Section 9: HVAC/R Temperature Sensors

- Complete range of sensors for Building Automation Systems
- RTDs, thermistors, and transmitters
- Accurate and stable sensing ensures maximum energy efficiency
- Optional high accuracy calibration of transmitters and sensors
- 3-day shipment for most items

DIMENSIONS:
2.75" (70 mm) W
4.50" (114 mm) H
1.56" (40 mm) D

DIMENSIONS:
3.12" (79 mm) W
2.09" (54 mm) H
1.80" (46 mm) D

DIMENSIONS:
1.60" (41 mm) W
5.55" (141 mm) H
2.05 (52 mm) D

DIMENSIONS:
2.75" (70 mm) W
4.50" (114 mm) H
0.18" (5 mm) D

COMPACT WALL-MOUNT SENSOR
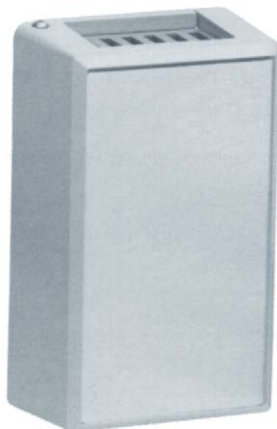
FULL SIZE WALL-MOUNT SENSOR

EXPLOSIONPROOF WALL-MOUNT SENSOR

FLUSH WALL-MOUNT SENSOR

Room Air Temperature Sensors

Room air sensors are designed for wall mounting. Choose from two plastic enclosure styles with brushed aluminum faceplates or a flushmount stainless steel model.

The full-size enclosure and flushmount fit over standard junction boxes. The full size enclosure has optional knockouts for Wiremold raceway surface wiring. Just remove knockouts with pliers.

The compact room air sensor mounts directly on drywall.

See page 9-8 for 4 to 20 mA transmitters.

The explosionproof sensor is UL listed and CSA approved for Class I, Groups C and D; Class II, Groups E, F, and G; and Class III. Request Application Aid #19 for more hazardous area information and the various standards and agencies (including FM, CSA, CENELEC and ATEX).

Specifications

Temperature range:
-45.5 to 100°C (-50 to 212°F).
Leadwires:
Full size and compact: AWG 22,
    PTFE insulated, 4" (100 mm) long.
Explosionproof and flush mount: AWG 26,
    PTFE insulated, 6" (150 mm) inside cover.
Moisture resistance: Meets MIL-STD-202, Method 104, Test Condition B.

IN STOCK

Three day shipment standard for RTDs (Room air sensors stocked only with 4" lead length)

How to order room air sensors

S472PB	Model number from table
Y	**Number of leads:** Y = 2 leads / Z = 3 leads
4	**Lead length in inches:** (stocked only in 4")
K0	**Knockouts (full size only):** K0 = No knockouts / K1 = Knockouts for Wiremold raceway
S472PBY4K0 ← Sample P/N	

For replacement cover only, order part AC692KO or AC692K1 for full size, AC551 for compact.

How to order explosionproof wall-mount sensors and flush wall-mount sensors

S100147PD	Model number from table
Y	**Number of leads:** Y = 2 leads / Z = 3 leads
S100147PDY ← Sample P/N	

Transmitters must be installed in a separate enclosure.

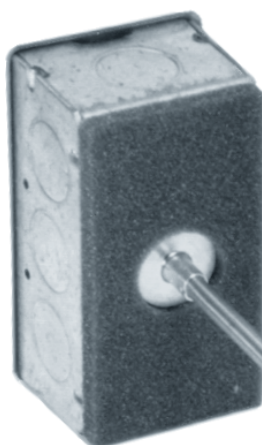| Element		TCR $\Omega/\Omega/°C$	Compact room air sensors	Full size room air sensors	Explosion-proof wall-mount sensors	Flush mount room air sensors
RTDs						
Platinum,	100 Ω ±0.1% at 0°C	0.00391	S405PB	S472PB		
Platinum,	100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	0.00385	S448PD	S473PD	S100147PD	S101456PD
Platinum,	1000 Ω ±0.1% at 0°C	0.00385	S449PF	S474PF	S100148PF	S101456PF
Platinum,	1000 Ω ±0.1% at 0°C	0.00375	S483PW	S489PW	S101608PW	S101456PW
Nickel-iron,	1000 Ω ±0.12% at 70°F	0.00527	S403FB	S470FB		
Nickel-iron,	2000 Ω ±0.12% at 70°F	0.00527	S404FC	S471FC		
HW,	3000 Ω at -30.2°C	0.00262	S100064PX	S100063PX		
Thermistors		$R25/R125$				
Thermistor,	2,252 Ω ±1% at 25°C	29.2	TS426TA	TS424TA	TS100149TA	TS101769TA
Thermistor,	10,000 Ω ±1% at 25°C	23.5	TS427TB	TS425TB	TS100150TB	TS101769TB

DUCT POINT SENSOR

ENCLOSURE:
2.12" (54 mm) W
4.0" (102 mm) H
1.75" (44 mm) D

OUTSIDE AIR SENSOR

DIMENSIONS:
5.6" (142 mm) L
1.6" (41 mm) H
1.3" (33 mm) W

PROBE DIA:
0.25" (6.4 mm)
0.188" (4.8 mm) AT TIP

Special options:
- Weatherproof connection box
- All stainless steel probe

Duct and Outside Air Temperature Sensors

Sense temperature of air streams in ducts and plenums. Sensors include a junction box with gasket to prevent leakage and vibration noise.

