

► SECTION 1: ASSEMBLIES

- Easy-to-order temperature sensor assemblies to fit a variety of applications
- RTDs, thermocouples, and transmitters
- Fittings, connection heads, and thermowells included
- Tip-sensitive, high temperature, explosionproof, and flameproof options

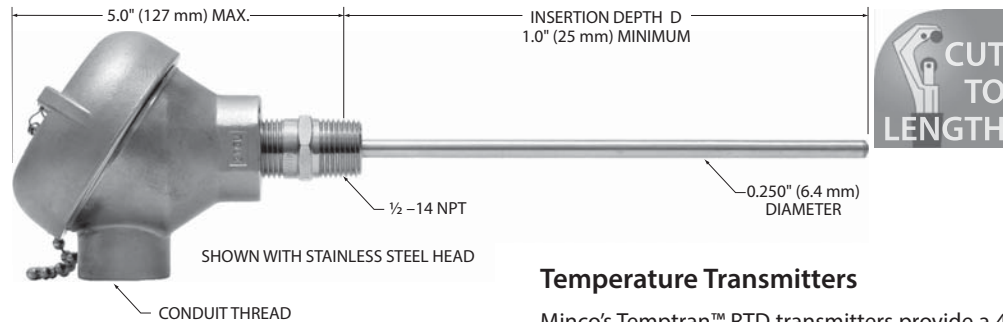
To specify custom assemblies see:

Probes	Section 2
Accessories	Section 3
Transmitters	Section 4

To specify humidity assemblies see Section 8

Tip-sensitive spring loaded.....	1-2 to 1-3
Tip-sensitive Direct immersion.....	1-4 to 1-5
Tip-sensitive with thermowells.....	1-6 to 1-7
High temp. with thermowells	1-8 to 1-9
Explosionproof/Flameproof.....	1-10 to 1-15
Hazardous area	1-16 to 1-21
Eurostyle.....	1-22 to 1-23
Specifying custom assemblies	1-24

Tip-sensitive Spring-loaded RTDs



Overview

Fast and accurate readings from bearings, blocks, and other solids. Minco's spring-loaded holder ensures solid contact in drilled holes and has a built-in oil seal. The sensing probe features a copper alloy tip for quick response to temperature changes.

- Tip-sensitive RTD probe for use to 260°C (500°F)
- Spring-loaded holder with fluid seal
- Cast iron, stainless steel, or aluminum connection head

Specifications

Temperature range: -50 to 260°C (-58 to 500°F).

Material:

Probe: Stainless steel with copper alloy tip.

Holder: Stainless steel with Viton O-ring.

Connection head: Cast iron, aluminum, or stainless steel.

Pressure rating: 50 psi (3.4 bar).

Insulation resistance: 100 megohms minimum at 100 VDC, leads to case.

Connection: Terminal block for wires to AWG 14.

Time constant: Typical value in moving water:

Single element: 1.5 seconds.

Dual element: 3.0 seconds.

Sensing Elements

Element		Code
Platinum (0.00392 TCR)	100 Ω ±0.5% at 0°C	▼PA
Platinum (0.00385 TCR) (Meets EN60751, Class B)	100 Ω ±0.1% at 0°C	▼PD
Platinum (0.00385 TCR)	100 Ω ±0.5% at 0°C	PE
Copper (0.00427 TCR)	10 Ω ±0.2% at 25°C	CA
(dual)	10 Ω ±0.5% at 25°C	CC
Nickel (0.00672 TCR)	120 Ω ±0.5% at 0°C	NA

Temperature Transmitters

Minco's Temptran™ RTD transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Special high-accuracy calibration: For high system accuracy, specify transmitters with matched calibration. Calibration data traceable to NIST will also be provided. Get more information on page 4-22.

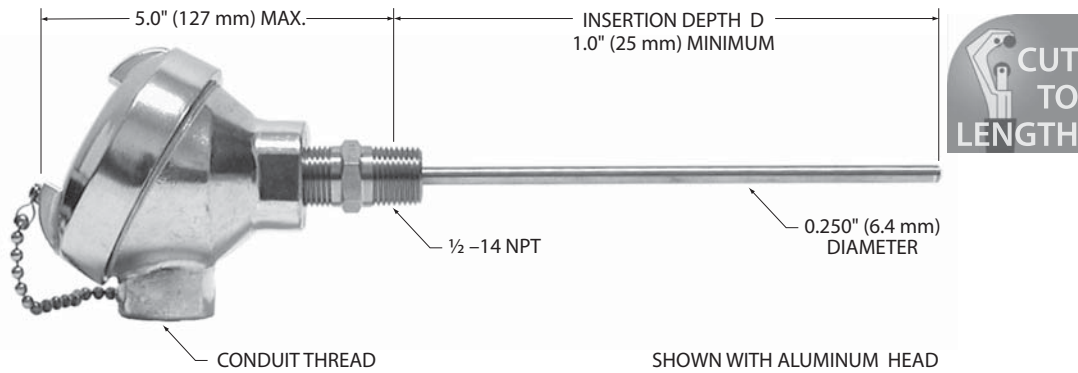
Specification and order options

AS5004	Assembly number ▼ AS5004: Single element RTD ▼ AS5005: Dual element RTD
PA	Sensing element from table
60	Insertion depth D: Specify in 0.1" increments (Ex: 60 = 6.0 inches) ▼ :15, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 140, 160, 180, 200, 240, 300, 360
Z	Leads per sensing element: Y = 2 leads ▼ Z = 3 leads (required for CA and CC elements) X = 4 leads (PD elements only)
1	Conduit thread: ▼ 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
A	Connection head: C = Cast iron ▼ A = Aluminum S = Stainless steel
To order sensor assembly, stop here.	
To order with transmitters (single platinum element only) add:	
211	Temptran™ transmitter model: 211 = TT211: Fixed Range (2-lead RTDs) 508 = TT508: Programmable (2 & 3-lead RTDs) 511 = TT511: HART® Programmable (2, 3, & 4-lead RTDs)
A	Temperature range codes starting on page 4-20 or at www.minco.com
1	Calibration: 1 = Nominal calibration 2 = Match calibrated, 0.75% total system accuracy. For other calibration options, contact Minco
AS5004PA60Z1A211A1 = Sample part number	

▼ = STANDARD OPTIONS

Specifications subject to change

Tip-sensitive Spring-loaded Thermocouples



Overview

Fast and accurate readings from bearings, blocks, and other solids. Minco's spring-loaded holder ensures solid contact in drilled holes and has a built-in oil seal. The sensing probe features a copper alloy tip for quick response to temperature changes.

- Tip-sensitive Thermocouple for use to 260°C (500°F)
- Spring-loaded holder with fluid seal
- Cast iron, stainless steel, or aluminum connection head

Specifications

Temperature range: -50 to 260°C (-58 to 500°F).

Material:

Probe: Stainless steel with copper alloy tip.
 Holder: Stainless steel with Viton O-ring.
 Connection head: Cast iron, aluminum, or stainless steel.

Pressure rating: 50 psi (3.4 bar).

Insulation resistance: 10 megohms minimum at 100 VDC, leads to case. Ungrounded junctions only.

Connection: Terminal block for wires to AWG 14.

Time constant: Typical value in moving water:

Grounded junction: 1.5 seconds.
 Ungrounded junction: 7 seconds

Temperature Transmitters

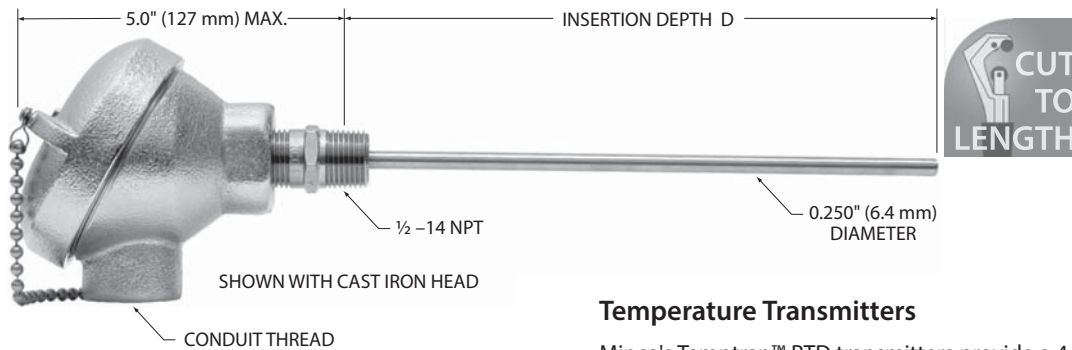
Minco's Tempran™ thermocouple transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Specification and order options

AS5192	Assembly number ▼ AS5191: Single junction ▼ AS5192: Dual junction
E	Junction type: ▼ E = Chromel-Constantan J = Iron-Constantan ▼ K = Chromel-Alumel T = Copper-Constantan
U	Junction grounding: G = Grounded ▼ U = Ungrounded
120	Insertion depth D: Specify in 0.1" increments (Ex: 120 = 12.0 inches) ▼: 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120
P	
1	Conduit thread: ▼ 1 = 1/2 - 14 NPT ▼ 2 = 3/4 - 14 NPT
A	Connection head: C = Cast iron ▼ A = Aluminum S = Stainless steel
To order sensor assembly, stop here.	
To order with transmitter, add:	
509	Tempran™ transmitter model: 205 = TT205: Fixed Range, Miniature 509 = TT509: Programmable, Hockey Puck 511 = TT511: HART® Programmable, Hockey Puck
A	Temperature range codes starting on page 4-20 or at www.minco.com
AS5192EU120P1A509A = Sample part number	

▼ = **STANDARD OPTIONS**
 Specifications subject to change

Tip-sensitive Direct Immersion RTDs



Overview

Mount sensors directly in fluid flow for fast response. Probes are rated to 100 psi (6.9 bar). For use in non-corrosive fluids only.

- RTD probe for use to 260°C (500°F)
- Adjustable fluid seal fitting
- Cast iron, stainless steel, or aluminum connection head

Specifications

Temperature range: -50 to 260°C (-58 to 500°F).

