



ATEX / IECEx Temperature Sensors Hazardous Areas Zones 0, 1 and 2



Thermocouple & RTD sensors and accessories approved for use in explosion proof and intrinsically safe areas zones 0, 1 & 2 for a wide range of temperature measurement applications

Certification

Our ATEX & IECEx protection concepts

All designs of temperature sensor and feedthrough in this catalogue have been approved for use in areas with the following protection concepts:

Ex d Flameproof/Explosion Proof – Category 2, Zones 1, 2 (Gas)

- Ex db IIC T6...T1 Gb Ta = –40°C to 60°C
- Standard EN IEC 60079-1 refers
- Designed to contain an explosion and quench the flame
- Sensors incorporate a suitable heavy duty enclosure or threaded fitting with tight seals

Ex e Increased Safety – Category 2, Zones 1, 2 (Gas)

- Ex eb IIC T6...T1 Gb Ta = –40°C to 60°C
- Standard EN IEC 60079-7 refers
- Design ensures no arcs, sparks or hot surfaces that could ignite an explosive mixture with a minimum IP54 enclosure rating
- Sensors incorporate a suitable heavy duty enclosure or threaded fitting with tight seals

Ex tb Enclosure – Category 2, Zones 21, 22 (Dust)

- Ex tb IIIC T80°C...T440°C Db
- Standard EN IEC 60079-31 refers
- Protects against combustible and conductive dusts, rugged tight enclosures are used

Ex ia/Ex ib Intrinsically Safe – Categories 1 & 2, Zones 0, 1, 2 (Gas), Zones 20, 21, 22 (Dust)

- Ex ia IIC T6...T1 Ga Ta = –40°C to 60°C
- Ex ib IIC T6...T1 Gb Ta = –40°C to 60°C
- Ex ia IIIC T80°C...T440°C Da
- Ex ib IIIC T80°C...T440°C Db
- Standard EN IEC 60079-11 refers
- Designed to limit the energy of arcs or sparks that could potentially ignite an explosive mixture
- Sensors used in this area must be wired through a suitably approved barrier



Ex areas can be known by different names such as “Hazardous Locations”, “Hazardous Areas”, “Explosive Atmospheres” and the like and relate to areas where flammable vapours, gases, combustible dusts or liquids are likely to occur in quantities sufficient to cause a fire or explosion.

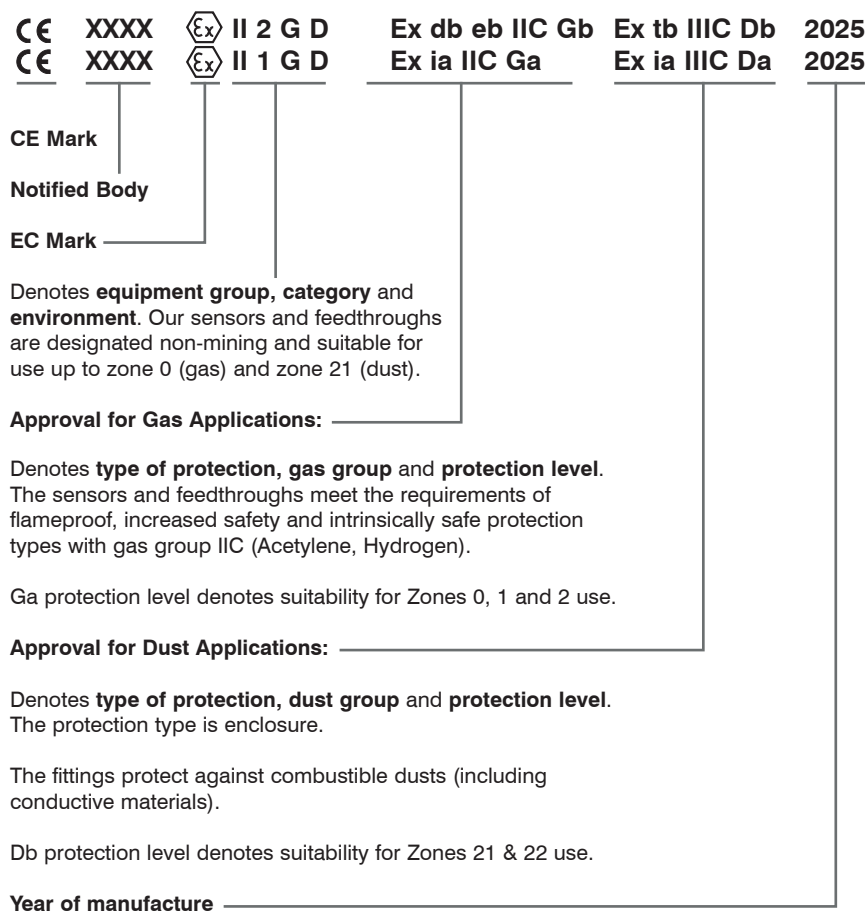
Once an area is classified as potentially explosive, a risk analysis will normally dictate that only electrical and mechanical equipment that is suitably certified can be installed. The European ATEX Directive (2014/34/EU) and IECEx international certification system force manufacturers to gain certification of electrical and/or mechanical products that can be used in a potentially explosive atmosphere.

Hazardous areas are divided into zones which relate to the predicted occurrence of when an explosive atmosphere may be present (see zone diagram below).

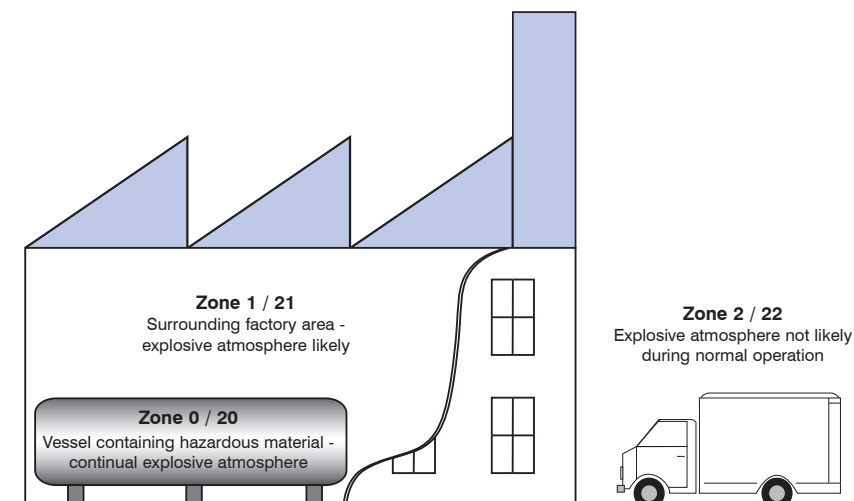
Our extensive range of ATEX / IECEx approved products is designed and tested for use in hazardous areas with type Ex d Ex e and Ex tb protection concepts allowing them to be used for both gas and dust applications in Zone 1/21 and 2/22 areas.

They are also suitable for installation in Ex ia/Ex ib intrinsically safe (IS) circuits in zones 0/20, 1/21 and 2/22 (see page 25 for details).

Our ATEX / IECEx Approval Explained



Typical ATEX / IECEx Zone Diagram



Thermocouples with Pot Seal

Mineral insulated thermocouples with pot seal and extension cable.

4-5

Thermocouples with Head

Mineral insulated thermocouples terminated in die cast alloy or stainless steel terminal heads.

6-7

Spring Loaded Thermocouples

Thermocouple assemblies with die cast alloy or stainless steel terminal heads and mineral insulated spring loaded insert.

8-9

Thermocouples with Termination Entry Gland

Mineral insulated thermocouples with a termination entry gland ready for connection to an enclosure.

