20 mA transmitter output, order sensor with the 100 Ω platinum RTD and accessory AA10xx.

Examples:

TB [D] [C] [2]

TRA [F] [1]

Remote Probe

TRA [ ] [ ] [ ]

Sensor Type

B = 100R platinum, RTD
C = 1k platinum, RTD
D = 10k T2, Thermistor
E = 2.2k, Thermistor
F = 3k, Thermistor
G = 10k CPC, Thermistor
H = 10k T3, Thermistor
J = 10k Dale, Thermistor
K = 10k w/11k shunt, Thermistor
M = 20k NTC, Thermistor
N = 1800 ohm, Thermistor
P = 10mV/°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
Z = 10k E1, Thermistor

Cal Certificate

0 = None
1 = 1 point Cal validation
2 = 2 point Cal validation

Cable Length

None = 3 ft (0.9 m)
A = 6 ft (1.8 m)*
B = 10 ft (3.1 m)*
C = 20 ft (6.1 m)**
D = 25 ft (7.6 m)**
E = 50 ft (15 m)**
F = 100 ft (30 m)**

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

ACCESSORIES

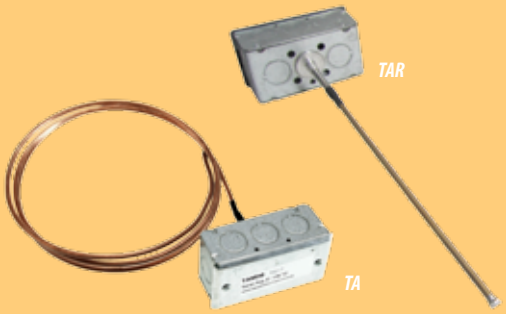
Klipet mounting clip for TRA probe (AA64)

AA64

TEMPERATURE

Averaging Temperature Sensors

High Accuracy Specialty Sensors



DESCRIPTION

The **TA Series** offers two styles of sensors, the flexible TA and the rigid TAR. These sensors average the temperature read across the entire length of the copper tubing, making them ideal for duct temperature measurements.

FEATURES

- Temperature averaging sensors average the 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...cover all your averaging applications with one line
- Copper tubing enhances response time

TEMPERATURE

SPECIFICATIONS

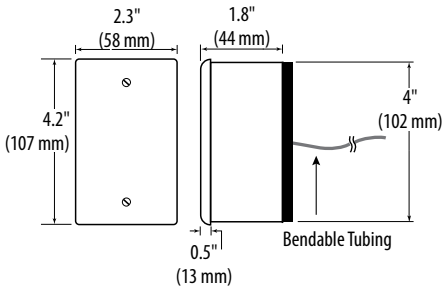
5 Year Warranty

Wiring	22 AWG; 2-wire: RTD/Thermistor
Linitemp:	
Input Power	5 to 30VDC
Output	10mV/°C
Operating Temperature	-25° to 105°C (-13° to 221°F)
Resistive:	
RTD/Thermistor	See table, facing page
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)*
Error 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

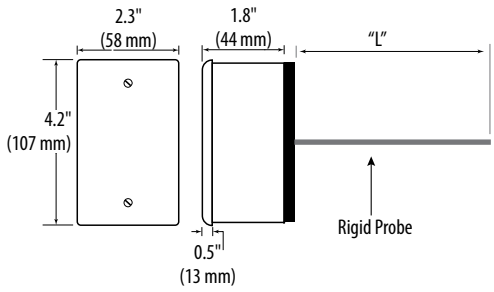
**Room temperature error documented on each unit.*

DIMENSIONAL DRAWINGS

TA



TAR



Class	Pt RTD		THERMISTOR										
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

ORDERING INFORMATION

TA

Flexible Probe Length
- ***M** = 6' (1.8m)
- **H** = 12' (3.6m)
- **J** = 24' (7.3m)