Material:

Probe: Stainless steel with copper alloy tip.
 Fitting: Stainless steel, silicone rubber O-ring.
 Connection head: Cast iron, aluminum, or stainless steel.

Pressure rating: 100 psi (6.9 bar).

Insulation resistance: 100 megohms minimum at 100 VDC, leads to case.

Connection: Terminal block for wires to AWG 14.

Time constant: Typical value in moving water:
 Single element: 2.0 seconds.
 Dual element: 5.0 seconds.

Sensing elements

Element		Code
Platinum (0.00392 TCR)	100 Ω ±0.5% at 0°C	PA
Platinum (0.00385 TCR) (Meets EN60751, Class B)	100 Ω ±0.1% at 0°C	▼PD
Platinum (0.00385 TCR)	100 Ω ±0.5% at 0°C	PE
Copper (0.00427 TCR)	10 Ω ±0.2% at 25°C	CA
(dual)	10 Ω ±0.5% at 25°C	CC
Nickel (0.00672 TCR)	120 Ω ±0.5% at 0°C	NA

Temperature Transmitters

Minco's Tempran™ RTD transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

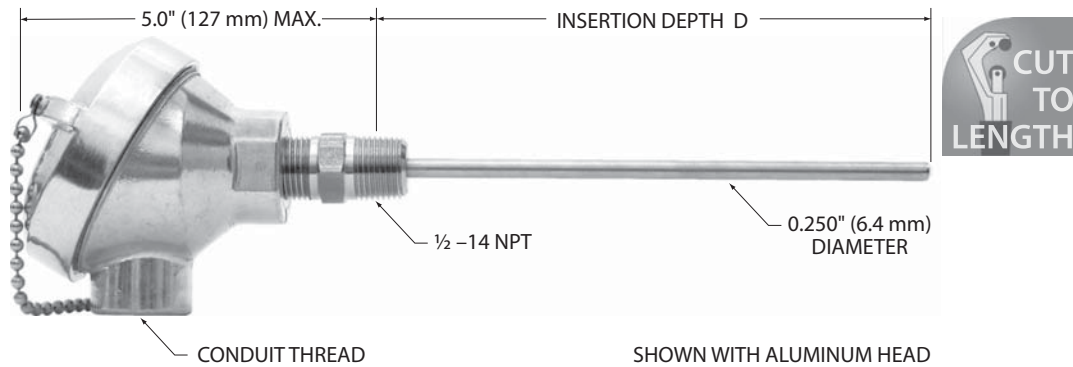
Special high-accuracy calibration: For high system accuracy, specify transmitters with matched calibration. Calibration data traceable to NIST will also be provided. Get more information on page 4-22.

Specification and order options

AS5200	Assembly number ▼AS5200: Single element ▼AS5201: Dual element
PD	Sensing element from table
100	Insertion depth D: Specify in 0.1" increments (Ex: 100 = 10.0 inches) ▼:15, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 140, 160, 180, 200, 240, 300, 360
Z	Leads per sensing element: Y = 2 leads ▼Z = 3 leads (required for CA and CC elements) X = 4 leads (PD elements only)
1	Conduit thread: ▼1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
A	Connection head: C = Cast iron ▼A = Aluminum S = Stainless steel
To order sensor assembly, stop here. To order with transmitters (single platinum element only) add:	
508	Tempran™ transmitter model: 211 = TT211: Fixed Range (2-lead RTDs) 508 = TT508: Programmable (2 & 3-lead RTDs) 511 = TT511: HART® Programmable (2, 3, & 4-lead RTDs)
A	Temperature range codes starting on page 4-20 or at www.minco.com
1	Calibration: 1 = Nominal calibration 2 = Match calibrated, 0.75% total system accuracy. For other calibration options, contact Minco
AS5200PD100Z1A508A1 = Sample part number	

▼ = STANDARD OPTIONS
 Specifications subject to change

Tip-sensitive Direct Immersion Thermocouples



Overview

Mount sensors directly in fluid flow for fast response. Probes are rated to 100 psi (6.9 bar). For use in non-corrosive fluids only.

- Thermocouple for use to 260°C (500°F)
- Adjustable fluid seal fitting
- Cast iron, stainless steel, or aluminum connection head

Specifications

Temperature range: -50 to 260°C (-58 to 500°F).

Material:

Probe: Stainless steel with copper alloy tip.
 Fitting: Stainless steel, silicone rubber O-ring.
 Connection head: Cast iron, aluminum, or stainless steel.

Pressure rating: 100 psi (6.9 bar).

Insulation resistance: 10 megohms minimum at 100 VDC, leads to case. Ungrounded junctions only.

Connection: Terminal block for wires to AWG 14.

Time constant: Typical value in moving water:

Grounded junction: 1.5 seconds.
 Ungrounded junction: 7 seconds.

Temperature Transmitters

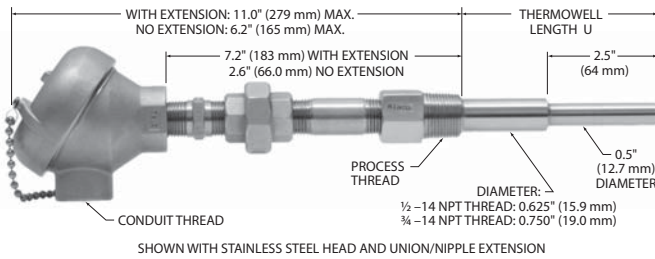
Minco's Tempran™ thermocouple transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Specification and order options

AS5205	Assembly number AS5205: Single junction AS5206: Dual junction
E	Junction type: E = Chromel-Constantan J = Iron-Constantan K = Chromel-Alumel T = Copper-Constantan
U	Junction grounding: G = Grounded U = Ungrounded
215	Insertion depth D: Specify in 0.1" increments (Ex: 215 = 21.5 inches)
P	
1	Conduit thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
C	Connection head: C = Cast iron A = Aluminum S = Stainless steel
To order sensor assembly, stop here.	
To order with transmitter, add:	
509	Tempran™ transmitter model: 205 = TT205: Fixed Range, Miniature 509 = TT509: Programmable, Hockey Puck 511 = TT511: HART® Programmable, Hockey Puck
A	Temperature range codes starting on page 4-20 or at www.minco.com
AS5205EU215P1C509A = Sample part number	

▼ = STANDARD OPTIONS
 Specifications subject to change

Tip-sensitive RTDs with Thermowells



Overview

Thermowells protect sensors from the effects of fluid flow and pressure. These assemblies are spring-loaded for positive probe contact against the bottom of the thermowell. The probe's copper alloy tip provides superior time response and reduces error from stem conduction.

- 316 stainless steel thermowell
- Tip-sensitive RTD probe for use to 260°C (500°F)
- Spring-loaded probe
- Cast iron, stainless steel, or aluminum connection head

Specifications

Temperature range: -50 to 260°C (-58 to 500°F).

Material:

Probe: Stainless steel with copper alloy tip.
 Connection head: Cast iron, aluminum, or stainless steel.
 Thermowell: 316 stainless steel.
 Extension: Stainless steel.

Pressure rating: 7000 psi (483 bar) at 21°C, reducing to 6300 psi (433 bar) at 260°C.

Standard U dimensions: 2.5, 4.5, 6.0, 7.5, 8.0, 10.5, 13.5, 16.5, and 22.5".

Insulation resistance: 100 megohms minimum at 100 VDC, leads to case.

Connection: Terminal block for wires to AWG 14.

Time constant: 17 seconds typical in moving water.

Sensing elements

Element		Code
Platinum (0.00392 TCR)	100 Ω ±0.5% at 0°C	PA
Platinum (0.00385 TCR) (Meets EN60751, Class B)	100 Ω ±0.1% at 0°C	▼PD
Platinum (0.00385 TCR)	100 Ω ±0.5% at 0°C	PE
Copper (0.00427 TCR)	10 Ω ±0.2% at 25°C	CA
(dual)	10 Ω ±0.5% at 25°C	CC
Nickel (0.00672 TCR)	120 Ω ±0.5% at 0°C	NA

Temperature Transmitters

Minco's Tempran™ RTD transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

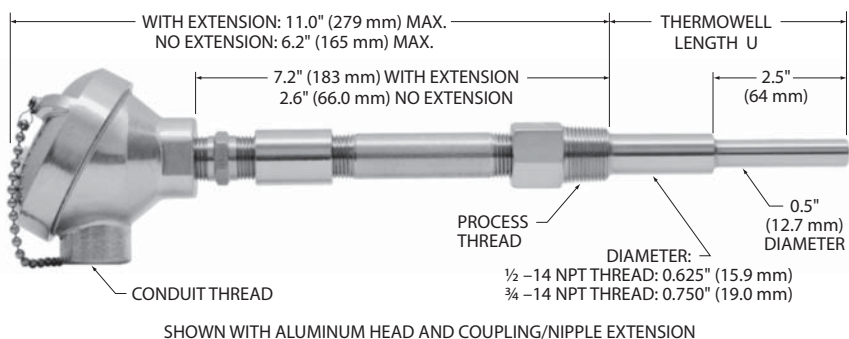
Special high-accuracy calibration: For high system accuracy, specify transmitters with matched calibration. Calibration data traceable to NIST will also be provided. Get more information on page 4-22.

Specification and order options

AS5140	Assembly number ▼AS5140: Single element RTD ▼AS5141: Dual element RTD
CA	Sensing element from table
60	Thermowell length U: Specify in 0.1" increments (Ex: 60 = 6.0 inches) ▼:15, 20, 25, 30, 40, 45, 60, 75, 90, 100, 105, 120, 150
Z	Leads per sensing element: Y = 2 leads ▼Z = 3 leads (required for CA and CC elements) X = 4 leads (PD elements only)
1	Conduit thread: ▼1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
A	Connection head: C = Cast iron ▼A = Aluminum S = Stainless steel
1	Thermowell process thread: ▼1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
U	Extension option: P = Coupling/nipple extension ▼N = No extension ▼U = Union/Nipple extension
To order sensor assembly, stop here. To order with transmitters (single platinum element only) add:	
508	Tempran™ transmitter model: 211 = TT211: Fixed Range (2-lead RTDs) 508 = TT508: Programmable (2 & 3-lead RTDs) 511 = TT511: HART® Programmable (2, 3, & 4-lead RTDs)
A	Temperature range codes starting on page 4-20 or at www.minco.com
1	Calibration: 1 = Nominal calibration 2 = Match calibrated, 0.75% total system accuracy. For other calibration options, contact Minco
AS5140CA60Z21A1U508A1 = Sample part number	

▼ = STANDARD OPTIONS
 Specifications subject to change

Tip-sensitive Thermocouples with Thermowells



Overview

Thermowells protect sensors from the effects of fluid flow and pressure. These assemblies are spring-loaded for positive probe contact against the bottom of the thermowell. The probe's copper alloy tip provides superior time response and reduces error from stem conduction.