10-11

Thermocouple Feedthroughs

Used to extend thermocouple signals over medium to long distances.

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RTD Pt100 Sensors with Pot Seal

RTD Pt100 sensors with pot seal and extension cable.

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RTD Pt100 Sensors with Head

RTD Pt100 sensors terminated in die cast alloy or stainless steel terminal heads.

14-15

Spring Loaded Pt100 Sensors

RTD Pt100 sensors with die cast alloy or stainless steel terminal heads and mineral insulated spring loaded insert.

16-17

RTD Pt100 Sensors with Termination Entry Gland

RTD Pt100 sensors with a termination entry gland ready for connection to an enclosure.

18-19

Compression Fittings

Compression fittings and terminal entry glands.

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Terminal Heads and Enclosures

for temperature sensors.

21-22

4 to 20mA Indicator

ATEX / IECEx approved accessories for use with temperature sensors.

23

Sealed Feedthroughs

for pressure and vacuum applications.

24

Notes for Intrinsically Safe Applications

Application guidance and advice

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Technical Notes

General Specifications and Further Information.

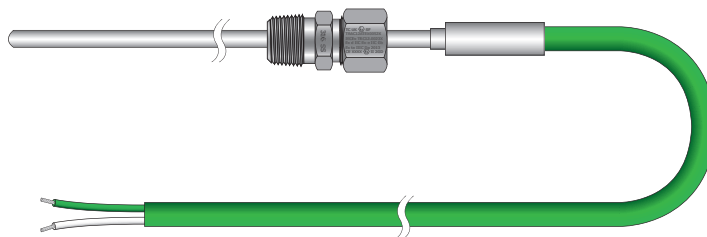
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ATEX / IECEx Thermocouples with Pot Seal

Mineral Insulated Thermocouples 1.0mm to 3.0mm dia.

Our ATEX / IECEx mineral insulated thermocouple assemblies are manufactured from cable that conforms to IEC 61515 and their semi rigid construction allows them to be bent and formed to suit particular applications without impairing performance. An adjustable threaded compression fitting is required to achieve approval.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da, see page 25 for details
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 1.0mm to 3.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- PVC or PFA insulated twisted extension cables. Other cables available.
- UKAS calibration available



The above sensor must be installed using the compression fitting supplied to maintain Ex d / Ex tb approval.
For Ex ia applications a compression fitting is not required to maintain approval



SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Operational Properties	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	Very good corrosion resistance throughout the operating temperature range. Suited to a wide range of industrial applications. Enjoys high ductility.	800°C
316L	316L Stainless Steel (Types K, J, T & E)	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. 316L stainless steel has high oxidation resistance.	800°C
310	310 Stainless Steel (Type K)	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. Has high oxidation resistance which is maintained if subsequent manipulation is strictly limited.	1100°C
600	Inconel 600 (Types K, N, R, S & B)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation. Type R, S or B thermocouples with an Inconel 600 sheath are not recommended for use above 800°C. Do not use in sulphur bearing atmospheres above 550°C.	1100°C
114	Nicrobell D (Types K & N)	Recommended for use with high temperature type 'K' and most type 'N' applications. Very good high temperature strength. Excellent performance in oxidising, carburising, reducing and vacuum atmospheres. Do not use in sulphur containing atmospheres.	1250°C
156	Hastelloy X (Type K)	Improved high temperature resistance to oxidation and attack by sulphur. Retains excellent tensile strength at high temperatures. This sheath is applicable to reducing neutral and inert atmospheres. Develops a tightly adherent oxide film which does not spall at high temperatures.	1220°C
446	AISI 446 (Type K)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Particularly suited for use in high concentration sulphur bearing atmospheres at high temperature. * Should be mounted vertically at temperatures above 700°C.	1150°C
800	Incoloy 800 (Type K)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation and carburisation. Resistant to sulphur bearing atmospheres.	1100°C

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	1.0mm	0.039"
	1.5mm	0.059"
	2.0mm	0.079"
	3.0mm	0.118"

SECTION 4	Type of Sensing Junction
2I 2ID 2IT	 INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT if a triplex element is required.

SECTION 5	Extension Cables (please specify length in metres)
A82	PVC Insulation (105°C) (Termination: 3P2L seal, temperature rating 90°C)
B55	PFA Insulation (250°C) (Termination: 3P2LA seal, temperature rating 230°C)

* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 50mm PTFE 'tails'.

SECTION 6	Stainless Steel Adjustable Compression Fittings		
Dia.	1/8" BSPT	1/4" BSPT	1/2" BSPT
1.0mm	SFS18T10EX	SFS14T10EX	—
1.5mm	SFS18T15EX	SFS14T15EX	—
2.0mm	SFS18T20EX	SFS14T20EX	—
3.0mm	SFS18T30EX	SFS14T30EX	SFS12T30EX

Other thread sizes are available - please see page 14 for details.

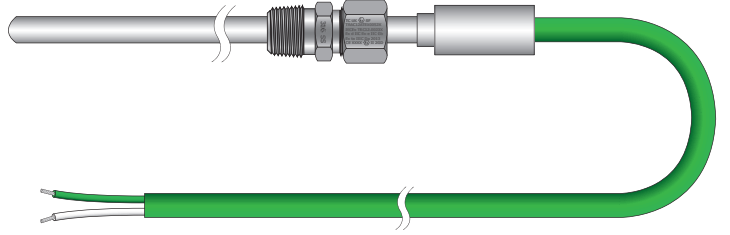
Order Code - Example									
Type N°	I.S. Version (Optional, please see page 25 for details)	Thermocouple Type (See section 1)	Sheath Length in mm	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (Pot seal, see section 5)	Extension Cable (See section 5)	Compression Fitting (See section 6)
52	- IS	- K	- 450	- 321	- 3.0	- 2I	- 3P2L	- 2m A82KX	- SFS14T30EX

ATEX / IECEx Thermocouples with Pot Seal

Mineral Insulated Thermocouples 4.5mm to 8.0mm dia.

Our ATEX / IECEx mineral insulated thermocouple assemblies are manufactured from cable that conforms to IEC 61515 and their semi rigid construction allows them to be bent and formed to suit particular applications without impairing performance. An adjustable threaded compression fitting is required to achieve approval.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da, see page 25 for details
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 4.5mm to 8.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- PVC or PFA insulated twisted extension cables. Other cables available.
- UKAS calibration available



The above sensor must be installed using the compression fitting supplied to maintain Ex d / Ex tb approval.
For Ex ia applications a compression fitting is not required to maintain approval



SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Operational Properties	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	Very good corrosion resistance throughout the operating temperature range. Suited to a wide range of industrial applications. Enjoys high ductility.	800°C
316L	316L Stainless Steel (Types K, J, T & E)	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. 316L stainless steel has high oxidation resistance.	800°C
310	310 Stainless Steel (Type K)	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. Has high oxidation resistance which is maintained if subsequent manipulation is strictly limited.	1100°C
600	Inconel 600 (Types K, N, R, S & B)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation. Type R, S or B thermocouples with an Inconel 600 sheath are not recommended for use above 800°C. Do not use in sulphur bearing atmospheres above 550°C.	1100°C
114	Nicrobell D (Types K & N)	Recommended for use with high temperature type 'K' and most type 'N' applications. Very good high temperature strength. Excellent performance in oxidising, carburising, reducing and vacuum atmospheres. Do not use in sulphur containing atmospheres.	1250°C
156	Hastelloy X (Type K)	Improved high temperature resistance to oxidation and attack by sulphur. Retains excellent tensile strength at high temperatures. This sheath is applicable to reducing neutral and inert atmospheres. Develops a tightly adherent oxide film which does not spall at high temperatures.	1220°C
446	AISI 446 (Type K)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Particularly suited for use in high concentration sulphur bearing atmospheres at high temperature. * Should be mounted vertically at temperatures above 700°C.	1150°C
800	Incoloy 800 (Type K)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation and carburisation. Resistant to sulphur bearing atmospheres.	1100°C

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	4.5mm	0.177"
	6.0mm	0.236"
	8.0mm	0.315"

SECTION 4	Type of Sensing Junction
2I 2ID 2IT	 INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT if a triplex element is required.