These point-sensing thermometers feature a fast-responding aluminum sensing tip.

Custom options include a NEMA 4 weatherproof connection box and an all stainless steel probe.

Outside air sensors are designed to mount on conduit outside your building. They include an elbow type enclosure and sun shield.

See page 9-8 for 4 to 20 mA transmitters. See page 9-4 for duct averaging sensors.

Specifications

Temperature range:
Probe: -45.5 to 135°C (-50 to 275°F).
Gasket: 100°C (212°F) max.
Leadwires: AWG 22, PTFE insulated, 4" (100 mm) long.
Moisture resistance: Point sensors meet MIL-STD-202, Method 104, Test Condition B.

How to order tip-sensitive duct thermometers

S450PD	Model number from table
Y	**Number of leads:** Y = 2 leads / Z = 3 leads
12	**Insertion depth in inches:** 1 inch = 25.4 mm / Standard lengths: 3, 6, 12, 18" / Minimum: 3"

S450PDY12 ← Sample P/N
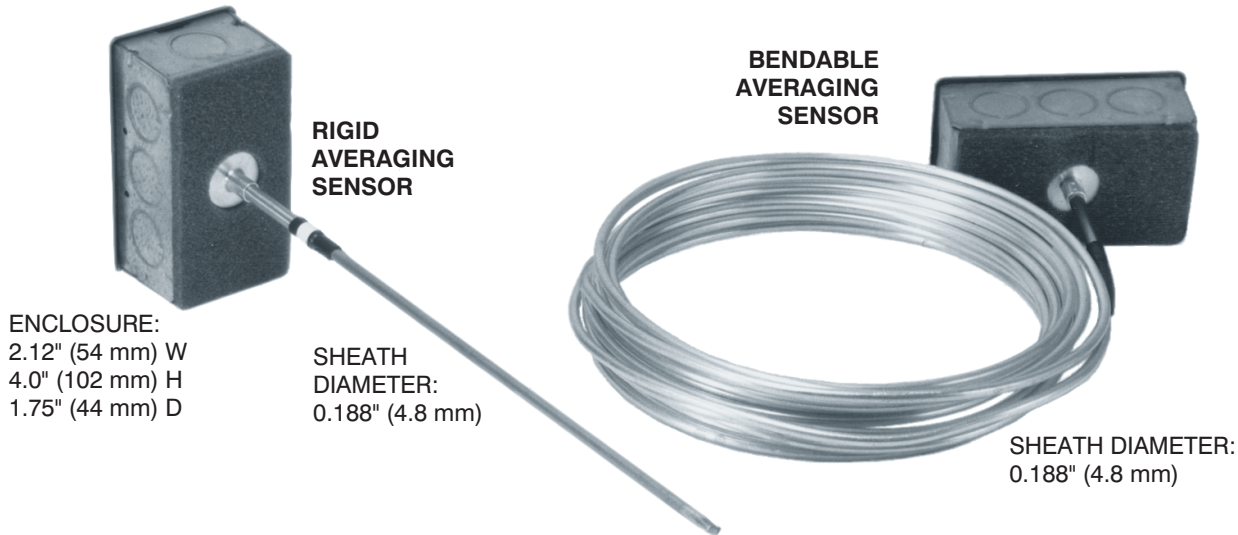
How to order outside air sensors

S414PB	Model number from table
Z	**Number of leads:** Y = 2 leads / Z = 3 leads
S414PBZ ← Sample P/N	

⚠ **Transmitters must be installed in a separate location from outside air sensors.**

Element		TCR $\Omega/\Omega/°C$	Duct point sensors	Outside air sensors
RTDs				
Platinum,	100 Ω ±0.1% at 0°C	0.00391	S408PB	S414PB
Platinum,	100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	0.00385	S450PD	S454PD
Platinum,	1000 Ω ±0.1% at 0°C	0.00385	S451PF	S455PF
Platinum,	1000 Ω ±0.1% at 0°C	0.00375	S484PW	S486PW
Nickel-iron,	1000 Ω ±0.12% at 70°F	0.00527	S406FB	S412FB
Nickel-iron,	2000 Ω ±0.12% at 70°F	0.00527	S407FC	S413FC
HW,	3000 Ω at -30.2°C	0.00262	S100060PX	S100062PX
Thermistors		R_{25}/R_{125}		
Thermistor,	2,252 Ω ±1% at 25°C	29.2	TS430TA	TS428TA
Thermistor,	10,000 Ω ±1% at 25°C	23.5	TS431TB	TS429TB