Sensor Type
- **B** = 100R platinum, RTD
- **C** = 1k platinum, RTD
- **D** = 10k, T2, Thermistor
- **H** = 10k, T3, Thermistor
- **J** = 10k, Dale, Thermistor
- **M** = 20k, NTC
- **N** = 1800 ohm, Thermistor
- **P** = 10mV/C, Linitemp
- **R** = 10k US, Thermistor

Cal Certificate
- **0** = None
- **1** = 1 point Cal validation**
- **2** = 2 point Cal validation***

TAR

Rigid Probe Length "L"
- **E** = 12" (0.3m)
- **F** = 18" (0.5m)
- **G** = 24" (0.6m)
- **N** = 30" (0.8m)
- **K** = 36" (0.9m)
- **P** = 48" (1.2m)

Sensor Type
- **B** = 100R platinum, RTD
- **C** = 1k platinum, RTD
- **D** = 10k, T2, Thermistor
- **H** = 10k, T3, Thermistor
- **J** = 10k, Dale, Thermistor
- **M** = 20k, NTC
- **N** = 1800 ohm, Thermistor
- **P** = 10mV/C, Linitemp
- **R** = 10k US, Thermistor

Cal Certificate
- **0** = None
- **1** = 1 point Cal validation**
- **2** = 2 point Cal validation***

Examples:

TA	H	C	2
TAR	F	N	1

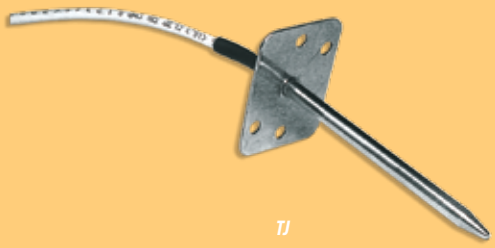
** Available with sensor types J,N,P*
*** The 18", 24", 30", 36", and 48" Rigid probes are calibrated to 22.5°C only.*
**** Available for all Flexible probe lengths. Not available for Rigid probes longer than 12".*

ACCESSORIES

Klipet mounting clip for TA/TAR probe (AA64)

TEMPERATURE

VAV Discharge Temperature Sensors



VAV Discharge Air Sensor For Reheat Applications

DESCRIPTION

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.

APPLICATIONS

- VAV reheat boxes
- Dual duct boxes
- Fan coils
- Prove that the 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

FEATURES

- Stainless steel duct probe with mounting flange...quick, easy installation
- 5' (1.5 m) plenum rated cable standard...eliminates need to splice
- 4" or 8" (102 mm or 204 mm) duct probes for application flexibility
- 2-wire installation (optional quick disconnect)...installs in just a few short minutes
- Installation ready for VAV systems and plenum areas...saves money on job commissioning and warranty service

SPECIFICATIONS

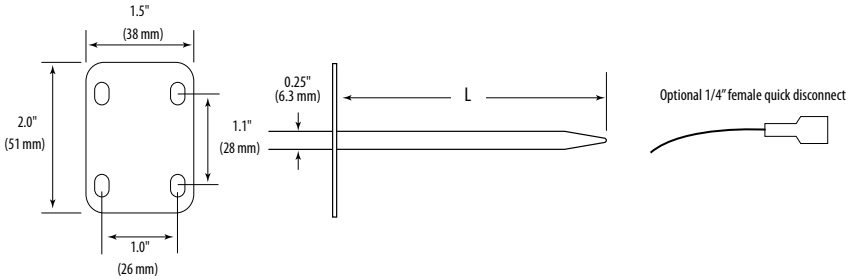
5 Year Warranty

Wiring	22 AWG; 2-wire: RTD/Thermistor
Probe	Stainless Steel
Linitemp:	
Input Power	5 to 30VDC
Output	1µA/°C or 10mV/°C
Operating Temperature	Probe: -25° to 105°C (-13° to 221°F); Wiring: up to 75°C (167°F)
Resistive:	
RTD/Thermistor	See table, facing page
Accuracy:	
Calibration Error	1.5°C (2.7°F) typical; 2.5°C (4.5°F) max. at 25°C (77°F)*
Error 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

