

2009

Enercorp is a Canadian manufacturer of humidity, temperature and pressure instrumentation for energy management, process and climate monitoring applications.

In designing our products we strive to have the best price in the market, but never at the expense of quality. We insist that savings be achieved through innovative design, and manufacturing efficiency.

Having completed over 30 years in business we are pleased to share this catalog with you. In it you will find a collection of some of our most popular instrumentation products.

Please visit us online at www.enercorp.com or call us toll free at 1(800)ENERCOP if you would like to discuss your application.

INDEX

TEMPERATURE

HUMIDITY

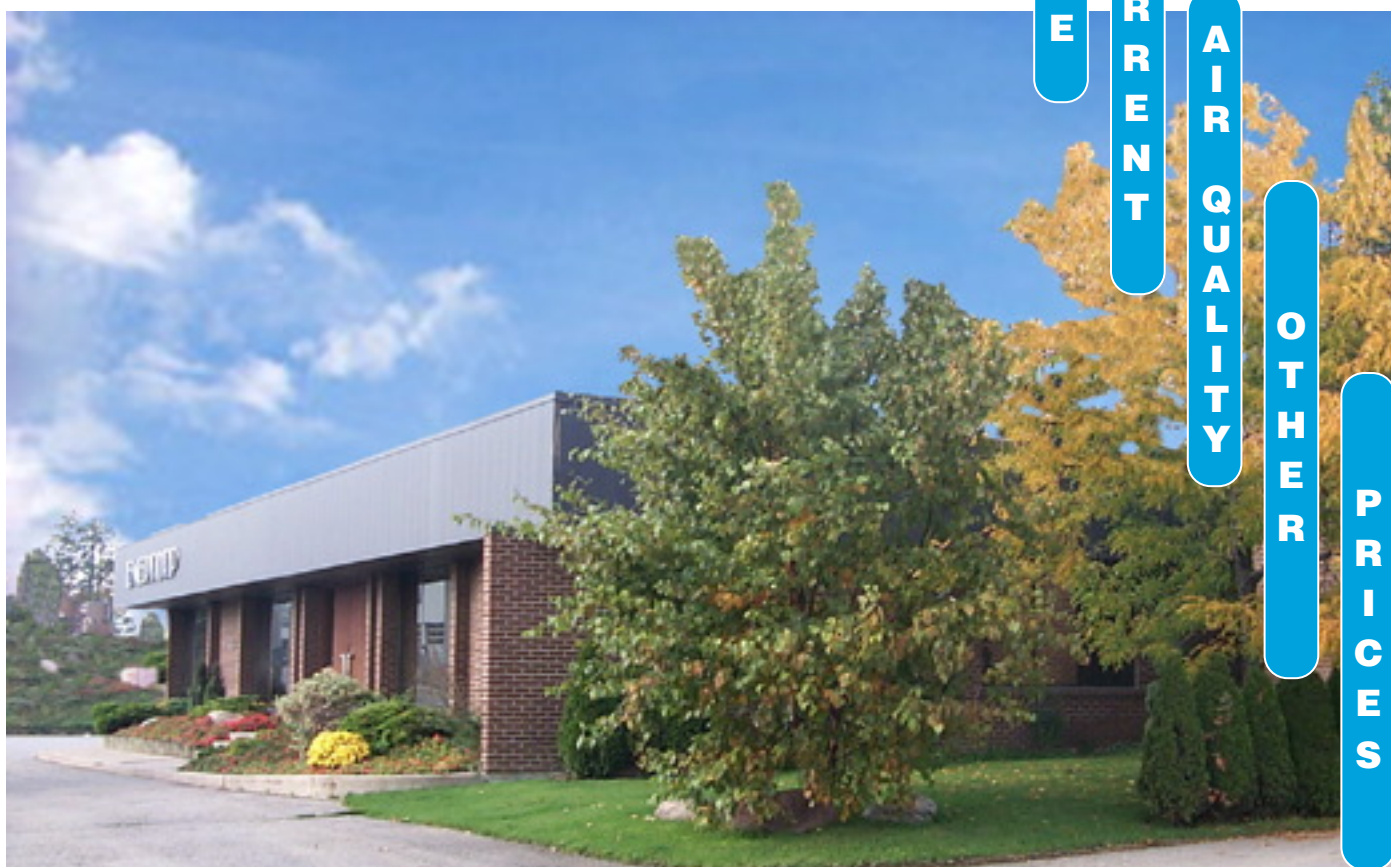
PRESSURE

CURRENT

AIR QUALITY

OTHER

PRICES



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FEATURED PRODUCTS

Stainless Steel Pressure Transmitter

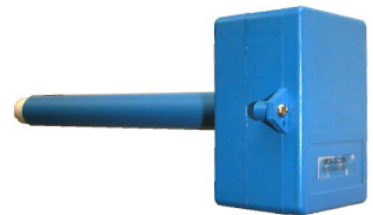
The **robust design** of these two wire, 4-20 mA pressure transmitters allow use in a wide range of applications. Several available ranges cover pressures from -30"Hg to 1000 psi. They have been specially designed to withstand harsh refrigeration conditions for use with ammonia and freon as well as being highly vibration resistant. (page 32)



First class wind transmitter is designed to evaluate the location and capacity of future wind power systems. It measures the horizontal component of wind speed. The measured value is available as a digital or analog signal. It can be transmitted to display instruments, recording instruments and data loggers as well as to process control systems. For winter operation the instrument is equipped with electronically regulated heating for smooth operation of the ball bearings, and preventing the shaft and slot from icing up. (page 32)

Humidity transmitters have 5 to 98% rH range

The **new improved sensor** in all our humidity transmitters provides accurate humidity readings from 5 to 98% rH. This is especially important when measuring low indoor humidity during the winter or high humidity in climate chambers and curing rooms. (page 21)

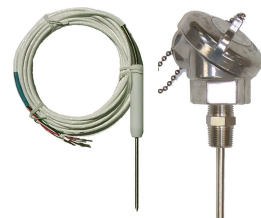


Programmable isolated hockey puck for RTD's at low cost

The **streamlined electronics** in our TXR420 eliminates the expensive components required for thermocouple measurement. If you only need to measure RTD's save 30% on the cost of the dual purpose TXP420 and still get all the other features. (page 5)

Current transducer has 0-5V output for 0-200 amps AC

At **\$100 or less** this is an inexpensive and convenient way to monitor AC through your plant. Other products in the family provide 4-20mA outputs or switching of AC or DC loads. The switches can be used as proofing points or detectors of abnormal conditions such as broken belts, worn tooling or clogged filters. Available as both split core and solid core. (page 39)



Custom temperature and smokehouse sensors

RTD, thermocouple or thermistor temperature sensors are manufactured to customer specifications. We also manufacture a line of rugged, reliable and accurate smokehouse temperature sensors. (pages 3,4 & 18)

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GENERAL PURPOSE INDUSTRIAL

- **Accurate Platinum RTD**
- **Rugged construction**
- **Splashproof**

General purpose large version

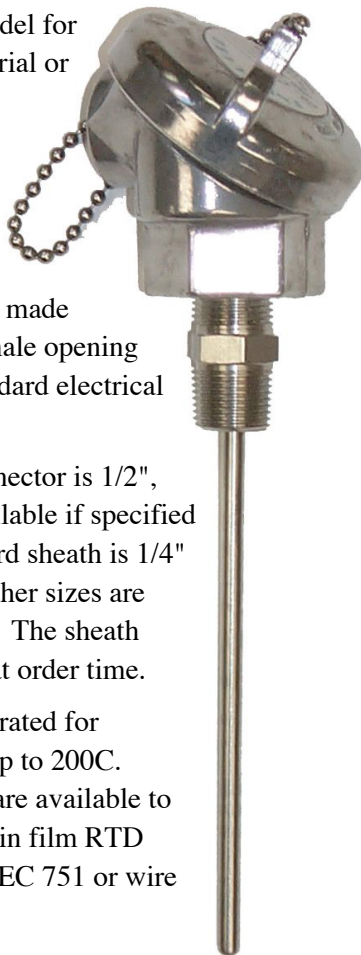
This is the all purpose model for general heavy duty industrial or commercial temperature measurement.

It features a large threaded cast aluminum head with gasket.

Electrical connections are made through the 3/4" NPT female opening suitable for piping or standard electrical fittings.

The standard process connector is 1/2", although 3/4" NPT is available if specified at order time. The standard sheath is 1/4" O.D. stainless steel and other sizes are available to special order. The sheath length must be specified at order time.

The standard assembly is rated for measuring temperatures up to 200C. 400C and 600C versions are available to special order. We use a thin film RTD sensor to DIN 43 760 or IEC 751 or wire wound if requested.



ORDERING DATA

TS-GPL-R-100- () - () - ()
 stem connection temp(C)
 inches 8 = 1/2" NPT 400
 12 = 3/4" NPT 600

e.g. TS-GPL-R-100-4-8 general purpose industrial probe with large head and 100 ohm RTD, 4" long stem and 1/2" NPT process thread rated for standard 200C operation.

- **Accurate Platinum RTD**
- **Rugged construction**
- **Splashproof**

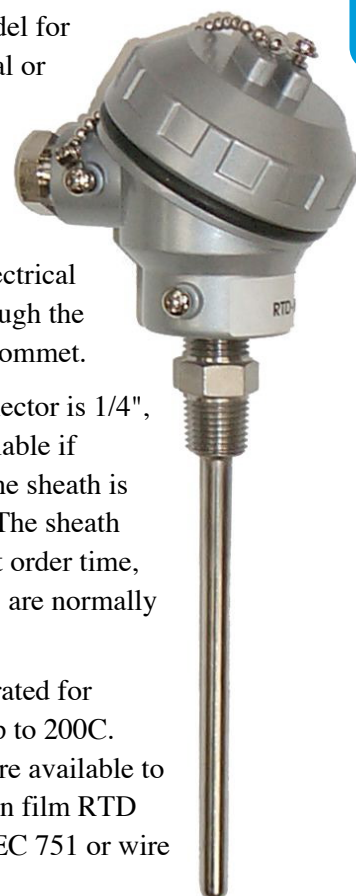
General purpose small version

This is the all purpose model for general light duty industrial or commercial temperature measurement.

It features a small threaded cast aluminum head with O-ring seal. Electrical connections are made through the cable gland with rubber grommet.

The standard process connector is 1/4", although 1/2" NPT is available if specified at order time. The sheath is 1/4" O.D. stainless steel. The sheath length must be specified at order time, although 4" and 6" lengths are normally available from stock.

The standard assembly is rated for measuring temperatures up to 200C. 400C and 600C versions are available to special order. We use a thin film RTD sensor to DIN 43 760 or IEC 751 or wire wound if requested.



ORDERING DATA

TS-GPS-R-100- () - () - ()
 stem connection temp(C)
 inches 4 = 1/4" NPT 400
 8 = 1/2" NPT 600

e.g. TS-GPS-R-100-6-4-400 general purpose industrial probe with small head and 100 ohm RTD, 6" long stem and 1/4" NPT process thread rated for 400C operation.

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ISOLATED PROGRAMMABLE HOCKEY PUCK TRANSMITTER

TEMPERATURE

- Electrically isolated
- Any RTD or thermocouple
- Program on your PC
- 4-20 or 20-4mA output

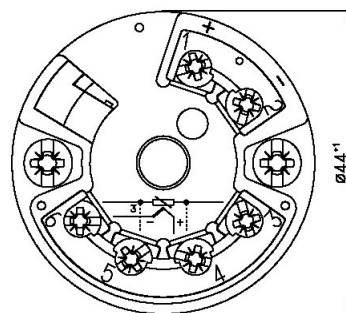
This is the one transmitter you need to stock for all your maintenance needs. Using your PC and the available software simply program this transmitter for any one of 7 RTD or 13 thermocouple types or customize the calibration linearization at up to 40 points to fit none standard transmitter outputs.

The output signal can be inverted and can be programmed to be linear with temperature or linear with resistance or mV input.

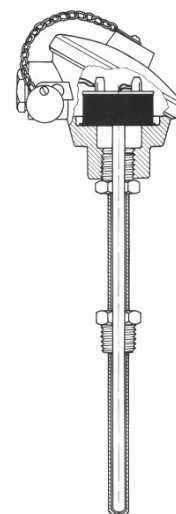
Features include a 7mm central hole for easy spring loading of 1/4" tube, insulating barriers between terminals to prevent shorts and a captive cover on programming pins to keep them clean.

SPECIFICATIONS

<i>Output:</i>	4-20 mA or 20-4mA
<i>Power Supply:</i>	8-35 VDC, Polarity protected
<i>Temperature drift:</i>	+0.005 %/ deg C
<i>Supply effect:</i>	+0.01% / V deviation from 24V
<i>Open circuit:</i>	>21.5mA
<i>Short circuit;</i>	3.6mA or 21mA configurable
<i>Ambient temp:</i>	-40 + 85 C
<i>Storage temp;</i>	-40 +100 C
<i>Typical Accuracy :</i>	0.1% TXP420, 0.2% TXR420
<i>Case</i>	polycarbonate
<i>Size</i>	44mm dia x 21mm
<i>Weight</i>	50 gm approx
<i>Input TXP420</i>	RTD's: DIN, Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, T/C's: J,K,T,E,S,R,B,L,U,N, MoRe5-MoRe41, W3Re-W25Re D, W5Re-W26Re C, User defined polynomial
<i>Input TXR420</i>	Pt100 100 ohm DIN RTD only



DIMENSIONS



TYPICAL INSTALLATION

ORDERING DATA

MODEL	INPUT
TXP420	All inputs
TXR420	100 ohm DIN RTD only
Please specify input type and measuring range.	
TX420-SW	PC software.
TX420-CABLE	PC cable

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TEMPERATURE TRANSDUCER

- **2 wire 4...20mA connection**
- **Wide operating range**
- **Low price**
- **0.5% accuracy**

MODEL: TT-R-100

The TT-R-100 is used to convert a platinum RTD temperature sensor to a 4-20 mA signal to interface with your energy management panel. The output is proportional over a selected span.

The resistance change of the RTD passes through a bridge to the amplifier and is converted to a proportional d.c. current in the output stage. The output current is controlled through a feedback circuit and thereby becomes independent of load. A diode protects against reverse polarity. This technology is field proven and has been capable of withstanding rigorous environmental chamber testing while retaining linearity without damage.

This technique produces a very reliable system with good accuracy at an excellent price.

TECHNICAL DATA

Stock Ranges

-50 to +50C
0 to +50C
0 to +100C

Models

TT-BB-R-100 Blue Box Mounted
TT-ST-R-100 Snap Track Mounted
TT-DR-R-100 DIN Rail Enclosure Mounted
TT-R-100 Unmounted PC Board

You can change the first two characters of any EMCS temperature sensor from TS to TT and specify the range.

ORDERING DATA

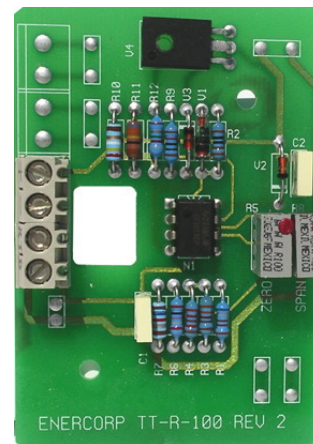
TT - () - R -100 / ()
BB = blue box Range
ST = snap track Stock values -50+50C / 0+50C / 0+100C
DR = din rail

e.g. TT-ST-R-100/0+35C Temperature transmitter mounted on snap track with 0 +35C temperature range
or TT-P-4-R-100/-50+50C 4" pipe RTD sensor with -50+50C temperature transmitter built-in



TT-DR-R-100

TT-R-100



Initial Calibration

+/- 0.2%

Linearity

+/- 0.1% of span

Operating Temperature

-20 to +70C

Temperature Drift

Less than 0.012% Span / degC

Supply Voltage

15 to 30 Vdc (nominal)

Supply Voltage Error

0.01% max of fullscale per volt deviation from 24Vdc

Maximum Load

(Vsupply-12)/20mA

Load Error

0.02% max of full scale per 100 ohms

Output

4 to 20mA in 2-wire technology

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SPACE AIR TEMPERATURE

- **High ventilation design**
- **Convenient 2 part construction**
- **Fire retardant ABS housing**

High Ventilation Executive Case has ventilation slots 50% larger than some competitors allowing more air to flow past the sensor providing faster response and more accurate readings.

Our new two piece construction is more convenient to install than the older three piece construction still used by some suppliers. Our ABS plastic molding is fire retardant.

We mount the sensing element and a "Phoenix" terminal strip securely on a circuit board.

Versatile Case has room for two circuit boards. This is the choice to make when you need to measure both temperature and humidity at one location. The 4-5/8"L x 1-5/8"H x 3"W enclosure mounts directly over a standard electrical 1110 box for wiring convenience.



Chose Your Sensor

Thermistors are the most sensitive meaning lead resistance has minimal effect on system accuracy.

Platinum RTD's are the most stable with almost no calibration drift. Their stability make them the choice in demanding applications.

4-20mA Transmitters using 100 ohm RTD's are available in the same housings when RTD's have been specified for use with a panel that will not accept RTD's directly.

Standard Executive case shown here



Time override is available with our optional tactile feedback push button which is mounted under the decorator plate. Pushing can alert the DDC to begin time override operation. Customer specified circuitry can be supplied on request. Specify option TOS.

Local Setpoint override is available with our integrated slide potentiometer. This provides a variable 1 to 11K resistance signal at built-in terminals. A DDC panel could change the setpoint by +/-3 degrees dependent on the resistance value. Specify option SS.

Operating Temperature The maximum operating temperature is 80C.



ORDERING DATA

TS - S - () - () - () - () - ()
 case style sensor type sensor value Time Over-ride Local Setpoint Adjust
 E=executive R = RTD 100 = 100 ohms TOS if required SS if required
 V=versatile T = Thermistor 10K = 10k ohms

e.g. TS-E-T-10K-TOS-SS Space sensor in executive enclosure with 10K thermistor, push button time over-ride and slide switch pot for local setpoint adjustment

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TEMPERATURE

- 090 | 0 |

IMMERSION TEMPERATURE

- **Spring Loaded**
- **Moisture sealed**
- **Hinged cover case**
- **Platinum RTD or Thermistor**

Fast response with spring loading

This probe is used to measure the temperature of fluids or gases in pipes. We spring load these probes to provide a good thermal contact with the base of the mating thermowell ensuring fast and accurate measurements. The temperature sensor which is PC board mounted for better reliability is potted in heat transfer compound for rapid response and vibration protection. Our molded case with hinged cover is easy to install. It is designed to accept a 2-wire transmitter.

Matched Pairs: On request 1/3 DIN RTD's provide 1/10th deg C accuracy for energy consumption calculations.

TECHNICAL DATA

Platinum RTD's are the most stable temperature sensors between -50 and 400C. They show almost no calibration drift with time. Their stability, wide temperature range and almost linear output make them the choice in demanding applications.

NTC Thermistors are the most sensitive sensors known for measurements from -50C to +150C. Their temperature coefficient can be as high as several percent per degree C. This means that lead resistance from installation of thermistors in remote areas has minimal effect on accuracy.

ORDERING DATA

TS - P - () - () - ()

thermowell length in inches	sensor type R = RTD T = Thermistor	sensor value 100 = 100 ohms 10K = 10k ohms
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e.g. TS-P-4-T-10K Immersion sensor, for 4" thermowell with 10K thermistor



Retrofit Work

Our step down adaptor model BUSHING-8-W, allows fast and easy retrofitting of new sensors to older systems with installed pipe thermometers or bulb and capillary thermometers. This is a brass step-down bushing to reduce the 1-1/4-18 UNEF thread commonly used on these older systems to the 1/2" NPT thread used by our pipe thermometers.



Each is supplied with a brass sleeve to adapt the 1/4" stem to the 0.385 bore of the well.

Operating Temperature The construction of these sensors limits their maximum operating temperature to 105C.

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PIPE SENSOR WITH LED READOUT

- **Bright display** in F or C
- **Only one well** for display & DDC
- **Thermistor,RTD or transmitter**
- **Easy mounting**

Easy to read

The LED option adds a high intensity red LED digital indicator to our pipe sensor for displaying local temperatures. This can be very useful in retrofit work when glass thermometer wells are re-used for HVAC sensors. Previously it was either expensive or impractical to shut down a section of the physical plant while a an extra well was welded in.

Now we have combined two sensors in the same sheath one connected to the indicator and one thermistor or RTD of your choice to connect to the control panel. An RTD can optionally be connected to a 4-20mA transmitter located in the same housing.

Jumpers on the circuit board permit field changes from Fahrenheit to Celcius and permit the 10ths of a degree indication to be converted to full degrees only.

An inexpensive option adds a setpoint alarm which can switch a one amp AC load.

Matched Pairs: On request 1/3 DIN RTD's provide 1/10th deg C accuracy for energy consumption calculations.

TECHNICAL DATA

Supply: 8 to 40 VDC or 8 to 32 VAC

Display: 3 1/2 digits, 0.56" high intensity red

Connection: Power and relay: Faston
Sensors: 2 x 3pole screw terminals

Accuracy: 0.25% +/- 1 digit

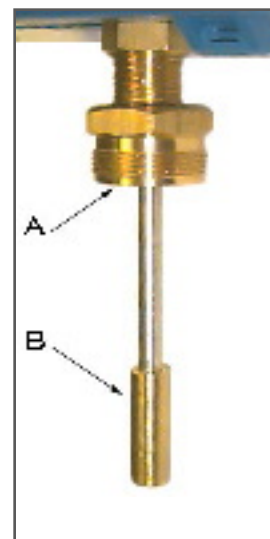
Input: 2 x 100 ohm RTD or 2 x 4-20mA

Temperature:
ambient -20+70C, measured -50+105C



Retrofits

If you are re-using existing glass thermometer wells we offer an adaptor bushing and a brass sleeve to improve heat transfer.



ORDERING DATA

Pipe Sensor:

**TS-P-(4/6)-(R/T)-
(100/1000/10K)-LED-
(C/F)-(A-XXX)**

Choose one from each pair of brackets

(4/6) Thermowell size in inches, normally 4 or 6

(R/T) RTD or Thermistor

(100/1000/10K) 100 or 1000 ohm or 10K resistance

LED 1/2" high LED readout option

(C/F) Celcius of Fahrenheit calibration

(A-XXX) Alarm if desired and setpoint value

Accessories:

A: Reducing bushing: **BUSHING-8-W**

B: Conversion Sleeve: **SLEEVE-B-W**

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FLEX-CABLE PROBE

- **Platinum RTD or Thermistor**
- **Conforms to any duct size**
- **Very easy to install**
- **Totally flexible**

Easy to install flex-cable

Our probe is constructed using CSA rated FT6 plenum cable. Numerous sensors are encapsulated in 316 s/s sheaths at equal distances along the length of the cable. The complete assembly acts as a single temperature sensor and any temperature change is averaged across the sensors. The probe can easily be strung to fit any size duct.

For lengths up to 12 feet or for most economical applications, we average the readings of four encapsulated sensors. For 24 foot probes and more demanding applications, we use nine sensors spaced along the length of the cable.

Our molded case with hinged cover is easy to install. The cover is fastened with one captive screw. Provision is made for a front identification tag. The back is completely smooth so it fits flush against the mounting surface. Circuit board slots inside are designed to accept a 2-wire transmitter if required.

TECHNICAL DATA

Platinum RTD's are the most stable temperature sensors between -50 and 400C. Their stability, wide temperature range and almost linear output make them the choice in demanding applications.