IN STOCK

Three day shipment standard for RTDs

RIGID AVERAGING SENSOR

BENDABLE AVERAGING SENSOR

ENCLOSURE:
2.12" (54 mm) W
4.0" (102 mm) H
1.75" (44 mm) D

SHEATH DIAMETER:
0.188" (4.8 mm)

SHEATH DIAMETER:
0.188" (4.8 mm)

Averaging Temperature Sensors
True continuous elements

Sense temperature of air streams in ducts and plenums. Sensors include a junction box with gasket to prevent leakage and vibration noise.

These sensors have a continuous element to sense true average temperature along their entire length. They provide accurate composite readings in locations where air may be stratified into hot and cold layers.

Rigid averaging sensors have a brass case. Bendable models have aluminum sheaths (copper on special order), formable to a radius of 4". Bendable sensors can criss-cross ducts to average temperatures in two dimensions.

Specifications

Temperature range:
Probe: -45.5 to 135°C (-50 to 275°F).
Gasket: 100°C (212°F) max.
Leadwires: AWG 22, PTFE insulated, 8" (200 mm) long.
Moisture resistance: Meet MIL-STD-202, Method 104, Test Condition B.

Special options:

- Weatherproof connection box
- Sensor only, no box
- Lengths to 100 feet (30 m)
- Thermistor averaging sensors

These averaging sensors do not actually contain platinum. They use a proprietary sensing element that closely matches the platinum curve over the specified range, at a much lower cost.

How to order rigid averaging sensors

S456PE	Model number from table
Y	**Number of leads:** Y = 2 leads Z = 3 leads
12	**Insertion depth in <u>inches</u>:** 1 inch = 25.4 mm Standard lengths: 12, 18, 24, 36, 48, 60, 72"

S456PEY12 ← Sample P/N

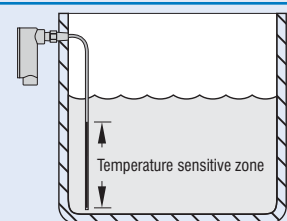## How to order bendable averaging sensors

S457PE	Model number from table
Z	**Number of leads:** Y = 2 leads Z = 3 leads
24	**Insertion length in <u>feet</u>:** 1 foot = 0.3 m Standard lengths: 6, 12, 24 feet

S457PEZ24 ← Sample P/N

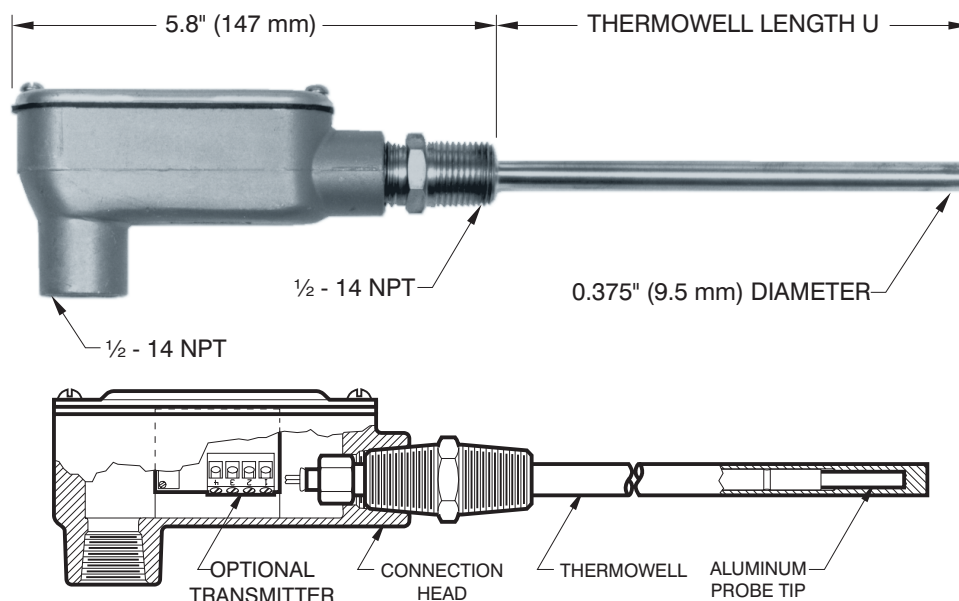| RTDs (Tolerance: ±0.25% at 70°F)		TCR $\Omega/\Omega/°C$	Rigid averaging sensors	Bendable averaging sensors
Platinum,	100 Ω at 0°C	0.00391	S423PB	S447PB
Platinum,	100 Ω at 0°C	0.00385	S456PE	S457PE
Platinum,	1000 Ω at 0°C	0.00385	S493PF	S475PF
Platinum,	1000 Ω at 0°C	0.00375	S492PW	S488PW
Nickel-iron,	1000 Ω at 70°F	0.00527	S421FB	S445FB
Nickel-iron,	2000 Ω at 70°F	0.00527	S422FC	S446FC
HW,	3000 Ω at -30.2°C	0.00262	S20080PX	S15215PX