- 316 stainless steel thermowell
- Tip-sensitive thermocouple for use to 260°C (500°F)
- Spring-loaded probe
- Cast iron, stainless steel, or aluminum connection head

Specifications

Temperature range: -50 to 260°C (-58 to 500°F).

Material:

Probe: Stainless steel with copper alloy tip.
Connection head: Cast iron, aluminum, or stainless steel.
Thermowell: 316 stainless steel.
Extension: Stainless steel.

Pressure rating: 7000 psi (483 bar) at 21°C, reducing to 6300 psi (433 bar) at 260°C.

Standard U dimensions: 2.5, 4.5, 6.0, 7.5, 8.0, 10.5, 13.5, 16.5, and 22.5".

Insulation resistance: 10 megohms min. at 100 VDC, leads to case. Ungrounded junctions only.

Connection: Terminal block for wires to AWG 14.

Time constant: Typical value in moving water.
Grounded junction: 17 seconds.
Ungrounded junction: 22 seconds.

Temperature Transmitters

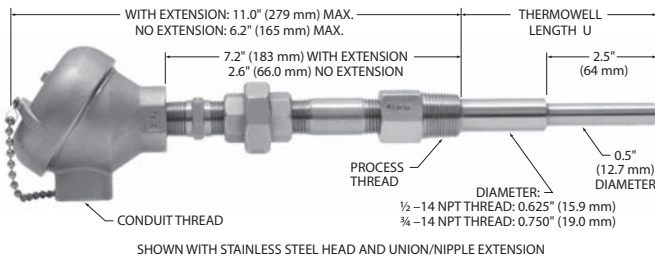
Minco's Temptran™ thermocouple transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Specification and order options

AS5145	Assembly number AS5145: Single junction TC AS5146: Dual junction TC
E	Junction type: E = Chromel-Constantan J = Iron-Constantan K = Chromel-Alumel T = Copper-Constantan
U	Junction Grounding: G = Grounded U = Ungrounded
135	Thermowell length U: Specify in 0.1" increments (Ex: 135 = 13.5 inches)
P	
1	Conduit thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
C	Connection head: C = Cast iron A = Aluminum S = Stainless steel
1	Thermowell process thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
U	Extension option: P = Coupling/nipple extension N = No extension U = Union/Nipple extension
To order sensor assembly, stop here. To order with transmitter, add:	
509	Temptran™ transmitter model: 205 = TT205: Fixed Range, Miniature 509 = TT509: Programmable, Hockey Puck 511 = TT511: HART® Programmable, Hockey Puck
A	Temperature range codes starting on page 4-20 or at www.minco.com
AS5145EU135P1C1U509A = Sample part number	

▼ = STANDARD OPTIONS
Specifications subject to change

550°C RTDs with Thermowells



Overview

Sense temperature in high-pressure fluids and gases. These assemblies are spring-loaded for positive probe contact against the bottom of the thermowell.

- 316 stainless steel thermowell
- RTD probe for use to 550°C (1022°F)
- Spring-loaded probe
- Cast iron, stainless steel, or aluminum connection head

Note: For temperatures less than 260°C (500°F), assemblies using tip-sensitive sensors are recommended.

Specifications

Temperature range:

Thermowell and sensor: -100 to 550°C (-148 to 1022°F).

Connection head:

- Cast iron: 260°C (500°F) max.
- Aluminum: 316°C (600°F) max.
- Stainless steel: 121°C (250°F) max.

Material:

- Probe: 316 stainless steel.
- Connection head: Cast iron, aluminum, or stainless steel.
- Thermowell: 316 stainless steel.
- Extension: Stainless steel.

Pressure rating: 7000 psi (483 bar) at 21°C, reducing to 2500 psi (172 bar) at 550°C.

Standard U dimensions: 2.5, 4.5, 6.0, 7.5, 8.0, 10.5, 13.5, 16.5, and 22.5".

Insulation resistance: 10 megohms min. at 100 VDC, leads to case.

Connection: Terminal block for wires to 14 AWG.

Time constant: 23 seconds typical in moving water.

Sensing elements

Element		Code
Platinum (0.00391 TCR)	100 Ω ±0.1% at 0°C	PB
Platinum (0.00385 TCR) (Meets EN60751, Class B)	100 Ω ±0.1% at 0°C	PD

Temperature Transmitters

Minco's Temptran™ RTD transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

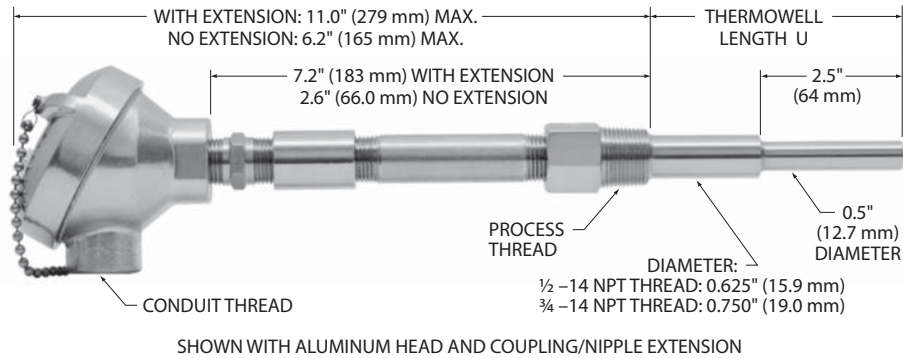
Special high-accuracy calibration: For high system accuracy, specify transmitters with matched calibration. Calibration data traceable to NIST will also be provided. Get more information on page 4-22.

Specification and order options

AS5160	Assembly number AS5160
PB	Sensing element from table
105	Thermowell length U: Specify in 0.1" increments (Ex: 105 = 10.5 inches)
Z	Leads per sensing element: Y = 2 leads Z = 3 leads X = 4 leads (PD elements only)
2	Conduit thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
C	Connection head: C = Cast iron A = Aluminum S = Stainless steel
1	Thermowell process thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
U	Extension option: P = Coupling/nipple extension N = No extension U = Union/Nipple extension
To order sensor assembly, stop here.	
To order with transmitters add:	
508	Temptran™ transmitter model: 211 = TT211: Fixed Range (2-lead RTDs) 508 = TT508: Programmable (2 & 3-lead RTDs) 511 = TT511: HART® Programmable (2, 3, & 4-lead RTDs)
A	Temperature range codes starting on page 4-20 or at www.minco.com
1	Calibration: 1 = Nominal calibration 2 = Match calibrated, 0.75% total system accuracy. For other calibration options, contact Minco
AS5160PB105Z2C1U508A1 = Sample part number	

▼ = STANDARD OPTIONS
Specifications subject to change

550°C Thermocouples with Thermowells



Overview

Sense temperature in high-pressure fluids and gases. These assemblies are spring-loaded for positive probe contact against the bottom of the thermowell.

Note: For temperatures less than 260°C (500°F), assemblies using tip-sensitive sensors are recommended.

- 316 stainless steel thermowell
- Thermocouple probe for use to 550°C (1022°F)
- Spring-loaded probe
- Cast iron, aluminum or stainless steel connection head

Specifications

Temperature range:

Thermowell and sensor: -100 to 550°C (-148 to 1022°F).

Connection head:

Cast iron: 260°C (500°F) max.

Aluminum: 316°C (600°F) max.

Stainless steel: 121°C (250°F) max.

Material:

Probe: 316 stainless steel.

Connection head: Cast iron, aluminum, or stainless steel.

Thermowell: 316 stainless steel.

Extension: Stainless steel.

Pressure rating: 7000 psi (483 bar) at 21°C, reducing to 2500 psi (172 bar) at 550°C.

Standard U dimensions:

2.5, 4.5, 6.0, 7.5, 8.0, 10.5, 13.5, 16.5, and 22.5".

Insulation resistance: 10 megohms min. at 100 VDC, leads to case. Ungrounded junctions only.

Connection: Terminal block for wires to 14 AWG.

Time constant: 60 seconds typical in moving water.

Temperature Transmitters

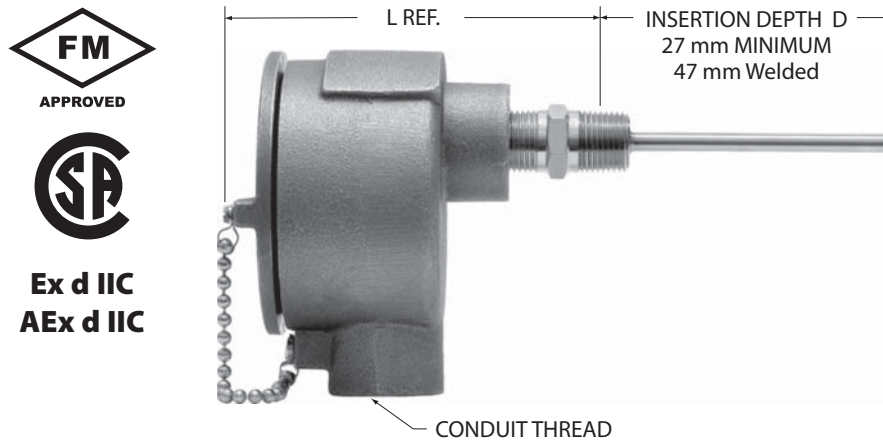
Minco's Tempran™ thermocouple transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Specification and order options

AS5165	Assembly number: AS5165
K	Junction type: E = Chromel-Constantan J = Iron-Constantan K = Chromel-Alumel
U	Junction Grounding: G = Grounded U = Ungrounded
135	Thermowell length U: Specify in 0.1" increments (Ex: 135 = 13.5 inches)
P	
1	Conduit thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
C	Connection head: C = Cast iron A = Aluminum S = Stainless steel
1	Thermowell process thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT
U	Extension option: P = Coupling/nipple extension N = No extension U = Union/Nipple extension
To order sensor assembly, stop here. To order with transmitter, add:	
509	Tempran™ transmitter model: 205 = TT205: Fixed Range, Miniature 509 = TT509: Programmable, Hockey Puck 511 = TT511: HART® Programmable, Hockey Puck
A	Temperature range codes starting on page 4-20 or at www.minco.com
AS5165KU135P1C1U509A = Sample part number	

▼ = STANDARD OPTIONS
Specifications subject to change

Explosionproof/Flameproof RTD Sensors



Overview

Explosionproof and flameproof rating for hazardous areas where accurate temperature sensing is critical.