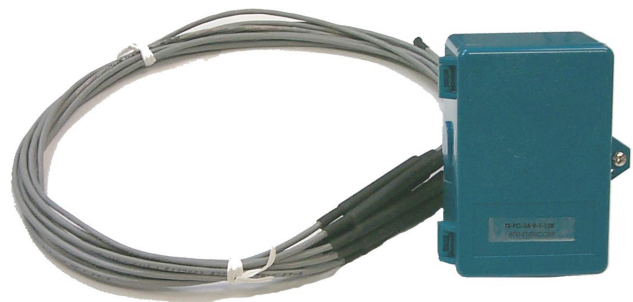
Our standard RTD's use 100 or 1000 ohm thin film elements to DIN 43 760 (IEC 751) class B with a tolerance of 0.3 deg C. We also supply class A thin film RTD's as well as sensors with wire wound elements in class B, class A and 1/5 DIN tolerances.

ORDERING DATA

TS - FC - () - () - () - ()

cable length in feet	no. sensors 4 or 9	sensor type R = RTD T = Thermistor	sensor value 100 = 100 ohms 10K = 10k ohms
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e.g. TS-FC-24-9-T-10K Flex-cable averaging sensor 24 feet long with nine 10K thermistors



NTC Thermistors are the most sensitive sensors known for temperature measurement from -50C to +150C.

The temperature coefficient of thermistors can be as high as several percent per degree C. This means that lead resistance from installation of thermistors in remote areas has minimal effect on system accuracy.

Since they are semiconductors they must not be exposed to temperatures near their maximum operating limits or they can drift out of specified tolerance.

Our standard thermistor has a 10K resistance at 25C and a tolerance of +/- 0.2C. On request other calibrations and accuracies are available.

Operating Temperature The construction of these sensors limits their maximum operating temperature to 105C.

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OUTDOOR AIR TEMPERATURE SENSOR

- **Platinum RTD or Thermistor**
- **Rugged Construction**
- **Low Cost**

Weather proof air sensor

Our outdoor air temperature sensors contain a rugged RTD or thermistor sensor for high accuracy and long term stability for temperatures between -50C to +80C or a thermistor for ease of connection to certain control systems. This assembly's construction consists of a waterproof seal, a weather resistant shield and non-corrosive material to withstand all weather conditions. The cover of the sensor rejects solar heat for more accurate temperature measurements. The sensor has a 1/2" NPT female thread for conduit mounting or clamp-on installation.

TECHNICAL DATA

Platinum RTD's are the most stable temperature sensors between -50 and 400C. They show almost no calibration drift with time. Their stability, wide temperature range and almost linear output make them the choice in demanding applications. Our standard RTD uses a 100 ohm thin film element to DIN 43 760 (IEC 751) with a tolerance of 0.3 deg C. We also supply thin film RTD's with a tolerance of +/- 0.1 C or 0.05 percent in values of 100, 500 and 1000 ohms.

Wire wound ceramic RTD's with accuracies as high as +/- 0.06 degrees Celcius or 0.025 percent are in stock for high precision applications.

ORDERING DATA

TS - O - () - ()

sensor type	sensor value
R = RTD	100 = 100 ohms
T = Thermistor	10K = 10k ohms

e.g. TS-O-T-10K Space sensor in executive enclosure with 10K thermistor

NTC Thermistors are the most sensitive sensors known for temperature measurement from -50C to +150C. The temperature coefficient of thermistors can be as high as several percent per degree C. This means that lead resistance from installation of thermistors in remote areas has minimal effect on system accuracy. Since they are semiconductors they must not be exposed to temperatures near their maximum operating limits or they can drift out of specified tolerance. Our standard thermistor has a 10K resistance at 25C and a tolerance of +/- 0.2C. On request other calibrations and accuracies are available.

Operating Temperature
The construction of these sensors limits their operating temperature to -50...+70C.



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PLATE TEMPERATURE SENSOR

- **Platinum RTD or Thermistor**
- **Rugged Construction**
- **Low Cost**

Excellent for public places

Our plate air temperature sensors are ideal for public or high traffic areas where a conventional space sensor could be easily damaged. The flush mounting eliminates accidental damage from knocks by machinery or people. The plain cover makes it unattractive to vandals since its function is not obvious.

The stainless steel face reflects radiant heat while the sensor mounted in contact with the back of the plate provides fast, accurate space temperature readings.

An adhesive foam backing secures the sensor to the plate and provides some insulation from temperatures inside the mounting wall. If mounting this sensor on an outside wall or one with a temperature that could be different than the surrounding space the installer should add sufficient insulation behind the sensor to ensure accurate space temperature readings.

TECHNICAL DATA

Platinum RTD's are the most stable temperature sensors between -50 and 400C. They show almost no calibration drift with time. Their stability, wide temperature range and almost linear output make them the choice in demanding applications. Our standard RTD uses a 100 ohm thin film element to DIN 43 760 (IEC 751) with a tolerance of 0.3 deg C. We also supply thin film RTD's with a tolerance of +/- 0.1 C or 0.05 percent in values of 100, 500 and 1000 ohms.

Wire wound ceramic RTD's with accuracies as high as +/- 0.06 degrees Celsius or 0.025 percent are in stock for high precision applications.

ORDERING DATA

TS - PL - () - ()
 sensor type sensor value
 R = RTD 100 = 100 ohms 1000 = 1000 ohms
 T = Thermistor 10K = 10k ohms

e.g. T-PL-R-1000 Plate sensor with 1000 ohm RTD



NTC Thermistors are the most sensitive sensors known for temperature measurement from -50C to +150C. The temperature coefficient of thermistors can be as high as several percent per degree C. This means that lead resistance from installation of thermistors in remote areas has minimal effect on system accuracy. Since they are semiconductors they must not be exposed to temperatures near their maximum operating limits or they can drift out of specified tolerance. Our standard thermistor has a 10K resistance at 25C and a tolerance of +/- 0.2C. On request other calibrations and accuracies are available.

Operating Temperature The construction of these sensors limits their maximum operating temperature to 105C.

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FLUE GAS TEMPERATURE

- **Two wire 4-20mA connection**
- **Rugged design**
- **0.5% accuracy**

Sensor selection:

Thermistors will not withstand the high flue gas temperatures and can not be used.

RTD's are the most stable and accurate sensors up to 400C and are normally selected for this range.

Thermocouples are extremely rugged and durable at high temperatures and are the best choice for measurements from 400C to 1200C.

We TIG weld the thermocouple junction to the tip of the sheath in order to ensure the fastest possible response time.

We add 2-wire 4-20mA transmitters if your panel will not accept RTD's or thermocouples directly.

CONSTRUCTION

Our flue gas temperature transmitters are constructed using the same technique we use in the industrial sensors we supply to power plants and heavy industries. The RTD or thermocouple is embedded in magnesium oxide, packed and sealed within a stainless steel sheath.

Because the sensor is so well protected from shock in this construction, long life is ensured, even under the most severe conditions.

We incorporate a flange in our standard design in order to make mounting easy.

The terminal box containing the transmitter electronics is mounted on a stand-off to minimize heat transfer from the flue gas to the electronics.

The electronics convert the sensor signal to a standard 4 to 20mA 2-wire signal, for simple, economical and reliable wiring over long transmission lines.



TECHNICAL DATA

RTD models

Operating Temperature: -50 to + 400C

Optional 4-20mA transmitter Ranges: 0 to +200C or 0 to +400C, others on request. The temperature of the head containing the transmitter has a maximum temperature of 70C.

Thermocouple models

Operating Temperature: -50 to + 1000C

Optional 4-20mA transmitter Ranges: 0 to +600C or 0 to +1000C, others on request. The temperature of the head containing the transmitter has a maximum temperature of 70C

All models

Supply Voltage: 13 to 30 Vdc (24Vdc nominal)
Output: 2-wire 4 to 20mA

ORDERING DATA

TS - F - (stem length in inches) - (R-100=RTD, K=thermocouple)

TT - F - (stem length in inches) - (R-100=RTD, K=thermocouple) - (transmitter range)

e.g.

TT-F-12-K-0+600C Flue gas temperature transmitter assembly with 12" immersion, "K" thermocouple & 4-20mA transmitter with 0 to 600C span

TS-F-18-R-100 Flue gas temperature assembly with 18" immersion, 100 ohm RTD but NO transmitter

ENERCOP instruments Ltd

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STRAP-ON TEMPERATURE SENSORS

- **Platinum RTD or thermistor**
- **Rugged Construction**
- **0.1, 0.2 or 0.3C accuracy**

All purpose economy

We have engineered our strap-on sensors to ensure long life and rapid response. The sensor is mounted using PC board technology to eliminate strain on the sensor leads, increasing reliability. This assembly is potted in heat transfer compound to provide rapid response and cushion the sensor from vibration. The eight foot PVC lead wire makes it convenient to connect to a nearby utility box.

TECHNICAL DATA

Platinum RTD's are the most stable temperature sensors between -50 and 400C. They show almost no calibration drift with time. Their stability, wide temperature range and almost linear output make them the choice in demanding applications. Our standard RTD uses a 100 ohm platinum thin film element to DIN 43 760 (IEC 751) with a tolerance of ± 0.3 deg C. We also supply thin film RTD's with a tolerance of ± 0.1 C in values of 100, 500 and 1000 ohms. Wire wound ceramic RTD's with accuracies as high as ± 0.06 degrees Celcius are in stock for high precision applications.

NTC thermistors are the most sensitive sensors known to exist for temperature measurement from -50C to +150C. The temperature coefficient of thermistors can be as high as several percent per degree C. This means that lead resistance from installation of thermistors in remote locations has minimal effect on system accuracy. Since they are semiconductors they must not be exposed to temperatures above their operating limits or they can

drift out of specified tolerance.

Our standard thermistor has a 10K resistance at 25 deg C and a tolerance of ± 0.2 C. On request other calibrations and accuracies available on order.

Construction

Sheath	316 stainless steel
Lead	8'-6" long PVC
Conductors	22 gage, 3 conductor for RTD's and 2 conductor for thermistors
Thermistor	Standard is 10K at 25C and 817 ohms at 100C with a tolerance of 0.2 deg C. Other calibrations are available on request.
RTD	100 ohms at 0C DIN class B standard. Other calibrations are available on request.
Temperature	-10..+105C



ORDERING DATA

TS - SO - () - ()

sensor type

sensor value

R = RTD

100 = 100 ohms

T = Thermistor

10K = 10k ohms

e.g. TS-SO-T-10K Strap on sensor with 10K thermistor

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BRASS PLATE TEMPERATURE

- **Fast pipe temperatures**
- **No thermowell required**
- **Rugged armoured leads**

Accurate easy to install pipe sensor

When you need to measure the temperature of a pipe's contents and no thermowell is available this is the solution. Simply add a little heat transfer paste to the smooth side of the brass plate and fasten the assembly to the pipe with a hose clamp. The 9 thou thick brass shim stock plate conforms readily to even small diameter pipes. Then cover the whole assembly with insulation, running the lead wire to a nearby junction box.

The brass plate will provide excellent heat transfer from the pipe to the sensor sheath which we silver solder to the plate. The 3/16" OD sheath is smaller than our normal strap on sensor to promote rapid heat transfer.

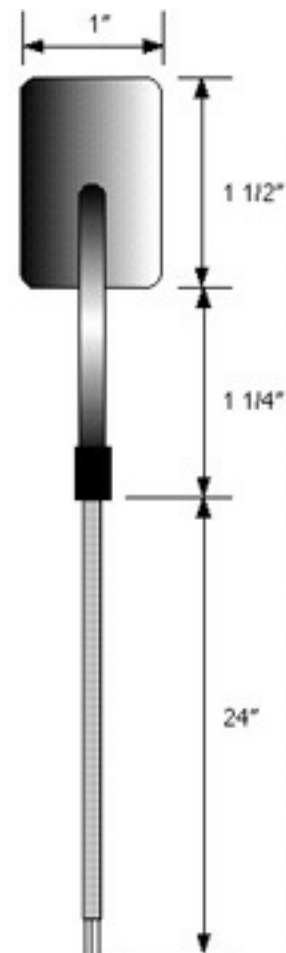
The stainless steel braided lead wire jacket provides good abrasion resistance.

Platinum RTD's are the most stable temperature sensors between -50 and 400C. Their stability, wide temperature range and almost linear output make them the choice in demanding applications.

NTC Thermistors are the most sensitive sensors from -50C to +150C with temperature coefficients as high as several percent per degree C. This means that lead resistance has minimal effect on system accuracy.

4-20mA Transmitters using 100 ohm RTD's are available when RTD's have been specified for use with a panel that will not accept RTD's directly.

Operating Temperature The construction of these sensors makes them suitable for operation between -50C and 200C.



ORDERING DATA

TS - BP - () - ()

sensor type	sensor value
R = RTD	100 = 100 ohms
T = Thermistor	10K = 10k ohms

e.g. TS-BP-R-100 Brass plate sensor with 100 ohm RTD

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SOIL TEMPERATURE

- **Moisture Sealed**
- **Designed for Greenhouses**
- **Platinum RTD or Thermistor**

Reliable greenhouse operation

We have engineered our greenhouse soil temperature probe to ensure long life, rapid response and to seal against moisture.

The sensor is mounted using PC board technology to eliminate strain on the sensor leads, increasing reliability. This assembly is potted in heat transfer compound to provide rapid response and protection from vibration. The cover of our molded case is gasketed to eliminate moisture problems. The stainless steel sensing probe is sealed by an O-ring where it joins the case.

The lead wires are attached to a terminal strip inside the case and exit the case through a moisture sealing strain relief fitting. Should the leads ever become damaged they can be changed without changing the sensor. Hundreds of these probes have been installed in greenhouses with excellent reliability.

TECHNICAL DATA

Platinum RTD's: Our standard is a 100 ohm thin film element to DIN 43 760 (IEC 751) with a tolerance of 0.3 deg C.

NTC Thermistors: Our standard has a 10K resistance at 25C and a tolerance of +/- 0.2C.

Operating Temperature These sensors are intended for operation between -20C and 105C.

ORDERING DATA

TS - L - () - () - ()
 stem length sensor type sensor value
 in inches R = RTD 100 = 100 ohms
 T = Thermistor 10K = 10k ohms

e.g. TS-L-4-T-10K Soil sensor, for 4" long with 10K thermistor



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SMOKEHOUSE TEMPERATURE SENSORS

- **Platinum RTD's or thermocouples**
- **Rugged sealed construction**
- **Good prices and fast delivery**

European quality, Canadian price

We have continually refined the design of our smokehouse insertion or core temperature and wet/dry probes with the help of smokehouse operators and installers.

The stainless probe is threaded and sealed into the teflon handle for ruggedness and moisture sealing. The stainless steel spring reduces wear on the lead wire as it exits the handle.

The 316 stainless steel sheath and white teflon handle and connection cable are ideal for food service.

Since intermediate connections between the sensing element and the temperature recorder or controller can be a major cause of failure we build our probes with leads long enough to run directly to the recorder or controller.

Lead: *RTD's* - Teflon jacketed conductors. White teflon over jacket with wire mesh screen. 2 or 3 conductors per sensor.

Thermocouples - Teflon jacketed thermocouple wires with silicone over jacket.

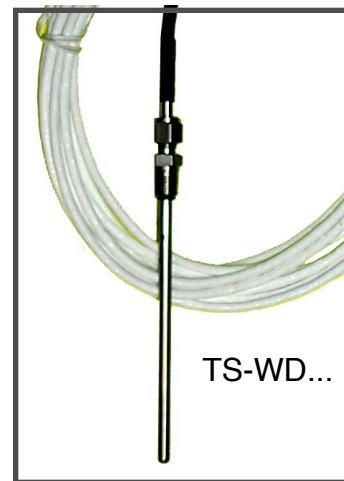
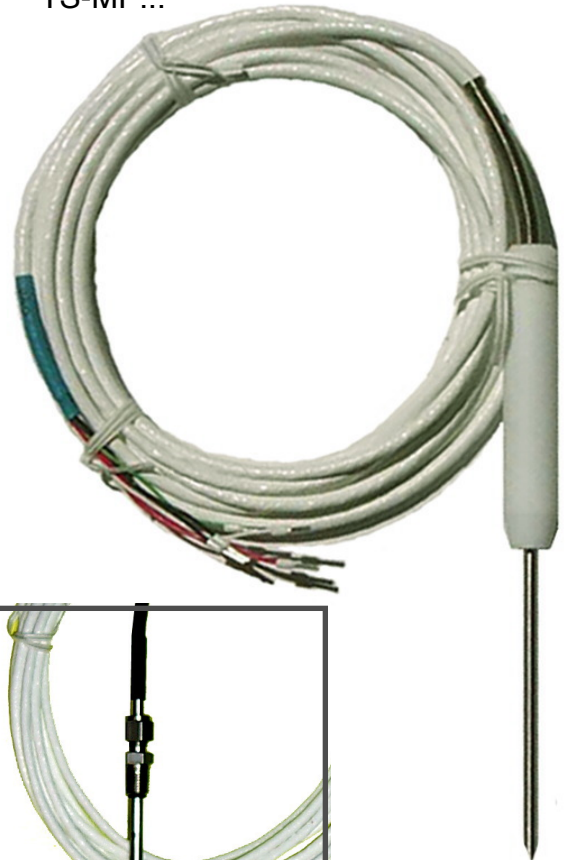
RTD class B DIN EN60751 according to IEC751

Probe: *wet/dry* 1/4" O.D. x 8" long 316 SS

meat 3/16" O.D. x 4 1/4" long 316 SS

Thread: *wet/dry* 1/4" compression fitting

TS-MP...



ORDERING DATA

TS - () - (sensor type) - (sensor value) - (D if duplex) - (3 if 3-wire) - (lead inches)

MP=meat R = RTD 100 = 100 ohms

WD=wet/dry TC = thermocouple J or K

e.g. TS - WD - R - 100 - D - 3 - 240

Wet/dry temperature assembly with two 100 ohm RTD sensors in three wire construction, 20 feet or 240 inches long.

e.g. TS-MP-R-100-D-160

Meat probe with 100 ohm RTD, duplex style with standard 13 foot lead wire. Add lead length in inches if other than 13 feet.

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THERMOWELLS

- **Brass or Stainless Steel**
- **Stocked for fast delivery**
- **Low Cost**

THERMOWELLS

Thermowells are recommended to protect both the operator and the temperature sensor. The proper thermowell will reduce the possibility of damage to the temperature sensor due to corrosion, pressure or the flow of abrasive or viscous media. In addition a defective instrument may be removed without shutting down or draining the process.

These stock wells have 1/2" process & instrument connections with a 0.260" bore. Wells with other dimensions and materials are readily available on order.

We manufacture our thermowells for the energy management industry in large quantities on high speed NC machines. This allows us to offer these wells at excellent prices while maintaining the quality & tolerances you expect. We stock brass and stainless steel wells in 4", 6" and 8" lengths for immediate delivery.

TECHNICAL DATA

Stainless steel should be considered at higher temperatures or pressures or where corrosion could be a problem.

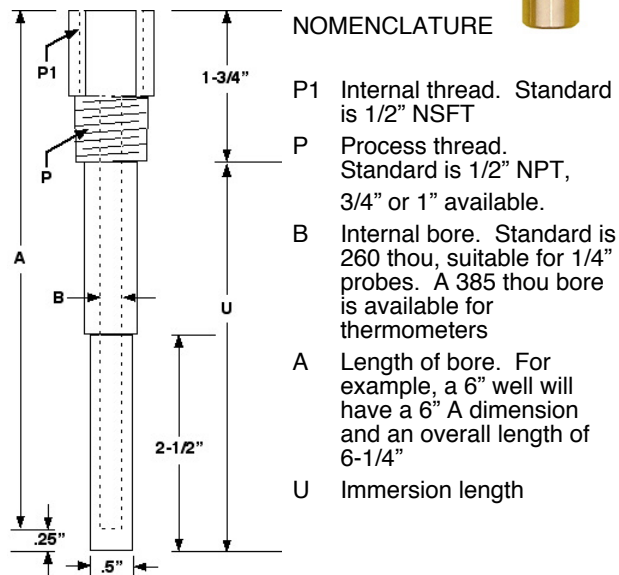
Brass wells are usually chosen for measuring water or steam at moderate temperatures and pressures. In these conditions they provide good protection and corrosion resistance. Brass is more economical than stainless steel.

ORDERING DATA

TW - () - () - () - () - ()

material	length in inches	process option	stainless option	bore option
B = brass		1/2" is standard	304 is standard	260 is standard
S = stainless		others available	316 if required	385 if required

e.g. TW - S - 4 304 stainless steel thermowell 4" long with 1/2" NPT process connection



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HIGH TEMPERATURE HUMIDITY TRANSMITTER

- **Temperatures up to 140C**
- **Remote Probe Option**
- **Stainless Steel Construction**
- **2-Wire, 4...20mA**

MODEL: HTM-R-598

Our high temperature humidity transmitter has been designed to meet the demands of wood drying, pallet sanitizing and other heat treating and drying applications requiring humidity measurements in atmospheres above 100C. The polymer based humidity sensor is one of the most stable sensors available. The 2 wire, 4-20 mA design provides ease of installation, lowering the cost of field wiring.

The high accuracy over the wide range of 5-98% rH allows precise measurement of the humidity over the operating range of 0 to +140C.

Each transmitter is calibrated in our computer operated atmospheric simulation chamber against our traceable Standard, a Condensation Dew Point Hygrometer. Each is delivered with a computer calibrated traceable 3 point certificate.

A Pt100 platinum RTD can be added to provide temperature outputs. Additionally, a temperature transmitter can be added to provide 2-wire, 4-20mA temperature output as well.

ORDERING DATA

HTM-R-598	duct humidity transmitter
HTTM-R-598	duct humidity/temperature transmitter
HTM-R-598-100	with 100 ohm platinum RTD
HTM-R-598-S	special version as specified



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TECHNICAL DATA

Range

operating: 5 - 98% rH

calibration: 0 - 100% rH

Accuracy

+/- 2% or better at 25 degrees C

Temperature Dependence

0.2% rH per degree C

Response Time

1 minute from 90% to 10% rH

Output

4 to 20mA in 2-wire technology

Load

250/500 ohms +/-1% at 12 /24 VDC supply

Power Supply

24 VDC +/- 15%

Operating Temperature- Probe / Electronics

0 to +140C / 75C

Stability

+/- 2% rH in 24 months typical

Medium

Do not expose to vapours that attack plastic such as acetone.

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WIDE RANGE DUCT HUMIDITY TRANSMITTER

- **Now measures 5 to 98% rH**
- **Temperature compensated**
- **Computer certified**
- **2-Wire, 4...20mA**

MODEL: HTM-D-598

Our microprocessor based, temperature compensated humidity transmitter has been designed to meet the demands of energy management, environmental and process industries. The polymer based humidity sensor is one of the most stable sensors available. The 2 wire, 4-20 mA design provides ease of installation, lowering the cost of field wiring.

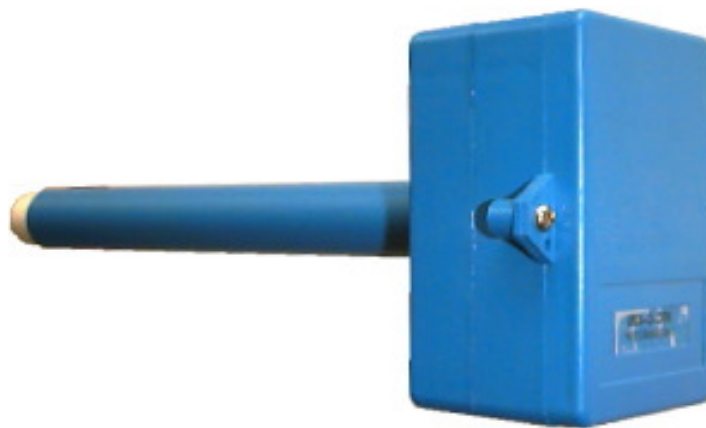
The high accuracy over the wide range of 5-98% rH allows precise measurement of the humidity over the operating range of 0 to +60C. Even condensation on the sensor will not harm it.