Sump sensors

A sump averaging sensor (S100479) lets you define the temperature sensitive zone to match tank fluid levels (see drawing at right).

For more information, call Minco and request bulletin RT-13 or go to www.minco.com/support

Temperature sensitive zone

5.8" (147 mm) — THERMOWELL LENGTH U

½ - 14 NPT

0.375" (9.5 mm) DIAMETER

½ - 14 NPT

OPTIONAL TRANSMITTER — CONNECTION HEAD — THERMOWELL — ALUMINUM PROBE TIP

Fluid Immersion Temperature Sensors

Sense temperature of heated/chilled water or other fluids in pipes or tanks.

Immersion sensors include stainless steel thermowells for insertion directly into fluid streams. The sensing probe may be removed without breaking the fluid seal. Brass thermowells are also available.

See page 9-8 for 4 to 20 mA transmitters.

Specifications

Temperature range:
-45.5 to 260°C (-50 to 500°F).
Leadwires: AWG 22, PTFE insulated, 4" (100 mm) long.
Thermowell pressure rating:
1880 psi (130 bar).
Moisture resistance: Meets MIL-STD-202, Method 104, Test Condition B.

How to order

S479PD	Model number from table
Y	**Number of leads:** Y = 2 leads Z = 3 leads
60	**Thermowell length U:** Specify in 0.1" increments (Ex: 60 = 6.0 inches) Standard thermowell lengths are 3" and 6", contact factory for other lengths
S479PDY60 ← Sample P/N	

How to order replacement stainless steel thermowells

| TW488	Model number
U	
60	**Thermowell length U:** Specify in 0.1" increments (Ex: 60 = 6.0 inches) Standard thermowell lengths are 3" and 6", contact factory for other lengths
TW488U60 ← Sample P/N	

Element		TCR Ω/Ω/°C	Model number
Platinum,	100 Ω ±0.1% at 0°C	0.00391	S478PB
Platinum,	100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	0.00385	S479PD
Platinum,	1000 Ω ±0.1% at 0°C	0.00385	S480PF
Platinum,	1000 Ω ±0.1% at 0°C	0.00375	S490PW*
Nickel-iron,	1000 Ω ±0.12% at 70°F	0.00527	S476FB*
Nickel-iron,	2000 Ω ±0.12% at 70°F	0.00527	S477FC*
HW,	3000 Ω at -30.2°C	0.00262	S100061PX*

* Maximum temperature is 266°F (130°C).

IN STOCK

Three day shipment for standard lengths of 3" or 6"

LEAD LENGTH — 1.5"*
(38.1 mm)

0.5" (12.7 mm)
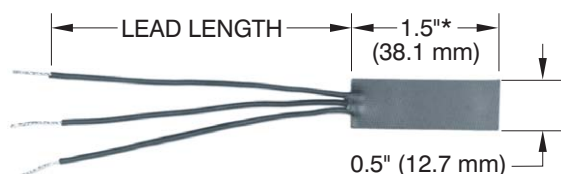
THICKNESS: 0.045" (1.2 mm) over element
*MODEL S468PF IS 3.0" (76.2 mm) LONG

A Thermal-Ribbon accurately senses fluid through pipe walls. No draining, welding, drilling, or tapping — just tape the Thermal-Ribbon in place beneath a layer of insulation. Shown with AC766 Mounting Kit.
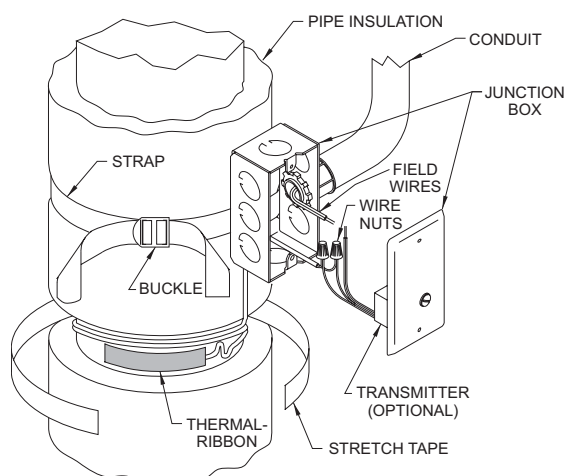
Flexible Thermal–Ribbon™ Pipe Sensors

Flexible Thermal-Ribbon™ sensors mount on the pipe surface — saving time and money during installation. There's no expense of a pipefitter to drain, drill, and tap the pipe for a thermowell because there is no thermowell! When properly installed and insulated, the accuracy and response of a Thermal-Ribbon equals an immersed thermowell assembly.