- Tip sensitive, all stainless or MgO filled probes available
- Hazardous area rated
- High temp process temperature options (600°C) available. Contact Minco for more information.

Specifications

Temperature range:

- 50 to 260°C (-58 to 500°F)
- 50 to 600°C (-58 to 1112°F) for MgO Probes

Material:

Probe: Stainless steel (tip sensitive models have copper alloy tip).
 Holder: Stainless steel.
 Connection head:
 Copper free aluminum alloy (CH104)
 316 stainless steel (CH106).

Pressure rating: See table on next page.

Insulation resistance: 10 megohms min. at 100 VDC, leads to case.

Connection: Terminal block for wires to 14 AWG.

Time constant: Typical value in moving water.

Tip sensitive:

- Single element 1.5 seconds.
- Dual element 5 seconds.

All stainless and MgO filled: 10 seconds.

Explosionproof and flameproof ratings:

National and Canadian Electrical Code:

- Class I, Divisions 1 and 2, Groups B, C, and D,
- Class II, Groups E, F, and G,
- T6 (Ta = 40°C),
- T2 (Ta = 260°C). Ta limited to 160°C for CSA Class II locations.

National Electrical Code (Article 505):

- Class I, Zones 1 and 2, AEx d IIC,
- T6 (Ta = 40°C), T2 (Ta = 260°C).

Canadian Electrical Code (IEC 60079):

- Zones 1 and 2, Ex d IIC,
- T6 (Ta = 40°C), T2 (Ta = 260°C).

Hazardous area requirements

For more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, IECEx and ATEX), visit www.minco.com.

▼ = **STANDARD OPTIONS**
 Specifications subject to change

Assembly numbers

Probe diameters	0.215" (5.5 mm)		0.236" (6.0 mm)		0.250" (6.4 mm)	
Number of elements	Single	Dual	Single	Dual	Single	Dual
Tip-sensitive	AS760	AS761	AS700	AS701	▼AS720	▼AS721
All stainless	AS762	AS763	AS702	AS703	AS722	AS723
MgO filled (platinum only)			AS704		AS724	AS725

Connection head and fitting options

CH104: Aluminum IP65, Type 3 and 4.

CH106: 316 stainless steel IP66, Type 3, 4, and 4X.

Fitting	Process thread	Pressure Rating	L REF.	Code	Minimum Insertion Depth (mm)
Welded	1/2 - 14 NPT	200 psi (13.8 bar)	4.4" (112 mm)	0*	47
Welded	G 1/2	200 psi (13.8 bar)	4.2" (107 mm)	2*	47
Adjustable spring-loaded	1/2 - 14 NPT	50 psi (3.4 bar)	5.7" (144 mm)	▼4	27
Adjustable spring-loaded	G 1/2	50 psi (3.4 bar)	5.7" (144 mm)	6	27
Fixed spring-loaded	1/2 - 14 NPT	None	4.4" (112 mm)	8**	27

* 0.250 diameter only for all stainless and MgO probes (not available in tip-sensitive, 0.215" diameter or 0.236" diameter probes).

** 0.236 and 0.250 diameters only for fixed spring-loaded fittings.

Note: Connection head dimensions are found on pages 3-2 to 3-3.

Sensing elements

Element	Code	Code	
		Single	Dual
Platinum (0.00392 TCR) 100 Ω ±0.5% at 0°C	PA	PAPA	
Platinum (0.00385 TCR) 100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	▼PD	PDPD	
Platinum (0.00385 TCR) 100 Ω ±0.06% at 0°C (Meets EN60751, Class A)	PM	PMPM	
Platinum (0.00385 TCR) 100 Ω ±0.5% at 0°C	PE	PEPE	
Platinum (0.00375 TCR) 1000 Ω ±0.12% at 0°C	PW	PWPW	
Copper (0.00427 TCR) (dual) 10 Ω ±0.2% at 25°C 10 Ω ±0.5% at 25°C	CA		
		CCCC	
Nickel (0.00672 TCR) 120 Ω ±0.5% at 0°C	NA	NANA	
Nickel (0.00618 TCR) 100 Ω ±0.22% at 0°C	NB	NBNB	

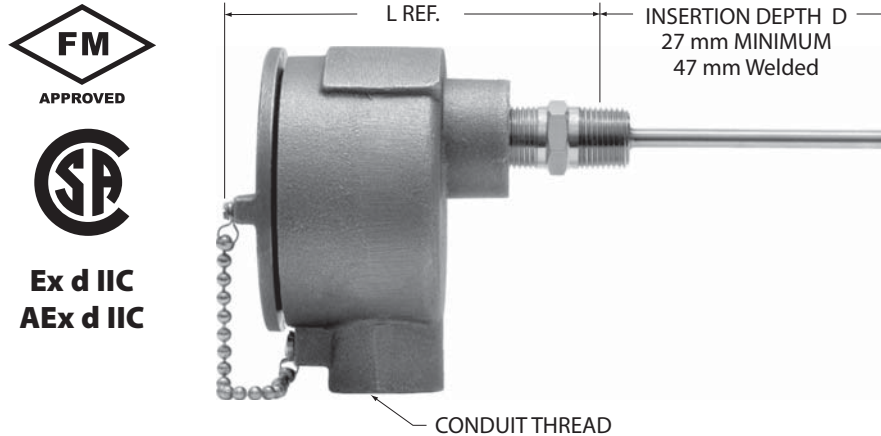
Specification and order options

AS720	Assembly number from table
4	Fitting from table
PD	Sensing element from table
100	Insertion depth D (mm): See table for minimums ▼:76, 100, 127, 150, 178, 200, 229, 250, 279, 305, 350, 406, 457, 500, 610
Z	Leads per sensing element: Y = 2 leads (n/a for copper) ▼Z = 3 leads X = 4 leads
3	Conduit thread: ▼3 = 1/2 - 14 NPT 4 = 3/4 - 14 NPT
A	Connection head material: A = Aluminum S = 316 Stainless Steel
0	Extension: 0 = No Extension 2 = 1/2 NPT Nipple (2")/Union (2.6" length adder) 3 = 1/2 NPT Nipple (3")/Union (3.6" length adder) 4 = 1/2 NPT Nipple (4")/Union (4.6" length adder) 6 = 1/2 NPT Nipple (6")/Union (6.6" length adder)
X0X	No Thermowell
AS7204PD100Z3A0X0X= Sample part number	

▼ = STANDARD OPTIONS

Specifications subject to change

Explosionproof/Flameproof Thermocouple Sensors



Overview

Explosionproof and flameproof rating for hazardous areas where accurate temperature sensing is critical.

- Tip sensitive, MgO filled probes available
- Hazardous area rated

Specifications

Temperature range:

- 50 to 260°C (-58 to 500°F)
- 50 to 600°C (-58 to 1112°F) for MgO Probes

Material:

Probe: Stainless steel (tip sensitive models have copper alloy tip).
 Holder: Stainless steel.
 Connection head:

- Copper free aluminum alloy (CH104)
- 316 stainless steel (CH106).

Pressure rating: See table on next page.

Insulation resistance: 10 megohms min. at 100 VDC, leads to case. Ungrounded junctions only.

Connection: Terminal block for wires to 14 AWG.

Time constant: Typical value in moving water.

Tip sensitive:

- Grounded 1.5 seconds.
- Ungrounded 7 seconds.

MgO filled:

- Grounded: 1.5 seconds.
- Ungrounded: 5.0 seconds.

Explosionproof and flameproof ratings:

National and Canadian Electrical Code:

- Class I, Divisions 1 and 2, Groups B, C, and D,
- Class II, Groups E, F, and G,
- T6 (Ta = 40°C),
- T2 (Ta = 260°C). Ta limited to 160°C for CSA Class II locations.

National Electrical Code (Article 505):

- Class I, Zones 1 and 2, AEx d IIC,
- T6 (Ta = 40°C), T2 (Ta = 260°C).

Canadian Electrical Code (IEC 60079):

- Zones 1 and 2, Ex d IIC,
- T6 (Ta = 40°C), T2 (Ta = 260°C).

Temperature Transmitters

Minco's Temptran™ RTD transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Contact Minco if transmitter is required

Hazardous area requirements

For more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, IECEx and ATEX), visit www.minco.com.

▼ = STANDARD OPTIONS
 Specifications subject to change

Connection head and fitting options

CH104: Aluminum IP65, Type 3 and 4.

CH106: 316 stainless steel IP66, Type 3, 4, and 4X.

Fitting	Process thread	Pressure Rating	L REF.	Code	Minimum Insertion Depth (mm)
Welded	1/2 - 14 NPT	200 psi (13.8 bar)	4.4" (112 mm)	0*	47
Welded	G 1/2	200 psi (13.8 bar)	4.2" (107 mm)	2*	47
Adjustable spring-loaded	1/2 - 14 NPT	50 psi (3.4 bar)	5.7" (144 mm)	4	27
Adjustable spring-loaded	G 1/2	50 psi (3.4 bar)	5.7" (144 mm)	6	27
Fixed spring-loaded	1/2 - 14 NPT	None	4.4" (112 mm)	8**	27

* Welded fitting only available with 0.250 MgO filled probes [minimum insertion (2.5" 63mm)]

** 0.236 and 0.250 diameters only for fixed spring-loaded fittings.

Note: Connection head dimensions are found on pages 3-2 to 3-3.