Each transmitter is calibrated in our computer operated atmospheric simulation chamber against our traceable Standard, a Condensation Dew Point Hygrometer. Each is delivered with a computer calibrated traceable 3 point certificate.

An RTD or thermistor can be added to provide temperature outputs. Additionally, a temperature transmitter can be added to provide 2-wire, 4-20mA temperature output as well.

ORDERING DATA

HTM-D-598	2% duct humidity transmitter
HTTM-D-598	duct humidity/temperature transmitter
HTM-D-598-10K	with 10K thermistor
HTM-D-598-100	with 100 ohm platinum RTD
HTM-D-598-S	special version as specified



TECHNICAL DATA

Range

operating: 5 - 98% rH
calibration: 0 - 100% rH

Accuracy

+/- 2% or better at 25 degrees C

Temperature Dependence

0.2% rH per degree C

Response Time

1 minute from 90% to 10% rH

Output

4 to 20mA in 2-wire technology

Load

250/500 ohms +/- .1% at 12 /24 VDC supply

Power Supply

24 VDC +/- 15%

Operating/Storage Temperature

0 to +75 C/-20 to +75 C for 0-100%rH, non-condensing

Stability

+/- 2% rH in 24 months typical

Medium

Do not expose to vapours that attack plastic such as acetone.

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WIDE RANGE SPACE HUMIDITY TRANSMITTER

- Measures 5 to 98% rH
- Temperature compensated
- Computer certified
- 2-Wire, 4...20mA
- 2% accuracy

MODEL: HTM-S-598

Our microprocessor based, temperature compensated humidity transmitter has been designed to meet the demands of energy management, environmental and process industries. The polymer based humidity sensor is one of the most stable sensors available. The 2 wire, 4-20 mA design provides ease of installation, lowering the cost of field wiring.

The high accuracy over the wide range of 5-98% rH allows precise measurement of the humidity over the operating range of 0 to +60C. Even condensation on the sensor will not harm it.

Each transmitter is calibrated in our computer operated atmospheric simulation chamber against our traceable Standard, a Condensation Dew Point Hygrometer. Each is delivered with a computer calibrated traceable 3 point certificate.

An RTD or thermistor can be added to provide temperature outputs. Additionally, a temperature transmitter can be added to provide 2-wire, 4-20mA temperature output as well.

ORDERING DATA

HTM-S-598	2% space humidity transmitter
HTTM-S-598	space humidity/temperature transmitter
HTM-S-598-10K	with 10K thermistor
HTM-S-598-100	with 100 ohm platinum RTD
HTM-S-598-S	special version as specified



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TECHNICAL DATA

Range

operating: 5 - 98% rH
calibration: 0 - 100% rH

Accuracy

+/- 1, 2 or 3%rH at 25 degrees C

Temperature Dependence

0.2% rH per degree C

Response Time

1 minute from 90% to 10% rH

Output

4 to 20mA in 2-wire technology

Load

250/500 ohms +/- .1% at 12 /24 VDC supply

Power Supply

24 VDC +/- 15%

Operating/Storage Temperature

0 to +60 C/-20 to +70 C for 0-100%rH, non-condensing

Stability

+/- 2% rH in 24 months typical

Medium

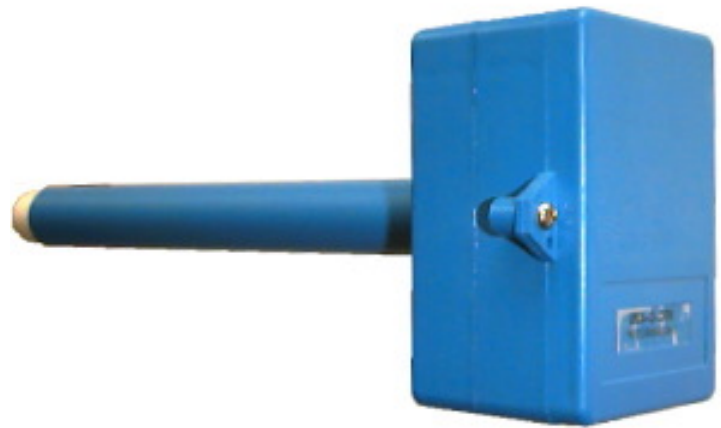
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ECONOMY 3% DUCT HUMIDITY TRANSMITTER

- Temperature compensated
- 2-Wire, 4...20mA
- Economical pricing
- 3% accuracy
- Measures 10 to 90% rH



MODEL: HTM-D-420

Our temperature compensated humidity transmitter has been designed to meet the demands of energy management, environmental and process industries. The polymer based humidity sensor is one of the most stable sensors available. The 2 wire, 4-20 mA design provides ease of installation, lowering the cost of field wiring.

The high accuracy over the wide range of 10-90% rH allows precise measurement of the humidity over the operating range of 0 to +60C. Even condensation on the sensor will not harm it.

Each transmitter is calibrated in our computer operated atmospheric simulation chamber against our traceable Standard, a Condensation Dew Point Hygrometer.

ORDERING DATA

HTM-D-420 3% duct humidity transmitter

TECHNICAL DATA

Range

operating: 10 - 90% rH
calibration: 0 - 100% rH

Accuracy

+/- 3% at 25 degrees C

Temperature Dependence

0.2% rH per degree C

Response Time

1 minute from 90% to 10% rH

Output

4 to 20mA in 2-wire technology

Load

250/500 ohms +/- .1% at 12 /24 VDC supply

Power Supply

24 VDC +/- 15%

Operating/Storage Temperature

0 to +60 C/-20 to +70 C for 0-100%rH, non-condensing

Stability

+/- 2% rH in 24 months typical

Medium

Do not expose to vapours that attack plastic such as acetone.

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ECONOMY 3% SPACE HUMIDITY TRANSMITTER

- Temperature compensated
- 2-Wire, 4...20mA
- Economical pricing
- 3% accuracy
- Measures 10 to 90% rH



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MODEL: HTM-S-420

Our temperature compensated humidity transmitter has been designed to meet the demands of energy management, environmental and process industries. The polymer based humidity sensor is one of the most stable sensors available. The 2 wire, 4-20 mA design provides ease of installation, lowering the cost of field wiring.

The high accuracy over the wide range of 10-90% rH allows precise measurement of the humidity over the operating range of 0 to +60C. Even condensation on the sensor will not harm it.

Each transmitter is calibrated in our computer operated atmospheric simulation chamber against our traceable Standard, a Condensation Dew Point Hygrometer.

ORDERING DATA

HTM-S-420 3% space humidity transmitter

TECHNICAL DATA

Range

operating: 10 - 90% rH
calibration: 0 - 100% rH

Accuracy

+/- 3%rH at 25 degrees C

Temperature Dependence

0.2% rH per degree C

Response Time

1 minute from 90% to 10% rH

Output

4 to 20mA in 2-wire technology

Load

250/500 ohms +/- .1% at 12 /24 VDC supply

Power Supply

24 VDC +/- 15%

Operating/Storage Temperature

0 to +60 C/-20 to +70 C for 0-100%rH, non-condensing

Stability

+/- 2% rH in 24 months typical

Medium

Do not expose to vapours such as acetone that attack plastic.

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ASPIRATED HUMIDITY TRANSMITTER

- Now measures 5 to 98% rH
- Temperature compensated
- Computer certified
- 2-Wire, 4...20mA
- Economical pricing

MODEL: HTM-A-598

Our microprocessor based, temperature compensated humidity transmitter has been designed to meet the demands of greenhouse operators, energy management, environmental and process industries. The polymer based humidity sensor is one of the most stable sensors available. The 2 wire, 4-20 mA design provides ease of installation, lowering the cost of field wiring.

The 2% accuracy over the wide range of 5 to 98% rH allows precise measurement of the humidity over the operating range of 0 to +60C. Even condensation on the sensor will not harm it.

Each transmitter is calibrated in our computer operated atmospheric simulation chamber against our traceable Standard, a Condensation Dew Point Hygrometer. Each is delivered with a computer calibrated traceable 3 point certificate.

An RTD or thermistor can be added to provide temperature outputs. Additionally, a temperature transmitter can be added to provide 2-wire, 4-20mA temperature output as well.

A miniature fan is available on HTC-A models to provide aspiration while the white housing limits solar heating.

ORDERING DATA

HTM-A-598	splashproof, aspirated
HTM-W-598	splashproof, not aspirated
HTTM-A-598	with 4-20mA -50+50C temperature transmitter
HTM-A-598-10K	with 10K thermistor
HTM-A-598-100	with 100 ohm platinum RTD



TECHNICAL DATA

Range

operating: 5 - 98% rH / calibration: 0 - 100% rH

Accuracy

2% or better at 25 degrees C

Temperature Dependence

0.2% rH per degree C

Response Time

1 minute from 90% to 10% rH

Output

4 to 20mA in 2-wire technology

Load

250/500 ohms +/- .1% at 12 /24 VDC supply

Power Supply

24 VDC +/- 15%

Operating/Storage Temperature

0 to +60 C/-20 to +70 C for 0-100%rH, non-condensing

Stability

+/- 2% rH in 24 months typical

Medium

Do not expose to vapours such as acetone that attack plastic.

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WET / DRY BULB PSYCHROMETER

- **Aspirated with built-in fan**
- **2% accuracy**
- **Reflects solar radiation**
- **Corrosion resistant**

MODEL: HT-WD-A

Our wet and dry bulb psychrometer has been designed for mushroom and greenhouse applications. Wet and dry bulb humidity measurements taken with this instrument are extremely accurate because we use matched pairs of sensors and provide forced ventilation across the wet bulb using a miniature fan.

This psychrometer functions throughout the complete humidity range including the area between 90 and 100%rH where mushroom growers especially need precise control.

The outside of the unit is white to reflect solar radiation and the sensors are mounted inside the instrument so that sunshine can not reach them.

The large water reservoir typically requires filling only once a month in high humidity areas. At low humidities more frequent filling may be required.

The fan and both temperature sensors are connected at a terminal strip inside the moisture resistant junction box on the top of the instrument.

The unit is splashwater resistant and usually suspended by the two eyelets on the top of the unit.

Because the fan will require replacement from time to time the fan assembly can be removed with one screw for easy access to the fan.



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TECHNICAL DATA

Range

operating: 0 to 100% rH / 0 to +45C

Accuracy

2%rH / 0.3C at 25 degrees C

Size

12" x 4" x 8" (L x W x H)

Response Time

1 minute from 90% to 10% rH

Output

2 x Pt100 standard, 2 x 10K or 4-20mA optional

Load

500 ohms + / - .1% at 24 VDC supply

Power Supply

24 VDC + / - 10%

Operating/Storage Temperature

0 to +60 C / -20 to +70 C for 0-100%rH, non-condensing

Medium

Do not expose to vapours such as acetone that attack plastic.

ORDERING DATA

HT - WD - A - () - ()

sensor type	sensor value
R = RTD	100 = 100 ohms
T = Thermistor	10K = 10k ohms

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PRECISION WET / DRY BULB rH TRANSDUCER

- **High Accuracy**
- **Wide temperature range.**
- **4-20 mA sourcing output**
- **Small size and easy installation**
- **Low cost**

APPLICATION

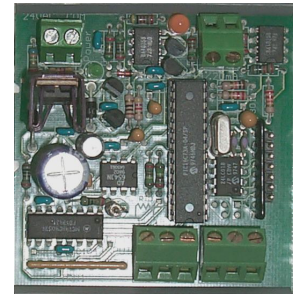
The HT-WD-420 offers inexpensive yet very accurate rH measurements over a wide temperature range. It works with two RTD sensors in a wet/dry bulb arrangement. The board may be used for rH measurements in industrial environment where high temperatures and harsh environment preclude the use of other instruments. It may also be used for enthalpy control and in any accurate climate monitoring applications.

PRODUCT DESCRIPTION

The HT-WD-420 transmitter is a microprocessor based device that uses the signal from two 3-wire RTD sensors (wet bulb and dry bulb) to calculate the relative humidity value. The microprocessor utilizes a scientific rH calculation algorithm that produces very accurate data over a wide temperature range. (This algorithm is a refined version of ASHRAE equations used originally for the creation of Psychrometric Charts)

The board may be programmed for various above sea level values to allow rH compensation in the wet/dry method. The output is linear in its entire range from 0 to 100 % rH. The 4-20 mA transmitter is sourcing to a loop with Rmax of 1000 R.

The board is equipped with angular connectors for easy wiring. It mounts in a 2.75 inch wide snap-track (provided).



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TECHNICAL DATA

Power:	24 VAC, 2 VA
Input:	3 wire RTD's; 100 ohms 385 Platinum to IEC 751 (DIN 43 760)
Output:	4-20mA, sourcing, maximum loop resistance 1000 ohms
Accuracy:	0.5 % FS for the entire range (linearity better than 0.5%)
Temp Range:	Typical input range 0 to 100 deg. C
Indication:	Power Supply - green LED Output Status - orange LED
Dimensions:	plastic housing 3.5" x 4.75" x 2.625" with 2.75" x 2.75" board mounted internally on TR-2 snaptrack

ORDERING DATA

HT-WD-420 psychrometric transmitter

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instruments ltd

25 Shornccliffe Rd, Toronto, ON, M9B 3S4 Tel 1(800)ENERCORP or (416)231-5335 Fax 1(877)ENERCORP or (416)231-7662
Visit our on-line catalogue at www.enercorp.com our e-mail address is info@enercorp.com

OUTDOOR HUMIDITY

- Operates from -60 to +70C
- Two percent accuracy
- Long Term Reliability

RUGGED WIDE RANGE

These humidity transmitters are the type used on unattended remote weather stations across Canada. Even in arctic conditions they perform accurately and without problem. In energy management projects with hundreds of points it is normal to have only one outdoor humidity sensor. If that sensor is not accurate then energy costs may rise and building comfort may suffer. The trouble free, accurate, service year after year of these transmitters can quickly justify their higher cost.

PRINCIPLE OF OPERATION

Specially prepared human hair is used as a sensor. These hairs are specially treated to make them react quickly to changes in humidity. The individual hairs which combine to make the measuring element lengthen when the humidity increases and contract when the humidity decreases. The change in length is transferred to the rotary axis of a potentiometer. This technique for humidity measurement has been successfully used for many years but still provides today the most accurate, stable measurement of humidity at a reasonable cost. Solid state humidity sensors, although cheaper do not offer the long term stability or the low temperature capabilities of this transmitter.

APPLICATION

In energy management applications this transmitter is normally mounted in a make-up air plenum just inside the monitored building. This protects it from snow, ice and rain while still providing monitoring of outside conditions. If this is not possible an outdoor weather shield or weather hut are available.

ORDERING DATA

Model 1.1000.50.515	0-200 ohms output
Model 1.1000.50.515-420:	2 wire 4-20 mA
Model 1.1005.50.515	0-200 ohms output/Pt100
Model 1.1005.50.515-420:	2 wire 4-20 mA/Pt100

TECHNICAL DATA

Output	0 to 200 ohms linear or 4-20mA in 2-wire technology for rH. Pt100 RTD output is also included with 1.1005.. models.
Accuracy	+/- 2% rH, +/- 0.3 deg C
Operating Range	10...100% r.H / -60 to +70C
Calibration Range	0...100% r.H.
Enclosure	stainless steel



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TEMPERATURE / HUMIDITY RECORDER

- **1% temperature 2 or 3% rH**
- **1/7/31 day switchable**
- **Self Contained**
- **Traceable certification available**

DESIGN AND FUNCTION

Use our thermohygrographs when ever you need a record of humidity and temperature conditions. Just put them in place and start recording, no connections, not even a power cord. That's faster, easier and likely less expensive than electronic instrumentation and data loggers.

Because we can supply them with traceable humidity and temperature certification and these recorders are easily transported to our Toronto plant for re-certification they may be ideal to meet your QA requirements. Applications include laboratories, clean rooms, museums, libraries, warehouses, environmental chambers and humidity sensitive production areas.

The sensing elements are located inside a sturdy housing, well protected from mechanical damage. Since the transmission mechanism has minimal friction and is insensitive to shocks and temperature changes, correct readings of atmospheric conditions are guaranteed.

An aged circular bimetal is used to guarantee precise temperature measurement. The radius change of this bimetal with temperature is transmitted through a lever system to the recording pen.

The humidity sensor is a "harp" of human hair,"H", or proprietary plastic fibres,"K", whose length changes with humidity. The changing length is transmitted through a lever system to the recording pen. "K" elements are maintenance free and give 3% accuracy. "H" elements require weekly excursions to 95% to give 2% accuracy.

INDOOR VERSION

The chart drive is powered by a single pen light battery which will operate continuously for up to 12 months. Quartz tuning keeps chart rotation constant even if the battery is weak. A switch on the drum provides a selection of 1, 7 or 31 day rotation.

ORDER NO: 1.0665.02.014

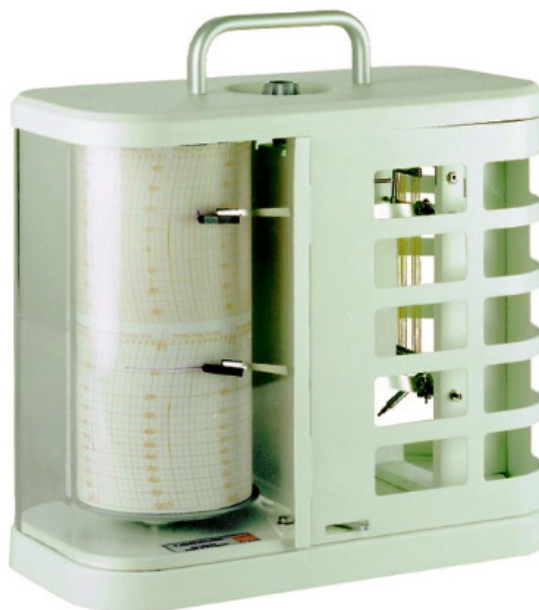
Recording Time: 1/7/31 day switchable
Humidity Element: "K" (0-100% rH)
Temperature range: 0-40 degrees C
Accuracy: 3% rH / 1% temperature
Chart width: 2x82 mm
Divisions: 5% rH, 0.5 degree C
Dimensions: 280 x 140 x 260 mm

OUTDOOR VERSION

The chart drive is powered by an 8 day clockwork mechanism. The clockwork functions well down to minus 35 degrees Celsius, a temperature not yet possible with quartz drives. Human hair bundles in a harp arrangement sense humidity with 2% accuracy.

ORDER NO: 1.0640.00.000

Recording Time: 7 day
Humidity Element: "H" (0-100% rH)
Temperature range: -35...+45 degrees C
Accuracy: 2% rH / 1% temperature
Chart width: 2x82 mm
Divisions: 5% rH, 1 degree C
Dimensions: 280 x 140 x 260 mm



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MOISTURE METER FOR SOLID MATERIALS

- **Wide selection of probes**
- **Fast & Accurate**
- **Calibrated to product**

AQUA-BOY Moisture Meters are designed for easy portability, fast operation with instantaneous indication and universal use.

The AQUA-BOY is a compact, handy unit supplied with accessories, in a carrying case.

The AQUA-BOY meter is housed in a robust case, shaped to protect the large dial and controls.

Power is supplied to the AQUA-BOY by a 9 V battery.

The measuring principle of the AQUA BOY is based on the electrical conductivity of the material which always bears a fixed relation to the moisture. All changes in resistance inside the measuring ranges of interest are sufficiently pronounced to ensure a high degree of accuracy for the readings obtained with the AQUA-BOY.

The electrical indicating accuracy of the AQUA-BOY is $\pm 0.1\%$ while the reproducibility is $\pm 0.2\%$ referred of the absolute readings on the meter dial.

Long years of practical experience of our development department in cooperation with industrial specialists and scientists as well as official test and research laboratories assure long and reliable service to the AQUA-BOY in accordance with the latest know how in electronic moisture detection.

OPERATING INSTRUCTIONS

Battery check Depress the red test button. The needle must then point in the red area. If not, change the battery.

Measuring Connect the electrode to the meter and bring it into firm contact with the product to be measured. Depress the white button and read the result directly on the meter. Release the white button to finish the operation.

TECHNICAL SPECIFICATIONS

Size: $6 \frac{5}{8} \times 4 \frac{1}{2} \times 2$ " , 170 x 115 x 50 mm (L x W x H)

Weight: 14 oz, 0.4 kg



HUMIDITY

The following is a list of the versions of the Aqua -Boy that are available. Please request a detailed data sheet on the Aqua-Boy and related probes.

Timber - (all species)	Timber - (newly cut)
Glued laminated wood	Structural timber
Construction materials	Flooring
Cereals	Malt
Corn	Raw and roasted coffee
Tea	Cocoa
Paper - (all types)	Paper - (cardboard)
Bitumen felt	Cellophane sausage skin
Textiles	Cottonseed
Lint cotton	Jute
Sisal	Feathers
Tobacco	Leather
Almonds	Hazel-nut
Brazil-nuts	Marzipan
Figs	Hops
Copra	Fish meal
Cork	

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CURRENT TO PRESSURE TRANSMITTER

- Industry Standard Valve
- Updated Electronics
- 4...20mA or 2...10VDC

The **VIP-9000** is an I/P or V/P transducer for interfacing electronic control panels to pneumatic valves. A 4...20 mA or 2...10 VDC (capable of delivering 20 mA) input signal is converted by the electronics to a 3 to 15 psi pneumatic signal to position dampers and valve actuators.

We have incorporated a very low air consumption industry standard valve with new electronics to provide excellent reliability with flexible voltage or current inputs.



TECHNICAL DATA

Input Signal 4 ... 20 mA or 2 ... 10 VDC. Voltage signals must be capable of delivering 20 mA.

Input Impedance 500 ohms

Output Signal 3 to 15 psi

Air Supply Required 20 psi nominal, 30 psi maximum, clean, dry, oil free air required. Add in-line filter if necessary.

Air Consumption for Sizing 0.008 scfm at 15 psi

Air Capacity for Air Mains Size 16 scim

Maximum Air Capacity 515 scim at 20 psi supply

Linearity +/- 1% of span

Hysteresis 0.75% of span

Operating/Storage Temperature -29 to 60C / -40 to 71C (-20 to 140F/-40 to 160F)

Humidity 5 to 95% rH, non-condensing

Dimensions 3-7/8"H x 3"W x 2-1/2" D
(98x76x67mm)

Connections Screw terminal and barbed fittings for 1/4" OD plastic tubing

Mounting Upright position. Supplied with plastic track for panel mounting

ORDERING DATA

VIP-9000

ACCESSORIES

PRESSURE GAUGE

Size 1 1/2" dia

Mount 1/8" NPT back

Range 0+30psi/0+200kPa

Accuracy 2%

Movement Bourdon tube

ORDER # VIP-PG



MOUNTING "T"

Thread 1/8" NPT female

Hose 1/4" O.D./0.170 I.D.

Material Brass

Mount Through tab holes

ORDER # VIP-T



BETTER INLINE FILTER

This filter is rated at 0.2 microns and changes colour when contaminated by oil. Use to protect VIP-9000.

Hose 1/4" O.D./0.170 I.D.

ORDER # VIP-F02



GOOD INLINE FILTER

This filter is rated at 10 microns. Does not change colour. Use to protect VIP-9000 from dirt particles only.

Hose 1/4" O.D./0.170 I.D.

ORDER # VIP-F10



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STAINLESS STEEL PRESSURE TRANSMITTER

- **0.5% accuracy**
- **two wire 4...20mA**
- **high vibration resistance**
- **robust design**
- **ammonia and freon versions**

MODEL PX61

Pressure transmitters determine the pressures in liquids and gases and convert these pressures to an electrical signal. The PX61 features compact construction, an integral amplifier, large output signal and extensive medium compatibility. The design provides a 1/2% accurate, economical transmitter that can operate accurately over a wide temperature range with corrosion resistance.