Increased cable length affects the readings of lower resistance RTDs (100R platinum, RTD).
** Room temperature error documented on each unit.*

VERIS INDUSTRIES™

DIMENSIONAL DRAWING



Class	Pt RTD		THERMISTOR										
Type	**100 Ohm**	**1000 Ohm**	**2.2k**	**3k**	**10k Type 2**	**10k Type 3**	**10k Dale**	**10k 3A221**	**10k "G" US**	**20k**	**20k "D"**	**100k**	**10k Type 2**	**10k Type 3**
Accuracy	±0.3°C	±0.3°C	±0.2°C	±0.2°C	±1.0°C	±0.2°C	±0.2°C	±1.1°C	±0.2°C	Consult	Consult	Consult	±0.1°C 20/70°C	±0.1°C
	0.0385 curve	0.0385 curve	0/70°C	0/70°C	-50/150°C	0/70°C	-20/70°C	0/70°C	0/70°C	Factory	Factory	Factory	±0.2°C 0/20°C	0/70°C
Temp. Response*	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
													High Accuracy	

*PTC: Positive Temperature Coefficient

*NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)

°C	°F	100 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	10k Type 2	10k Type 3
-50	-58	80.306	803.06	154,464	205,800	692,700	454,910	672,300	-	441,200	1,267,600	-	-	692,700	454,910
-40	-40	84.271	842.71	77,081	102,690	344,700	245,089	337,200	333,562	239,700	643,800	803,200	3,366,000	344,700	245,089
-30	-22	88.222	882.22	40,330	53,730	180,100	137,307	177,200	176,081	135,300	342,000	412,800	1,770,000	180,100	137,307
-20	-4	92.160	921.60	22,032	29,346	98,320	79,729	97,130	96,807	78,910	189,080	220,600	971,200	98,320	79,729
-10	14	96.086	960.86	12,519	16,674	55,790	47,843	55,340	55,252	47,540	108,380	122,400	553,400	55,790	47,843
0	32	100.000	1000.00	7,373	9,822	32,770	29,588	32,660	32,639	29,490	64,160	70,200	326,600	32,770	29,588
10	32	103.903	1039.03	4,487	5,976	19,930	18,813	19,900	19,901	18,780	39,440	41,600	199,000	19,930	18,813
20	68	107.794	1077.94	2,814	3,750	12,500	12,272	12,490	12,493	12,260	24,920	25,340	124,900	12,500	12,272
25	77	109.735	1097.35	2,252	3,000	10,000	10,000	10,000	10,000	10,000	20,000	20,000	100,000	10,000	10,000
30	86	111.673	1116.73	1,814	2,417	8,055	8,195	8,056	8,055	8,194	16,144	15,884	80,580	8,055	8,195
40	104	115.541	1155.41	1,199	1,598	5,323	5,593	5,326	5,324	5,592	10,696	10,210	53,260	5,323	5,593
50	122	119.397	1193.97	811.5	1,081	3,599	3,894	3,602	3,600	3,893	7,234	6,718	36,020	3,599	3,894
60	140	123.242	1232.42	561.0	747	2,486	2,763	2,489	2,486	2,760	4,992	4,518	24,880	2,486	2,763
70	158	127.075	1270.75	395.5	527	1,753	1,994	1,753	1,751	1,990	3,512	3,100	17,510	1,753	1,994
80	176	130.897	1308.97	284.0	378	1,258	1,462	1,258	1,255	1,458	2,516	2,168	12,560	1,258	1,462
90	194	134.707	1347.07	207.4	-	919	1,088	917	915	1,084	1,833	1,542	9,164	919	1,088
100	212	138.506	1385.06	153.8	-	682	821	679	678	816.8	1,356	1,134	6,792	682	821
110	230	142.293	1422.93	115.8	-	513	628	511	509	623.6	1,016	816	5,108	513	628
120	248	146.068	1460.68	88.3	-	392	486	389	388	481.8	770	606	3,894	392	486
130	266	149.832	1498.32	68.3	-	303	380	301	299	376.4	591	456	3,006	303	380
Sensor Codes		**B**	**C**	**E**	**F**	**D**	**H**	**J**	**S**	**R**	**M**	**U**	**T**	**W**	**Y**

