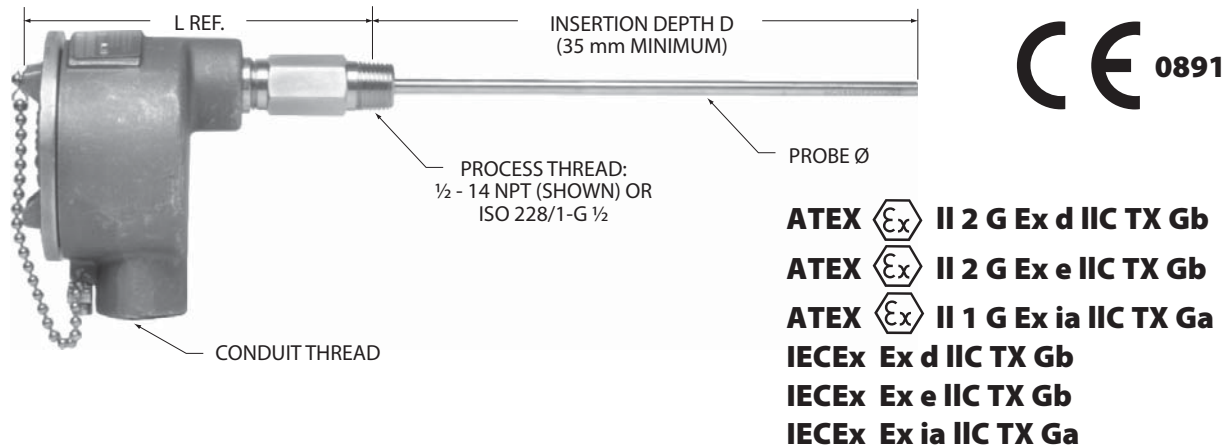





# Flameproof, Increased Safety and Intrinsic Safety RTD Sensors – Per European and International Requirements



**ATEX**  **II 2 G Ex d IIC TX Gb**  
**ATEX**  **II 2 G Ex e IIC TX Gb**  
**ATEX**  **II 1 G Ex ia IIC TX Ga**  
**IECEX Ex d IIC TX Gb**  
**IECEX Ex e IIC TX Gb**  
**IECEX Ex ia IIC TX Ga**

## 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](http://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	

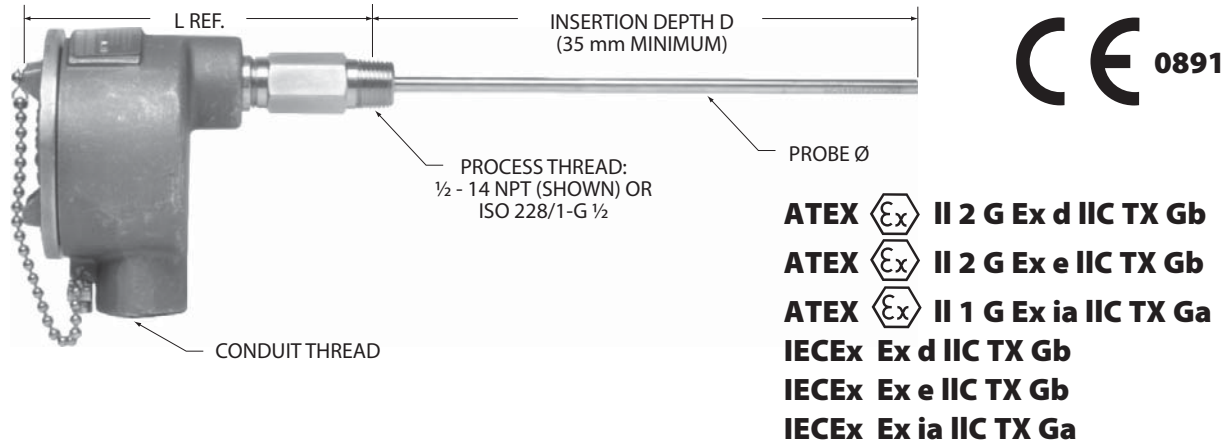
## Specification and order options

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](http://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

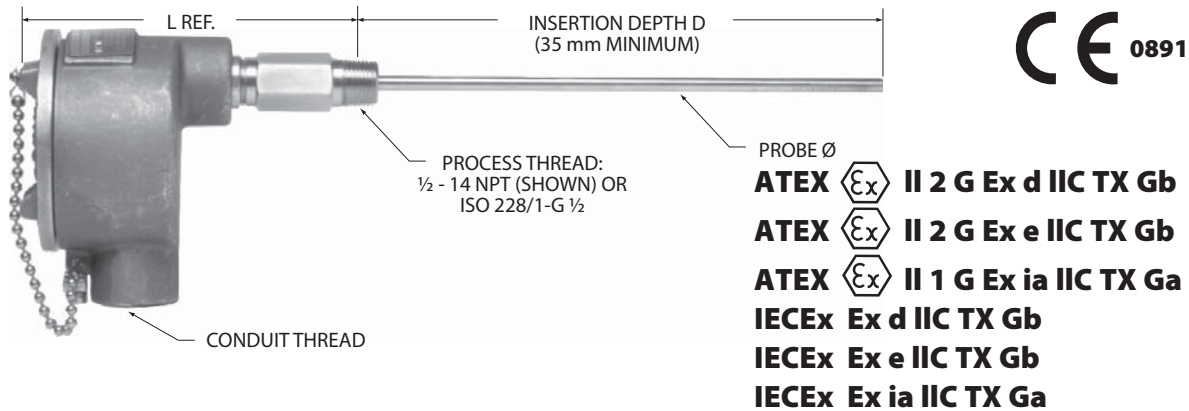
## Specification and order options

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](http://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](http://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