OPERATION

The ceramic diaphragm sensing element deflects under pressure. The mechanical deformation is converted to an electrical signal by means of a DMS-bridge. An electronic system converts the DMS-signals to a standard 4-20 mA signal.

TECHNICAL DATA

Wetted parts / Case

Stainless steel & Viton / stainless steel & polycarbonate

Ambient/Medium temperature

0...+60°C / 0...+85°C

Pressure Connection

1/4" NPT

Supply Voltage

24 V DC +/- 10%

Output

2-wire 4 to 20 mA, max load = 450 Ohms



Accuracy

0.5% using the bfls method

Errors

load - < 0.15%, ambient temperature - 0.05%/deg C

Hysteresis

0.2% max, (linear characteristic)

Overload limit

200% full scale

Enclosure

IP65 (NEMA 4)

Response time

10 msec

Operating position

unrestricted

ORDERING DATA

RANGES ORDER

-30" Hg....15psi	PX61-3015
0...30psi	PX61-30-R
0...60psi	PX61-60-R
0...100psi	PX61-100-R
0...160psi	PX61-160-R
0...250psi	PX61-250-R
0...500psi	PX61-500-R
0...1000psi	PX61-1000-R

-R indicates suitable for either ammonia or freon

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DIFFERENTIAL PRESSURE TRANSDUCER

- Low ranges from 1.5 " Wg
- Snap-in track mounting
- Low price with 1% accuracy

MODEL: WGT-420

The model WGT-420 differential pressure transducer has been developed primarily for HVAC and similar applications. It converts a differential or gauge air pressure signal to a 4-20 mA signal. It provides higher accuracy at the same cost as the LPTB models it replaces.

The new silicone sensor offers excellent performance characteristics at a low cost. A signal conditioning circuit runs as a two wire 4-20mA device.

The input pressure signals are mechanically dampened to reduce sensitivity to turbulence and short duration pressure fluctuations.

Integral zero and span adjustments are factory calibrated to specified output signal levels and may be field adjusted if required. The circuit design produces very little interaction between span and zero pots.

Typical applications of this instrument include HVAC monitoring of filter differential pressures, fan static pressures, clean room pressures, variable air volume systems and velocity pressures.

ORDERING DATA

WGT-420-010B +/-0 to 1" Wg

WGT-420-015 0 to 1.5" Wg

WGT-420-020 0 to 2" Wg

WGT-420-030 0 to 3" Wg

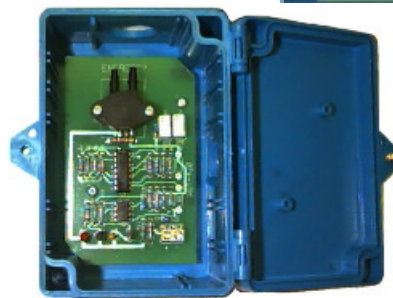
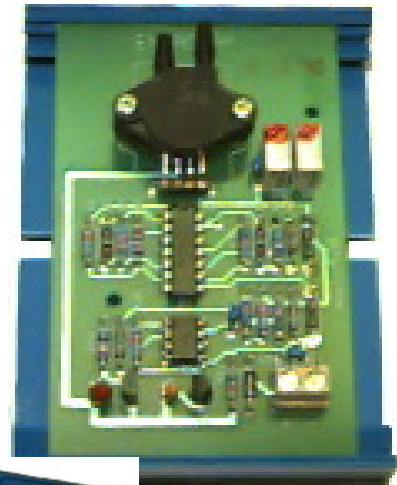
WGT-420-050 0 to 5" Wg

WGT-420-100 0 to 10" Wg

The WGT-420 can also be supplied in other pressure ranges. Please consult factory with your requirements

The WGT-420 is normally supplied on snap-in track. It is also designed to fit in the same enclosure we use for our duct mount temperature and humidity instruments. Please specify *enclosure mounting* if required.

Snap-in track mounting



Enclosure mounting

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TECHNICAL DATA

Accuracy

+/- 1% of span on ranges with span of 3" w.g. or more, +/-1.5% on smaller ranges

Output

4-20 mA, 2 wire

Overload Limit

3 x nominal maximum pressure
5 x nominal max pressure with rezeroing

Operating Temperature

-20 + 70C

Temp Compensation Range

0 to 70 C

Pressure connection

0.180 OD slip on fitting

Supply voltage (Vs)

9 to 30 Vdc

Media

Air, and non-ionic fluids

Wetted parts

Glass filled nylon, silicon diaphragm, alumina

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DIFFERENTIAL PRESSURE SWITCH

- **Adjustable setpoint**
- **0.05 to 12" w.g. range**
- **UL / CSA**

APPLICATION

The model AFS-22 is a general purpose proving switch designed for HVAC and energy management applications. It may be used to sense positive, negative or differential air pressure.

DESCRIPTION

The plated housing contains a diaphragm, a calibration spring and a snap acting switch.

The sample connections on each side of the diaphragm accept 0.25" O.D. metallic tubing via the integral compression ferrule and nut.

An enclosure cover guards against accidental contact with the live switch terminal screws and the set point adjusting screw. The enclosure cover will accept a 0.5" conduit connection.

MOUNTING

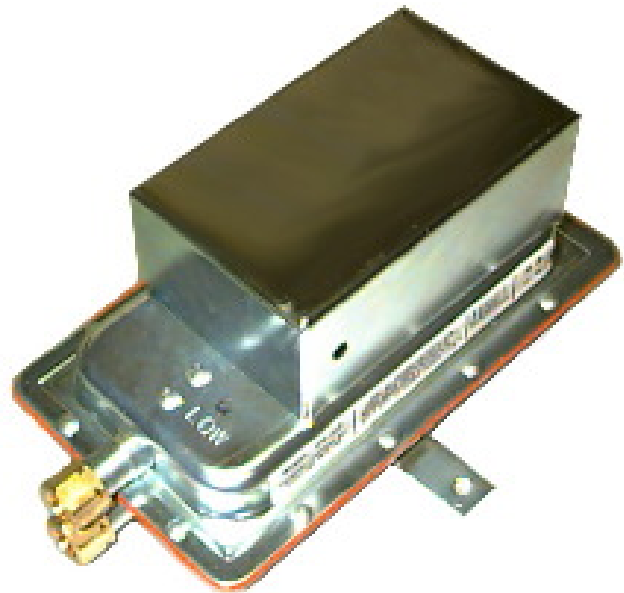
Select a mounting location which is free from vibration. The AFS-222 must be mounted with the diaphragm in any vertical plane in order to obtain the lowest specified operating set point. Avoid mounting with the sample line connections in the UP position. Surface mount via the two 3/16" diameter holes in the integral mounting bracket. The mounting holes are 3-7/8" apart.

AIR CONNECTION

The AFS-222 is designed to accept firm wall sample lines of 1/4" O.D. tubing by means of ferrule and nut compression connections. An optional adaptor suitable for slip on flexible tubing is available.

For sample lines up to 10 feet, 1/4" O.D. tubing is acceptable. For lines up to 20 feet use 1/4" I.D. tubing. For lines up to 60 feet use 1/2" I.D. tubing.

Locate the sample probe a minimum of 1.5 duct diameters downstream from the air source. Install the sampling probe as close to the centre of the air stream as possible.



TECHNICAL DATA

<i>Switching Differential</i>	From 0.02" w.c. at min set point to 0.8" at max setpoint
<i>Measured Media</i>	Air or combustion gasses that will not degrade silicon
<i>Max Pressure</i>	1/2 psi
<i>Temperature Range</i>	-40 to +82C
<i>Life</i>	100,000 cycles min at max pressure and electrical load
<i>Electrical Rating</i>	300VA pilot duty at 115 to 277VAC, 10 amps noninductive
<i>Electrical Connections</i>	Screw type terminals with cup washers
<i>Conduit Opening</i>	7/8" diameter opening accepts 1/2" conduit
<i>Contacts</i>	SPDT
<i>Approvals</i>	CSA, UL, FM

ORDERING DATA

Model AFS-222 Air Flow Switch

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SPLIT CORE PRODUCT SUMMARY

- Simple clamp on design
- Install with power on
- Top mounted terminals
- Indicator & adjustment on top

SPLIT CORE SENSORS

Our split core current switches and current transducers feature the function of our most popular solid core models with the ease of use of a split core design. The small additional cost of the split core version is usually more than paid for by the decrease in installation cost. All models are CSA and UL approved or UL listed for use in Canada and the U.S.



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SC250 for switching both AC and DC circuits

Convenient single range of 1.5 to 150 amp sensing without jumpers switches AC or DC loads to 300 mA.

SC225 for switching both AC and DC circuits

Fixed switching at 1.5 amps. No adjustment needed. Fast / certain installation for ON/OFF monitoring.

SC100 converts AC current to 0-5VDC

Self powered sensor converts AC current to linear, proportional 0 to 5 VDC output with an accuracy of +/- 1% full scale.. Two models give 10 to 200 amp full scale jumper selectable ranges.

SC200 converts AC current to 4-20mA

Loop powered sensor converts AC current to linear, proportional 4 to 20mA output with an accuracy of +/-1% full scale.. Two models give 10 to 200 amp full scale jumper selectable ranges.

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SWITCH AC OR DC LOADS

- **Adjustable setpoint**
- **Switches AC or DC loads**
- **1 range of 1 to 150 amps**

Model SC250

This adjustable setpoint current operated solid state sensor monitors currents from 1.5 to 150 Amperes and switches up to 135 volts AC or DC. Internal circuits are totally powered by induction from the line being monitored.

Design enhancements offer zero off-state leakage in the solid state relay output while switching both AC and DC circuits. The contact is not polarity sensitive, simplifying wiring.

Installation Features

- Universal sensor for both AC and DC switching can simplify installation and reduce mix ups.
- Smart LED flashes rapidly to indicate current has tripped switch, flashes slowly to indicate presence of current below switching point and turns off to indicate current below 1.5 amps or not present.
- Substantial labour cost savings with split core design which easily clamps around cables.
- Small size: mounts easily in tight spaces. Can be hung or tied directly onto wires or cables.
- Self-powered design eliminates need for power supplies and power wiring.

Quality and Reliability

- Field-proven solid-state reliability--highest quality circuits-- no questionable metal contacts
- UL Listed in U.S. and Canada
- Five-year warranty

Applications

- Upgrade from differential pressure and air-flow switches
- Direct connection to PLC, DDC and fire system inputs, for status and proof-of-performance
- Monitor all types of fans: stairway, exhaust, supply, return and tower



- Monitor all types of pumps: tower, condenser, hot and cold water and sump
- Monitor all types of heating elements, ideal for heat tracing
- Monitor motors throughout plant or building to confirm ON/OFF status.
- Directly control light loads, such as lamps and relays

TECHNICAL DATA

Monitored AC Current

1.5-150 Amps, 6-60 Hz

Switch NO, 300mA continuous at 135volts AC or DC

Maximum Current

Continuous 150A

6seconds 400A

1 second 1000A

Size: 2.5" H x 2.6" W x 1.15" D

Through hole 0.85" diameter

Temperature -50C to +65C

Case ABS meets UL flammability rating 94V-0

ORDERING DATA

Ask for model SC250 complete with status LED

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EASY TO INSTALL STATUS INDICATION

- **No installation mix ups**
- **Switches AC or DC loads**
- **1 range of 1 to 250 amps**
- **Pre-set trip point of 1.5 amps**

Model SC225

The SC225 is our easiest to install fixed setpoint current operated solid state status sensor for status indication.

The one unit is pre-set to switch at 1.5 amps and will switch either AC or DC loads. This flexible design eliminates installation problems. It is not possible to incorrectly set the trip point or install a DC unit when an AC load should be switched.

The split core design means that retrofit installations are simplified since power does not have to be shut off and connections do not have to be broken.

The SD225 monitors from 1 to 250 Amperes and switches up to 135 volts AC or DC. Internal circuits are totally powered by induction from the line being monitored.

Design enhancements offer zero off-state leakage in the solid state relay output. The contact is not polarity sensitive, simplifying wiring.

Installation Features

- Lowest installed cost—no adjustment needed.
- Large apertures: 0.85" through hole accommodates up to 350 MCM cable.
- Contact switches up to 135 volts AC and DC.
- Single range monitors from 1 to 250 Amps
- Small size: mounts easily in tight spaces. Can be hung or tied directly onto wires or cables.
- Self-powered design eliminates need for power supplies and power wiring

Quality and Reliability

- Field-proven solid-state reliability--highest quality circuits-- no questionable metal contacts
- UL Listed in U.S. and Canada



Applications

- Upgrade from differential pressure and air-flow switches
- Monitor all types of pumps: tower, condenser, hot and cold water and sump
- Monitor all types of heating elements, ideal for heat tracing
- Monitor motors throughout plant or building to confirm ON/OFF status.
- Directly control light loads, such as lamps and relays

TECHNICAL DATA

Monitored AC Current

1.5-250 Amps, 6-60 Hz

Switch

NO, 300mA continuous at 135volts AC or DC

Maximum Current

Continuous 250A
6 seconds 500A
1 second 1000A

Size: 2.5" H x 2.6" W x 1.15" D

Through hole 0.85" diameter

Temperature -50C to +65C

Case ABS meets UL flammability rating 94V-0

ORDERING DATA model SC225

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AC CURRENT SENSOR with 4-20mA output

- **Output 4-20mA**
- **Simple clamp on design**
- **Install while power on**
- **Top mounted terminals**

Model SC200 SERIES

Our split core current transducers convert a monitored AC current to a proportional 4-20mA output.

Applications:

They are used to monitor motors, pumps, conveyors, machine tools and any electrical load where an analogue representation is required over a range of currents. All models are CSA approved and UL listed.

Description:

The SC200 comprises a current transformer, power circuit, precision rectifier, high-gain servo amplifier and span and zero adjustments. Each sensor has three user selectable ranges. The two wire loop powered 4-20mA output is available on two 6-32 screw terminals.

TECHNICAL DATA

Size: Units are 2.5"H x 2.6"W x 1.2"D with an integral mounting base 3.5" long and mounting centres of 3". The through hole is 0.85" square for up to #4/0 cable.

Operating temperature: -55C to +65C.

Case: ABS (Meets UL flammability rating 94V-0)

Accuracy: +/-0.5% of full scale.

Repeatability: +/-0.1% full scale

Frequency: Flat from 20-100 Hz.

Response time: 100 msec (10 to 90%)

Ripple: Less than 10 millivolts

Supply: 21 to 40VDC

Protection: Reverse polarity, high current



Electrical Specifications:

Model	Range	Jumper	Max Current
SC200-1	0 to 10A 0 to 20A 0 to 50A	None Mid High	200 A continuous on any range
SC200-2	0 to 100A 0 to 150A 0 to 200A	None Mid High	1200A for 15 sec on any range

ORDERING DATA

Model SC200-1 for ranges of 0 to 10, 0 to 20 and 0 to 50 amps full scale.

Model SC200-2 for ranges of 0 to 100, 0 to 150 and 0 to 200 amps full scale.

Output is linear with input.

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AC CURRENT SENSOR with 0 to 5V output

- Output 0 to 5 VDC
- Simple clamp on design
- Install while power on
- Top mounted terminals

Model SC100 SERIES

Our split core current transducers convert a monitored AC current to a proportional DC voltage of 0 to 5 Volts.

Applications:

They are used to monitor motors, pumps, conveyors, machine tools and any electrical load where an analogue representation is required over a range of currents. All models are CSA approved and UL listed.

Description:

The SC100 comprises a current transformer, range selector, rectifier-filter and scaling circuit. Each sensor has three basic user selectable ranges. The 0-5 VDC output is available on two 6-32 screw terminals.

TECHNICAL DATA

Size: Units are 2.5"H x 2.6"W x 1.2"D with an integral mounting base 3.5" long and mounting centres of 3". The through hole is 0.85" square for up to #4/0 cable.

Operating temperature: -55C to +65C.

Case: ABS (Meets UL flammability rating 94V-0)

Accuracy: +/-1% of full scale when loaded with 1 megaohm.

Repeatability: +/-1% full scale

Frequency: Calibrated for 50-60 Hz and within +/-2% from 20-100 Hz.

Response time: 100 msec (10 to 90%)

Ripple: Less than 10 millivolts



Electrical Specifications:

Model	Range	Jumper Amps	Max Cont Amps	Max 6 sec ON 15 sec OFF	Max 1 sec ON 15 sec OFF
SC100-1L	0 -10	None	80	125	250
	0 -20	Mid	110	150	300
	0 -50	High	175	215	400
SC100-2L	0-100	None	200	300	600
	0-150	Mid	300	450	800
	0-200	High	400	500	1000

ORDERING DATA

Model SC100-1L for ranges of 0 to 10, 0 to 20 and 0 to 50 amps full scale.

Model SC100-2L for ranges of 0 to 100, 0 to 150 and 0 to 200 amps full scale. Output is proportional to input between 0 amps and end of range.

ENERCOP instruments Ltd

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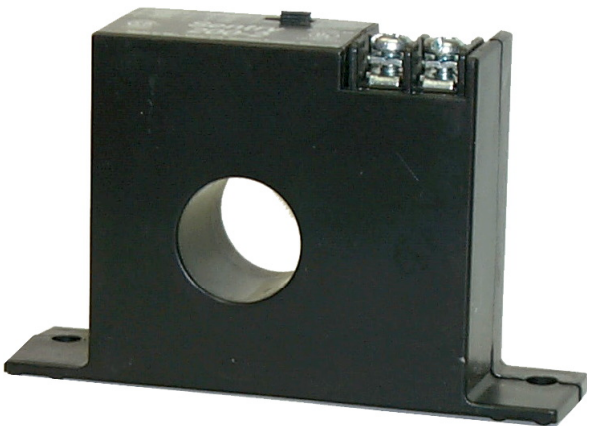
SOLID CORE PRODUCT SUMMARY

- **5 year Unconditional Warranty**
- **Low Cost**
- **CSA/UL**

SOLID CORE SENSORS

Choose our solid core models when you need the lowest cost. Our newest models 225, 245 and 250 are especially convenient since they switch both AC and DC loads and require no range jumper.

New smart LED's in our switches provide no off-state leakage. All models are CSA approved or UL listed in both Canada and the US.



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225 for status indication

Self powered solid-state relay switches AC or DC loads when monitored current reaches 1 amp. Our lowest cost unit needs no adjustment reducing installation time. Ideal status monitor for DDC systems

245 can be set to trip from 1 to 150 Amps

Self powered solid-state relay adds 1 to 150 amp adjustable setpoint to D225.

250 has status LED and adjustable setpoint

Self powered solid-state relay adds LED status indicator to D245.

100 converts AC current to 0-5 VDC

Selectable jumper provides three operating ranges. Model A100-1 has ranges 10, 20 and 50 amps full scale. Model A100-2 has ranges 100, 150 and 200 amps full scale.

200 converts AC current to 4-20 mA

Loop powered sensor converts AC current to linear, proportional 4 to 20mA output with an accuracy of +/- 0.5% full scale.. Ranges 10, 20 and 50 or 100, 150 and 200 amps full scale.

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LOW COST STATUS INDICATION

- **Switches AC or DC loads**
- **1 range of 1 to 250 amps**
- **Lowest Cost**

Model 225

The 225 is our lowest cost fixed setpoint current operated solid state status sensor. It monitors from 1 to 250 Amperes and switches up to 135 volts AC or DC. Internal circuits are totally powered by induction from the line being monitored.

Design enhancements offer zero off-state leakage in the solid state relay output while switching both AC and DC circuits. The contact is not polarity sensitive, simplifying wiring.

The 225 is ideal for status indication. It switches at 1 amp without requiring setpoint adjustment.

Installation Features

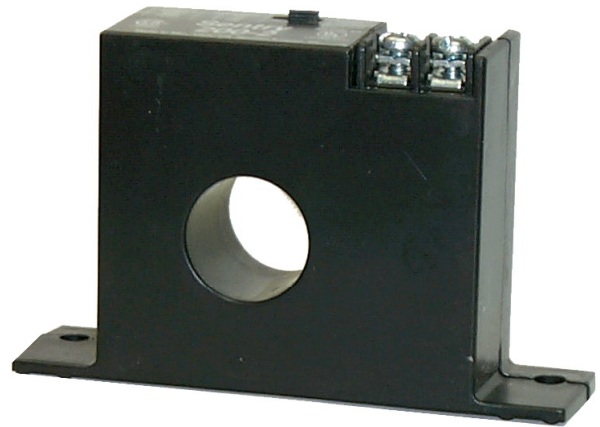
- Lowest installed cost—no adjustment needed.
- Large apertures: 0.55" hole in the D225 accommodates up to 2/0 cable.
- Contact switches up to 135 volts AC and DC.
- Single convenient range monitors from 1 to 250 Amps
- Small size: mounts easily in tight spaces. Can be hung or tied directly onto wires or cables.
- Self-powered design eliminates need for power supplies and power wiring.

Quality and Reliability

- Field-proven solid-state reliability--highest quality circuits-- no questionable metal contacts
- UL Listed in U.S. and Canada

D225 Series Applications

- Upgrade from differential pressure and air-flow switches
- Direct connection to PLC, DDC and fire system inputs, for status and proof-of-performance
- Monitor all types of fans: stairway, exhaust,



supply, return and tower

- Monitor all types of pumps: tower, condenser, hot and cold water and sump
- Monitor all types of heating elements, ideal for heat tracing
- Monitor motors throughout plant or building to confirm ON/OFF status.
- Directly control light loads, such as lamps and relays

TECHNICAL DATA

Monitored AC Current

1-250 Amps, 6-60 Hz

Switch NO, 300mA continuous at 135volts AC or DC

Maximum Current

Continuous 250A

6 seconds 500A

1 second 1000A

Size: 2.18" H x 3.53" W x 0.94" D

Through hole 0.75" diameter

Temperature -50C to +65C

Case ABS meets UL flammability rating 94V-0

ORDERING DATA

Ask for model 225

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SWITCHES AC OR DC LOADS

- **Adjustable setpoint**
- **Switches AC or DC loads**
- **1 range of 1 to 150 amps**

Sentry 250

This adjustable setpoint current operated solid state sensor monitors currents from 1 to 150 Amperes and switches up to 135 volts AC or DC. Internal circuits are totally powered by induction from the line being monitored.

Design enhancements offer zero off-state leakage in the solid state relay output while switching both AC and DC circuits. The contact is not polarity sensitive, simplifying wiring.

Installation Features

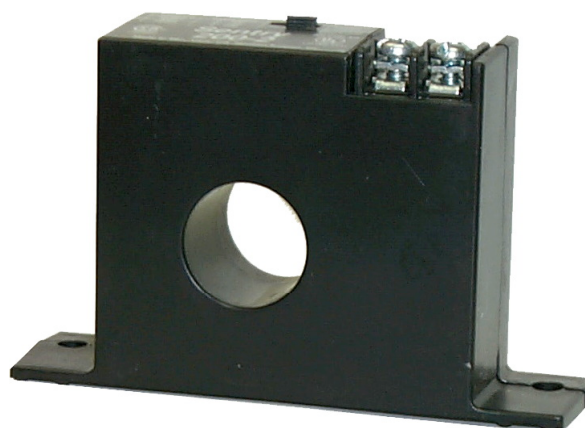
- Large aperture of 0.55" accommodates up to 2/0 cable.
- Contact switches up to 135 volts AC and DC.
- Single convenient range monitors from 1 to 150 Amps
- Small size: mounts easily in tight spaces. Can be hung or tied directly onto wires or cables.
- Self-powered design eliminates need for power supplies and power wiring.