Assembly numbers

Probe diameters	0.215" (5.5 mm)		0.236" (6.0 mm)		0.250" (6.4 mm)	
	Single	Dual	Single	Dual	Single	Dual
Number of elements						
Tip-sensitive	AS766	AS767	AS706	AS707	AS726	AS727
MgO filled			AS708	AS709	AS728	AS729

Specification and order options

AS706	Assembly number from table
4	Fitting from table
E	Junction type from table
U	Junction Grounding: G = Grounded U = Ungrounded
100	Insertion depth D (mm): See table for minimums
P	
3	Conduit thread: 3 = 1/2 - 14 NPT 4 = 3/4 - 14 NPT
A	Connection head material: A = Aluminum S = 316 Stainless Steel
0	Extension: 0 = No Extension 2 = 1/2 NPT Nipple (2")/Union (2.6" length adder) 3 = 1/2 NPT Nipple (3")/Union (3.6" length adder) 4 = 1/2 NPT Nipple (4")/Union (4.6" length adder) 6 = 1/2 NPT Nipple (6")/Union (6.6" length adder)
X0X	No Thermowell
AS7064EU100P3A0X0X = Sample part number	

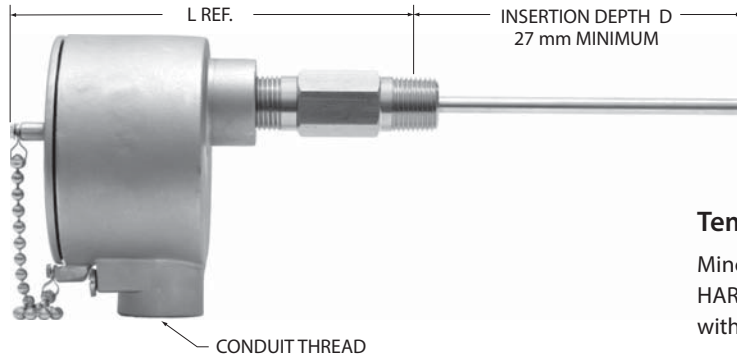
Junction types

Thermocouple Junction	
Chromel-Constantan	E
Iron-Constantan	J
Chromel-Alumel	K
Copper-Constantan	T

▼ = STANDARD OPTIONS

Specifications subject to change

Explosionproof/Flameproof RTDs with Transmitters



Ex d IIC
AEx d IIC

Overview

- Tip sensitive, all stainless or MgO filled RTD probe
- Temptran™ transmitter for long signal path

Specifications

Temperature range:

- 50 to 260°C (-58 to 500°F)
- 50 to 600°C (-58 to 1112°F) for MgO Probes

Material:

- Probe: Stainless steel (tip sensitive models have copper alloy tip).
- Holder: Stainless steel.
- Connection head:
 - Copper free aluminum alloy (CH104)
 - 316 stainless steel (CH106).

Pressure rating: See table on next page.

Insulation resistance: 10 megohms min. at 100 VDC, leads to case.

Connection: Terminal block for wires to 14 AWG.

Time constant: Typical value in moving water.

Tip sensitive:

- Single element 1.5 seconds.
- Dual element 5 seconds.

All stainless and MgO filled: 10 seconds.

Explosionproof and flameproof ratings:

- National and Canadian Electrical Code:
 - Class I, Divisions 1 and 2, Groups B, C, and D,
 - Class II, Groups E, F, and G,
 - T6 (Ta = 40°C),
 - T2 (Ta = 260°C). Ta limited to 160°C for CSA Class II locations.
- National Electrical Code (Article 505):
 - Class I, Zones 1 and 2, AEx d IIC,
 - T6 (Ta = 40°C), T2 (Ta = 260°C).
- Canadian Electrical Code (IEC 60079):
 - Zones 1 and 2, Ex d IIC,
 - T6 (Ta = 40°C), T2 (Ta = 260°C).

Temperature Transmitters

Minco's Temptran™ RTD transmitters provide a 4 to 20 mA or HART® Protocol signal that can be sent over long distances with a simple 2-wire system.

Leadwires:

- 2-lead RTD: TT211, TT520, TT521
- 3-lead RTD: TT520, TT521
- 4-lead RTD: TT520, TT521

Physical: Epoxy potted for moisture resistance.

See Section 4 for complete temperature transmitter specifications.

Hazardous area requirements

For more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, IECEx and ATEX), visit www.minco.com.

Assembly numbers

Probe diameters	0.215" (5.5 mm)	0.236" (6.0 mm)	0.250" (6.4 mm)
Tip-sensitive	AS760	AS700	AS720
All stainless	AS762	AS702	AS722
MgO filled		AS704	AS724

Sensing elements

Element		Code: Single
Platinum (0.00392 TCR)	100 Ω ±0.5% at 0°C	PA
Platinum (0.00385 TCR)	100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	PD
Platinum (0.00385 TCR)	100 Ω ±0.06% at 0°C (Meets EN60751, Class A)	PM
Platinum (0.00385 TCR)	100 Ω ±0.5% at 0°C	PE
Platinum (0.00375 TCR)	1000 Ω ±0.12% at 0°C	PW
Copper (0.00427 TCR)	10 Ω ±0.2% at 25°C	CA
Nickel (0.00672 TCR)	120 Ω ±0.5% at 0°C	NA
Nickel (0.00618 TCR)	100 Ω ±0.22% at 0°C	NB

▼ = STANDARD OPTIONS
Specifications subject to change

Connection head and fitting options

CH104: Aluminum IP65, Type 3 and 4.

CH106: 316 stainless steel IP66, Type 3, 4, and 4X.

Fitting	Process thread	Pressure Rating	L REF.	Head	Code	Minimum Insertion Depth (mm)
Welded	1/2 - 14 NPT	200 psi (13.8 bar)	4.4" (112 mm)	CH104	0*	47
Welded	1/2 - 14 NPT	200 psi (13.8 bar)	4.2" (106 mm)	CH106	1*	47
Welded	G 1/2	200 psi (13.8 bar)	4.2" (107 mm)	CH104	2*	47
Welded	G 1/2	200 psi (13.8 bar)	4.0" (101 mm)	CH106	3*	47
Adjustable spring-loaded	1/2 - 14 NPT	50 psi (3.4 bar)	5.7" (144 mm)	CH104	4	27
Adjustable spring-loaded	1/2 - 14 NPT	50 psi (3.4 bar)	5.4" (138 mm)	CH106	5	27
Adjustable spring-loaded	G 1/2	50 psi (3.4 bar)	5.7" (144 mm)	CH104	6	27
Adjustable spring-loaded	G 1/2	50 psi (3.4 bar)	5.4" (138 mm)	CH106	7	27
Fixed spring-loaded	1/2 - 14 NPT	None	4.4" (112 mm)	CH104	8**	27
Fixed spring-loaded	1/2 - 14 NPT	None	4.2" (106 mm)	CH106	9**	27

* 0.250 diameter only for all stainless and MgO probes.
(not available in tip-sensitive, 0.215" diameter or 0.236" diameter probes)

** 0.236 and 0.250 diameters only for fixed spring-loaded fittings.
Note: Connection head dimensions are found on page 3-2.

Temperature transmitter range codes

Popular ranges below. More range codes starting on page 4-20 and at www.minco.com

Code	Range	
EO	-50 to 100°C	-58 to 212°F
BC	-30 to 30°C	-22 to 86°F
S	-17.8 to 37.8°C	0 to 100°F
AC	-17.8 to 93.3°C	0 to 200°F
AN	-17.8 to 148.9°C	0 to 300°F
AG	-17.8 to 260°C	0 to 500°F
AP	-6.7 to 21.1°C	20 to 70°F
A	-6.7 to 48.9°C	20 to 120°F
N	0 to 50°C	32 to 122°F
C	0 to 100°C	32 to 212°F
J	0 to 150°C	32 to 302°F
K	0 to 200°C	32 to 392°F
V	10 to 65.6°C	50 to 150°F
P	37.8 to 179.4°C	100 to 355°F
BH	50 to 150°C	122 to 302°F

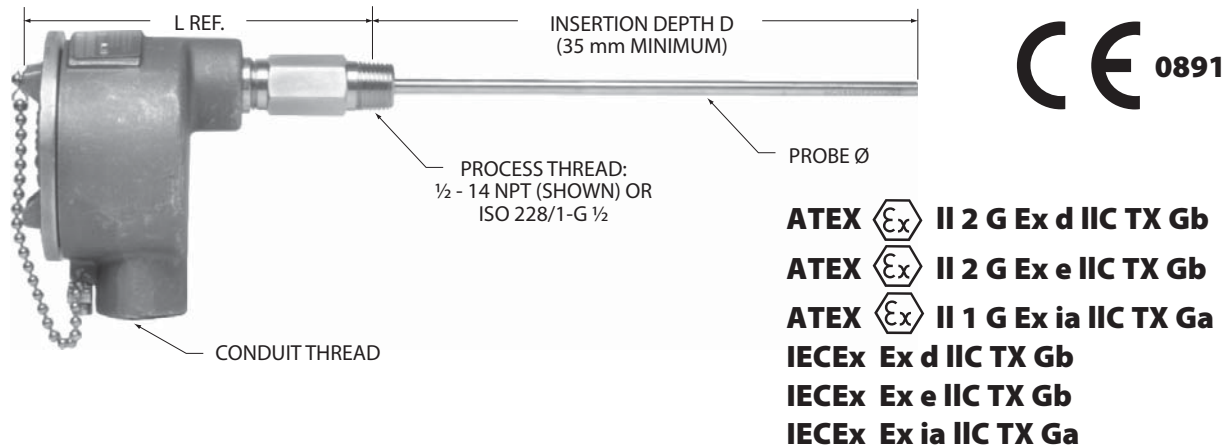
▼ = STANDARD OPTIONS

Specifications subject to change

Specification and order options

AS720	Assembly number from table
4	Fitting from table
PD	Sensing element from table
100	Insertion depth D (mm): See table for minimums ▼:76, 100, 127, 150, 178, 200, 229, 250, 279, 305, 350, 406, 457, 500, 610
Z	Leads per sensing element: Y = 2 leads (n/a for copper) ▼Z = 3 leads X = 4 leads
3	Conduit thread: 3 = 1/2 - 14 NPT 4 = 3/4 - 14 NPT
A	Connection head material: A = Aluminum S = 316 Stainless Steel
0	Extension: 0 = No Extension 2 = 1/2 NPT Nipple (2")/Union (2.6" length adder) 3 = 1/2 NPT Nipple (3")/Union (3.6" length adder) 4 = 1/2 NPT Nipple (4")/Union (4.6" length adder) 6 = 1/2 NPT Nipple (6")/Union (6.6" length adder)
X0X	No Thermowell
1	Temptran™ code: 1 = TT518: Programmable Hockey Puck (2 or 3-lead RTDs) 2 = TT519: Programmable Hockey Puck (Thermocouple only) 4 = TT211: Fixed range Rectangular (2-lead RTDs) 7 = TT521: HART® Programmable Hockey Puck (2, 3, or 4-lead RTDs or Thermocouples)
N	Temperature range code from table
1	Calibration: 1 = Nominal calibration 2 = Match calibrated, 0.75% total system accuracy. For other calibration options, contact Minco
AS7204PD100Z3A0X0X1N1 = Sample part number	