To compute Linitemp Temperature:

2-Wire version (1µA/°C)
µA reading - 273.15=Temperature in °C
3-Wire version (10mV/°C)
mV reading/10 - 273.15 = Temperature in °C

ORDERING INFORMATION

Probe Length "L"

TJ [ ]

B = 4"(102mm)
D = 8"(204mm)

Sensor Type [ ]

B = 100R platinum, RTD
C = 1k platinum, RTD
D = 10k T2, Thermistor
E = 2.2k, Thermistor
F = 3k, Thermistor
G = 10k CPC, Thermistor
H = 10k T3, Thermistor
J = 10k Dale, Thermistor
K = 10k 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
Z = 10k E1, Thermistor

Output

R

= Resistive

Cal Certs [ ]

0 = None
1 = 1 Point Cal Cert
2 = 2 Point Cal Cert

Option [ ]

0 = Standard 5 ft. cable, No QDs
1 = 1/4" Female Quick Disconnects (QD)
2 = 1/4" QDs with 8 ft. leadwires
3 = 10 ft. cable, no QDs

Example:

TJ | B | D | R | 2 | 1

Test Equipment Contents

For your convenience, Veris Industries offers a selection of handheld testing devices for verifying electrical functions, monitoring air quality, and measuring air flow and temperature.

MODEL	DESCRIPTION	PAGE
275/440/196/133	Electrical Testers	314
1010/1008/770	Air Quality Testers	316
575C1/597C1/621C3	Air Flow, Humidity, and Pressure Testers	318
381IR/368IR/505	Speciality Meters	320

Test Equipment Sensor Selection Guide

FEATURES	Electrical Testers	Air Quality Testers	Air Flow Testers	Humidity Testers	Pressure Testers	Speciality Testers
Voltage and Current	275/440/196/133 page 314					
Resistance	275/440/196/133 page 314					
Frequency	275/440/196 page 314					
Capacitance	275/440 page 314					
Temperature		1010/1008 page 316	575C1 page 318	597C1 page 318		
CO_2 Level		1010/1008 page 316				
CO Level		1010/770 page 316				
Differential Pressure					621C3 page 318	
Humidity		1010 page 316		597C1 page 318		
Dew Point		1010 page 316				
Air Flow			575C1 page 318			
Distance						381/368 page 320
Surface Speed						505 page 320

RELIABLE HANDHELD TESTING TOOLS

When performing field equipment checks, accurate handheld tools are indispensible. Veris Industries offers a line of current, temperature, air quality, pressure, and humidity measurement devices.

TPI 440 (U003-0014)

- True RMS DMM/1 MHz Oscilloscope with graphing and logging capability, helps find intermittent issues

TPI 1010 (U003-0004)

- True IAQ Meter using IR technology, provides long-term repeatable results

TPI 597C1 (U003-0007

- Fast response Hygrometer, allows for accurate readings in a rapidly changing environment

VERIS INDUSTRIES™

Electrical Testers

275 Meter

- Autoranging AC/DC amps
- True RMS
- 11,000 count display with 41 segment analog bargraph
- AC/DC voltage, amperage, resistance, capacitance, temperature and frequency modes...full-featured meter in a compact, rugged package

440 Oscilloscope/Multimeter

- 1 MHz oscilloscope bandwidth
- RS-232 for PC communication
- Trending mode enables graphing of surges and dropouts
- AC/DC volts, AC/DC amps, resistance, capacitance, and frequency modes
- Integral true RMS 4000-count autoranging multimeter