SECTION 5	Extension Cables (please specify length in metres)
A82	PVC Insulation (105°C) (Termination: 3P4CLA seal, temperature rating 90°C)
B55	PFA Insulation (250°C) (Termination: 3P4CLA seal, temperature rating 230°C)

* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 50mm PTFE 'tails'.

SECTION 6	Stainless Steel Adjustable Compression Fittings		
	Dia.	1/8" BSPT	1/4" BSPT
		1/2" BSPT	
4.5mm	SFS18T45EX	SFS14T45EX	SFS12T45EX
6.0mm	SFS18T60EX	SFS14T60EX	SFS12T60EX
8.0mm	—	SFS14T80EX	SFS12T80EX

Other thread sizes are available - please see page 14 for details.

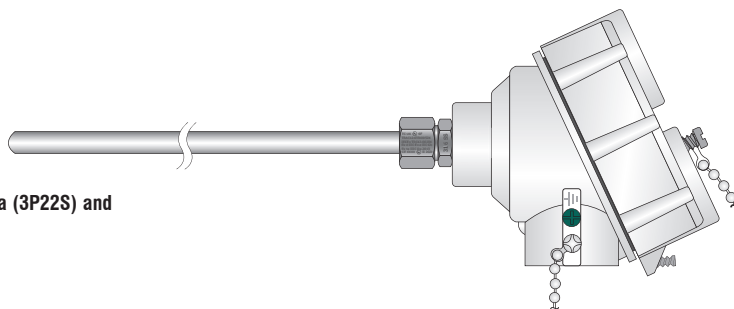
Order Code - Example									
Type N°	I.S. Version (Optional, please see page 25 for details)	Thermocouple Type (See section 1)	Sheath Length in mm	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (Pot seal, see section 5)	Extension Cable (See section 5)	Compression Fitting (See section 6)
52	- IS	- J	- 450	- 321	- 6.0	- 2I	- 3P4CLA	- 2m B55JX	- SFS12T60EX

ATEX / IECEx Thermocouples with Terminal Head

Mineral Insulated Thermocouples 4.5mm to 8.0mm dia.

These semi rigid thermocouples are supplied with an IP68 terminal head and are ideal where a heavy duty connection with cable is to be made near the sensor. They can be used with service temperatures up to 1250°C (minimum stand-off lengths shown on page 26 must be observed).

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da (3P22S) and Ex II 2 GD Ex ib IIC Gb/IIIC Db (3P22/3P27), see page 25
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 4.5mm to 8.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- Die cast alloy or stainless steel terminal heads available
- Simplex, duplex and triplex sensors available as well UKAS calibration

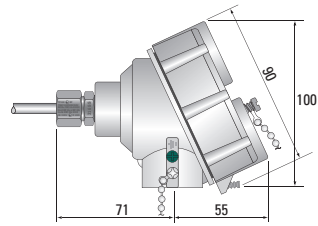
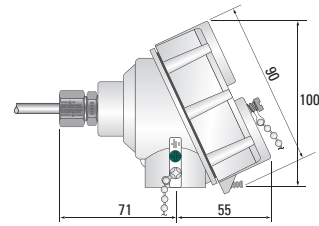
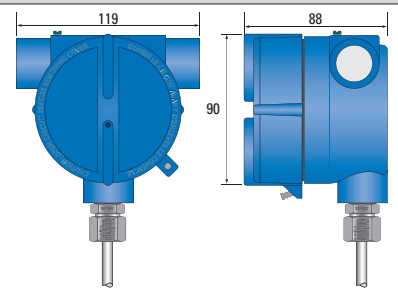


SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	800°C
316L	316L Stainless Steel (Types K, J, T & E)	800°C
310	310 Stainless Steel (Type K)	1100°C
600	Inconel 600 (Types K, N, R, S & B)	1100°C
114	Microbell D (Types K & N)	1250°C
156	Hastelloy X (Type K)	1220°C
446	AISI 446 (Type K)	1150°C
800	Incoloy 800 (Type K)	1100°C

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (inches)
Standard Sizes	4.5mm	0.177"
	6.0mm	0.236"
	8.0mm	0.315"

SECTION 4	Type of Sensing Junction	
2I		INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT if a triplex element is required.
2ID		
2IT		

SECTION 5	Type of Terminal Head (supplied with an M20 cable entry as standard. Other sizes are available - see page 21 for details)		
3P22	 <i>Also available in blue (order code 3P22B)</i>	3P22S	
	Standard Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.		Standard Stainless Steel Head Weatherproof and explosion proof stainless steel terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.
		3P27	
			Dual Cable Entry Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head for large devices with two cable entries at right angles to the tube entry and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.

SECTION 6	Optional Stainless Steel Adjustable Compression Fittings			
	Dia.	1/8" BSPT	1/4" BSPT	1/2" BSPT
	4.5mm	SFS18T45EX	SFS14T45EX	SFS12T45EX
	6.0mm	SFS18T60EX	SFS14T60EX	SFS12T60EX
	8.0mm	—	SFS14T80EX	SFS12T80EX

Other thread sizes are available - please see page 14 for details.

SECTION 7	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)	
TXISO/ATEX	 <i>Fully Linearised</i>	Microprocessor based head mounted transmitter ATEX rated to Ex ia IIC T6. Fully scaleable and fully linearised for thermocouple input. The transmitter is pre-programmed to the required temperature range or, alternatively, it can be re-programmed easily by your PC using our software which should be ordered separately. Other types of transmitter are available on page 25.

Order Code - Example									
Type N°	I.S. Version (Optional, please see page 25 for details)	Thermocouple Type (See section 1)	Sheath Length in mm	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (See section 5)	Compression Fitting (Optional, see section 6)	Transmitter (Optional, see section 7)
52	- IS	- K	- 750	- 321	- 6.0	- 2I	- 3P22	- SFS14T60EX	- TXISO/ATEX(0/100°C)

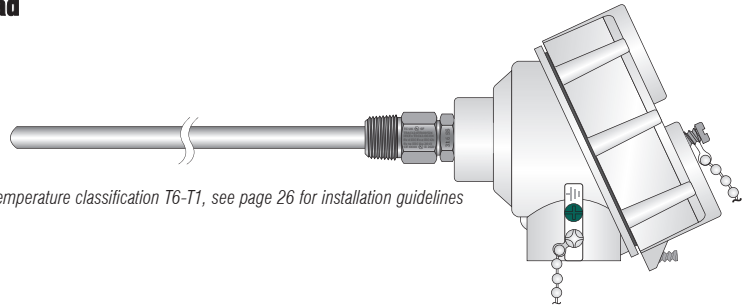
ATEX / IECEx Thermocouples with Terminal Head

Mineral Insulated Thermocouples with Fixed Process Thread

These semi rigid thermocouples are supplied with an IP68 terminal head and are ideal where a heavy duty connection with cable is to be made near the sensor. They can be used with service temperatures up to 1250°C² (installation guidelines shown on page 26 must be observed).¹

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da (3P22S) and Ex II 2 GD Ex ib IIC Gb/IIIC Db (3P22/3P27)
- Fixed thread for direct process connection
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 4.5mm to 8.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- Simplex, duplex and triplex sensors available as well UKAS calibration