Quality and Reliability

- Field-proven solid-state reliability--highest quality circuits-- no questionable metal contacts
- UL Listed in U.S. and Canada

Applications

- Upgrade from differential pressure and air-flow switches
- Direct connection to PLC, DDC and fire system inputs, for status and proof-of-performance
- Monitor all types of fans: stairway, exhaust, supply, return and tower



- Monitor all types of pumps: tower, condenser, hot and cold water and sump
- Monitor all types of heating elements, ideal for heat tracing
- Monitor motors throughout plant or building to confirm ON/OFF status.
- Directly control light loads, such as lamps and relays

TECHNICAL DATA

Monitored AC Current

1-150 Amps, 6-60 Hz

Switch NO, 300mA continuous at 135volts AC or DC

Maximum Current

Continuous 150A

6seconds 400A

1 second 1000A

Size: 2.18" H x 3.53" W x 0.94" D

Through hole 0.75" diameter

Temperature -50C to +65C

Case ABS meets UL flammability rating 94V-0

ORDERING DATA

Ask for model Sentry 250

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AC CURRENT SENSOR with 0-5V output

- Output 0 to 5 VDC
- Lowest cost transducer
- No power supply needed

Model 100 SERIES

Our solid core current transducers convert a monitored AC current to a proportional DC voltage of 0 to 5 Volts.

Applications:

They are used to monitor motors, pumps, conveyors, machine tools and any electrical load where an analogue representation is required over a range of currents. All models are CSA approved and UL listed.

Description:

The Sentry 100 comprises a current transformer, range selector, rectifier-filter and scaling circuit. Each sensor has three basic user selectable ranges. The 0-5 VDC output is available on two 6-32 screw terminals.

TECHNICAL DATA

Operating temperature: -50C to +65C.

Case: ABS (Meets UL flammability rating 94V-0)

Accuracy: +/-1% of full scale when loaded with 1 megaohm.

Repeatability: +/-1% full scale

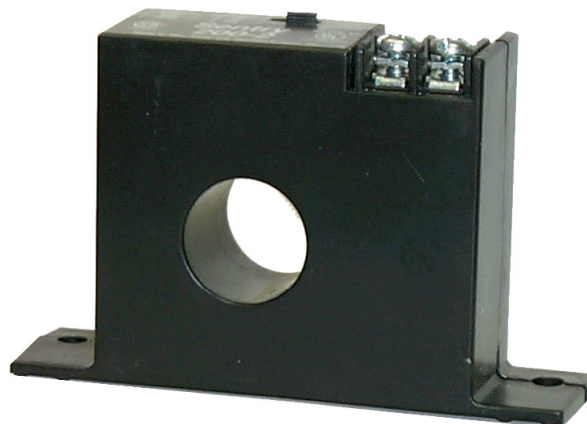
Frequency: Calibrated for 50-60 Hz and within +/-2% from 20-100 Hz.

Response time: 100 msec (10 to 90%)

Ripple: Less than 10 millivolts

Size: 2.18" H x 3.53" W x 0.94" D

Through hole 0.75" diameter



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Electrical Specifications:

Model	Range Amps	Jumper Amps	Max Cont Amps	Max 6 sec ON 15 sec OFF	Max 1 sec ON 15 sec OFF
100-1L	0 to 10	None	80	125	250
	0 to 20	Mid	110	150	300
	0 to 50	High	175	215	400
100-2L	0 to 100	None	200	300	600
	0 to 150	Mid	300	450	800
	0 to 200	High	400	500	1000

ORDERING DATA

Model Sentry 100-1L for ranges of 0 to 10, 0 to 20 and 0 to 50 amps full scale.

Model Sentry 100-2L for ranges of 0 to 100, 0 to 150 and 0 to 200 amps full scale. Output is proportional to input between 0 amps and end of range.

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AC CURRENT SENSOR with 4-20mA output

- **Output 4-20mA**
- **1/2% accuracy**
- **Linear output from 0 amps**

Model 200 SERIES

Our solid core current transducers convert a monitored AC current to a proportional 4-20mA output.

Applications:

They are used to monitor motors, pumps, conveyors, machine tools and any electrical load where an analogue representation is required over a range of currents. All models are CSA approved and UL listed.

Description:

The 200 comprises a current transformer, power circuit, precision rectifier, high-gain servo amplifier and span and zero adjustments. Each sensor has three user selectable ranges. The two wire loop powered 4-20mA output is available on two 6-32 screw terminals.

TECHNICAL DATA

Operating temperature: -10C to +70C.

Case: ABS (Meets UL flammability rating 94V-0)

Accuracy: +/-0.5% of full scale.

Repeatability: +/-0.1% full scale

Frequency: Flat from 20-100 Hz.

Response time: 300 msec (99%)

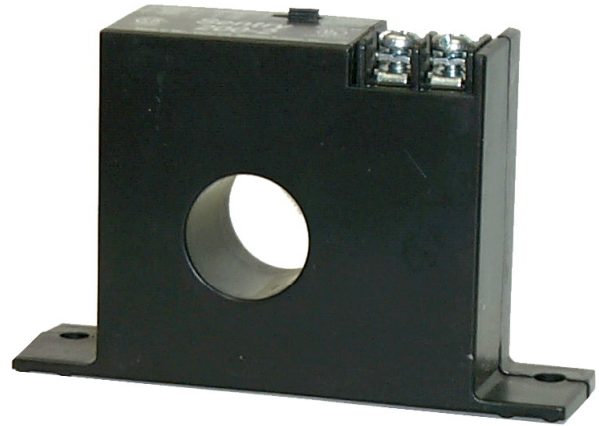
Ripple: Less than 10 millivolts

Supply: 21 to 40VDC

Protection: Reverse polarity, high current

Size: 2.18" H x 3.53" W x 0.94" D

Through hole 0.75" diameter



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Electrical Specifications:

Model	Range	Jumper	Max Current
200-1	0 to 10A	None	200 A continuous on any range
	0 to 20A	Mid	
	0 to 50A	High	
200-2	0 to 100A	None	1200A for 15 sec on any range
	0 to 150A	Mid	
	0 to 200A	High	

ORDERING DATA

Model 200-1 for ranges of 0 to 10, 0 to 20 and 0 to 50 amps full scale.

Model 200-2 for ranges of 0 to 100, 0 to 150 and 0 to 200 amps full scale.

Output is linear with input.

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FAN and PUMP STATUS

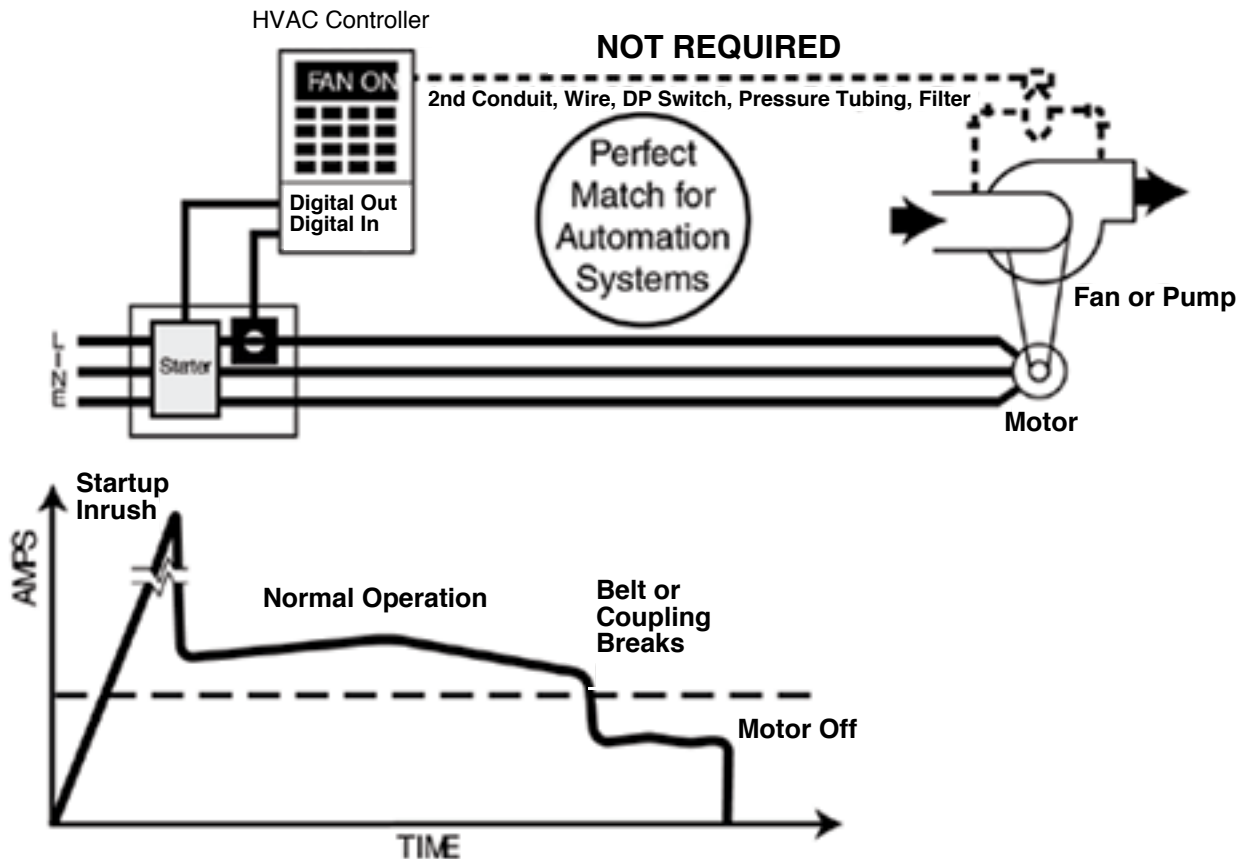
Reliable, Economical Electronic Fan and Pump Status

Select the right sensor

- **Series 250 Switches** require a few turns of a potentiometer and a glance at the SmartLED™
- **Series 100 and 200 transducers** provide an analog output signal, allowing for software alarm set points and real time current monitoring

Concept: When fans or pumps are moving air or water, they draw a typical amperage load. If the belt or coupling breaks, the amperage drops to about half of the normal load. Use our current sensors and your automation system to monitor this change.

Benefits: Solid-state sensors won't wear out or drift like electromechanical pressure switches, resulting in fewer callbacks. Less conduit means less electrician time. And no pipe taps means less pipefitter time and the elimination of a potential leak source.



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AIR QUALITY MONITOR / CONTROLLER

- **Wide spectrum gas sensor**
- **4 to 20mA & 0 to 10V output**
- **Easy to configure**

AQT-3000

The AQT operates by looking at the signal from a full spectrum sensor and judges the degree of pollution. The sensor is sensitive to a wide variety of air pollutants such as carbon monoxide, ketones, aldehydes, esters benzene, alcohols, hydrogen, reducing hydrocarbons, and cigarette smoke.

Our new version is the result of 15 years of development work in the air quality field. Our previous versions have demonstrated, in hundreds of installations, that they can improve levels of clean air in occupied spaces while saving energy by providing fresh air in proportion to demand.

New Features

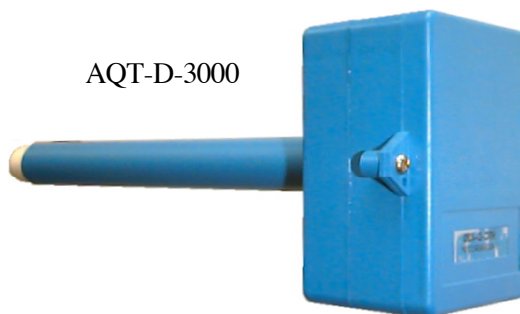
1. Better accuracy with a 15 bit instead of 10 bit A/D converter providing high resolution.
2. Programmable continuous analog output instead of the previously available stepped output.
3. 4-20mA output in addition to the previously available voltage output.
4. Improved algorithm and more powerful micro-processor for determining control output.
5. Built in switching power supply to reduce power consumption by up to 75%.

For the unit to perform efficiently it must work as a monitor/controller, i.e. it must be able to act upon pollution level changes. The analog outputs are continuous 4 to 20mA and 0...10 VDC.

Our newer technology now permits the monitoring of other tracer gasses which are produced by humans in proportion to CO₂. In addition, the AQT-3000 is also sensitive to more harmful contaminants which CO₂ monitors fail to detect. Coupled with much lower prices for the AQT-3000, it is an alternative that should be evaluated.



AQT-S-3000



AQT-D-3000

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TECHNICAL DATA

Supply Voltage	15 to 30 VDC
Supply Current	100 mA
Operating temperature	-10 to 60 C
Operating Humidity	10 to 95% rH
Outputs	4 to 20mA / 0...10 VDC
Output Impedance	> 1k ohms for voltage 1000*Vs/24 for current

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CO₂ MONITOR / CONTROLLER

- 5 years between re-calibration
- New lower price
- 4-20mA or voltage selectable
- Programmable alarm optional

The AirSense model 310 is a non-dispersive infrared analyzer for measuring CO₂ concentration in ventilation systems and indoor living spaces. Its measurement range of 0-5000ppm covers the range required to monitor compliance with ASHRAE or other ventilation efficiency standards.

Packaged in a compact, distinctively styled enclosure, the Model 310 can be discreetly installed anywhere from the board room to the boiler room. Standard center wiring access and fully floating outputs make installation a snap.

The model 310 provides several output alternatives. A voltage or 4-20mA current output is standard. An optional LCD readout is available. An optional relay contact can be configured to open or close above a user-adjustable setpoint.

A simple one-point calibration procedure and a built-in calibration port that requires no special fittings or adapters make the Model 310 simple to maintain.

Displays and Indicators

The basic Model 310 has a single green LED on the front panel which illuminates whenever the unit is operating. This LED is on steady when the measured concentration is below the high limit, and blinks whenever the concentration is above the limit. The standard factory high limit is 1000ppm, but can be easily adjusted in the field. The display option adds a 4 digit liquid crystal display (LCD) to the front panel. The display shows the measured CO₂ concentration in parts per million.



Repeatability

+/-20ppm

Accuracy +/-5% of reading or +/-75ppm, whichever is greater

Response Less than 1 minute

Pressure Dependence

0.003% per ft altitude. Can be field corrected.

Annual Drift +/-75 ppm

Calibration Interval 5 years

Operating Temperature Range 0-50C

Operating Humidity Range 0-90% RH (non Condensing)

Dimensions 5.2" X 3.2" X 1.4" (6.5 oz)

Power Input 20-28 VAC, 18-30VDC less than 2W @24VDC

Optional Display 4 Digit LCD Display

Analog Output 0-10 V or 4-20 mA jumper selectable. Shipped with 0-2000ppm range. Field adjustable to any subset between 0 and 5000ppm

Measurement Range 0-5,000 ppm

Relay 2 A @24VAC, field adjustable high limit jumper selectable as N/O or N/C

ORDERING DATA

310eRL CO2 Wall transmitter-LCD/Relay

310-eRLD CO2 Duct transmitter-LCD/Relay

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DIGITAL CONTROLLER

- **Single or double setpoint**
- **RTD, thermocouple, mA inputs**
- **Self optimizing**
- **Programmable alarm**

Easy to read

The VT10 controller family is very well suited for any application requiring reliable and accurate temperature control.

The plug in chassis permits rapid replacement without involving any wiring changes.

The controller has two numerical displays for process value (red) and setpoint (green). The green display is also used for comments during programming. Operation is by four membrane keys and is arranged on three different levels.

The VT10 can be programmed as either a single or double setpoint controller. When used as a double setpoint controller it can be used to control two independent heating and cooling loops. Both loops in this case have PID feedback.

The instrument has one or two relay outputs. Options include 4-20mA control output, RS485 and built-in 2-wire transmitter power supply. One output can be configured as an alarm in eight different ways.

Resistance thermometers, thermocouples, mA or voltage inputs can be directly accepted.

Self optimization ensures automatic adjustment of the controller parameters to the process. The ramp function permits a controlled approach to the setpoint.

The standard supply voltage is 85 to 265 VAC.

All connections are made to the instrument through screw terminals.

1/16th DIN (48mm x 48mm), 1/4 DIN (96mm x 96mm) and 1/8th DIN vertical models are available.



TECHNICAL DATA

Inputs:	100 ohm RTD, J, K, T, E, S, R, B, N thermocouples, 4-20mA, 0-10V
Display:	Two 3 1/2 digit LED displays, which can be programmed in Fahrenheit or Celsius for temperature sensors. They can display 0 to 100% for mA or voltage inputs.
Relays:	Two, 5A and 10A at 250 VAC
Supply:	85 to 265 VAC
Accuracy:	0.2C for RTD's, 2C for thermocouples

ORDERING DATA

VT4810	1/16th DIN
VT9610	1/4 DIN
VT4910	1/8 DIN vertical

options

Extra output
4-20mA control output
2-wire transmitter supply

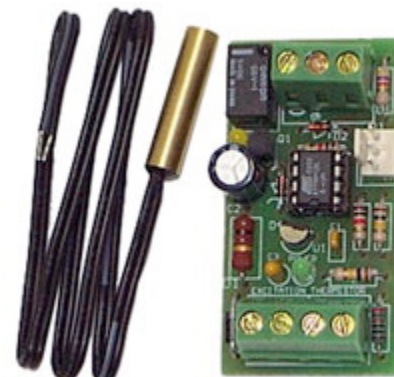
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SIMPLE TEMPERATURE CONTROLLER

- Inexpensive, microprocessor design
- User programmable using GUI software
- Relay output, SPDT 1A contact
- Programmable hysteresis and minimum cycle timing
- Stand alone operation with remote monitoring option
- 10 K thermistor, mounting track and programming software included



APPLICATION:

The ETTR may be used as a simple temperature controller, providing on/off relay output for fans, heaters, shut off valves and safety systems. Because of its software adjustable parameters, the product is highly customizable - an ideal solution for many OEM temperature control applications.

PRODUCT DESCRIPTION:

The ETTR is a programmable temperature relay with the ability to act as an ON/OFF temperature controller. The device is capable of fully stand alone operation, but may be monitored and programmed with the custom software and a serial RS232 interface.

The unit may be programmed in two control modes: (a) temperature range mode in which it will turn ON the output relay between two defined temperatures and (b) set point mode in which it will turn ON below a defined temperature and OFF above a defined temperature. The span between the temperatures may be adjusted to customize the hysteresis. The ETTR may also be placed in a manual mode of operation in which the relay is controlled via the GUI software.

SPECIFICATIONS:

- Power: 12 to 24 VAC or VDC
- Input: Single NTC 10K thermistor in brass tubing (provided),
- Output: Form C output relay (rated 1A @ 30 VDC and 0.5A @ 125 VAC)
- Indication: Status - Green LED
- solid = Power ON

- flashing = Thermistor wiring fault

Temperature: -25°C to 100°C (-13°F to 212°F)

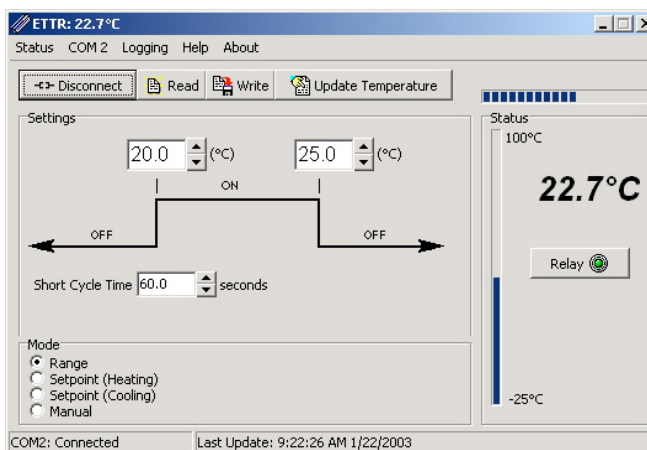
Dimensions: 1" x 2.25" (26 x 57 mm), board mounts in TR-1 plastic snap track (provided)

Computer Interface: serial communications via RS232 port. Windows® based software and connection cable sold separately.

ORDERING DATA

- ETTR** controller
- ETTR-SW** Windows® software
- ETTR-CABLE** interface cable

Sample programming screen temperature range mode shown



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PR20 series - PAPERLESS RECORDER

- No more charts or pens
- DIN cutout makes upgrades easy
- 6 isolated inputs, RTD, T/C, V, mA
- Bright high contrast display
- Data stored on floppy and flash

Have your recorders ever run out of chart paper or ink? Perhaps, you've had paper jams or the mechanical drive mechanism of your recorders acts up from time to time. Maybe you had to actually look for data on some old charts and didn't have even a little bit of fun doing it.

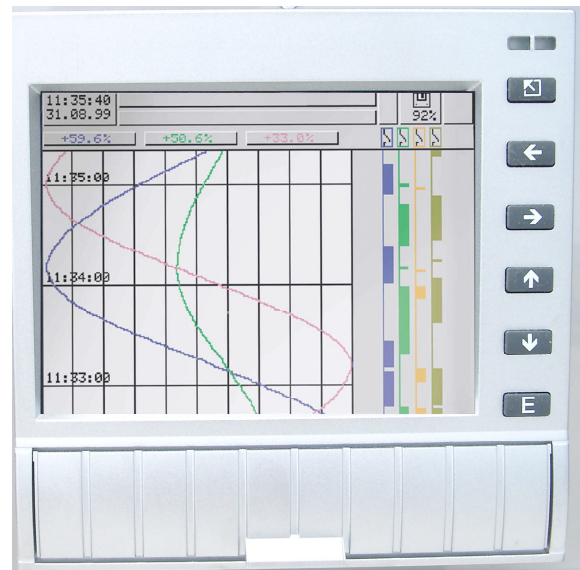
We have a solution. Our new *PR20* is the perfect replacement for your old recorder. It's DIN cutout fits in the hole left by most recorders with a European heritage. In minutes it can be programmed for up to six channels of RTD's, thermocouples, Voltage or mA signals in any mixture and any range.

Because the signals are electrically isolated you will not have problems with the signal from one channel interfering with another channel's signal.

Isn't it time to consider an upgrade to those old recorders. Get the benefits of digital technology without the hassel of a PLC or networking approach.

For double security we store data in non-volatile flash memory as well as on the built-in 3-1/2" floppy drive. Our included evaluation software runs under Windows to display and graph the data. The data can be exported to spreadsheet programs for further analysis or graphing.

Since the *PR20* uses no pens or paper it can save thousands of dollars in operating costs over the life of the installation when compared to conventional recording techniques.



TECHNICAL DATA

Inputs:	100, 500 or 1000 ohm platinum DIN RTD, Pt100 JIS, J, K, E, S, R, B, T, N, L, U, W3, W5 thermocouples, 4-20mA, 0-10V
Display:	5" backlit colour LCD with 320 x 240 pixel resolution.
Supply:	115...230VAC, 48...63Hz optionally 24...48VDC/AC
Accuracy:	0.5% or better
Depth:	210 mm
Options:	3 relays, 4 digital inputs, RS232/485. Specify code 261

ORDERING DATA

PR20	6 channel recorder with fully programmable inputs
PR20-HM	6 channel recorder with double memory option
PR20-PCA	Graphing program for Ecograph (included with recorder purchase)

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DIGITAL INDICATOR

- Two RTD inputs in °F or °C
- measure supply & return values
- Easy surface mounting

The **DIS-3000** digital indicator is a low cost, instrument for displaying one or two temperatures from RTD sensors.

The standard version accepts two RTD temperature sensor inputs. The first value is continually displayed and the second is displayed when a button on the front of the instrument is depressed.

Wet/Dry bulb: The DIS-3000 is a convenient way to monitor temperatures from a wet and dry bulb psychrometer.

Heat pumps: The DIS-3000 is an easily installed and inexpensive way to monitor supply and return temperatures from any cooling or heating equipment. Since it can be powered by a 9 volt battery it can even be used as a portable instrument in a pinch.

The thermostat style surface mount case is quick to install with sheet metal screws and does not require a panel cutout. You will need a knock out behind the case for the power and temperature sensor connections.