196 Digital Multimeter

- 0-24mA DC output for simulating and testing process loop controls
- 50,000 count display with backlight...easy readability
- RS-232 output
- Autoranging

133 Basic Multimeter

- Large, easy-to-read 2000-count backlit display
- Data hold feature
- Protective boot
- AC/DC voltage, AC/DC amps, and resistance modes

SPECIFICATIONS

275:

DC Voltage	600V range, 0.01mV max. res., ±0.5% basic accuracy
AC Voltage	600V range, 0.01mV max. res., ±0.5% basic accuracy
DC Amps	400A range, 0.01A max. res., ±0.8% basic accuracy
DC Microamps	1100µA range, 0.01µA max. res., ±3% basic accuracy
AC Amps	400A range, 0.01A max. res., ±3% basic accuracy
Frequency	110MHz range, 0.1Hz max. res., ±1% basic accuracy
Resistance	110MΩ range, 0.01Ω max. res., ±1% basic accuracy
Capacitance	110mF range, 0.001nF max. res., ±3% basic accuracy
Temperature	1000°F range, 0.1°F max. res., ±1% basic accuracy

440:

DC Voltage	400mV, 4, 40, 400, 1000V range, ±0.3% basic accuracy
AC Voltage	300mV, 3, 30, 300, 750V range, ±0.75% basic accuracy
DC Amps	400µA, 4000µA, 40mA, 400mA, 4A, 10A range, ±0.5% basic accuracy
AC Amps	300µA, 3000µA, 30mA, 300mA, 3A, 10A range, ±75% basic accuracy
Frequency	1Hz to 2MHz ±0.05% basic accuracy
Resistance	400Ω, 4kΩ, 40kΩ, 400kΩ, 4MΩ, 30MΩ ±0.3% basic accuracy
Capacitance	400nF, 4µF, 40µF, 400µF ±3% basic accuracy

196:

DC Voltage	1000V max. input, 0.0001V max. res., ±0.05% basic accuracy
AC Voltage	1000V max. input, 0.001V max. res., ±0.4% basic accuracy
DC Amps	1A max. input, 0.0001mA max. res., ±0.5% basic accuracy
AC Amps	1A max. input, 0.0001mA max. res., ±0.75% basic accuracy
Frequency	500kHz max. input, 0.01Hz max. res., ±0.05% basic accuracy
Resistance	50MΩ max. input, 0.01Ω max. res., ±0.05% basic accuracy

133:

DC Voltage	1000V max. input, 0.1mV max. res., ±0.5% basic accuracy
AC Voltage	750V max. input, 0.1mV max. res., ±0.8% basic accuracy
DC Amps	10A max. input, 0.1µA max. res., ±0.5% basic accuracy
AC Amps	10A max. input, 0.1µA max. res., ±1% basic accuracy
Resistance	20MΩ max. input, 0.1Ω max. res., ±0.5% basic accuracy

All products include a one year warranty on probes and leads, a two year warranty on sensors, and a three year warranty on meters.

APPLICATIONS

275

440

196

133

TEST EQUIPMENT

ORDERING INFORMATION

MODEL	MFR PART #	DESCRIPTION	UL	CE	RoHS
U003-0003	275	Clamp-on meter	●	●	●
U003-0014	440	Oscilloscope with Integral true RMS digital multimeter			●
U003-0018	196	Digital multimeter	●	●	●
U003-0019	133	Basic multimeter	●	●	●

Air Quality Testers

1008

770

1010

1010 Indoor Air Quality Meter: CO_2, CO, Temperature, and Humidity

- Monitors CO_2 for correct air circulation/exchanges
- Calculates percent outside air to maintain comfortable CO_2 levels in buildings and work spaces
- Accurate measurements of ambient conditions in warehouses and parking garages
- Measures temperature and humidity concurrently and calculates dew point and wet bulb temperatures
- Log up to 10,000 readings in 1 second to 1 hour intervals