Temperature classification T6-T1, see page 26 for installation guidelines

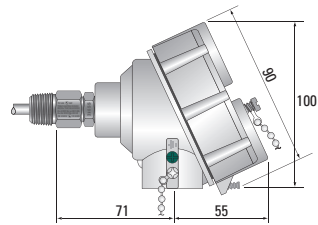
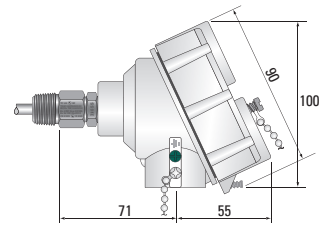
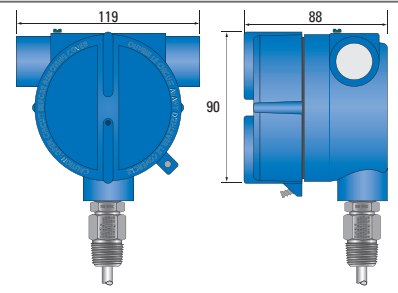


SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	800°C
316L	316L Stainless Steel (Types K, J, T & E)	800°C
310	310 Stainless Steel (Type K)	1100°C
600	Inconel 600 (Types K, N, R, S & B)	1100°C
114	Nicrobell D (Types K & N)	1250°C
156	Hastelloy X (Type K)	1220°C
446	AISI 446 (Type K)	1150°C
800	Incoloy 800 (Type K)	1100°C

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	4.5mm	0.177"
	6.0mm	0.236"
	8.0mm	0.315"

SECTION 4	Type of Sensing Junction	
2I		INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT if a triplex element is required.
2ID		
2IT		

SECTION 5	Type of Terminal Head (supplied with an M20 cable entry as standard. Other sizes are available - see page 21 for details)		
3P22	 <i>Also available in blue (order code 3P22B)</i>	Standard Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.	
3P22S		Standard Stainless Steel Head Weatherproof and explosion proof stainless steel terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.	
3P27		Dual Cable Entry Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head for large devices with two cable entries at right angles to the tube entry and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.	

SECTION 6	Process Connection Thread			
Code	Thread Size	Code	Thread Type	
12	1/2"	T	BSPT	
34	3/4"	P	BSPP	
M16	M16 x 1.5mm	N	NPT	
M20	M20 x 1.5mm	M	Metric	

SECTION 7	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)	
TXISO/ATEX	 <i>Fully Linearised</i>	Microprocessor based head mounted transmitter ATEX rated to Ex ia IIC T6. Fully scaleable and fully linearised for thermocouple input. The transmitter is pre-programmed to the required temperature range or, alternatively, it can be re-programmed easily by your PC using our software which should be ordered separately. Other types of transmitter are available on page 25.

Order Code - Example

Type N°	I.S. Version (Optional, please see page 25 for details)	Thermocouple Type (See section 1)	Sheath Length in mm	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (See section 5)	Process Connection (See section 6)	Transmitter (Optional, see section 7)
52	- IS	- K	- 750	- 321	- 6.0	- 2I	- 3P22	- 12T	- TXISO/ATEX(0/100°C)

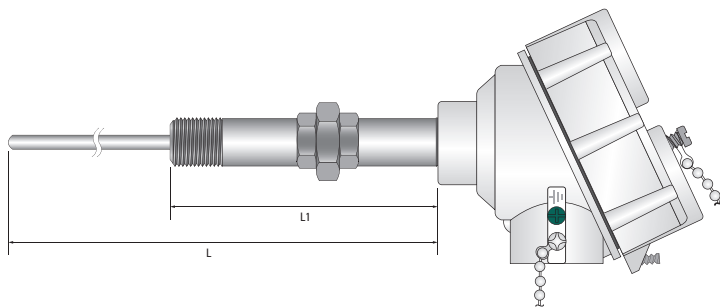
Notes (1) Sensor design shall be assessed by method (b) of our installation guidelines on page 26 as no stand-off is available.
(2) Maximum service temperature of terminal head end seals is 60°C

ATEX / IECEx Spring Loaded Thermocouples

Mineral Insulated Thermocouples 3.0mm to 8.0mm dia.

These semi rigid spring loaded thermocouples are supplied with an IP68 terminal head and threaded flameproof extension and are ideal for installation in thermowell pockets and where good contact with the process is required. They can be used with service temperatures up to 1250°C (minimum stand-off lengths shown on page 26 must be observed).

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIC Da (3P22S) and Ex II 2 GD Ex ib IIC Gb/IIC Db (3P22/3P27)
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 3.0mm to 8.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- Spring loaded thermocouple insert with wide choice of process connections
- UKAS calibration available

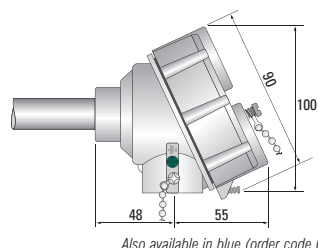
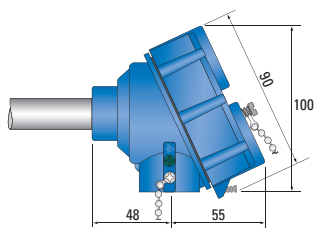
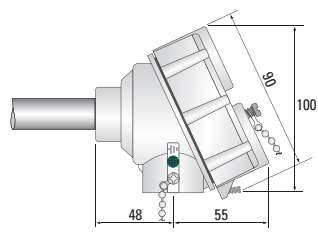


SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

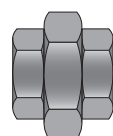
SECTION 2	Sheath Material	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	800°C
316L	316L Stainless Steel (Types K, J, T & E)	800°C
310	310 Stainless Steel (Type K)	1100°C
600	Inconel 600 (Types K, N, R, S & B)	1100°C
114	Microbell D (Types K & N)	1250°C
156	Hastelloy X (Type K)	1220°C
446	AISI 446 (Type K)	1150°C
800	Incoloy 800 (Type K)	1100°C

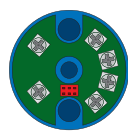
SECTION 3	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	3.0mm	0.177"
	4.5mm	0.118"
	6.0mm	0.236"
	8.0mm	0.315"

SECTION 4	Type of Sensing Junction	
2I 2ID 2IT		INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT if a triplex element is required.

SECTION 5	Type of Terminal Head (supplied with an M20 cable entry as standard. Other sizes are available - see page 21 for details)		
3P22	 <i>Also available in blue (order code CE22B)</i>	3P22B	
	Standard Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.		Standard Die Cast Alloy Head (Blue) Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.
		3P22S	
			Standard Stainless Steel Head Weatherproof and explosion proof stainless steel terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.

SECTION 6	Process Connection Thread
Code	Thread Size
12T	1/2" BSPT
12P	1/2" BSPP
12N	1/2" NPT
M20	M20 x 1.5mm

SECTION 7	Optional (Rotating Union) Fitting
RUSS	 Stainless steel rotating union to allow positioning of the terminal head.

SECTION 8	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)
TXISO/ATEX	 <i>Fully Linearised</i> Microprocessor based head mounted transmitter ATEX rated to Ex ia IIC T6. Fully scalable and fully linearised for thermocouple input. The transmitter is pre-programmed to the required temperature range or, alternatively, it can be re-programmed easily by your PC using our software which should be ordered separately. Other types of transmitter are available on page 25.