Flameproof, Increased Safety and Intrinsic Safety RTD Sensors – Per European and International Requirements



Overview

Complies with European standards for electrical apparatus for potentially explosive atmospheres: ATEX Directive 94/9/EC and International IECEx certification schemes for explosive atmospheres.

- Flameproof assemblies can be used in Zones 1 or 2
- Increased safety assemblies can be used in Zones 1 or 2
- Intrinsic safety assemblies can be used in Zones 0, 1 or 2 when used with an appropriate barrier
- Features tip-sensitive, all stainless or MgO filled RTD probe for fast response
- Spring-loaded holder ensures good probe contact
- U.S. or metric threads

Specifications

Temperature range:

- 50 to 260°C (-58 to 500°F)
- 50 to 600°C (-58 to 1112°F) for MgO Probes

Material:

Tip-sensitive probe: Stainless steel with copper alloy tip.
 All stainless RTD: Stainless steel.
 MgO filled RTD: Stainless steel.
 Fittings: Stainless steel.

Connection head:

- CH356: 316 stainless steel IP66, Type 3, 4, and 4X.
- CH357: Aluminum alloy IP65, Type 3 and 4.
- CH358: Epoxy coated aluminum alloy IP66, Type 3, 4, and 4X.

Pressure rating:

Spring-loaded holder: 50 psi (3.4 bar).
 Fluid seal fitting: 100 psi (6.9 bar).

Insulation resistance: 100 megohms min. at 100 VDC, leads to probe case.

Connection: Terminal block for wires up to AWG 14.

Time constant: Typical value in moving water.

Tip sensitive:

- Single element 1.5 seconds.
- Dual element 7 seconds.
- All stainless and MgO filled: 10 seconds.

Hazardous area requirements

For more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, IECEx and ATEX), visit www.minco.com.

▼ = **STANDARD OPTIONS**
 Specifications subject to change

Fitting options

Fitting	Process Thread	L REF.		Code	Pressure Rating
		CH356	CH357/CH358		
Fluid Seal	1/2 - 14 NPT		4.6" (116 mm)	0*	50psi (3.4 bar)
Fluid Seal	G 1/2		4.4" (111 mm)	1*	50psi (3.4 bar)
Set screw spring-loaded	1/2 - 14 NPT	5.3" (135 mm)	5.6" (143 mm)	2	50psi (3.4 bar)
Set screw spring-loaded	G 1/2	5.0" (128mm)	5.4" (136 mm)	3	50psi (3.4 bar)
Fixed spring-loaded	1/2 - 14 NPT	4.5" (115 mm)		4	None
Welded	1/2 - 14 NPT	4.2"(107 mm)	4.5" (115 mm)	6**	200psi (13.8 bar)
Welded	G 1/2	4.0" (101 mm)	4.3" (109 mm)	7**	200psi (13.8 bar)
Release knob spring-loaded	1/2 - 14 NPT	5.4" (137 mm)	5.7" (145 mm)	8	50psi (3.4 bar)
Release knob spring-loaded	G 1/2	5.2" (132 mm)	5.5" (140 mm)	9	50psi (3.4 bar)

* Not available with CH356 stainless steel connection head.

** 0.250" (6.4mm) for all stainless and MgO only (not available in tip-sensitive or 0.236" diameter models).

RTD Assembly Numbers

Probe Diameters	0.236" (6.0mm)		0.250" (6.4mm)	
	Single	Dual	Single	Dual
Tip Sensitive	AS800	AS801	AS810	AS811
All Stainless	AS802	AS803	AS812	AS813
MgO Platinum	AS804		AS814	AS815

Notes:

CH356: 316 stainless steel IP66, Type 3, 4, and 4X.

CH357: Aluminum alloy IP65, Type 3 and 4.

CH358: Epoxy coated aluminum alloy IP66, Type 3, 4, and 4X.

Get more information on connection heads on pages 3-2 to 3-3.

Sensing elements

Element	Code	Code	
		Single	Dual
Platinum (0.00392 TCR) 100 Ω ±0.5% at 0°C	PA	PAPA	
Platinum (0.00385 TCR) 100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	PD	PDPD	
Platinum (0.00385 TCR) 100 Ω ±0.06% at 0°C (Meets EN60751, Class A)	PM	PMPM	
Platinum (0.00385 TCR) 100 Ω ±0.5% at 0°C	PE	PEPE	
Platinum (0.00375 TCR) 1000 Ω ±0.12% at 0°C	PW	PWPW	
Copper (0.00427 TCR) 10 Ω ±0.2% at 25°C	CA		
(dual) 10 Ω ±0.5% at 25°C		CCCC	
Nickel (0.00672 TCR) 120 Ω ±0.5% at 0°C	NA	NANA	
Nickel (0.00618 TCR) 100 Ω ±0.22% at 0°C	NB	NBNB	

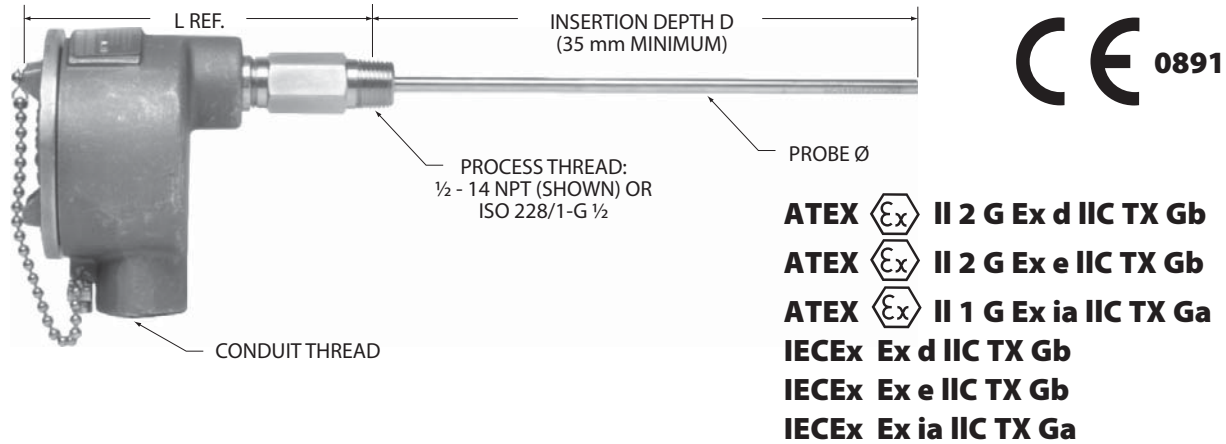
Specification and order options

AS800	Assembly number from table
4	Fitting from table
PD	Sensing element from table
100	Insertion depth D (in mm): (35-3000 mm)
X	Leads per sensing element: Y = 2 leads (n/a for copper) Z = 3 leads X = 4 leads (n/a for dual models)
3	Conduit thread: 3 = 1/2 - 14 NPT 4 = 3/4 - 14 NPT 5 = M20 x 1.5
A	Connection head material: A = Aluminum S = 316 Stainless Steel E = Aluminum, epoxy coated
0	Extension: 0 = No Extension 2 = 1/2 NPT Nipple (2")/Union (2.6" length adder) 3 = 1/2 NPT Nipple (3")/Union (3.6" length adder) 4 = 1/2 NPT Nipple (4")/Union (4.6" length adder) 6 = 1/2 NPT Nipple (6")/Union (6.6" length adder)
X0X	No Thermowell
AS8004PD100X3A0X0X = Sample part number	

▼ = STANDARD OPTIONS

Specifications subject to change

Flameproof, Increased Safety and Intrinsic Safety Thermocouple Sensors – Per European and International Requirements



Overview

Complies with European standards for electrical apparatus for potentially explosive atmospheres: ATEX Directive 94/9/EC and International IECEx certification schemes for explosive atmospheres.

- Flameproof assemblies can be used in Zones 1 or 2
- Increased safety assemblies can be used in Zones 1 or 2
- Intrinsic safety assemblies can be used in Zones 0, 1 or 2 when used with an appropriate barrier
- Features tip-sensitive or MgO filled thermocouple probe for fast response
- Spring-loaded holder ensures good probe contact
- U.S. or metric threads

Specifications

Temperature range:

- 50 to 260°C (-58 to 500°F)
- 50 to 600°C (-58 to 1112°F) for MgO Probes

Material:

- Tip-sensitive probe: Stainless steel with copper alloy tip.
- MgO filled thermocouple: Stainless steel.
- Fittings: Stainless steel.
- Connection head:
 - CH356: 316 stainless steel IP66, Type 3, 4, and 4X.
 - CH357: Aluminum alloy IP65, Type 3 and 4.
 - CH358: Epoxy coated aluminum alloy IP66, Type 3, 4, and 4X.

Pressure rating:

- Spring-loaded holder: 50 psi (3.4 bar).
- Fluid seal fitting: 100 psi (6.9 bar).