Options include stainless steel braid over leadwires to prevent abrasion damage, and pressure-sensitive adhesive for easier mounting (flat surfaces only).

See page 9-8 for 4 to 20 mA transmitters.

Specifications

Body material: Silicone rubber with polyimide backing.
Temperature range:
RTD: -62 to 200°C (-80 to 392°F).
Thermistor: -45.5 to 135°C (-50 to 275°F).
Leadwires: AWG 24, silicone rubber.
Moisture resistance: Meets MIL-STD-202, Method 104, Test Condition B.

How to order Thermal-Ribbons

S467PD	Model number from table
Z	**Number of leads:**
	Y = 2 leads
	Z = 3 leads
	YS = 2 leads, stainless steel braid
	ZS = 3 leads, stainless steel braid
36	**Lead length in inches**
A	**Adhesive backing:**
	A = No adhesive
	B = Pressure-sensitive adhesive
S467PDZ36A ← Sample P/N	

Mounting accessories:

AC766 mounting kit
See drawing above. Provides a pipe-mounted enclosure for transmitters and connections. Kit includes junction box, 5 ft. nylon strap, buckle, 4 wire nuts, and 6 ft. of #20 stretch tape.

#20 stretch tape
High temperature self-fusing silicone rubber tape for mounting Thermal-Ribbons to pipes. 1" wide rolls, 6 or 36 foot lengths.
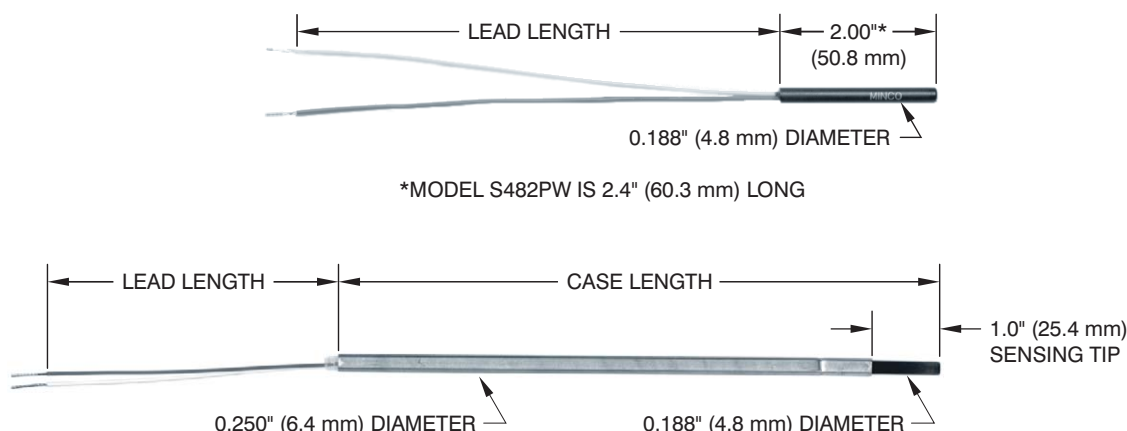
#6 RTV adhesive
Room temperature vulcanizing adhesive for attaching Thermal-Ribbons to surfaces. 3 oz. (89 ml) tube.

Element		TCR $\Omega/\Omega/°C$	Model number
RTDs			
Platinum,	100 Ω ±0.1% at 0°C	0.00391	S464PB
Platinum,	100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	0.00385	S467PD
Platinum,	1000 Ω ±0.1% at 0°C	0.00385	S468PF
Nickel-iron,	1000 Ω ±0.12% at 70°F	0.00527	S462FB
Nickel-iron,	2000 Ω ±0.12% at 70°F	0.00527	S463FC
HW,	3000 Ω at -30.2°C	0.00262	S100001PX
Thermistors		R_{25}/R_{125}	
Thermistor,	2,252 Ω ±1% at 25°C	29.2	TS436TA
Thermistor,	10,000 Ω ±1% at 25°C	23.5	TS437TB

IN STOCK

S462, S463, S464, S467

LEAD LENGTH — 2.00"* (50.8 mm)

0.188" (4.8 mm) DIAMETER

*MODEL S482PW IS 2.4" (60.3 mm) LONG

LEAD LENGTH — CASE LENGTH

1.0" (25.4 mm) SENSING TIP

0.250" (6.4 mm) DIAMETER

0.188" (4.8 mm) DIAMETER

Elements & Probes

Elements feature fast-responding RTD or thermistor elements in aluminum cases (except stainless steel on S482PW), with PTFE insulated leadwires. They can be assembled into probes or used separately as all-purpose sensors.