Order Code - Example

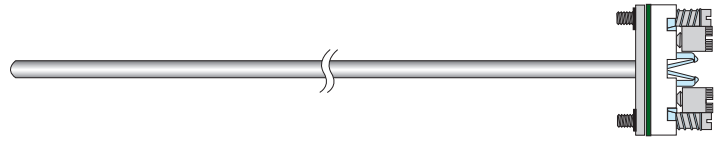
Type No	I.S. Version (Optional, please see page 25 for details)	Thermocouple Type (See section 1)	Length 'L' (See diagram)	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (See section 5)	Length 'L1' (See diagram)	Process Thread (See section 6)	Rotating Union Fitting (Optional, see section 7)	Transmitter (Optional, see section 8)
53	- IS	- K	- 300	- 321	- 6.0	- 2I	- 3P22	- 150	- 12P	- RUSS	- TXISO/ATEX(0/100°C)

ATEX / IECEx Thermocouples with DIN Terminal Block

Mineral Insulated Thermocouples 6.0mm to 8.0mm dia.

Our ATEX / IECEx intrinsically safe mineral insulated thermocouple insert assemblies are manufactured from cable that conforms to IEC 61515 and their semi rigid construction allows them to be bent and formed to suit particular applications without impairing performance.

- Approved to II 1 GD Ex ia IIC Ga (Gas) and Ex ia IIIC Da (Dust)
- High integrity construction suited to arduous operating conditions
- High accuracy and stability maintained throughout operating life
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 6.0mm to 8.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- Spring loaded thermocouple insert for connection to a standard DIN terminal head (33mm centres)
- Simplex, duplex and triplex sensors available
- UKAS calibration available



The above sensor must be terminated in a suitable ATEX / IECEx approved enclosure or box using appropriate glands



SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Operational Properties	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	Very good corrosion resistance throughout the operating temperature range. Suited to a wide range of industrial applications. Enjoys high ductility.	800°C
316L	316L Stainless Steel (Types K, J, T & E)	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. 316L stainless steel has high oxidation resistance.	800°C
310	310 Stainless Steel (Type K)	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. Has high oxidation resistance which is maintained if subsequent manipulation is strictly limited.	1100°C
600	Inconel 600 (Types K, N, R, S & B)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation. Type R, S or B thermocouples with an Inconel 600 sheath are not recommended for use above 800°C. Do not use in sulphur bearing atmospheres above 550°C.	1100°C
114	Nicrobell D (Types K & N)	Recommended for use with high temperature type 'K' and most type 'N' applications. Very good high temperature strength. Excellent performance in oxidising, carburising, reducing and vacuum atmospheres. Do not use in sulphur containing atmospheres.	1250°C
156	Hastelloy X (Type K)	Improved high temperature resistance to oxidation and attack by sulphur. Retains excellent tensile strength at high temperatures. This sheath is applicable to reducing neutral and inert atmospheres. Develops a tightly adherent oxide film which does not spall at high temperatures.	1220°C
446	AISI 446 (Type K)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Particularly suited for use in high concentration sulphur bearing atmospheres at high temperature. * Should be mounted vertically at temperatures above 700°C.	1150°C
800	Incoloy 800 (Type K)	Suitable for use in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation and carburisation. Resistant to sulphur bearing atmospheres.	1100°C

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	6.0mm	0.236"
	8.0mm	0.315"

SECTION 4	Type of Sensing Junction
2I 2ID 2IT	INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT if a triplex element is required.

SECTION 5	Terminal Block
3P20	

SECTION 6	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)
TXISO/ATEX	Microprocessor based head mounted transmitter ATEX rated to Ex ia IIC T6. Fully scaleable and fully linearised for thermocouple input. The transmitter is pre-programmed to the required temperature range or, alternatively, it can be re-programmed easily by your PC using our software which should be ordered separately. Other types of transmitter are available on request.

Order Code - Example

Type N°	Thermocouple Type (See section 1)	Sheath Length in mm	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (See section 5)	Transmitter (Optional, see section 6)
52 - IS	- K	- 500	- 600	- 6.0	- 2I	- 3P20	- TXISO/ATEX(0/100°C)

ATEX / IECEx Thermocouples with Termination Entry Gland

Mineral Insulated Thermocouples 1.0mm to 8.0mm dia.

Our ATEX / IECEx mineral insulated thermocouple assemblies are manufactured from cable that conforms to IEC 61515 and their semi rigid construction allows them to be bent and formed to suit particular applications without impairing performance.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIC Da, see page 25 for details
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 1.0mm to 8.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- Terminated in a compression gland pot seal with 50mm PTFE sleeved tails
- Simplex, duplex and triplex sensors available
- UKAS calibration available



Model shown is fitted with connection tails.

A choice of cables is also available, see section 6

The above sensor must be terminated in a suitable ATEX approved Enclosure or Box



SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	800°C
316L	316L Stainless Steel (Types K, J, T & E)	800°C
310	310 Stainless Steel (Type K)	1100°C
600	Inconel 600 (Types K, N, R, S & B)	1100°C
114	Nicrobell D (Types K & N)	1250°C
156	Hastelloy X (Type K)	1220°C
446	AISI 446 (Type K)	1150°C
800	Incoloy 800 (Type K)	1100°C

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	1.0mm	0.039"
	1.5mm	0.059"
	3.0mm	0.118"
	4.5mm	0.177"
	6.0mm	0.236"
	8.0mm	0.315"

SECTION 4	Type of Sensing Junction
2I	INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT for a triplex element.
2ID	
2IT	

SECTION 5	Termination Entry Gland (please use code number to specify thread size and material for the sensor diameter chosen)		
	Dia.	Thread Size	Order Code for Brass / Order Code for Stainless Steel
1.0mm	16mm ISO	SFBM16-10CBEX	SFSM16-10CBEX
1.5mm	16mm ISO	SFBM16-15CBEX	SFSM16-15CBEX
3.0mm	16mm ISO	SFBM16-30CBEX	SFSM16-30CBEX
4.5mm	16mm ISO	SFBM16-45CBEX	SFSM16-45CBEX
6.0mm	16mm ISO	SFBM16-60CBEX	SFSM16-60CBEX
8.0mm	16mm ISO	SFBM16-80CBEX	SFSM16-80CBEX
3.0mm	20mm ISO	SFBM20-30CBEX	SFSM20-30CBEX
4.5mm	20mm ISO	SFBM20-45CBEX	SFSM20-45CBEX
6.0mm	20mm ISO	SFBM20-60CBEX	SFSM20-60CBEX
8.0mm	20mm ISO	SFBM20-80CBEX	SFSM20-80CBEX

SECTION 6	Optional Extension Cables (please specify length in metres)	
A82	PVC Insulation (105°C) (Seal rating: 90°C)	
B55	PFA Insulation (250°C) (Seal rating: 230°C)	
C40	Fibreglass Insulation (480°C) (Seal rating: 260°C)	
* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 50mm PTFE 'tails'.		

SECTION 7	Optional Stainless Steel Adjustable Compression Fittings			
	Dia.	1/8" BSPT	1/4" BSPT	1/2" BSPT
1.0mm	SFS18T10EX	SFS14T10EX	—	—
1.5mm	SFS18T15EX	SFS14T15EX	—	—
3.0mm	SFS18T30EX	SFS14T30EX	SFS12T30EX	—
4.5mm	SFS18T45EX	SFS14T45EX	SFS12T45EX	—
6.0mm	SFS18T60EX	SFS14T60EX	SFS12T60EX	—
8.0mm	—	SFS14T80EX	SFS12T80EX	—

Other thread sizes are available - please see page 14 for details.