Insulation resistance: 100 megohms min. at 100 VDC, leads to probe case. Ungrounded junction models only on thermocouples.

Connection: Terminal block for wires up to AWG 14.

Time constant: Typical value in moving water.

Tip sensitive:

- Single element 1.5 seconds.
- Dual element 7 seconds.

All stainless and MgO filled: 10 seconds.

Temperature Transmitters

Minco's Temptran™ thermocouple transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Contact Minco if transmitter is required.

Hazardous area requirements

For more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, IECEx and ATEX), visit www.minco.com.

▼ = **STANDARD OPTIONS**
Specifications subject to change

Fitting options

Fitting	Process Thread	L REF.		Code	Pressure Rating
		CH356	CH357/CH358		
Fluid Seal	1/2 - 14 NPT		4.6" (116 mm)	0*	50psi (3.4 bar)
Fluid Seal	G 1/2		4.4" (111 mm)	1*	50psi (3.4 bar)
Set screw spring-loaded	1/2 - 14 NPT	5.3" (135 mm)	5.6" (143 mm)	2	50psi (3.4 bar)
Set screw spring-loaded	G 1/2	5.0" (128mm)	5.4" (136 mm)	3	50psi (3.4 bar)
Fixed spring-loaded	1/2 - 14 NPT	4.5" (115 mm)		4	None
Welded	1/2 - 14 NPT	4.2"(107 mm)	4.5" (115 mm)	6**	200psi (13.8 bar)
Welded	G 1/2	4.0" (101 mm)	4.3" (109 mm)	7**	200psi (13.8 bar)
Release knob spring-loaded	1/2 - 14 NPT	5.4" (137 mm)	5.7" (145 mm)	8	50psi (3.4 bar)
Release knob spring-loaded	G 1/2	5.2" (132 mm)	5.5" (140 mm)	9	50psi (3.4 bar)

* Not available with CH356 stainless steel connection head.

** 0.250" (6.4mm) for MgO only (not available in tip-sensitive or 0.236" diameter models).

Thermocouple Assembly Numbers

Probe Diameters	0.236" (6.0mm)		0.250" (6.4mm)	
	Single	Dual	Single	Dual
Number of elements	AS806	AS807	AS816	AS817
Tip Sensitive	AS806	AS807	AS816	AS817
MgO	AS808	AS809	AS818	AS819

Notes:

CH356: 316 stainless steel IP66, Type 3, 4, and 4X.

CH357: Aluminum alloy IP65, Type 3 and 4.

CH358: Epoxy coated aluminum alloy IP66, Type 3, 4, and 4X.

Get more information on connection heads on pages 3-2 to 3-3.

Junction types

Thermocouple Junction	Code
Chromel-Constantan	E
Iron-Constantan	J
Chromel-Alumel	K
Copper-Constantan	T

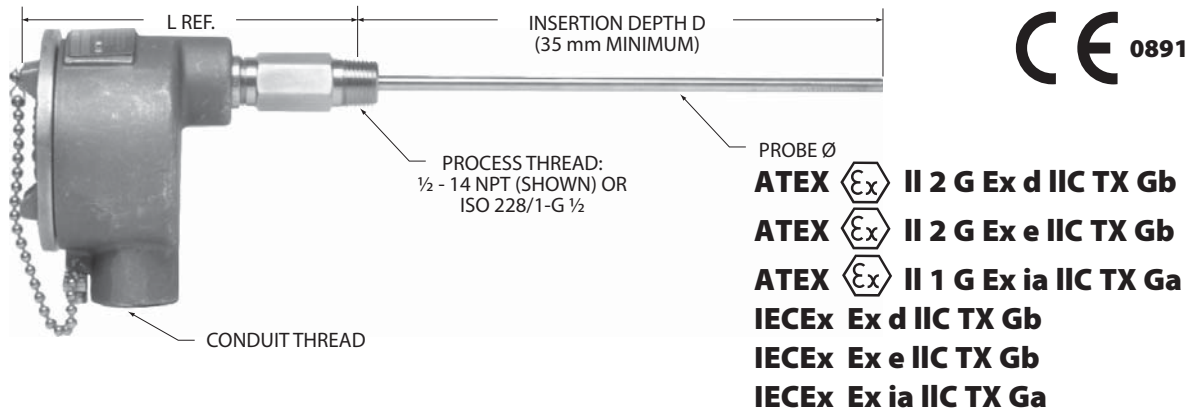
Specification and order options

AS806	Assembly number from table
4	Fitting from table
E	Junction type from table
U	Junction Grounding: G = Grounded U = Ungrounded
450	Insertion depth D (in mm): (35-3000 mm)
P	
3	Conduit thread: 3 = 1/2 - 14 NPT 4 = 3/4 - 14 NPT 5 = M20 x 1.5
A	Connection head material: A = Aluminum S = 316 Stainless Steel E = Aluminum, Epoxy coated
0	Extension: 0 = No Extension 2 = 1/2 NPT Nipple (2")/Union (2.6" length adder) 3 = 1/2 NPT Nipple (3")/Union (3.6" length adder) 4 = 1/2 NPT Nipple (4")/Union (4.6" length adder) 6 = 1/2 NPT Nipple (6")/Union (6.6" length adder)
X0X	No Thermowell
AS8064EU450P3A0X0X= Sample part number	

▼ = STANDARD OPTIONS

Specifications subject to change

Flameproof, Increased Safety and Intrinsic Safety RTDs with Transmitters – Per European and International Requirements



Overview

Complies with European standards for electrical apparatus for potentially explosive atmospheres: ATEX Directive 94/9/EC and International IECEx certification schemes for explosive atmospheres.

- Flameproof assemblies can be used in Zones 1 or 2
- Increased safety assemblies can be used in Zones 1 or 2
- Intrinsic safety assemblies can be used in Zones 0, 1 or 2 when used with an appropriate barrier
- Features tip-sensitive, all stainless or MgO filled RTD probe for fast response
- Spring-loaded holder ensures good probe contact
- U.S. or metric threads

Specifications

Temperature range:

- 50 to 260°C (-58 to 500°F)
- 50 to 600°C (-58 to 1112°F) for MgO Probes

Material:

- Tip-sensitive probe: Stainless steel with copper alloy tip.
- All stainless RTD: Stainless steel.
- MgO filled RTD: Stainless steel.
- Fittings: Stainless steel.
- Connection head:
 - CH356: 316 stainless steel IP66, Type 3, 4, and 4X.
 - CH357: Aluminum alloy IP65, Type 3 and 4.
 - CH358: Epoxy coated aluminum alloy IP66, Type 3, 4, and 4X.

Pressure rating:

- Spring-loaded holder: 50 psi (3.4 bar).
- Fluid seal fitting: 100 psi (6.9 bar).

Insulation resistance: 100 megohms min. at 100 VDC, leads to probe case.

Connection: Terminal block for wires to 14 AWG.

Time constant: Typical value in moving water.

Tip sensitive:

Single element 1.5 seconds.

All stainless and MgO filled: 10 seconds.

Temperature Transmitters

Minco's Temptan™ RTD transmitters provide a 4 to 20 mA or HART® Protocol signal that can be sent over long distances with a simple 2-wire system.

Leadwires:

- 2-lead RTD: TT211, TT520, TT521
- 3-lead RTD: TT520, TT521
- 4-lead RTD: TT520, TT521

Physical: Epoxy potted for moisture resistance.

See Section 4 for complete temperature transmitter specifications.

Hazardous area requirements

For more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, IECEx and ATEX), visit www.minco.com.

▼ = **STANDARD OPTIONS**
Specifications subject to change

Fitting options

Fitting	Process Thread	L REF.		Code	Pressure Rating
		CH356	CH357/CH358		
Fluid Seal	1/2 - 14 NPT		4.6" (116 mm)	0*	50psi (3.4 bar)
Fluid Seal	G 1/2		4.4" (111 mm)	1*	50psi (3.4 bar)
Set screw spring-loaded	1/2 - 14 NPT	5.3" (135 mm)	5.6" (143 mm)	2	50psi (3.4 bar)
Set screw spring-loaded	G 1/2	5.0" (128mm)	5.4" (136 mm)	3	50psi (3.4 bar)
Fixed spring-loaded	1/2 - 14 NPT	4.5" (115 mm)		4	None
Welded	1/2 - 14 NPT	4.2" (107 mm)	4.5" (115 mm)	6**	200psi (13.8 bar)
Welded	G 1/2	4.0" (101 mm)	4.3" (109 mm)	7**	200psi (13.8 bar)
Release knob spring-loaded	1/2 - 14 NPT	5.4" (137 mm)	5.7" (145 mm)	8	50psi (3.4 bar)
Release knob spring-loaded	G 1/2	5.2" (132 mm)	5.5" (140 mm)	9	50psi (3.4 bar)

* Not available with CH356 stainless steel connection head.

** 0.250" (6.4mm) for all stainless and MgO only

(not available in tip-sensitive or 0.236" diameter models).

RTD Assembly Numbers

Probe Diameters	0.236" (6.0mm)	0.250" (6.4mm)
Number of elements	Single	Single
Tip Sensitive	AS800	AS810
All Stainless	AS802	AS812
MgO Platinum	AS804	AS814

Notes:

CH356: 316 stainless steel IP66, Type 3, 4, and 4X.

CH357: Aluminum alloy IP65, Type 3 and 4.

CH358: Epoxy coated aluminum alloy IP66, Type 3, 4, and 4X.

Get more information on connection heads on pages 3-2 to 3-3.