TECHNICAL DATA

Supply: 8 to 40 VDC or 8 to 32 VAC

Display: 3 1/2 digits, 0.56" high intensity red

Connection: Power and relay: Faston

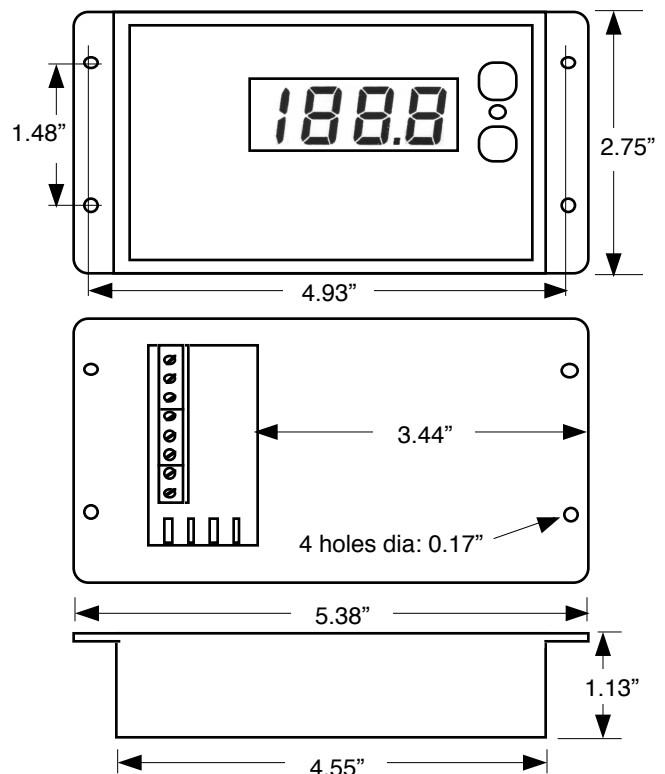
Sensors: 2 x 3pole screw terminals

Accuracy: 0.25% +/- 1 digit

Input: 2 x 100 ohm RTD



Dimensions



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ORDERING DATA

DIS-3000-(C/F)

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WIND SPEED & DIRECTION TRANSMITTERS

- Wind Velocity & Direction
- Heating built-in for de-icing
- 4 to 20mA outputs
- Simple hook-up
- Good price / performance

compact wind transmitters

Our *compact* wind transmitters have the perfect price performance ratio for most commercial and industrial applications. Their built-in heaters make them serviceable in winter conditions and their standard 4-20mA output signal makes them simple to interface to building control panels or industrial chart recorders.

Speed transmitter

The wind velocity is measured by means of a low inertia plastic cupstar whose ball-bearing axis is connected to a slotted disk. This disk is scanned opto-electronically and supplies 11 pulses with every rotation. These pulses are converted in the instrument to 4 ... 20mA.

Direction transmitter

The wind direction is measured by means of a low inertia metallic wind vane whose ball-bearing axis is connected to a slotted disk. The code disk is scanned opto-electronically and has been built with a 5 bit Gray Code to give a resolution of 11.25 degrees. This Gray-Code is converted in the instrument to 4 ... 20mA.

ORDERING DATA

4.3519.00.141	Wind speed transmitter
4.3129.00.141	Wind direction transmitter
4.3171.30.000	Mounting cross arm and U clamps



TECHNICAL DATA

Speed	<i>range</i>	0.5 to 50 m/sec
	<i>heating</i>	24V AC/DC:max 20W
	<i>output</i>	4 ... 20mA
	<i>cable</i>	12 m long
	<i>size</i>	135 x 165mm
Direction	<i>weight</i>	0.75 Kg
	<i>range</i>	0 ... 360 degrees
	<i>heating</i>	24V AC/DC:max 20W
	<i>output</i>	4 ... 20mA
	<i>cable</i>	12 m long
Traverse	<i>size</i>	270 x 240mm
	<i>weight</i>	1.1 Kg
	<i>spacing</i>	800 mm
Construction	<i>tube clamp</i>	40 mm
	<i>material</i>	aluminum
	<i>The external parts of the instruments are corrosion resistant being made of a combination of plastic and anodized aluminum. Labyrinth seals protect sensitive parts inside the instrument from humidity.</i>	

ENERCOP instruments Ltd

25 Shorncliffe Rd, Toronto, ON, M9B 3S4 Tel 1(800)ENERCOP or (416)231-5335 Fax 1(877)ENERCOP or (416)231-7662
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FIRST CLASS WIND TRANSMITTERS

- **New wind power site evaluation**
- **Low starting threshold**
- **High accuracy**
- **Great cost-performance ratio**

The First Class wind transmitter is designed to evaluate the location and capacity of future wind power systems. It measures the horizontal component of wind speed. The measured value is available as a digital signal at the output.

The rotation of the carbon-fiber reinforced plastic cup star is scanned opto-electronically and converted into a square wave signal. The frequency of this signal is proportional to the number of rotations. The measured value is available as a digital signal output.

It can be transmitted to display instruments, recording instruments and data loggers as well as to process control systems.

For winter operation the instrument is equipped with electronically regulated heating, which guarantees smooth operation of the ball bearings, and prevents the shaft and slot from

ORDERING DATA

- 4.3350.00.000** With heating
4.3350.10.000 Without heating



TECHNICAL DATA

Range	0.3...75 m/s (170 mph)
Instability (w/o calibration)	0.3-50m/s <3% of value<.3m/s 50-75m/s <6% of meas. value
Survival speed	for 1 hr. 100 m/s (225 mph)
Linearity	correl. factor r between freq. & speed, $r > 0.999\ 95$ (4-20 m/s)
Output	Form: rectangular Frequency: - 1000 Hz @ 50 m/s Amplitude: = supply volt, max 15V
Resolution	0.05 m wind run
Supply for opto-electr. scanning	$V = 3.3-42\ VDC$ $I = 0.3mA@3.3V$ (w/o ext. load) $<0.5mA@5V$ (w/o ext. load)
Wind load	@ 75 m/s approx. 100N
Dimensions	see dimensional diagram
Weight	approx. 0.5 kg
Protection	IP 55 (DIN 40050)

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ULTRASONIC WIND TRANSMITTERS

- 2 D Wind Speed & Direction
- Heating built-in for de-icing
- Digital & Analog outputs
- Highest accuracy
- Inertia free measurements

The Ultrasonic Anemometer 2D is designed to detect the horizontal components of wind speed and wind direction as well as the virtual temperature in two dimensions. Due to its very short measurement intervals, the instrument is ideal for the inertia-free measurement of gusts and peak values. In certain weather situations the accuracy of the air temperature measurement (virtual-temperature) surpasses that one of the classic method where the temperature transmitter is used in a weather and thermal radiation shield. The measured data are available as analogue signals and as a data telegram over a serial interface. The sensors instrument as well as the instrument body are automatically heated so that the measuring results, in case of critical ambient

ORDERING DATA

4.3810.00.340 Wind speed transmitter 2D
see detailed data sheet for other models
9.3389.10.000 Power Supply
4.3100.99.000 Lightning Rod



TECHNICAL DATA

Speed	<i>range</i>	0 to 60 m/sec
	<i>accuracy</i>	+/-0.1 m/s at 0...5 m/s +/-2% at > 5 m/s
	<i>resolution</i>	0.1 m/s
Direction	<i>range</i>	0 ... 360°
	<i>accuracy</i>	+/- 1.0°
	<i>resolution</i>	1 degree
Virtual Temp	<i>range</i>	-40...+70°C
	<i>accuracy</i>	+/-1 K
	<i>resolution</i>	0.1 K
Data Output	<i>digital</i>	RS232, RS485/422 baud rate 1200, 2400, 4800, 9600, 19200 adj.
	<i>analog</i>	4-20mA/2-10V or 0-20mA/0-10V
General	<i>meas. rate</i>	400 per sec. @ 25°C
	<i>op. voltage</i>	12-24V AC/DC, 3VA, htg.24VAC/DC,70VA

see detailed data sheet for further specs.

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CLASSIC WIND TRANSMITTERS

- **Wind Velocity & Direction**
- **Heating built-in for de-icing**
- **4 to 20mA outputs**
- **Process industry applications**
- **Rugged design**

The wind transmitter is used for the registration of the horizontal component of the wind velocity. The

measuring value will be placed at the output as analog signal. The signal can be given to display instruments,

recording instruments, datalogger as well as process wise systems. The wind transmitter is equipped with an

electronically regulated heating system in order to prevent ice and frost from the ball bearings and the outer

rotation parts (please refer to instrument models).

Power supply unit provides the transmitter and the heating system with current. It is

advisable to attach a Lightning rod in areas with considerable lightning activity.

ORDERING DATA

- 4.3303.22.041** Wind speed transmitter
4.3125.32.041 Wind direction transmitter
see detailed data sheet for other models
9.3388.00.000 Power Supply
4.3100.99.000 Lightning Rod



TECHNICAL DATA

- Range : see connection diagram
Start velocity : 0,3 m/s
Maximal load : 60 m/s
Electrical output : see connection diagram
Accuracy : 0.5 m/s or 2% of range
Resolution : 0.05 m wind run
Wind load-35 m/s : approx. 10 N
Distance constant : 5 m
Ambient temp. : -35...+80°C
Heating(#22): 24VAC/DC; approx. 20W electronically controlled
Connection : 5-pole plug
Mounting : onto a mast tube 1" dia, DIN 2441
Weight : 1 kg

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POWER SUPPLIES

- **Low Cost**
- **Snap track Installation**
- **Up to 1 Amp Output**

Variable voltage model PS24DC regulated power supply provides reliable and inexpensive power for applications requiring DC voltages between 2 and 24 volts.

A potentiometer on the circuit board will set the voltage level anywhere between 2 and 24 volts

Fixed voltage model PS24DCF provides reliable and very inexpensive power for applications requiring a fixed DC voltage of 24 volts

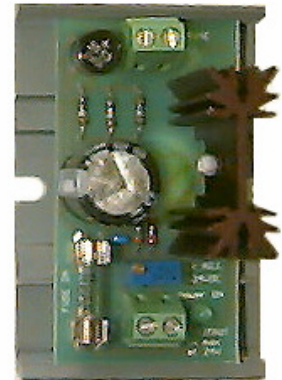
Because there is no potentiometer on the circuit board there is no possibility of obtaining the wrong voltage. This can speed installation as it is not necessary to check and adjust the voltage output.

The internal thermal overload protection and short circuit current limit make a fuse unnecessary on this model.

Both supplies can be used as the power source with any of our 2 wire 4...20mA transmitters. It can also be used with any 4 wire transmitters needing a direct current supply voltage.

Installation is fast with the snap track supplied. The barrier strips located at the top and bottom of the board make hook up fast and convenient. The built-in LED indicates power on.

**Variable
PS24DC**



**Fixed
PS24DCF**

TECHNICAL DATA

Output:	Maximum 1 amp at 24V at 20 deg C in free air	
Input:	24 volts AC	
Ripple:	minimum load:	0.004 vrms
	half load:	0.014 vrms
	full load:	0.280 vrms
Regulation:	97.5%	
Mounting:	Snap-track	
Output:	PS24DC	2 to 24V DC
	PS24DCF	24V DC

POWER SUPPLY

ORDERING DATA :

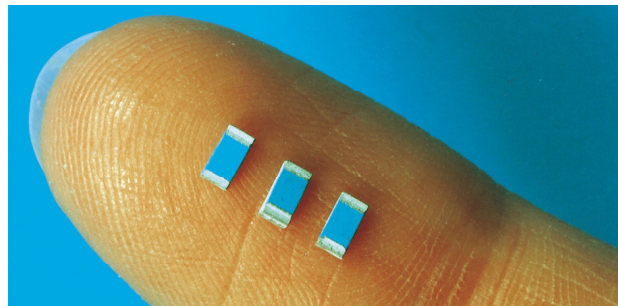
Model: PS24DC variable power supply adjustable from 2 to 24 Volts DC
Model: PS24DCF fixed power supply for 24 Volts DC

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PLATINUM CHIP SMD TEMPERATURE SENSOR

- -50 to +130 C
- 100 or 1000 ohm DIN RTD
- supplied in tape and reel
- RoHS compliant



These Pt 100 and Pt1000 SMD temperature sensors now have galvanic tin plated with nickel barrier solder connections.

Compared with styles using connecting wires the SMD temperature sensor is particularly rugged and intended essentially for automatic insertion in large-scale production.

Its platinum temperature sensor characteristics including long-term stability, interchangeability without recalibration and excellent reproducibility of electrical properties suit it to many applications.

It is suitable for surface and environment temperature measurement on circuit boards as well as for temperature compensation.

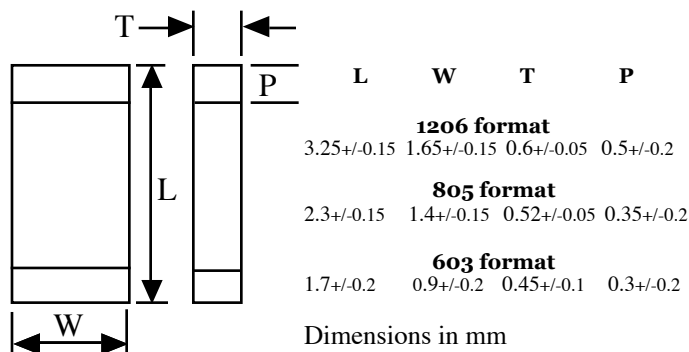
The platinum SMD temperature sensor must not be used without protection in a humid environment.

Platinum SMD temperature sensors are supplied in tape and reel packaging for automation assembly.

Small quantities can also be supplied loose.

ORDERING DATA

PCS 1.1503.1	100 ohm class B	1206 format
PCS 1.1503.10	1000 ohm class B	1206 format
PCS 1.0805.1	100 ohm class B	805 format
PCS 1.0805.10	1000 ohm class B	805 format
PCS 1.0603.10	1000 ohm class B	603 format



TECHNICAL DATA

Tolerance Class B ($0.3 + 0.005 \cdot t_{abs}$) C, $\alpha = 0.385 \text{ ohms / C}$ to DIN EN 60751 according to IEC 751

Processing Reflow or wave soldering (soldering temperature 235 deg C / max time 8 sec)

Measuring Current 100 ohm 0.3 mA to 1 mA
1000 ohm 0.1mA max 0.3mA

Self-heating

0.4 degC / mW for 1206 format

0.8 degC / mW for 0805 & 603 formats

Response time (water 0.4 m/s, air 2 m/s)

water $t_{0.5}$ 0.15 sec $t_{0.9}$ 0.30 sec for 1206 format

air $t_{0.5}$ 3.5 sec $t_{0.9}$ 10 sec for 1206 format

water $t_{0.5}$ 0.10 sec $t_{0.9}$ 0.25 sec for 805 & 603 formats

air $t_{0.5}$ 2.5 sec $t_{0.9}$ 8 sec for 805 & 603 formats

Stability max R_0 drift 0.06% after 1000 hr (250 hr-603) at 130C

Packaging face-up tape and reel

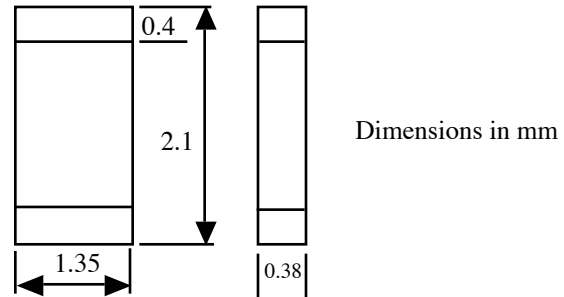
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HIGH TEMPERATURE PLATINUM SMD SENSOR

- **-50 up to +250 C**
- **100 or 1000 ohm DIN RTD**
- **for automatic insertion**
- **supplied in belt packaging**



The high temperature version of our Platinum SMD RTD temperature sensor opens up new applications for this style of sensor.

Many of these parts will be used in hybrid circuits, however any application requiring a high temperature part as well as mass production, precision, long-term stability and low cost will benefit from this design.

The contact surfaces are on the side with the active measuring layer – no edge metallising making the sensor designed for face-down mounting, to take into account current trends in the “adhesion instead of soldering” electronics sector.

Using conductive adhesives provides reliable and cost-effective connection technology, an alternative to the conventional application techniques, such as reflow or wave soldering.

An important advantage for users is that the ceramic substrate material of the sensor shows a similar thermal expansion to that of the hybrid circuit.

TECHNICAL DATA

Tolerance Class B $(0.3 + 0.005 * t_{abs})$ C, $\alpha = 0.385$ ohms / C

Temperature range

-50°C to +170°C, for adhesion mounting on a ceramic hybrid

-50°C to +150°C, for reflow soldering on expansion-adapted PCB material.

(By coordinating materials, design and connection technology, applications are possible up to +250°C)

Contact AgPd metallising in thick-film technology min. 17.5 %Pd

Self-heat coefficient in air 0.7 degC / mW

Response times in seconds

water @ 0.4 m/s $t_{50\%}$ 0.1s $t_{90\%}$ 0.2s

air @ 1 m/s $t_{50\%}$ 2.5s $t_{90\%}$ 8.0s

Ambient conditions Use unprotected only in dry environments

Processing Mounting using SMD insertion machines with Ag conductive adhesive is recommended. When mounting PCB circuits, the expansion relationship of the sensor and the substrate material must be taken into account.

Storage life Stored in a nitrogen atmosphere, min. 9 months

Packaging “Face-down” in blister reel, 4000 pcs / reel

Measured current 0.1 to max. 0.3 mA

Insulation resistance > 10 MΩ at 20°C; > 1 MΩ at 170°C (glass cover)

Long-term stability R_0 drift less than or equal to 0.06 % after 1000 h at 170°C

Specification DIN EN 60751

ORDERING DATA

PCS 1.0805.1HT	100 ohm class B	805 format
PCS 1.0805.10HT	1000 ohm class B	805 format
PCS 1.1206.1HT	100 ohm class B	1206 format
PCS 1.1206.10HT	1000 ohm class B	1206 format

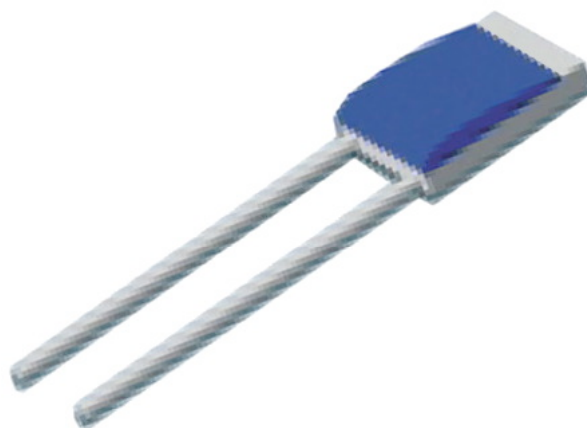
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THIN FILM PLATINUM TEMPERATURE SENSOR

- -70 to +500 C
- 100, 1000 or 10,000 ohm DIN RTD
- Class A, B or 1/3DIN
- economy bulk pack

The PC1.2004 sensors feature long term stability and precision over a wide temperature range. They are used in industrial, food processing and medical applications and because of their economy they are often used in applications requiring large quantities of sensors such as HVAC, automotive and energy generation.



TECHNICAL DATA

Temperature coefficient

TCR = 3850 ppm/°C

Temperature range

class B -70°C to +500°C

class A -30°C to +350°C

class 1/3B 0°C to +100°C

Leads Nickel platinum-clad wire

Specification DIN EN 60751

Size LxWxH, Leads 10mm

2002 2.3mm x 2.1mm x 0.8mm

2004 3.9mm x 2.1mm x 0.8mm

2006 5.9mm x 2.1mm x 0.9mm

Long-term stability

R₀ drift less than or equal to 0.04 % after 1000 h at 500°C

Vibration resistance

at least 40g acceleration at 10 to 2000 Hz, depending on mounting method

Insulation resistance > 10 MΩ at 20°C; > 1 MΩ at

500°C

Shock resistance

at least 100g acceleration with 8ms half sine wave, depending on mounting method

Self-heat coefficient in air 0.3°C / mW at 0°C

Response times in seconds

water @ 0.4 m/s t_{50%} 0.2s t_{90%} 0.3s

air @ 1 m/s t_{50%} 3.4s t_{90%} 11.5s

Ambient conditions

Use unprotected only in dry environments

Measured current

100 Ω 0.1 to max. 0.3 mA

1000 Ω 0.1 to max. 0.3 mA

10,000 Ω 0.1 to max. 0.25 mA

ORDERING DATA

PC1.2004.1-1/3 100 ohm class 1/3 bulk pack

PC1.2006.10K 10K ohm class B bulk pack

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MINIATURE THIN FILM PLATINUM TEMPERATURE SENSOR

- -70 to +500 C
- 100 or 1000 ohm DIN RTD
- Class A, B or 1/3DIN
- Lowest cost bulk pack

Our new PC1.2002 series are our least expensive thin film elements. They combine an extremely small size with long term stability and precision over a wide temperature range. They are used in industrial, food processing and medical applications and because of their economy they are often used in applications requiring large quantities of sensors such as HVAC, automotive and energy generation.

TECHNICAL DATA

Temperature coefficient

TCR = 3850 ppm/°C

Temperature range

class B -70°C to +500°C

class A -30°C to +350°C

class 1/3B 0°C to +100°C

Leads Platinum-clad nickel wire

Specification DIN EN 60751 (according to IEC 751)

Size

2.3mm x 2.1mm x 0.8mm LxWxH, Leads 10mm

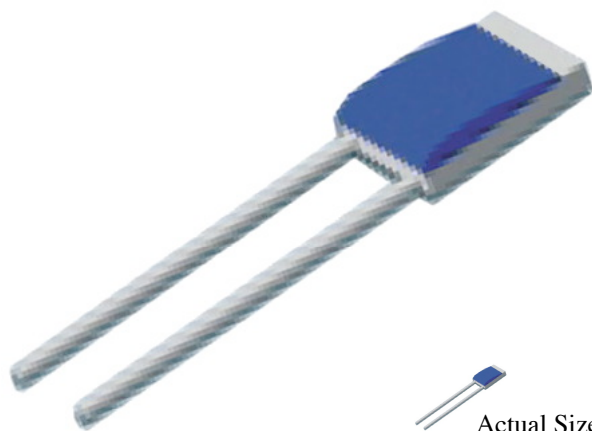
Long-term stability

R₀ drift less than or equal to 0.04 % after 1000 h at 500°C

Vibration resistance

at least 40g acceleration at 10 to 2000 Hz

Insulation resistance > 10 MΩ at 20°C; > 1 MΩ at 500°C



Actual Size
PC1.2002.1

Shock resistance

at least 100g acceleration with 8ms half sine wave

Self-heat coefficient in air 0.4°C / mW at 0°C

Response times in seconds

water @ 0.4 m/s t_{50%} 0.2s t_{90%} 0.4s

air @ 1 m/s t_{50%} 3.0s t_{90%} 9.0s

Ambient conditions

Use unprotected only in dry environments

Packaging Bulk pack of 1000 pieces

Measuring current

0.1 to max. 0.3 mA

ORDERING DATA

PC1.2002.1	100 ohm class B	bulk pack
PC1.2002.1-A	100 ohm class A	bulk pack
PC1.2002.1-1/3	100 ohm class 1/3	bulk pack
PC1.2002.10	1000 ohm class B	bulk pack
PC1.2002.10-A	1000 ohm class A	bulk pack

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CERAMIC WIRE WOUND PLATINUM RTD ELEMENTS

- -200 to +600 C
- 100 ohm DIN RTD
- Class A & 1/10 th DIN stocked
- Cryogenic applications

Our PK series ceramic wire wound elements are used primarily in applications above 500C or below minus 50C where thin film elements can not be used. They are also used when accuracies as high as 1/10th DIN are required. Because of their larger size they have lower self-heating coefficients which can improve accuracy especially with older instrumentation which may have higher measuring currents.