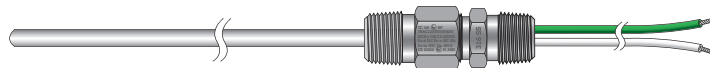
Order Code - Example

Type No	I.S. Version (Optional, please see page 25 for details)	Thermocouple Type (See section 1)	Sheath Length in mm	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (See section 5)	Extension Cable (Optional, see section 6)	Compression Fitting (Optional, see section 7)
52	- IS	- K	- 500	- 321	- 3.0	- 2I	- SFSM1630CBEX	- 2m A82KX	- SFS14T30EX

ATEX / IECEx Thermocouples with Termination Entry Gland

Mineral Insulated Thermocouples 1.0mm to 8.0mm dia.

Our ATEX / IECEx mineral insulated thermocouple assemblies are manufactured from cable that conforms to IEC 61515 and their semi rigid construction allows them to be bent and formed to suit particular applications without impairing performance.



Model shown is fitted with connection tails.

A choice of cables is also available, see section 6

The above sensor must be terminated in a suitable ATEX approved Enclosure or Box

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da, see page 25 for details
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in thermocouple types K, T, J, N, E, R, S and B
- Sheath diameters from 1.0mm to 8.0mm in a wide choice of materials
- Insulated measuring junction gives a floating output with high insulation resistance
- Terminated in a compression gland pot seal with threaded process entry and 50mm PTFE sleeved tails
- Simplex, duplex and triplex sensors available
- UKAS calibration available



SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	800°C
316L	316L Stainless Steel (Types K, J, T & E)	800°C
310	310 Stainless Steel (Type K)	1100°C
600	Inconel 600 (Types K, N, R, S & B)	1100°C
114	Microbell D (Types K & N)	1250°C
156	Hastelloy X (Type K)	1220°C
446	AISI 446 (Type K)	1150°C
800	Incoloy 800 (Type K)	1100°C

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	1.0mm	0.039"
	1.5mm	0.059"
	3.0mm	0.118"
	4.5mm	0.177"
	6.0mm	0.236"
	8.0mm	0.315"

SECTION 4	Type of Sensing Junction
2I	INSULATED The hot (measuring) junction is insulated from the sheath and this gives a floating output with a typical insulation resistance in excess of 100 megohms. Enter 2I for simplex, 2ID for duplex or 2IT for a triplex element.
2ID	
2IT	

SECTION 5	Termination Entry Gland (please use code number to specify thread size and material for the sensor diameter chosen)		
Dia.	Thread Size	Order Code for Brass	Order Code for Stainless Steel
1.0mm	16mm ISO	SFBM16-10CBEX	SFSM16-10CBEX
1.5mm	16mm ISO	SFBM16-15CBEX	SFSM16-15CBEX
3.0mm	16mm ISO	SFBM16-30CBEX	SFSM16-30CBEX
4.5mm	16mm ISO	SFBM16-45CBEX	SFSM16-45CBEX
6.0mm	16mm ISO	SFBM16-60CBEX	SFSM16-60CBEX
8.0mm	16mm ISO	SFBM16-80CBEX	SFSM16-80CBEX
3.0mm	20mm ISO	SFBM20-30CBEX	SFSM20-30CBEX
4.5mm	20mm ISO	SFBM20-45CBEX	SFSM20-45CBEX
6.0mm	20mm ISO	SFBM20-60CBEX	SFSM20-60CBEX
8.0mm	20mm ISO	SFBM20-80CBEX	SFSM20-80CBEX

SECTION 6	Optional Extension Cables (please specify length in metres)	
A82	PVC Insulation (105°C) (Seal rating: 90°C)	
B55	PFA Insulation (250°C) (Seal rating: 230°C)	
C40	Fibreglass Insulation (480°C) (Seal rating: 260°C)	

* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 50mm PTFE 'tails'.

SECTION 7	Process Connection Thread			
Code	Thread Size	Code	Thread Type	
12	1/2"	T	BSPT	
M16	M16 x 1.5mm	P	BSPP	
M20	M20 x 1.5mm	N	NPT	
		M	Metric	

Order Code - Example

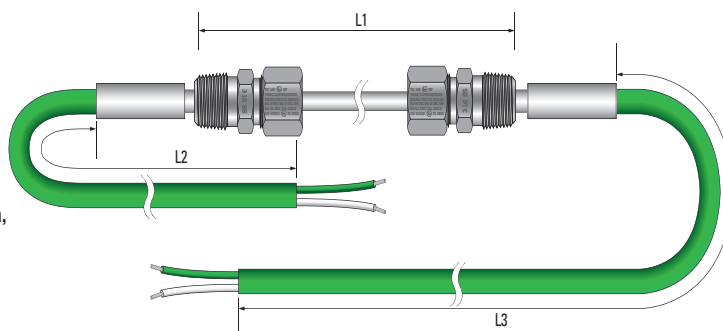
Type N°	I.S. Version (Optional, please see page 25 for details)	Thermocouple Type (See section 1)	Sheath Length in mm	Sheath Material (See section 2)	Sheath Diameter (See section 3)	Sensing Junction (See section 4)	Termination (See section 5)	Extension Cable (Optional, see section 6)	Process Connection (See section 7)
52	- IS	- K	- 500	- 321	- 3.0	- 2I	SFSM1630CBEX	- 2m A82KX	- 12T

ATEX / IECEx Thermocouple Feedthrough Assemblies

Thermocouple Feedthrough Assemblies

Our ATEX / IECEx mineral insulated feedthrough assemblies are typically used to extend thermocouple signals over medium to long distances up to 120 metres. The seamless metal sheath allows installation in the most arduous conditions.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da, see page 25 for details
- Available in thermocouple types K, T, J, N, E, R, S and B
- High integrity construction suited to arduous operating conditions
- Sheath diameters from 1.5mm to 6.0mm in a wide choice of materials
- Simplex, duplex and triplex feedthroughs available
- PVC, PFA and fibreglass insulated extension cables. Other cables available
- A wide range of connection threads and sizes are available

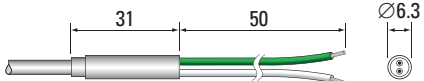
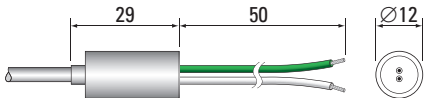


SECTION 1	Thermocouple Type	Temperature Range (continuous)
K	Nickel Chromium vs Nickel Aluminium	0°C to +1100°C
T	Copper vs Constantan	-185°C to +400°C
J	Iron vs Constantan	+50°C to +800°C
N	Nicrosil vs Nisil	0°C to +1200°C
E	Nickel Chromium vs Constantan	0°C to +800°C
R	Platinum - 13% Rhodium vs Platinum	0°C to +1600°C
S	Platinum - 10% Rhodium vs Platinum	0°C to +1550°C
B	Platinum - 30% Rhodium vs Platinum - 6% Rhodium	+100°C to +1600°C

SECTION 2	Sheath Material	Maximum Temperature
321	321 Stainless Steel (Types K, J, T & E)	800°C
316L	316L Stainless Steel (Types K, J, T & E)	800°C
310	310 Stainless Steel (Type K)	1100°C
600	Inconel 600 (Types K, N, R, S & B)	1100°C
114	Microbell D (Types K & N)	1250°C
156	Hastelloy X (Type K)	1220°C
446	AISI 446 (Type K)	1150°C
800	Incoloy 800 (Type K)	1100°C

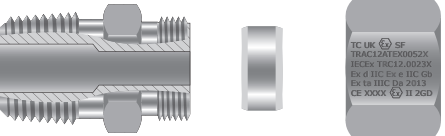
SECTION 3	Sheath Diameter (mm)	Sheath Diameter (inches)
Standard Sizes	1.5mm	0.059"
	2.0mm	0.079"
	3.0mm	0.118"
	4.5mm	0.177"
	6.0mm	0.236"

SECTION 4	Number of Elements
S	Simplex (2 wire)
D	Duplex (4 wire)
T	Triplex (6 wire)

SECTION 5		Pot Seal Terminations	
Standard Pot Seals	Temperature Rating	Dimensions	Description
	90°C for PVC cables 230°C for PTFE and PFA cables 260°C for fibreglass cables		For sheath diameters up to 3mm. Crimp on stainless steel pot seal potted with resin or high temperature resin. Supplied with PTFE solid tails 50mm long as standard.
	90°C for PVC cables 230°C for PTFE and PFA cables 260°C for fibreglass cables		For sheath diameters between 3mm and 6mm. Crimp on stainless steel pot seal potted with resin or high temperature resin. Supplied with PTFE solid tails 50mm long as standard.