Probes consist of elements assembled into stainless steel extension tubes. They are not suitable for direct fluid immersion but may be used with the thermowells on page 4-6.

See page 9-8 for 4 to 20 mA transmitters.

Specifications

Temperature range:
-45.5 to 135°C (-50 to 275°F).
Leadwires: AWG 22, PTFE insulated. Standard lengths are 4", 12" and 18".
Moisture resistance: Meets MIL-STD-202, Method 104, Test Condition B.
Insulation resistance: 1000 megohms min. at 500 VDC, leads to case.

How to order elements

S458PD	Model number from table
Z	**Number of leads:** Y = 2 leads Z = 3 leads (platinum only)
4	**Lead length in inches**
S458PDZ4 ← Sample P/N	

How to order probes

S411PB	Model number from table
60	**Case length:** Specify in 0.1" increments (Ex: 60 = 6.0 inches) Minimum length is 3"
Z	**Number of leads:** Y = 2 leads Z = 3 leads (platinum only)
4	**Lead length in inches**
S411PB60Z4 ← Sample P/N	

Element		TCR $\Omega/\Omega/°C$	Elements	Probes
RTDs				
Platinum,	100 Ω ±0.1% at 0°C	0.00391	S402PB	S411PB
Platinum,	100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	0.00385	S458PD	S460PD
Platinum,	1000 Ω ±0.1% at 0°C	0.00385	S459PF	S461PF
Platinum,	1000 Ω ±0.1% at 0°C	0.00375	S482PW	S485PW
Nickel-iron,	1000 Ω ±0.12% at 70°F	0.00527	S400FB	S409FB
Nickel-iron,	2000 Ω ±0.12% at 70°F	0.00527	S401FC	S410FC
HW,	3000 Ω at -30.2°C	0.00262	S100057PX	S100837PX
Thermistors		R_{25}/R_{125}		
Thermistor,	2,252 Ω ±1% at 25°C	29.2	TS438TA	TS440TA
Thermistor,	10,000 Ω ±1% at 25°C	23.5	TS439TB	TS441TB

IN STOCK

Three day shipment standard for RTDs

HVAC/R Sensors
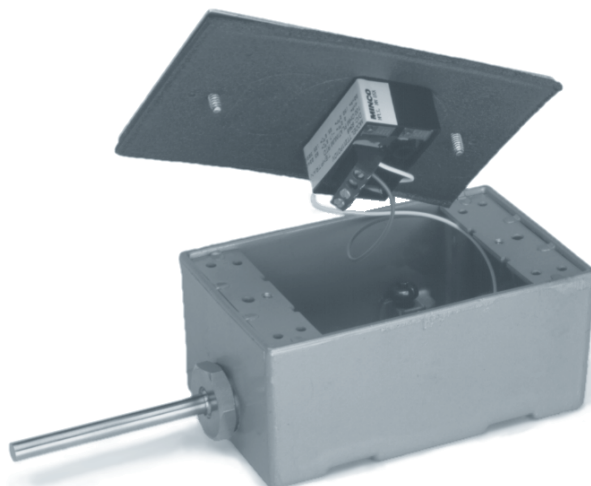
Refrigeration & Freezer Temperature System

- Ideal for refrigerated rooms, freezers, cold storage facilities, laboratories — anywhere an accurate, rugged, weatherproof temperature sensor is needed.

- 100 Ω platinum RTD probe is constructed of 316 stainless steel to be resistant to most chemicals, including ammonia. Operates to -452°F (-269°C).

- 4-20 mA transmitter is epoxy potted to protect circuitry from condensation and ice. Operates in ambient temperatures down to -13°F (-25°C).

- Transmitter is match calibrated to RTD for 0.75% system accuracy; free NIST certificate.

- Enclosure is gasketed and moisture resistant.

- RTD probe is available in lengths ranging from 2 inches to 48 inches, and the probe can be center-mounted for through-the-wall installation, or end-mounted for flush-to-the-wall mounting.

Specifications

Temperature range:
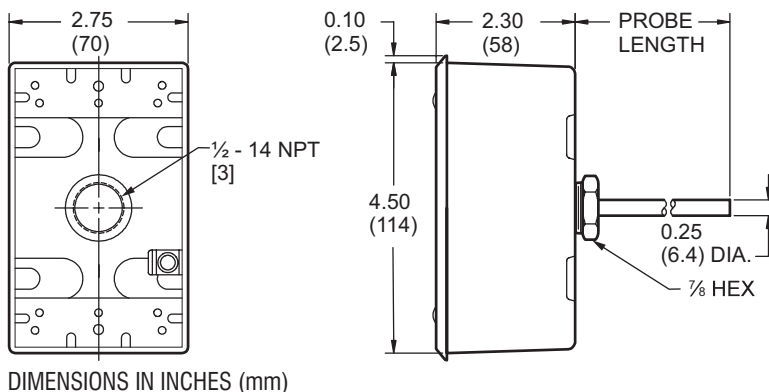Probe:-269 to 260°C (-452 to 500°F).
Transmitter:-25 to 85°C (-13 to 185°F).
RTD probe: 100 Ω platinum, 0.00385 TCR.
Transmitter: 4-20 mA output, 8.5 to 35 VDC loop powered.