Ceramic wire wound elements were once the standard RTD element. They have now been largely replaced for moderate temperatures and accuracy requirements by less expensive thin film and SMD element types.

We stock both class A and 1/10th DIN ceramic wire wound elements for applications requiring this design.

TECHNICAL DATA

Temperature coefficient

TCR = 3850 ppm/°C

Temperature range

-200°C to +600°C

Leads

Platinum-gold alloy wire

Specification

DIN EN 60751 (according to IEC 751)

Size

PK2630: 30mm long x 2.6mm diameter, Leads 10mm

PK1515: 15mm long x 1.5mm diameter, Leads 10mm

Long-term stability

extremely high level of temperature stability

Insulation resistance > 10 MΩ at 20°C; > 1 MΩ at 500°C



Shock resistance

high temperature shock resistance

Self-heat coefficient in air 0.04°C / mW at 0°C

Response times in seconds

water @ 0.4 m/s t_{50%} 0.3s t_{90%} 0.6s

air @ 1 m/s t_{50%} 11.0s t_{90%} 36.0s

Ambient conditions

Use unprotected only in dry environments

Packaging

Individual

Measuring current

1 mA maximum

ORDERING DATA

PK1.2630.1-A 100 ohm class A single

PK2.2630.1-A 100 ohm class A duplex

PK1.1515.1-1/10 100 ohm class 1/10 single

RTD ELEMENTS

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TEMPERATURE SENSOR WIRE

We stock a large variety of wire suitable for manufacturing and extending the leads of theocouples and RTD's. Examples of our most popular types follow. Please ask us for the type that you require if it is not shown.

RTD WIRE

TEFLON -60C to 200C

WIRE-MP 22awg, 4 conductor, 7x30 silver plated copper, 2 red and two white teflon insulated conductors with mesh shield and white teflon over jacket

WIRE-MP-DUPLEX

Same as WIRE-MP except 6 conductor with 2 red, 1 white, 2 black and 1 green

SILICONE -50C to 180C

WIRE-TESI 22awg, 3 conductor, 2 red, 1 white teflon with red silicone overjacket

THERMOCOUPLE WIRE

WIRE-17846 "J" calibration, 1 pair stranded with teflon jackets and blue silicone overjacket **180C - very flexible**

WIRE-17847 "K" calibration, 1 pair stranded with teflon jackets and green silicone overjacket **180C - very flexible**

K-20-GG "K" calibration, 1 pair 20awg solid with fiberglass insulation & jacket

KK-20-GG "K" special calibration, 1 pair 20awg solid with fiberglass insulation & jacket

J-20-GG "J" calibration, 1 pair 20awg solid with fiberglass insulation & jacket

K-20S-GG "K" calibration, 1 pair 20awg stranded with fiberglass insulation & jacket

J-20S-GG "J" calibration, 1 pair 20awg stranded with fiberglass insulation & jacket

K-16-HGHG "K" calibration, 1 pair 16awg solid with high temp fiberglass insulation & jacket

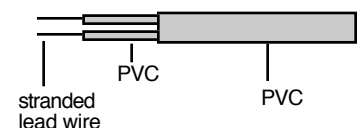
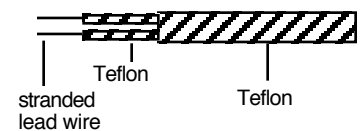
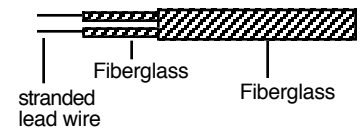
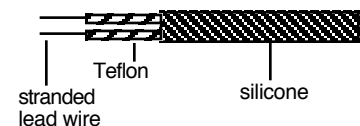
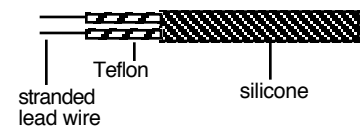
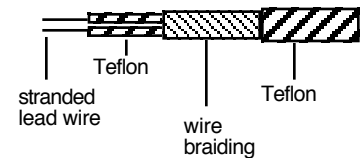
J-16-HGHG "J" calibration, 1 pair 16awg solid with high temp fiberglass insulation & jacket

K-20S-TT "K" calibration, 1 pair stranded with teflon insulation & jacket

RSX-16-TT "R" or "S" calibration, 1 pair solid, 16awg, extension grade with teflon insulation & jacket

KX-16-PP "K" calibration, 1 pair solid, 16awg, extension grade with PVC insulation & jacket

JX-20-PP "J" calibration, 1 pair solid, 20awg, extension grade with PVC insulation & jacket



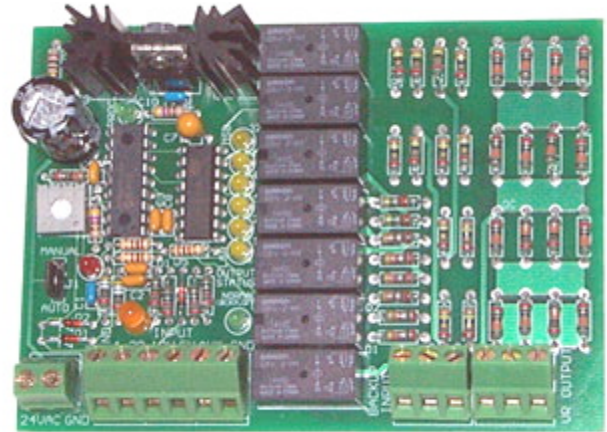
COMPONENTS

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VOLTAGE TO RESISTANCE TRANSDUCER

- **Small size, easy installation**
- **5 V, 10 V and 4-20 mA inputs**
- **Local Analog Override with indication.**
- **Output Status Indicators (LEDs).**
- **Backup Controller Option (with remote activation).**



APPLICATION:

The ETR is used to interface any resistance controlled device with a generic control system. The applications may include:

- Electric Actuator Control
- Resistive Sensor Simulation
- Chiller Stage Control

when the power is lost or a processor malfunction is detected. Remote activation of this feature is also possible by a 10 VDC signal.

The board mounts in a 3.25" wide snap track (provided) and is equipped with high quality angular connectors for fast and easy wiring.

PRODUCT DESCRIPTION:

The ETR accepts a generic Analog Output signal (voltage or current) and provides variable resistance output as a simulated potentiometer. The board performs 64 step approximation with about 1.5% output resolution. For high output accuracy the ETR's resistive array utilizes a number of 1% precision metal film resistors. Their unique configuration allows for over 4 Watts power dissipation.

The ETR is equipped with a Local Override feature that allows for manual output control. Output status is indicated by 6 LEDs in an easy to follow binary code. The input current loop, the Local Override mode and the processor status are also indicated by LEDs. As an option, the board may be equipped with a 'fail-safe' relay that will transfer the output to a backup controller

TECHNICAL DATA

Power:	24 VAC (or DC), 100 mA
Input:	0-10 VDC, 0-5 VDC, 4-20 mA via dedicated connectors, automatically detected.
Output:	Potentiometric Resistance; 64 Steps Standard 0-135 Ohm @ 4 Watts continuous.
Indication:	LEDs for Output Status (in binary), Processor Status, Local Override, Input Current Loop.
Dimensions:	L= 4.62" (116 mm), W= 3.25" (82 mm); Mounts in TR-3 snap track (provided)

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ORDERING DATA

ETR135 - 135 Ohm, 4 Watts (standard); any other value available as custom order.

ETRxxx/B - board with backup relay

ENERCOP instruments Ltd

25 Shorncliffe Rd, Toronto, ON, M9B 3S4 Tel 1(800)ENERCOP or (416)231-5335 Fax 1(877)ENERCOP or (416)231-7662
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ANALOG CURRENT/VOLTAGE RESCALING MODULE

- Field Selectable Ranges
- Reverse or Normal Acting Output
- LED Power Indicator
- Compact and Economical
- Snap Track Mounted

APPLICATIONS

Resistance to Current/Voltage Conversion
Voltage to Current/Voltage Conversion
Current to Current/Voltage Conversion
Shrink or Expand Sensor Ranges
Increase Analog Input Resolution
Reverse Signals
Adapt Non-compatible Signals

PRODUCT DESCRIPTION

The ARM is an analog rescaling module which accepts an analog voltage or current and rescales it to another voltage or current. Several preset ranges are jumper selectable. Trimmer potentiometers can then be used to make fine adjustments on output ranges for maximum flexibility.

The ARM can attenuate an input signal to 100%. The ARM also has an adjustable gain and offset. The output gain can be adjusted anywhere from 1 to 25 times the input. The offset of the output can be adjusted anywhere from + /- .25 to + /- 20 volts.

The ARM also has the ability to reverse a signal. The ARM also has a regulated DC power supply output to power sensors. By using voltage divider applications, the ARM can also accept a resistance input.

ORDERING DATA

Specify: ARM



TECHNICAL DATA

Supply 24 VDC +/- 10%, 22 to 28 VAC,
200 mA max

User Output 20 VDC, 30 mA max field adjustable with 15
turn pots

Input

Voltage Range 0 VDC min 35 VDC max

Current Range 0 mA min 44 mA max

Input Impedance Current=250 ohms Voltage=1
Mohms

Output

Voltage Range 0.25 VDC min 20 VDC max

Current Range 1.0 mA min 44 mA max

Signal Gain 1 to 25 times

Signal Attenuation 0 to 100 %

Signal Offset +/- 0.25 to 20 volts

Signal Inversion (Reverse Acting) 20 to 0.25 V

Load Impedance Current = 750 ohms @ 20 mA

Voltage = 5000 ohms @ 20 volts

Mechanical Requirements

Dimensions 3.25" L x 2.25" W x 1.5" H

Weight 2.0 oz

Mounting Furnished with 3.25" length of 2.25" wide
snap track

Environmental -20 to 150 deg F

10 to 95%RH non-condensing

RES
CAL
ING

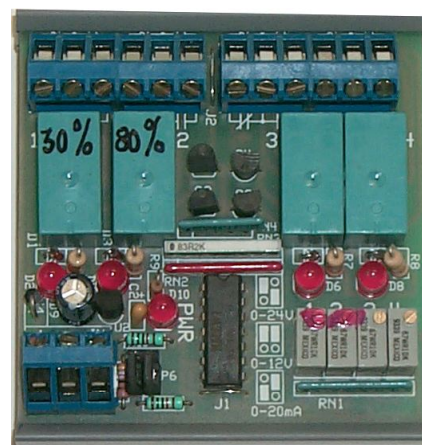
ENERCOP

instruments ltd

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Analog Current or Voltage to 4 Adjustable Relay Outputs

- Four Form C Outputs
- Field Adjustable Trip Levels
- LED Status Indicators
- Cascadeable (up to 16 ATL'S)
- Compact and Economical
- Snap Track Mount



Typical applications for the ATL include alarms, sequencers, level indicators and environmental controls.

The ATL accepts an analog voltage or current input signal and controls four relays. Each relay has an adjustable trip point which is set by a multi-turn trimmer potentiometer. Each relay is activated when the input signal is equal to or greater than the trip point setting.

The relays deactivate when the input signal is less than the trip point. Common (C), Normally Open (NO) and Normally Closed (NC) terminals are available at each relay. The ATL has LED indicators for power and for the status of each relay. By using voltage divider applications, the ATL can also accept a resistance input.

TECHNICAL DATA

<i>Power Supply</i>	24 VDC +/- 10% or 22 to 28 VAC @ 180 mA max		
<i>Signal</i>	0 to 12VDC	0 to 24 VDC	0 to 20 mA
<i>Deadband</i>	0.3 VDC (fixed)	0.6 mA (fixed)	
<i>Relays</i>	Form C, 2 amp max resistance		
	<i>Electrical Life</i>	100,000 operations @ 1 amp	
	<i>Mechanical Life</i>	10 million operations	
<i>Dimensions</i>	3 25" L x 3.25" W x 1.5" H		
<i>Weight</i>	3.2 oz		
<i>Mounting</i>	snaptrack		
<i>Environmental</i>	-20 to 150 deg F	10 to 95% non-condensing	

ORDERING INFORMATION

ATL

ENERCOP instruments Ltd

25 Shorncliffe Rd, Toronto, ON, M9B 3S4 Tel 1(800)ENERCOP or (416)231-5335 Fax 1(877)ENERCOP or (416)231-7662
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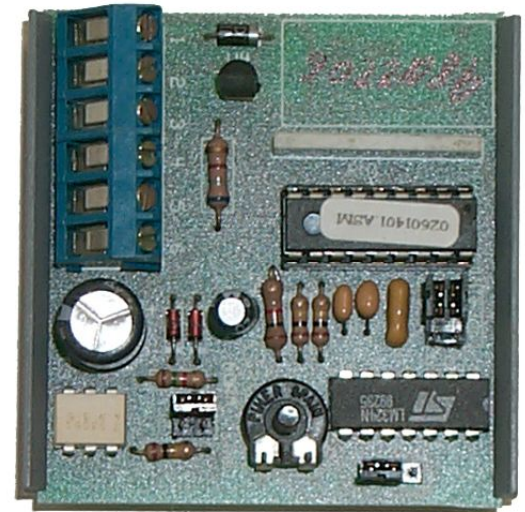
PULSE TO ANALOG TRANSDUCER

- **Field Selectable Preset I/O Ranges**
- **User Adjustable Output**
- **Status indicators**
- **No Wrap-Around**

PTA

The PTA converts a single pulse-width modulated input to an analog current or voltage output. There are two LED indicators that designate signal and power. A timed contact or solid state closure from the controlling microprocessor controller is converted to a linear analog output with 256 steps of resolution. The last output signal is held until the PTA receives the end of the next pulsed input signal. The PTA's output will not wrap around if an excessively long input pulse is received. Eight preset analog output signals are DIP switch selectable. In addition, the gain and offset potentiometer offer maximum user adjustability of the output signal. The input signal is optically isolated and can accept either positive or negative polarity.

Some applications of the PTA include variable speed pump drives, pulse to analog transducer, variable frequency fan drive control, digital to analog conversion, signal isolation, and electric actuator control.



TECHNICAL DATA

SUPPLY:	24V AC OR DC +/- 10%
CURRENT:	45 mA max
TRIGGER LEVEL:	Dry contact to common or 5-24 VAC/VDC (triac requires adapter kit)
TIME BETWEEN PULSES:	1 millisecond min
PULSE DURATION/RESOLUTION:	Range in seconds of dry contact, Triac or SSR closure +/- 40% of input single increment, 0.23 to 6 or 1 to 25.5 or .02 to 5 or .59 to 2.93 seconds /in 0.01 second increments
VOLTAGE RANGE:	Adjustable Range: 0 to 16 VDC (with adjustable offset)
CURRENT RANGE:	Adjustable Range: 0 to 20 mA (with adjustable offset)
ACCURACY:	+/- 5% nominal full scale (fixed); +/- 1% full scale (adjustable)
LOAD IMPEDANCE:	Current-0 to 750 ohm max; Voltage-1000 ohm to infinity min
DIMENSIONS:	3.25" L x 2.25" W x 1.5" H, mounted on a snaptrack
OPERATING:	-20 to 150 deg F, 10% to 95% non-condensing rH

ORDERING DATA

PTA - User adjustable voltage or current output

PTA2 - User adjustable voltage output only

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THERMISTOR TEMPERATURE SENSORS

- **Please read these instructions before you begin installation.**

INSTALLATION

All Enercorp thermistor temperature sensors are unaffected by polarity or position.

All space versions are supplied with a two pole terminal strip. Units with time over-ride (TOS) or setpoint over-ride (SS) features have labelled terminal blocks.

All other versions are supplied with 22 awg leads.

TROUBLESHOOTING

Sensor reads 0 or only a few ohms

Sensor reads over full scale or very high

Readings are erratic

Sensor or leads are shorted

Sensor or leads are open

Loose connection

CALIBRATION

These sensors have no built-in means of calibration. Minor adjustments must be made at the receiving instrument or DDC panel. If an adjustment of more than a degree is required first check your connections. If the connections are good the sensor may have been damaged by operation outside it's temperature range or mechanical causes. Damaged sensors can not be repaired and must be replaced.

SPACE

TS-S-E-T-10K

This unit is provided with two holes suitable for switch box or dry wall mounting. A two pole terminal is provided for hook-up and a hole through the circuit board and the back of the case is provided for wiring.

DUCT

TS-D-...-T-10K

Drill a hole in the duct large enough for the 1/4" sheath. The case should be mounted to the duct with two sheet metal screws. You will need a driver that is at least 3" long to reach to the bottom of the case. These drivers are available from Enercorp on request.

AVERAGING and FLEX CABLE

TS-A-...-T-10K, TS-FC-...T-10K

Mount like a duct sensor and then string the sensor to cover the largest duct area. These sensors are made of several individual sensors. The location of the individual sensors is clearly marked. Place these marked locations away from plenum walls to avoid areas with little air flow.

IMMERSION

TS-P-...-T-10K

Immersion sensors are provide with a 1/2" male NPT thread for thermowell mounting. The sheath is spring loaded to provide good thermal contact with the bottom of the thermowell. The assembly is not water tight and must be used with a thermowell which should be ordered separately. A conversion fitting, BUSHING-8-W, is available when reusing glass thermometer thermowells.

STRAP-ON

TS-SO-T-10K and TS-BP-T-10K

Strap-on and brass plate sensors should be mounted to the pipe with hose clamps. It is important that they then be covered with a layer of insulation to obtain reliable temperatures.

OUTSIDE AIR

TS-O-T-10K

These units are provided with male or female 1/2" threads and 18" leads. They should be mounted on an outdoor junction box or conduit in a horizontal position. The side of the white radiation shield without a slot should be mounted up.

PLATE

TS-PL-T-10K

This unit is provided with two holes suitable for switch box or dry wall mounting. This unit should be mounted on an interior wall whose cavity temperature is similar to the room to avoid measurement errors.

RTD TEMPERATURE TRANSMITTERS

- Please read these instructions before you begin installation.

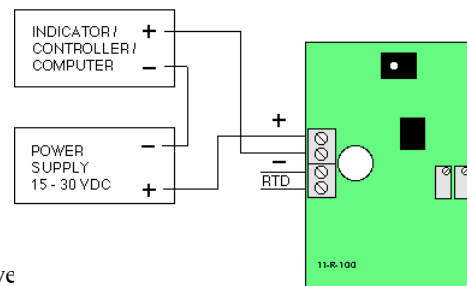
INSTALLATION

All Enercorp RTD temperature transmitters are unaffected by position and are reverse polarity protected.

TROUBLESHOOTING

No reading	1. Lead wires are reversed 2. No power to board - check voltage is between
Reading too low or too high	1. RTD wires shorted or RTD defective. Check that RTD resistance is about 100 ohms + 0.4 ohms/degree C above 0 C. 2. Check for correct transmitter range. 3. Check for condensation or mechanical damage to board.
Readings are erratic	Loose connection. Screw down all connections tightly.

WIRING



CALIBRATION

These transmitters have clearly marked zero and span pots. To calibrate connect a precision decade box to the RTD terminals. Since 1 degree Fahrenheit change is equal to a 0.2 ohm change you need a very accurate decade box to calibrate accurately. Insert a DVM set to mA in the 2-wire loop and apply power. With the decade box set to the scale beginning resistance from the table adjust the zero pot to obtain 4 mA. Change the resistance in the decade box to the scale end and adjust the span pot as necessary to obtain 20 mA. Go back and forth until the readings are stable.

SPACE

This unit is provided with two holes suitable for switch box or dry wall mounting. A two pole terminal is provided for hook-up and a hole through the circuit board and the back of the case is provided for wiring.

DUCT

Drill a hole in the duct large enough for the 1/4" sheath. The case should be mounted to the duct with two sheet metal screws.

AVERAGING and FLEX CABLE

Mount like a duct sensor and then string the sensor to cover the largest duct area. These units are made of several individual sensors. The locations of the individual sensors are clearly marked. Place these marked locations away from plenum walls to avoid areas with little air flow.

IMMERSION

Immersion sensors are provided with a 1/2" male NPT thread for thermowell mounting. The sheath is spring loaded to provide good thermal contact with the bottom of the thermowell. The assembly is not water tight and must be used with a thermowell which should be ordered separately.

STRAP-ON

Strap-on and brass plate sensors should be mounted to the pipe with hose clamps. It is important that they then be covered with a layer of insulation to obtain reliable temperatures. The transmitter is supplied in a separate housing for mounting away from the process.

OUTSIDE AIR

These units are provided with male or female 1/2" threads and 18" leads. They should be mounted on an outdoor junction box or conduit in a horizontal position. The side of the white radiation shield without a slot should be mounted up. The transmitter supplied in its own housing should be mounted inside the building.

PLATE

This unit is provided with two holes suitable for junction box or dry wall mounting. This unit should be mounted on an interior wall whose cavity temperature is similar to the room to avoid measurement errors.

deg F	ohms	deg C	ohms
-50	82.08	-50	80.32
0	93.03	0	100.00
100	114.68	35	113.61
125	120.04	50	119.39
250	146.48	100	138.50
400	177.48	200	175.84
750	246.68	400	247.06

THERMOWELLS

- Please read these instructions before you begin installation.

INSTALLATION

All our wells have a 1/2" NPT female thread for sensor connection. We recommend that you add some heat transfer paste to the bottom of the well to improve heat transfer before inserting the sensor. We recommend that you use a spring loaded sensor such as our TS-P-4-T-10K to ensure the sensor makes good thermal contact with the bottom of the well.

Select stainless steel at higher temperatures or pressures or where corrosion could be a problem. Our standard 304 S/S has excellent resistance to mildly corrosive atmospheres and can withstand higher pressures and temperatures than brass.

Brass wells are usually chosen for applications measuring water temperature or steam at moderate temperatures and pressures. In these conditions they provide good protection and corrosion resistance. Because brass is readily machined and less expensive than stainless steel these are more economical.

Use the table below to ensure that you are operating in the safe range.

Pressure - Temperature rating - lbs. per sq.inch

Material	Temperature - Fahrenheit						
	70	200	400	600	800	1000	1200
BRASS	5000	4200	1000	-	-	-	-
304	7000	6200	5600	5400	5200	4500	1650
316	7000	7000	6400	6200	6100	5100	2500

HUMIDITY TRANSMITTERS

- Please read these instructions before you begin installation.