1008 Indoor Air Quality Meter: CO_2 & Temperature

- Measures CO_2 levels in occupied spaces to maintain healthy conditions
- Measures ambient temperatures
- Record up to 48 readings in 30 minute intervals

770 Carbon Monoxide Monitor

- Detection range of 0-999 ppm
- Large, easy-to-read LCD
- Visual and audible alarms alert to unsafe CO levels
- Optional earphone attachment

SPECIFICATIONS

1010:

CO2 Range	0 to 5000 ppm
CO2 Accuracy	between 50°F and 104°F: ±3% of reading + 75 ppm; <50°F or >104°F: ±5% of reading + 75 ppm
Temperature Range, Accuracy	-20° to 60°C (-5° to 140°F), ±2°F (1°C)
Humidity Range, Accuracy	5 to 95%, ±3%
Dew Point Temperature	-44° to 57°C (-47° to 135°F)
CO Range, Accuracy	0 to 500 ppm, ±3 ppm or ±5% of reading, whichever is greater
% Outside Air	0 to 100%
Data Logging	Up to 10,000 samples; 1 sec to 23 hr, 59 min interval
Battery Life	40 hrs (typical)

1008:

CO2 Range	0 to 5000 ppm
CO2 Accuracy	between 50°F and 104°F: ±3% of reading + 75 ppm; <50°F or >104°F: ±5% of reading + 75 ppm
Temperature Range, Accuracy	-20° to 60°C (-5° to 140°F) ±2°F (1°C)

770:

CO Range	0 to 999 ppm
CO Accuracy	±3 ppm or ±5% of reading, whichever is greater
Resolution	1 ppm
Elapsed Time Indicator	Yes
Display	Backlit LCD
Alarm	Audible
Power Supply	1.5V AA (2)

All products include a one year warranty on probes and leads, a two year warranty on sensors, and a three year warranty on meters.

APPLICATIONS

1010/1008

770

ORDERING INFORMATION

CE RoHS Compliant

MODEL	MFR PART #	DESCRIPTION	CE	RoHS
U003-0004	1010	Indoor Air Quality Meter/Data Logger		●
U003-0004N	1010NIST	Indoor Air Quality Meter/Data Logger with NIST documentation		●
U003-0015	1008	Indoor Air Quality Meter		●
U003-0015N	1008NIST	Indoor Air Quality Meter with NIST documentation		●
U003-0005	770	Carbon Monoxide (CO) Meter	●	●
U003-0005N	770NIST	Carbon Monoxide (CO) Meter with NIST documentation	●	●

Air Flow, Humidity, and Pressure Testers

575C1 Anemometer

- Easy air temperature measurement while measuring airflow
- Uses both hotwire and vane type probes
- RS-232 port
- Record and recall minimum, maximum, and average readings
- Multiple measuring units: m/s, km/h, ft/min, knots, and mile/h

597C1 Hygrometer/Psychrometer

- Allows measurements of humidity, temperature, dew point and wet bulb temperatures
- Data record function for max. and min. temperature and humidity readings
- RS-232 output

621C3 Pressure Kit

- Temperature compensated for maximum accuracy
- Test air flow, static pressure drop, and draft pressure
- Multiple measuring units: in H_2O, mbar, kPa, mm H_2O, mm Hg, and in Hg
- Trim mode dampens surges

SPECIFICATIONS

575C1:

Air Velocity	Vane: 80 to 4900 ft/min ; Hotwire: 40 to 3900 ft/min
Air Velocity Accuracy	Vane: ±(2% of rdg + 3 digits); Hotwire: ±(5% of rdg + 3 digits)
Temperature Range	-20° to 80°C (-5°F to 175°F)
Temperature Accuracy	±(1% of rdg + 1°F + 3 digits)
Operating Temperature (base unit)	0° to 50°C (32° to 122°F)
Operating Humidity (base unit)	<80% RH noncondensing