How to order

AS100279	**Assembly number**
PD	**100 Ω platinum RTD**
67	**Probe length:** Specify in 0.1" increments (Ex: 67 = 6.7 inches)
M	**Temperature range for 4-20 mA output:** M = -50 to 50°C (-58 to 122°F) AD = -40 to 48.9°C (-40 to 120°F) DN = -30 to 50°C (-22 to 122°F) S = -18 to 37.8°C (0 to 100°F) BY = -10 to 40°C (14 to 104°F) Other ranges are available. See page 5-10.

AS100279PD67M ← Sample P/N

2.75 (70)

½ - 14 NPT [3]

0.10 (2.5)   2.30 (58)   PROBE LENGTH

4.50 (114)

0.25 (6.4) DIA.

⅞ HEX

DIMENSIONS IN INCHES (mm)

STANDARD
CONSTRUCTION

WASHDOWN
COMPATIBLE

Thermal Vial™ Temperature Sensing System

- Ideal for ultralow freezers, laboratories, blood banks, walk-in freezers and refrigerators, even incubators — anywhere accurate sensing of the contents instead of the air is a vital concern.

- Sealed polyethylene Thermal Vial™ virtually eliminates spillage and contamination. Simply fill with fluid such as ethylene glycol, alcohol, water, or a cryopreservative to accurately emulate the material being stored or processed.

- Large (50 mm × 50 mm) footprint provides stability on a shelf or rack. Holds 175 ml (6 oz) of fluid.

- 100 Ω Platinum RTD probe is constructed of 316 Stainless Steel and operates to -269°C (-452°F).

- Cable is reinforced with stainless steel braid for ruggedness.

- 4-20 mA transmitter is match calibrated to the RTD for ±0.75% of span system accuracy.

- NIST certificate and calibration data supplied at no additional cost.

Specifications

Temperature range:
Probe and vial: -269 to 120°C (-452 to 248°F).
Transmitter: -25 to 85°C (-13 to 185°F).
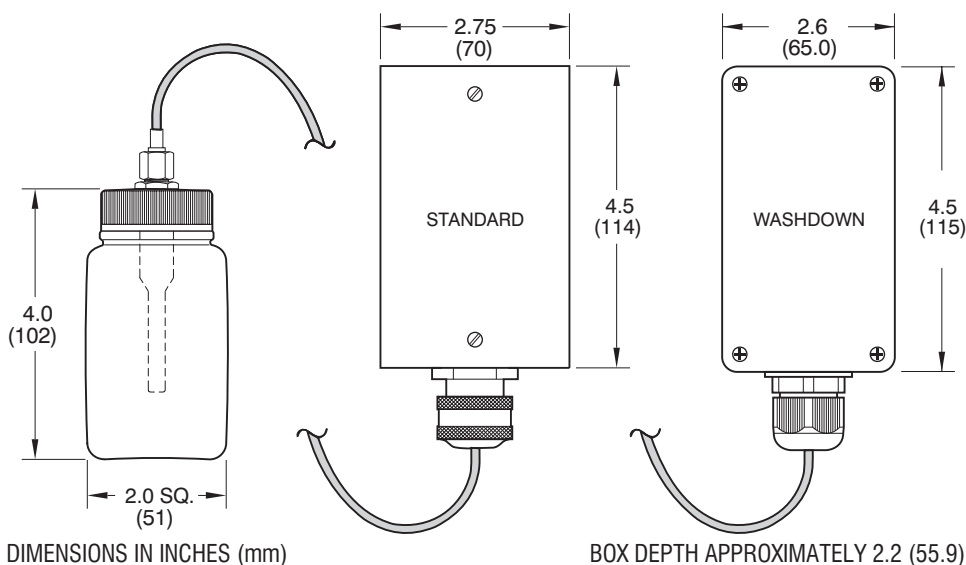**RTD probe:** 100 Ω Platinum;
TCR = 0.00385.
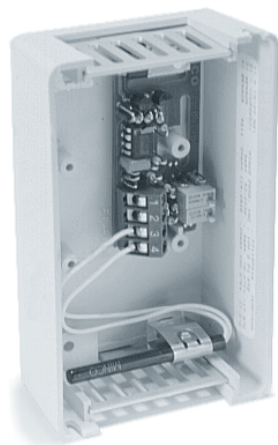**Transmitter:** 4 to 20 mA output;
8.5 to 35 VDC loop powered.