TECHNICAL DATA

Range

operating: 5 - 98% or 10 - 90% rH

calibration: 0 - 100% rH

Accuracy

2% or 3% at 25 degrees C or per certificate

Temperature Dependence

0.2% rH per degree C

Response Time

1 minute from 90% to 10% rH

Output

4 to 20mA in 2-wire technology

Load

250/500 ohms at 12 / 24 VDC supply

Power Supply

24 VDC +/- 15%

Operating/Storage Temperature

0 to +60 C/-20 to +70 C for 0-100%rH, non-condensing

Medium Do not expose to vapors that attack plastic such as acetone

MODELS

HTM-D-420

3% duct humidity transmitter

HTM-S-420

3% space humidity transmitter

HTM-D-598

2% duct humidity transmitter

HTM-S-598

2% space humidity transmitter

HTTM-. . .-598

humidity and temperature transmitter

-10K

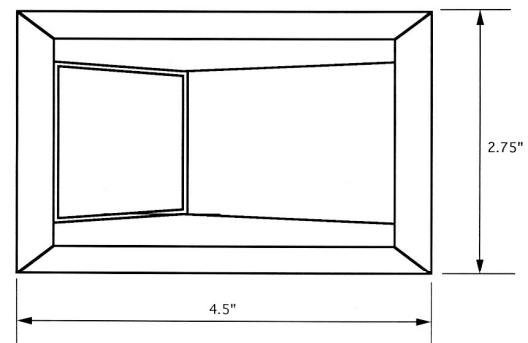
with 10K thermistor option

-100

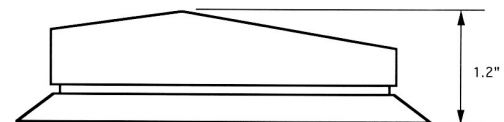
with 100 ohm platinum RTD option

DIMENSIONS SPACE TRANSMITTER

TOP VIEW

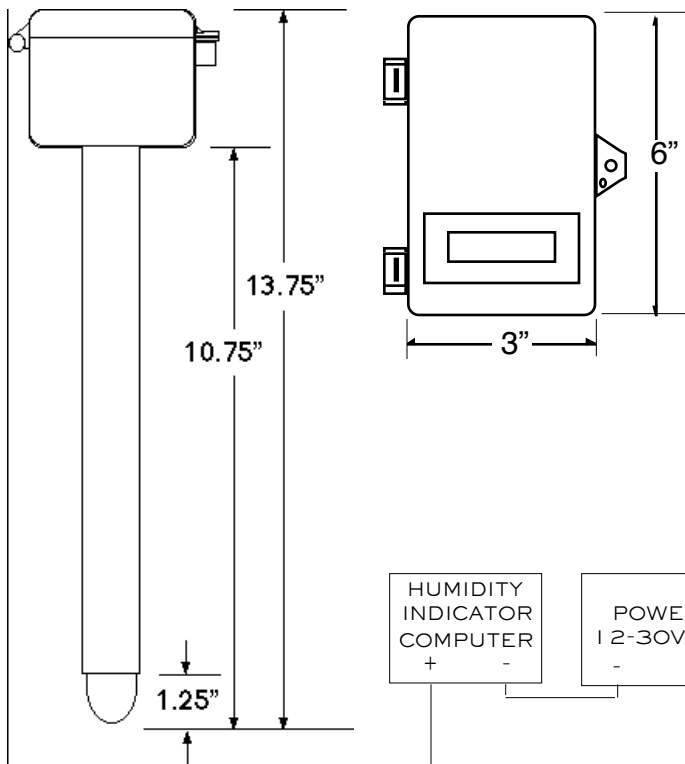


SIDE VIEW



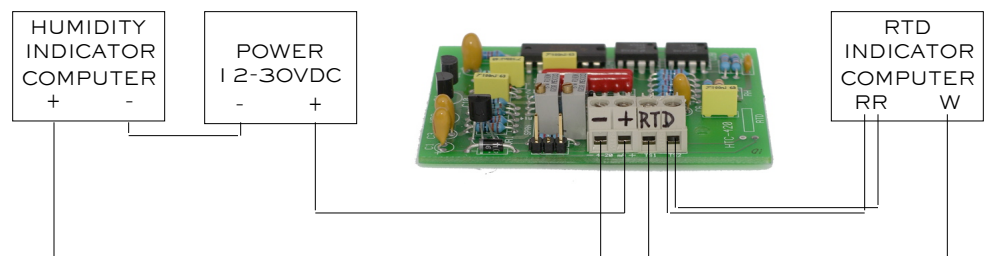
Mounting holes are provided at 3-1/4" centres for electrical junction boxes

DIMENSIONS DUCT TRANSMITTER



INSTALLATION
OPERATION

WIRING



VIP-9000 I/P TRANSMITTER INSTALLATION NOTES

- **Please read these instructions before you begin installation.**

QUICK INSTALL:

Mechanical

1. Attach the plastic track in the desired location using sheet metal screws. It is important that the instrument is mounted in an upright position with the silk screened arrow on the circuit board pointing up.

Electrical

1. Connect either a 2 to 10 volt or a 4 to 20 mA signal from your panel to the terminal strip on the VIP-9000. The terminal polarity is marked on the circuit board. The instrument is reverse polarity protected, but will not operate if the polarity is reversed.

Pneumatic

1. A 20 psi nominal, 30 psi maximum, clean, dry, oil free air supply is required. Add an in-line filter if there is any question about the quality of the air supply.
2. Connect the air supply to the barbed fitting with the black plastic hose. This connection is also marked "M" for MAIN on the body of the instrument.
3. Connect your pneumatic output to the barbed fitting with the white plastic hose. This connection is also marked "B" for BRANCH on the body of the instrument.

Jumper Function

Some older control panels do not current limit their analog voltage outputs. On start up using voltage inputs the VIP-9000 can draw over 40mA's for a few fractions of a second. If this current surge causes a problem with your panel the jumper should be removed or moved to the 2 left pins.

FUNCTION:

The VIP-9000 is an I/P or V/P transducer for interfacing electronic control panels to pneumatic valves. A 4...20 mA or 2...10 VDC (capable of delivering 20 mA) input signal is converted by the electronics to a 3 to 15 psi pneumatic signal to position dampers and valve actuators.



TECHNICAL DATA

Input Signal: Either 4 ... 20 mA or 2 ... 10 VDC. Voltage signals must be capable of delivering 20mA.

Output Signal: 3 to 15 psi

Air Supply Required: 20 psi nominal, 30 psi maximum, clean, dry, oil free air required. Add in-line filter if necessary.

Air Consumption for Sizing: 0.008 scfm at 15 psi

Air Capacity for Air Mains Size: 16 scim

Maximum Air Capacity: 515 scim at 20 psi supply

Operating/Storage Temperature: -29 to 60C / -40 to 71C (-20 to 140F/-40 to 160F)

Humidity: 5 to 95% rH, non-condensing

Optional In-line Filters:

10 micron version order model VIP-F10

0.1 micron version order model VIP-F02

Factory Calibration: The standard VIP-9000 is calibrated at the factory for 2 to 10V equals 3 to 15 psi and 4 to 20mA equals 3.6 to 15 psi. At 3 psi there is a small offset between the voltage and current inputs. This offset provides reverse polarity protection and a ripple signal to the valve to remove hysteresis. On request, versions calibrated 4 to 20mA = 3 to 15psi or custom ranges are available.

STAINLESS STEEL PRESSURE TRANSDUCER

- Please read these instructions before you begin installation.

MODEL PX61

Pressure transmitters determine the pressures in liquids and gases and convert these pressures to an electrical signal. The PX61 features compact construction, an integral amplifier, large output signal and extensive medium compatibility. The design provides a 1/2% accurate, economical transmitter that can operate accurately over a wide temperature range with corrosion resistance.

OPERATION

The ceramic coated steel diaphragm sensing element deflects under pressure. This deflection is transmitted to a thick-film resistor network mounted on the ceramic layer which causes the connected pair of opposite resistances to either expand or contract. This produces a positive or negative resistance change proportional to the pressure. A constant voltage supply to the bridge followed by a differential amplifier converts the signal to a magnified proportional voltage output.

This is added to a temperature dependent reference voltage and electronically compensated for temperature drift. The signal is finally converted via a voltage controlled current source to a standard 4-20 mA signal.

TECHNICAL DATA

Wetted parts / Case

Stainless steel

Ambient/Medium temperature

0...+85°C

Pressure Connection

1/4" NPT

Supply Voltage

12...30VDC (incl. peaks), 20 mA max. loading

Output 2-wire 4 to 20 mA, max load = $U-12V/0.02A$

Accuracy 1/2%

Errors load - < 0.15%, ambient temperature - 0.05%/°C

Hysteresis 0.2% max, (linear characteristic)

Overload limit

200% full scale

Enclosure IP65 (NEMA 4)

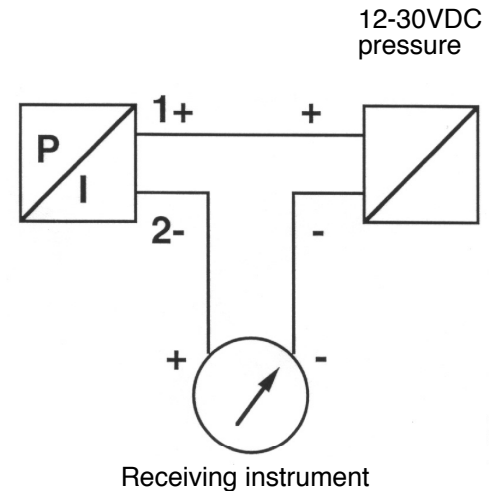
Response time

10 msec

Operating position

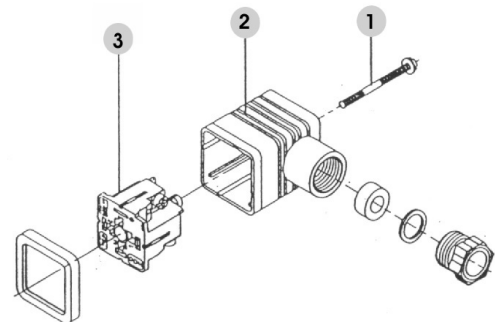
unrestricted

WIRING



CAUTION

Always use a wrench on the stainless steel fitting to tighten the transmitter into the process. Using the body of the transmitter to tighten it by hand can cause permanent damage.



DIFFERENTIAL PRESSURE TRANSDUCER

- Please read these instructions before you begin installation.

MODEL: WGT-420

The model WGT-420 converts a differential or gauge air pressure signal to a 4-20 mA signal. It provides higher accuracy using a new silicone sensor at the same cost as the LPTB models it replaces. A signal conditioning circuit runs as a two wire 4-20mA device.

The input pressure signals are mechanically dampened to reduce sensitivity to turbulence and short duration pressure fluctuations.

Integral zero and span adjustments are factory calibrated to specified output signal levels and may be field adjusted if required. The circuit design produces very little interaction between span and zero pots.

Typical applications of this instrument include HVAC monitoring of filter differential pressures, fan static pressures, clean room pressures, variable air volume systems and velocity pressures

TECHNICAL DATA

Accuracy

+/- 1% of span on ranges with span of 3" w.g. or more, +/-1.5% on smaller ranges

Output

4-20 mA, 2 wire

Overload Limit

3 x nominal maximum pressure
5 x nominal max pressure with rezeroing

Operating Temperature

-20 + 70C

Temp Compensation Range

0 to 70 C

Pressure connection

0.180 OD slip on fitting

Supply voltage (Vs)

9 to 30 Vdc

Media

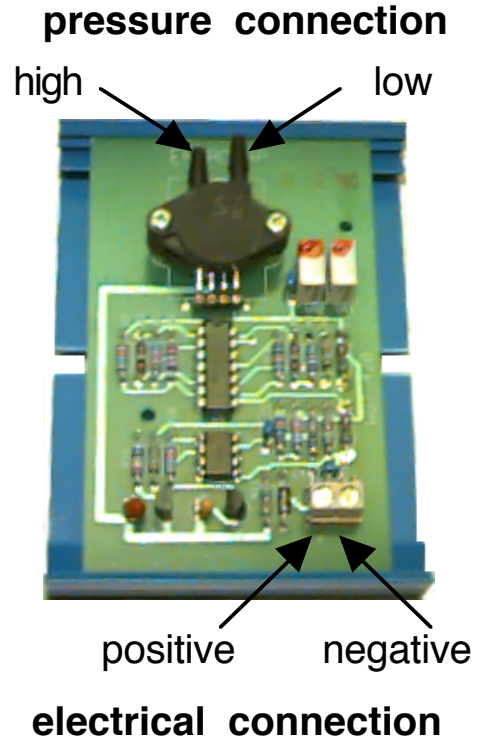
Air, and non-ionic fluids

Wetted parts

Glass filled nylon, silicon diaphragm, alumina ceramic

Ranges

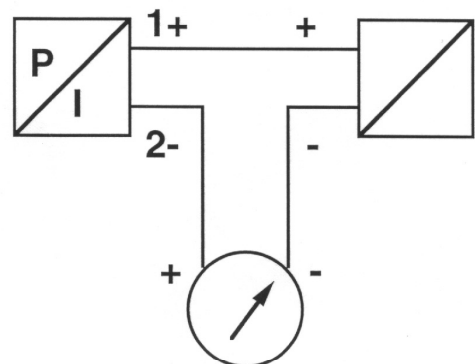
WGT-420-010B	+/-0 to 1" Wg
WGT-420-015	0 to 1.5" Wg
WGT-420-020	0 to 2" Wg
WGT-420-030	0 to 3" Wg
WGT-420-050	0 to 5" Wg
WGT-420-100	0 to 10" Wg



WIRING

WGT-420 differential pressure transmitter

12-30VDC power supply



INSTALLATION
OPERATION

WET / DRY BULB PSYCHROMETER

- Please read these instructions before you begin installation.

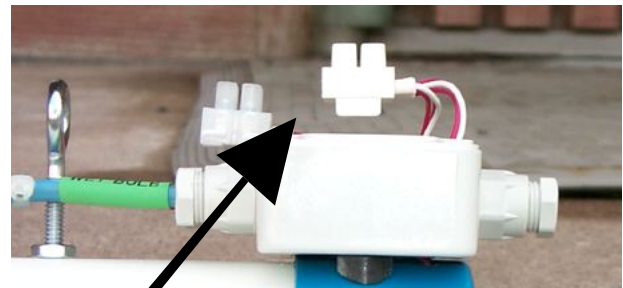
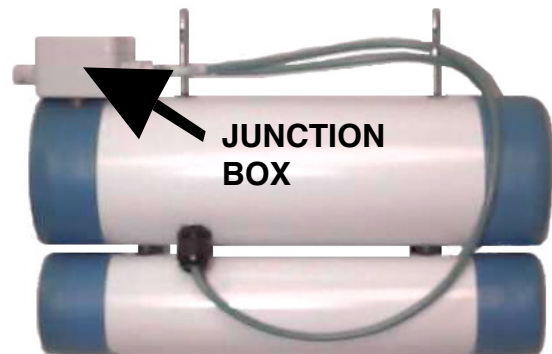
MODEL:HT- WD-A

This instrument measures wet and dry temperatures with precision RTD sensors with accuracies of ± 0.1 degree C. All connections are made in the NEMA 4 junction box mounted on the top of the instrument.

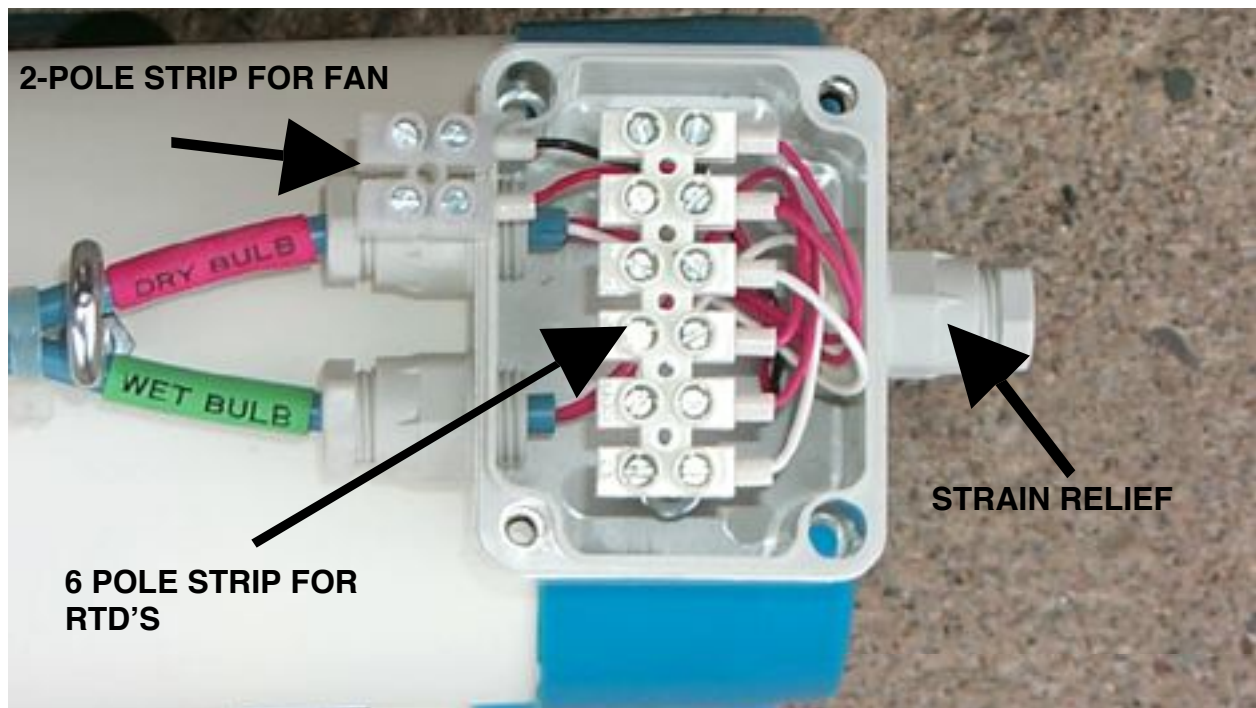
Wiring: Remove the junction box cover held on by two screws. Inside you will find two terminal blocks. Gently lift these out of the junction box until the attached leads are extended.

You will now see that the six pole block has three wires coming from the wet bulb sensor and three from the dry bulb. Please connect these to your receiving instrumentation. The two pole strip is for the 24V supply to the aspiration fan. Please attach positive to RED and negative to BLACK.

To maintain the NEMA 4 seal a single 8 conductor lead wire need to be fed through the strain relief. This wire can be purchased from the factory if not available locally.



TERMINAL STRIPS LIFTED OUT
OF JUNCTION BOX



AFS-222 PRESSURE SWITCH

- Please read these instructions before you begin installation.

INSTALLATION

Mounting Select a mounting location which is free from vibration. The AFS-222 must be mounted with the diaphragm in any vertical plane in order to obtain the lowest specified operating set point. Avoid mounting with the sample line connections in the UP position. Surface mount via the two 3/16" diameter holes in the integral mounting bracket. The mounting holes are 3-7/8" apart.

Air Connection The AFS-222 is designed to accept firm wall sample lines of 1/4" O.D. tubing by means of ferrule and nut compression connections. An optional adaptor suitable for slip on flexible tubing is available. For sample lines up to 10 feet, 1/4" O.D. tubing is acceptable. For lines up to 20 feet use 1/4" I.D. tubing. For lines up to 60 feet use 1/2" I.D. tubing.

Locate the sample probe a minimum of 1.5 duct diameters downstream from the air source. Install the sampling probe as close to the centre of the air stream as possible.

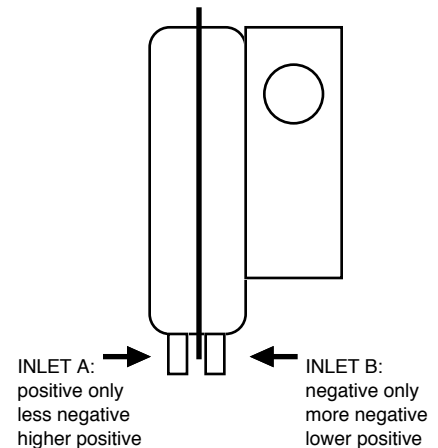
POSITIVE PRESSURE ONLY: Connect the sample line to inlet A; inlet B remains open to the atmosphere.

NEGATIVE PRESSURE ONLY: Connect the sample line to inlet B; inlet A remains open to the atmosphere.

TWO NEGATIVE SAMPLES: Connect the higher negative sample to inlet B. Connect the lower negative sample to inlet A.

TWO POSITIVE SAMPLES: Connect the higher positive sample to inlet A. Connect the lower positive sample to inlet B.

ONE POSITIVE AND ONE NEGATIVE SAMPLE: Connect the positive sample to inlet A. Connect the negative sample to inlet B.



Electrical Connection

Before pressure is applied to the diaphragm, the switch contacts will be in the normally closed (NC) position.



The snap switch has screw top terminals with cup washers. Wire alarm and control applications as shown above.

Field Adjustment

The adjustment range of an AFS-222 Air Switch is 0.05 to 12.0" w.c., ± 0.02 " w.c. To adjust the set point:

Turn the adjusting screw counterclockwise until motion has stopped. Next, turn the adjusting screw 4 complete turns in a clockwise direction to engage the spring. From this point, the next ten turns will be used for the actual calibration. Each full turn represents approximately 1.2" w.c.

Please note: To properly calibrate an Air Switch, a digital manometer or other measuring device should be used to confirm the actual set point.

AIR QUALITY TRANSMITTERS

- Please read these instructions before you begin installation.

METHOD OF OPERATION

The AQT-3000 senses volatile organic compounds, VOC's. People breath out VOC's, including ketones. Building materials out-gas VOC's such as formaldehyde from carpets and chip board. The AQT-2000 is therefore a good sensor of air quality deterioration due to both occupancy and chemicals in the work place.

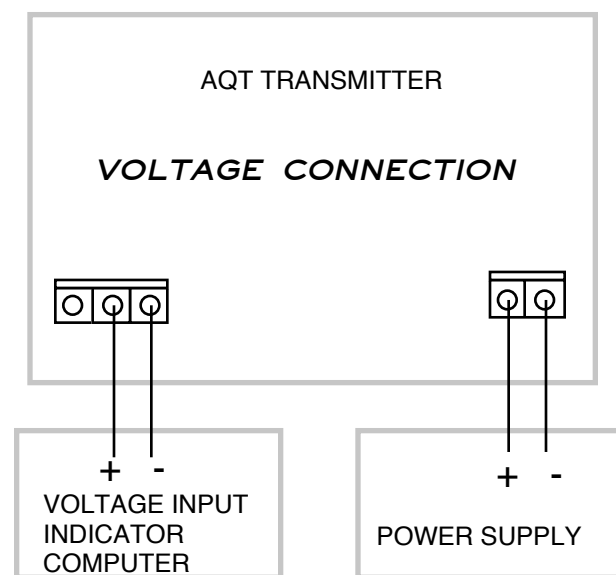
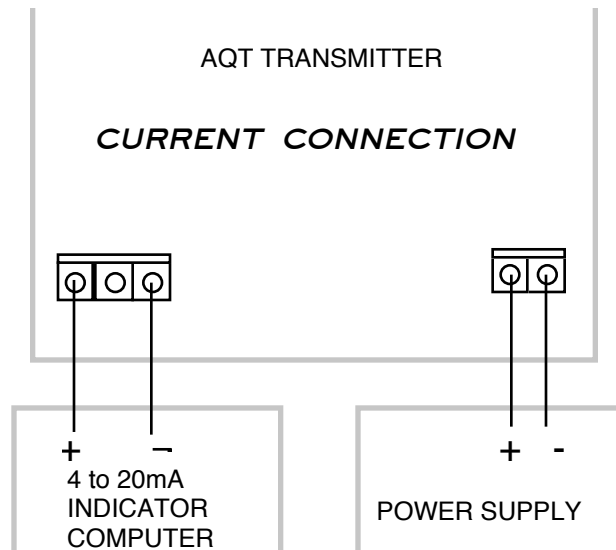
The AQT-3000 produces an analogue voltage or current signal proportional to air quality. In building control this signal is transmitted to a central control system which will decide on the appropriate action to take to control air quality. 4mA represents an atmosphere with no VOC's and 20mA represents an atmosphere containing only VOC's

On special order a controller version is available for applications such as portable classrooms where one AQT-3000, directly connected to a fresh air damper actuator, controls air quality. This version senses very small changes in air quality and responds quickly to any worsening of air quality but reacts slowly to improvements in air quality, insuring that contaminants are flushed from the monitored space.

WIRING & TECHNICAL DATA

Supply Voltage	12 to 30 VDC
Supply Current	100 mA
Operating temperature	-10 to 60 C
Operating Humidity	10 to 95% rH
Outputs	4 to 20mA / 0...10 VDC
Output Impedance	> 1k ohms for voltage 1000*Vs/24 for current

Note about outputs: Both the current and voltage outputs are always available
The standard instrument is shipped with 4 to 20mA and 2 to 10VDC outputs.



INSTALLATION
OPERATION

For more detailed information about the operation of our family of air quality instruments as well as our graphing software please request our Air Quality Installation and Operation Manual.