SECTION 6	Optional Extension Cables (please specify length in metres)
A82	PVC Insulation (105°C)
B55	PFA Insulation (250°C)
C40	Fibreglass Insulation (480°C)

* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 50mm PTFE 'tails'. Other cables are available on request, please contact us for details.

SECTION 7	Stainless Steel Adjustable Compression Fittings with Counter Bore					Optional Locknut	
	Diagram	Code	Thread Size	Code	Thread Type	Code	Diagram
		18 14 12 34 M16 M20	1/8" 1/4" 1/2" 3/4" M16 x 1.5mm M20 x 1.5mm	T P N M	BSPT BSPP NPT M	L	 <i>Only available for 'P' and 'M' threads</i>

Order Code - Example

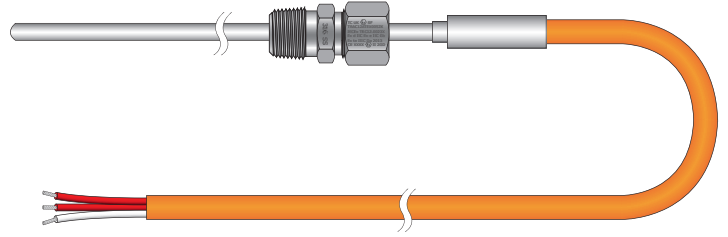
General Details														Process End			Connection End							
Type N°	I.S. Version (Optional, please see page 25 for details)		Thermocouple Type (See section 1)	Sheath Length 'L1'	Sheath Material (See section 2)	Sheath Diameter (See section 3)	No. of Elements (See section 4)	Cable Length 'L2'	Cable Type (See section 6)	Fitting Thread 1 (See section 7)	Cable Length 'L3'	Cable Type (See section 6)	Fitting Thread 2 (See section 7)											
54	-	IS	-	K	-	1000	-	600	-	3.0	-	S	-	1m	-	A82	-	12PL	-	1m	-	A82	-	12PL

ATEX / IECEx RTD Pt100 Sensors with Pot Seal

RTD Pt100 Resistance Thermometers 3.0mm to 8.0mm dia.

Our ATEX / IECEx approved flexible mineral insulated platinum resistance thermometers utilise, as standard, detector elements with a resistance of 100 ohms @ 0°C and a fundamental interval of 38.5 ohms to IEC 60751. Single and duplex elements are available. An adjustable threaded compression fitting is required to achieve approval.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da, see page 25 for details
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in B, A, 1/3, 1/5 and 1/10 grade accuracies
- Sheath diameters from 3.0mm to 8.0mm
- PVC or PFA insulated extension cables
- Wide operating temperature range of -200°C to +600°C
- UKAS calibration available



The above sensor must be installed using the compression fitting supplied to maintain Ex d / Ex tb approval.
For Ex ia applications a compression fitting is not required to maintain approval



SECTION 1	N° of Elements
1	Simplex
2	Duplex
3	Triplex

SECTION 2	Sheath Diameter (mm)	Sheath Diameter (Inches)
Standard Sizes	3.0mm	0.118"
	4.5mm	0.177"
	6.0mm	0.236"
	8.0mm	0.315"

SECTION 3	N° of Wires	
2	2 wire	
3	3 wire	
4	4 wire	

SECTION 4	Sheath Length
	As Required

SECTION 5	Termination
CE4CL	Other lengths of cable available

SECTION 6	Tolerance of Element (IEC 60751)		
Grade	Accuracy @ 0°C	Accuracy @ 100°C	Order Code
B	±0.30°C	±0.80°C	R100 - B
A	±0.15°C	±0.35°C	R100 - A
1/3	±0.08°C	±0.19°C	R100 - 1/3
1/5	±0.05°C	±0.15°C	R100 - 1/5
1/10	±0.03°C	±0.12°C	R100 - 1/10

SECTION 7	Extension Cables (please specify length in metres)	
RP	PVC Insulation (105°C) (Termination: CE4CL seal, temperature rating 90°C)	
		RP37 (3-wire)
		RP47 (4-wire)
RT	PFA Insulation (250°C) (Termination: CE4CLA seal, temperature rating 230°C)	
		RT37 (3-wire)
		RT47 (4-wire)
		RT67 (Duplex 3-wire)

* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 100mm Kapton 'tails'.

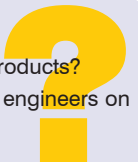
SECTION 8	Stainless Steel Adjustable Compression Fittings		
Dia.	1/8" BSPT	1/4" BSPT	1/2" BSPT
3.0mm	SFS18T30EX	SFS14T30EX	SFS12T30EX
4.5mm	SFS18T45EX	SFS14T45EX	SFS12T45EX
6.0mm	SFS18T60EX	SFS14T60EX	SFS12T60EX
8.0mm	—	SFS14T80EX	SFS12T80EX

Other thread sizes are available - please see page 14 for details.

Order Code - Example										
Type N°	I.S. Version (Optional, please see page 25 for details)	N° of Elements (See section 1)	Sheath Diameter (See section 2)	N° of Wires (See section 3)	Sheath Length (mm)	Termination (See section 5)	Resistance Value of Element	Grade of Element (See section 6)	Extension Cable (See section 7)	Compression Fitting (See section 8)
57	- IS	- 1	- 6.0	- 3	- 250	- CE4CL	- R100	- B	- 1m RP37	- SFS12T60EX

Need advice

on using our **ATEX** approved products?
Contact one of our experienced engineers on
01-4146980
or send an email to atex@tc.ie

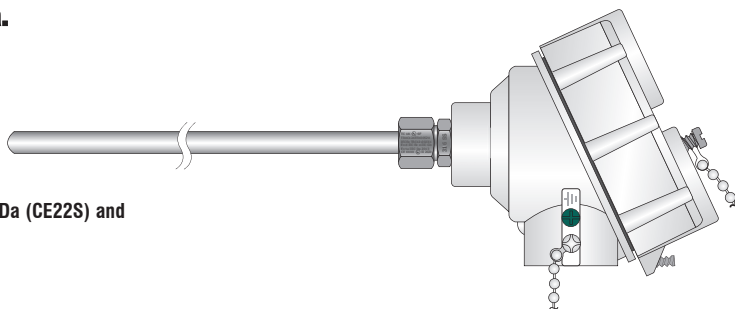


ATEX / IECEx RTD Pt100 Sensors with Terminal Head

RTD Pt100 Resistance Thermometers 4.5mm to 8.0mm dia.