How to order

AS101436	**Assembly number:** AS101436: Standard construction AS102437: Washdown compatible
PD	**100 Ω platinum RTD**
72	**Cable length in inches**
M	**Temperature range for 4-20 mA output:** AT = -100 to 40°C (-148 to -40°F) EZ = -100 to 0°C (-148 to 32°F) LN = -100 to 100°C (-148 to 212°F) M = -50 to 50°C (-58 to 122°F) BC = -10 to 30°C (-22 to 86°F) N = 0 to 50°C (32 to 122°F) Other ranges are available. See page 5-10.

AS101436PD72M ← Sample P/N

Washdown compatibility

The washdown compatible Thermal Vial includes a polycarbonate housing and PTFE sensor cable for compatibility with the chemicals commonly used.

4.0
(102)

2.0 SQ.
(51)

2.75
(70)

STANDARD

4.5
(114)

2.6
(65.0)

WASHDOWN

4.5
(115)

DIMENSIONS IN INCHES (mm)

BOX DEPTH APPROXIMATELY 2.2 (55.9)

Transmitters are mounted in the junction box on duct sensors, or in the connection head of fluid immersion sensors.

Outside air thermometers and Thermal-Ribbons: Transmitters are furnished separately. Install in an enclosure near the sensor, but away from excessive ambient temperatures.

Full size wall mount thermometers use the TT115 circuit-board style Temptran. The enclosure is thermally designed to minimize heating of the sensor by transmitter

Temptran™ 4 to 20 mA Transmitters

All HVAC RTDs are available with companion 4 to 20 mA transmitters. See page 5-2 for suitable models. (Room air thermometers use model TT115, which has the same specifications as TT111). Temptrans convert low-level RTD output to a standard current signal, immune to lead resistance and electrical noise. You can get accurate readings from points thousands of feet away.

How to order transmitters

To order HVAC/R sensors with integral transmitters, specify both the RTD and the Temptran part numbers.
Example: S450PDY12 / TT111PD1A = Platinum duct RTD and 20 to 120°F transmitter.

Special calibration

Standard transmitters are calibrated to the nominal resistance values of the RTD at the zero and span points. Total system error includes the tolerance of both the transmitter and the RTD sensor.

If you order Minco Temptrans calibrated to the actual resistance of the RTD (as measured in Minco's metrology lab), this effectively subtracts the sensor tolerance from system accuracy specifications.

For example, consider a transmitter with a range of 0 to 500°C. The transmitter itself is accurate to ±1.0°C (±0.2% of span, including calibration accuracy and linearity). The RTD interchangeability contributes an additional error of ±0.3°C at 0°C and ±2.8°C at 500°C. Total system error would be ±1.3°C at 0°C and ±3.8°C at 500°C. When you calibrate the sensor and transmitter as a set, the sensor error disappears, reducing system error to ±1.0°C over the full range — all for a nominal extra cost.

0.75% guaranteed accuracy

Minco guarantees a system accuracy (current signal vs temperature) of 0.75% of span when you order specially calibrated Temptrans with any RTD in this section. (An RTD with standard transmitter will deviate about 1-2% of span.) Tighter accuracies are available on special order.

Standard model	Special calibration
TT110	TT150
TT111	TT151
TT115	TT155
TT210	TT710
TT211	TT711

Free NIST traceability

With each matched sensor/transmitter set, Minco sends you calibration data traceable to the National Institute of Standards & Technology. This helps you comply with ISO 9001 and other quality standards.

Recalibration

Minco prints RTD resistance values right on the Temptran label to simplify recalibration. You simply connect a resistance decade box or "RTD simulator" in place of the RTD, dial in the correct values, and adjust zero and span. Because Minco RTDs shift less than 0.05°F per year in a typical HVAC installation, the printed values remain valid for many years.


```
MINCO            MODEL TT211PD1A
MPLS, MN USA     D/C: 9614          TEMPTRAN™
                 100 OHM PLATINUM RTD
                  4mA=    20.0°F=  -6.7°C=      97.932Ω
                 20mA=  120.0°F=  48.9°C=     118.969Ω
```

RTD resistances are printed on Temptran labels for easy recalibration of zero and span. A standard Temptran shows nominal values.


```
MINCO            MODEL TT711PD1A
MPLS, MN USA     D/C: 9614 S/N: 103  TEMPTRAN™
                 100 OHM PLATINUM RTD
                  4mA=    20.0°F=  -6.7°C=      97.427Ω
                 20mA=  120.0°F=  48.9°C=     118.988Ω
```

A specially calibrated Temptran shows *actual* resistance of the serialized, connected RTD.