597C1:

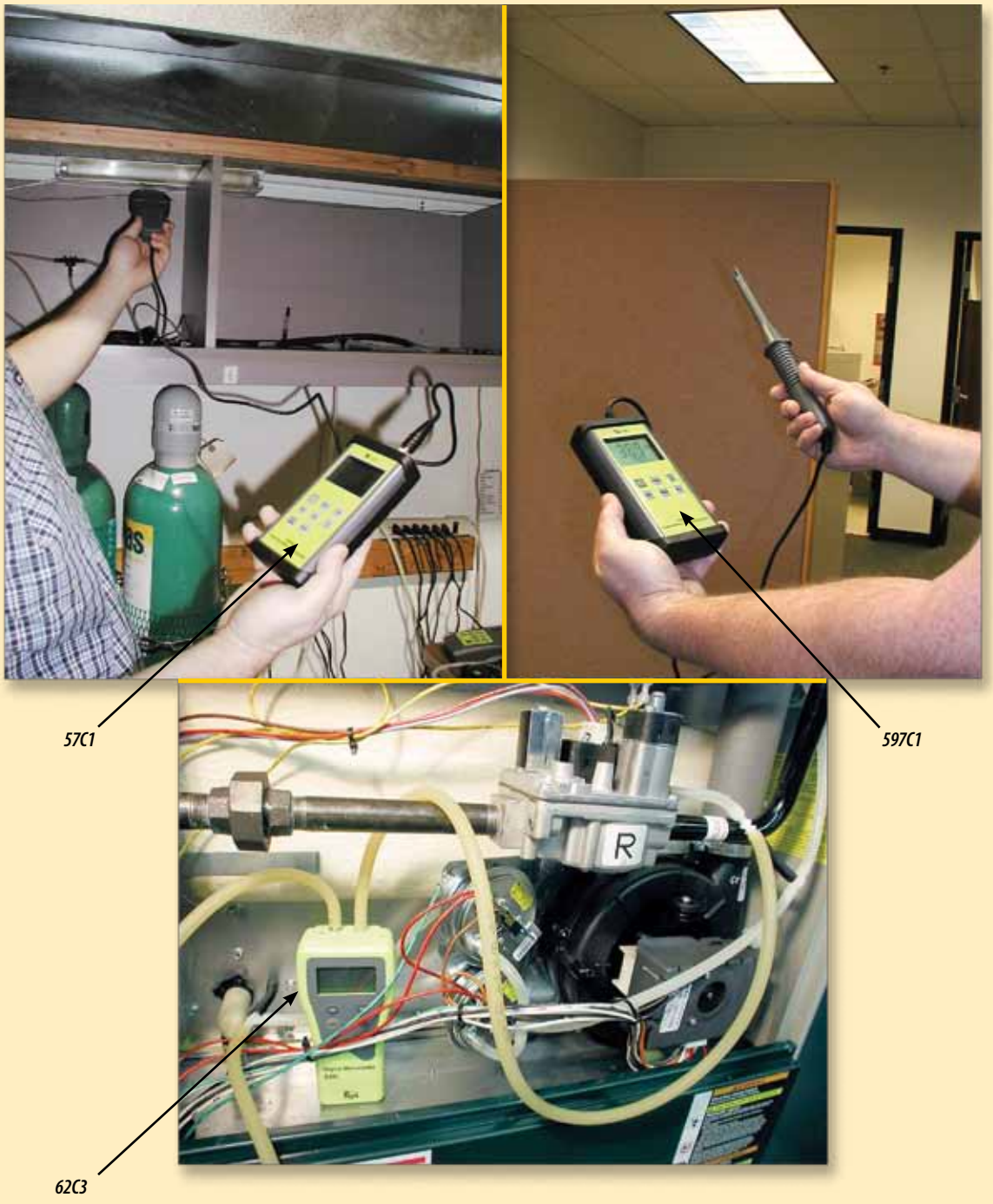
Relative Humidity	0 to 100%
RH Accuracy	<20°C ± (5% of reading +1% RH)@20-80% RH; >20°C ± (2% of reading +1% RH)@20-80% RH
Temperature Range	-40° to 80°C (-40°F to 176°F)
Temperature Accuracy	±(0.5% of rdg + 1°F + 3 digits)
Operating Temperature (base unit)	0° to 50°C (32° to 122°F)
Operating Humidity (base unit)	<90% RH noncondensing