Temperature transmitter range codes

Popular ranges below. More range codes on pages 4-20 and at www.minco.com

Code	Range
EO	-50 to 100°C -58 to 212°F
BC	-30 to 30°C -22 to 86°F
S	-17.8 to 37.8°C 0 to 100°F
AC	-17.8 to 93.3°C 0 to 200°F
AN	-17.8 to 148.9°C 0 to 300°F
AG	-17.8 to 260°C 0 to 500°F
AP	-6.7 to 21.1°C 20 to 70°F
A	-6.7 to 48.9°C 20 to 120°F
N	0 to 50°C 32 to 122°F
C	0 to 100°C 32 to 212°F
J	0 to 150°C 32 to 302°F
K	0 to 200°C 32 to 392°F
V	10 to 65.6°C 50 to 150°F
P	37.8 to 179.4°C 100 to 355°F
BH	50 to 150°C 122 to 302°F

Sensing elements

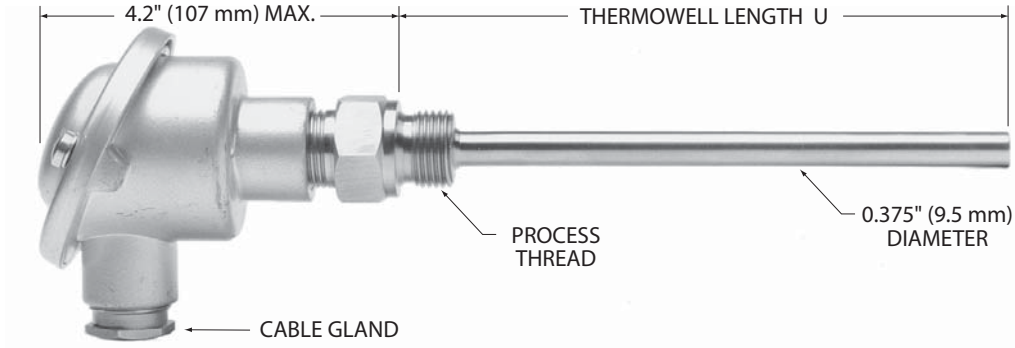
RTD sensing element	Code
Platinum (0.00392 TCR) 100 Ω ±0.5% at 0°C	PA
Platinum (0.00385 TCR) 100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	PD
Platinum (0.00385 TCR) 100 Ω ±0.5% at 0°C	PE

Specification and order options

AS800	Assembly number from table
4	Fitting from table
PD	Sensing element from table
100	Insertion depth D (in mm): (35-3000 mm)
Y	Leads per sensing element: Y = 2 leads (n/a for copper) Z = 3 leads X = 4 leads
3	Conduit thread: 3 = 1/2 - 14 NPT 4 = 3/4 - 14 NPT 5 = M20 x 1.5
A	Connection head material: A = Aluminum S = 316 Stainless Steel E = Aluminum, Epoxy coated
0	Extension: 0 = No Extension 2 = 1/2 NPT Nipple (2")/Union (2.6" length adder) 3 = 1/2 NPT Nipple (3")/Union (3.6" length adder) 4 = 1/2 NPT Nipple (4")/Union (4.6" length adder) 6 = 1/2 NPT Nipple (6")/Union (6.6" length adder)
X0X	No Thermowell
1	Temptran™ code: 1 = TT518: Programmable Hockey Puck (2 or 3-lead RTDs) 2 = TT519: Programmable Hockey Puck (Thermocouple only) 4 = TT211: Fixed range Rectangular (2-lead RTDs) 7 = TT521: HART® Programmable Hockey Puck (2, 3, or 4-lead RTDs or Thermocouples)
N	Temperature range code from table
1	Calibration: 1 = Nominal calibration 2 = Match calibrated, 0.75% total system accuracy. For other calibration options, contact Minco
AS8004PD100Y3A0X0X1N1 = Sample part number	

▼ = STANDARD OPTIONS
Specifications subject to change

Eurostyle Sensors



Overview

These low priced assemblies come complete with thermowells, spring-loaded probes, and connection heads. They provide accurate sensing and quick response in liquid or air streams. Specify U.S. or metric thread for global compatibility.

- Compact, economical RTD or thermocouple assembly
- Metric straight thread or U.S. tapered thread
- Tip-sensitive probe for use to 260°C (500°F)
- Optional European Form B connection head to DIN 43729
- Stainless steel thermowell

Temperature Transmitters

Minco's Temptran™ RTD transmitters provide a 4 to 20 mA signal or HART® Protocol that can be sent over long distances with a simple 2-wire system. See Section 4 for complete temperature transmitter specifications.

Special high-accuracy calibration: For high system accuracy, specify transmitters with matched calibration. Calibration data traceable to NIST will also be provided. Get more information on page 4-22.

Specifications

Temperature range: -50 to 260°C (-58 to 500°F).

Material:

Probe: Stainless steel with copper alloy tip.

Connection head: Cast aluminum.

Thermowell: 300 series stainless steel.

Pressure rating: 2755 psi (190 bar) at 25°C, reducing to 493 psi (34 bar) at 600°C.

Insulation resistance: 10 megohms min. at 100 VDC, leads to case. Ungrounded junctions only on thermocouples.

Connection: Terminal block for wires to 14 AWG.

Time constant: Typical in moving water:

RTD: 35 seconds.

Thermocouple: 27 seconds.

▼ = STANDARD OPTIONS

Specifications subject to change

Sensing elements

RTD sensing element		Code
Platinum (0.00392 TCR)	100 Ω \pm 0.5% at 0°C	PA
Platinum (0.00385 TCR) (Meets EN60751, Class B)	100 Ω \pm 0.1% at 0°C	PD
Platinum (0.00385 TCR)	100 Ω \pm 0.5% at 0°C	PE
Copper (dual) (0.00427 TCR)	10 Ω \pm 0.2% at 25°C 10 Ω \pm 0.5% at 25°C	CA CC
Nickel (0.00672 TCR)	120 Ω \pm 0.5% at 0°C	NA

RTD specification and order options

AS5240	Assembly number: AS5240: Single element RTD AS5241: Dual element RTD
PD	Sensing element from table
40	TW length U in 0.1" increments [Ex: 40 = 4.0 inches (102 mm)]
Z	Leads per sensing element: Y = 2 leads Z = 3 leads (required for CA/CC) X = 4 leads (single element only)
2	Conduit thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT 3 = PG cable gland (Eurostyle only)
A	Connection head: A = Standard aluminum head E = Eurostyle aluminum head
1	TW process thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT 3 = ISO 228/1 - G 1/2
To order sensor assembly, stop here. To order with transmitters, add:	
TT520	Temptran™ model: TT520: Programmable (2, 3, & 4-lead RTDs) TT521: HART® Programmable (2, 3, & 4-lead RTDs)
A	Temperature range codes starting on page 4-20 or at www.minco.com
1	Calibration: 1 = Nominal calibration 2 = Match calibrated, 0.75% total system accuracy. For other calibration options, contact Minco
AS5240PD40Z2A1TT520A1 = Sample part number	

Thermocouple specification and order options

AS5245	Assembly number: AS5245: Single junction TC AS5246: Dual junction TC
E	Junction type: E = Chromel-Constantan J = Iron-Constantan K = Chromel-Alumel T = Copper-Constantan
G	Junction grounding: G = Grounded U = Ungrounded
135	TW length U in 0.1" increments Specify in 0.1" increments [Ex: 135 = 13.5 inches (343 mm)]
P	
3	Conduit thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT 3 = PG cable gland (Eurostyle only)
E	Connection head: A = Standard aluminum head E = Eurostyle aluminum head
3	TW process thread: 1 = 1/2 - 14 NPT 2 = 3/4 - 14 NPT 3 = ISO 228/1 - G 1/2
To order sensor assembly, stop here. To order with transmitters, add:	
TT520	Temptran™ model: 520 = TT520: Programmable, Hockey Puck 521 = TT521: HART® Programmable, Hockey Puck
A	Temperature range codes starting on page 4-20 or at www.minco.com
AS5245EG135P3E3520A = Sample part number	

▼ = STANDARD OPTIONS
Specifications subject to change

Specifying Custom Assemblies

The standard assemblies in this section will fit a wide variety of installations. However, for more versatility you can create new assemblies from the probes, accessories, and transmitters in the pages listed.

Follow these steps:

1. Choose a probe

Select an RTD or thermocouple from Section 2. The section includes tip-sensitive, high temperature, and fast response models. Some have integral fittings or bayonet lockcaps.

Factors to consider are:

- Temperature rating
- Compatibility with receiving instruments
- Probe style and diameter
- Accuracy vs. cost

2. Add a fitting

See Section 3 for probe mounting fittings. Adjustable fittings, combined with cut-to-length probes, allow instant fabrication of assemblies to any length required. Included are spring-loaded holders, pressure fittings, and bayonet-style fittings.

Factors to consider are:

- Temperature rating
- Probe diameter
- Correct NPT threads
- Pressure ratings
- Compatibility with environment

3. Select a thermowell

Thermowells protect sensors from the effects of fluid flow and pressure. See Section 3 for a variety of well styles and materials.

Factors to consider are:

- Pressure rating
- Compatibility with fluid media
- Insertion depth
- Correct NPT thread

4. Attach a connection head

Finish off your assembly with a connection head for termination to remote extension wires. See page 3-2 for specifications.

Factors to consider are:

- Connection head size
- Temperature rating
- Correct pipe threads for fitting and conduit
- Number of terminals or wire nuts
- Hazardous area requirements

5. Install a transmitter

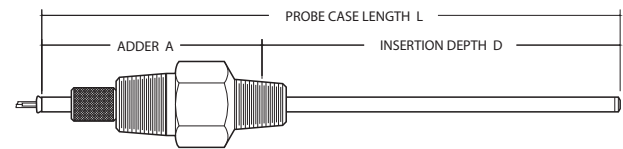
Transmitters convert sensor output to a 4 to 20 mA current signal, immune to leadwire resistance. See Section 4 for RTD and thermocouple transmitters.

Factors to consider are:

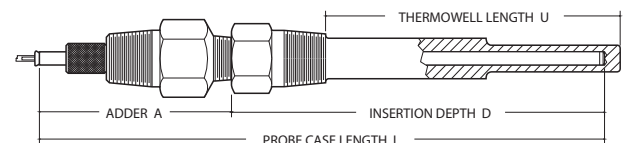
- Transmitter accepts sensor input
- Transmitter fits connection head
- Ambient temperature range acceptable

6. How to calculate probe length

All Minco fittings have probe length adders to help you determine total probe length. Total length L is the insertion depth D plus the adder A .



Thermowell drawings show an adder to convert thermowell length U to insertion depth D . Then use D plus the fitting adder A to find total probe length L .



▼ = STANDARD OPTIONS
Specifications subject to change