621C3:

Ranges	±120 inH20; ±300 mbar; ±30 kPa; ±5 psi; ±3000 mmH20; ±220 mmHg; ±9 inHg
Resolution	0.001 inH20
Accuracy	<±30 inH20 ±(0.2% of full scale) >±30 inH20 ±(1.0% of full scale)
Overpressure	200 inH20
Power Supply	9V battery
Operating Temperature (base unit)	0° to 40°C (32° to 104°F)
Operating Humidity (base unit)	<80% RH noncondensing
Storage Temperature (base unit)	-10° to 50°C (14° to 122°F)

All products include a one year warranty on probes and leads, a two year warranty on sensors, and a three year warranty on meters.

APPLICATIONS



ORDERING INFORMATION

MODEL	MFG PART #	DESCRIPTION	CE	RoHS
U003-0007	575C1	Combo Vane and Hotwire Anemometer	●	●
U003-0008	597C1	Hygrometer/Psychrometer	●	●
U003-0006	621C3	Dual Input Manometer	●	●

Specialty Meters

381 IR Thermometer

- Non-contact temperature sensing for safe surface temperature measurements
- Temperature compensated for accurate readings at low temperatures
- Easy-to-use one-button operation
- Laser pointer to show the center of the target to be measured
- Backlit LCD for easy readability
- Low battery indication

505 Tachometer

- Non-contact (photo) and contact RPM & surface speed
- Wide Measuring Range: 0.5 to 30,000 RPM
- Last measurement, maximum measurement and minimum measurement automatically saved and recalled
- 5-digit LCD for easy visibility

368 IR Thermometer

- 1/8" spot at 1.5"
- Pocket sized for easy portability
- Min./max. function
- Auto data hold
- Easy-to-read display

SPECIFICATIONS

381:

Non-contact IR Range	-20° to 300°C (-4° to 572°F)
Basic Accuracy	±2% of reading or ±3.5°F, whichever is greater
Response Time	500 msec
Spectral Response	7 to 14 µm
Emissivity	0.95 fixed
Field of View (Distance to Target)	8:1
Operating Temperature Range	0° to 50°C (32° to 120°F)

368:

Non-contact IR Range	-22° to 120°C (-8° to 248°F)
Basic Accuracy	±2% of reading or ±4°F, whichever is greater
Response Time	500 msec
Emissivity	0.95 fixed
Field of View (Distance to Target)	1:1.3
Operating Temperature Range	0° to 40°C (32° to 104°F)

505:

Photo Tachometer Range	6 to 30,000 RPM ±0.1% FS + 1 digit
Contact Tachometer Range	6 to 20,000 RPM ±0.1% FS + 1 digit
Surface Speed Range	0.9 to 3046 m/min ±0.1% FS + 1 digit; 2.0 to 9990 ft/min ±0.1% FS + 1 digit
Operating Temperature Range	0° to 50°C (32° to 122°F)
Operating Humidity Range	<80% RH
Power Supply	2 AA batteries

All products include a one year warranty on probes and leads, a two year warranty on sensors, and a three year warranty on meters.

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APPLICATIONS

ORDERING INFORMATION

MODEL	MFG PART #	DESCRIPTION	CE	RoHS
U003-0010	381	IR Thermometer with laser pointer	●	●
U003-0016	368	IR Thermometer, close range	●	●
U003-0017	505	Tachometer	●	●