Our ATEX / IECEx approved flexible mineral insulated platinum resistance thermometers utilise, as standard, detector elements with a resistance of 100 ohms @ 0°C and a fundamental interval of 38.5 ohms to IEC 60751. Single and duplex elements are available.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da (CE22S) and Ex II 2 GD Ex ib IIC Gb/IIIC Db (CE22/CE27), see page 25
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in B, A, 1/3, 1/5 and 1/10 grade accuracies
- Sheath diameters from 4.5mm to 8.0mm
- 316 seamless stainless steel sheath (other grades/materials available)
- Die cast alloy or stainless steel terminal heads available
- Wide operating temperature range of -200°C to +600°C, UKAS calibration is also available



SECTION 1	N° of Elements	SECTION 2	Sheath Diameter (mm)	Sheath Diameter (inches)	SECTION 3	N° of Wires			SECTION 4	Sheath Length
1	Simplex	Standard Sizes	4.5mm	0.177"	2	2 wire			As Required	
2	Duplex		6.0mm	0.236"	3	3 wire				
3	Triplex		8.0mm	0.315"	4	4 wire				

SECTION 5	Type of Terminal Head (supplied with an M20 cable entry as standard. Other sizes are available - see page 21 for details)		
CE22	Also available in blue (order code 3P22B) Standard Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.	CE22S	Standard Stainless Steel Head Weatherproof and explosion proof stainless steel terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.
		CE27	Dual Cable Entry Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head for large devices with two cable entries at right angles to the tube entry and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.

SECTION 6	Tolerance of Element (IEC 60751)			SECTION 7	Optional Stainless Steel Adjustable Compression Fittings		
Grade	Accuracy @ 0°C	Accuracy @100°C	Order Code	Dia.	1/8" BSPT	1/4" BSPT	1/2" BSPT
B	±0.30°C	±0.80°C	R100 - B	4.5mm	SFS18T45EX	SFS14T45EX	SFS12T45EX
A	±0.15°C	±0.35°C	R100 - A	6.0mm	SFS18T60EX	SFS14T60EX	SFS12T60EX
1/3	±0.08°C	±0.19°C	R100 - 1/3	8.0mm	—	SFS14T80EX	SFS12T80EX
1/5	±0.05°C	±0.15°C	R100 - 1/5				
1/10	±0.03°C	±0.12°C	R100 - 1/10				

Other thread sizes are available - please see page 14 for details.

SECTION 8	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)	
TXISO/ATEX	Microprocessor based head mounted transmitter ATEX rated to Ex ia IIC T6. Fully scalable and fully linearised for PT100 input. The transmitter is pre-programmed to the required temperature range or, alternatively, it can be re-programmed easily by your PC using our software which should be ordered separately. Other types of transmitter are available on page 25.	

Order Code - Example

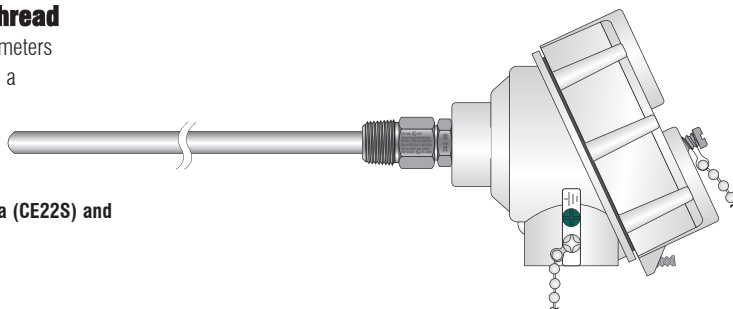
Type N°	I.S. Version (Optional, please see page 25 for details)	N° of Elements (See section 1)	Sheath Diameter (See section 2)	N° of Wires (See section 3)	Sheath Length (mm)	Termination (See section 5)	Resistance Value of Element	Grade of Element (See section 6)	Compression Fitting (Optional, see section 7)	Transmitter (Optional, see section 8)										
57	-	IS	-	1	-	6.0	-	3	-	450	-	CE22S	-	R100	-	B	-	SFS14T60EX	-	TXISO/ATEX(0/100°C)

ATEX / IECEx RTD Pt100 Sensors with Terminal Head

RTD Pt100 Resistance Thermometers with Fixed Process Thread

Our ATEX / IECEx approved flexible mineral insulated platinum resistance thermometers utilise, as standard, detector elements with a resistance of 100 ohms @ 0°C and a fundamental interval of 38.5 ohms to IEC 60751. Single and duplex elements are available.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da (CE22S) and Ex II 2 GD Ex ib IIC Gb/IIIC Db (CE22/CE27), see page 25
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in B, A, 1/3, 1/5 and 1/10 grade accuracies
- Sheath diameters from 4.5mm to 8.0mm
- 316 seamless stainless steel sheath (other grades/materials available)
- Die cast alloy or stainless steel terminal heads available
- Wide operating temperature range of -200°C to +600°C, UKAS calibration is also available



SECTION 1	N° of Elements	SECTION 2	Sheath Diameter (mm)	Sheath Diameter (inches)	SECTION 3	N° of Wires	SECTION 4	Sheath Length
1	Simplex	Standard Sizes	4.5mm	0.177"	2	2 wire		As Required
2	Duplex		6.0mm	0.236"	3	3 wire		
3	Triplex		8.0mm	0.315"	4	4 wire		

SECTION 5	Type of Terminal Head (supplied with an M20 cable entry as standard. Other sizes are available - see page 21 for details)		
CE22	Also available in blue (order code 3P22B) Standard Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.	CE22S	Standard Stainless Steel Head Weatherproof and explosion proof stainless steel terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.
		CE27	Dual Cable Entry Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head for large devices with two cable entries at right angles to the tube entry and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.

SECTION 6	Tolerance of Element (IEC 60751)		
Grade	Accuracy @ 0°C	Accuracy @100°C	Order Code
B	±0.30°C	±0.80°C	R100 - B
A	±0.15°C	±0.35°C	R100 - A
1/3	±0.08°C	±0.19°C	R100 - 1/3
1/5	±0.05°C	±0.15°C	R100 - 1/5
1/10	±0.03°C	±0.12°C	R100 - 1/10

SECTION 7	Process Connection Thread			
	Code	Thread Size	Code	Thread Type
	12	1/2"	T	BSPT
	34	3/4"	P	BSPP
	M16	M16 x 1.5mm	N	NPT
	M20	M20 x 1.5mm	M	Metric

SECTION 8	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)	
TXISO/ATEX	Fully Linearised Microprocessor based head mounted transmitter ATEX rated to Ex ia IIC T6. Fully scalable and fully linearised for PT100 input. The transmitter is pre-programmed to the required temperature range or, alternatively, it can be re-programmed easily by your PC using our software which should be ordered separately. Other types of transmitter are available on page 25.	

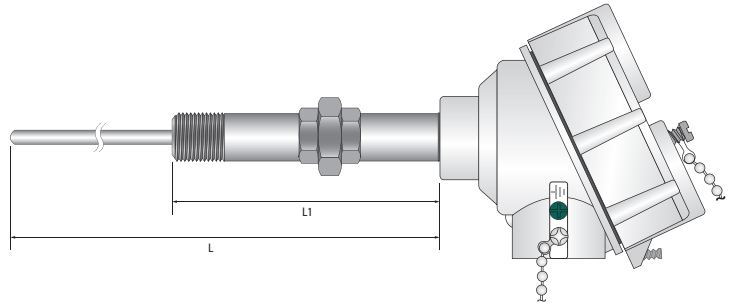
Order Code - Example										
Type N°	I.S. Version (Optional, please see page 25 for details)	N° of Elements (See section 1)	Sheath Diameter (See section 2)	N° of Wires (See section 3)	Sheath Length (mm)	Termination (See section 5)	Resistance Value of Element	Grade of Element (See section 6)	Process Connection (See section 7)	Transmitter (Optional, see section 8)
57	- IS	- 1	- 6.0	- 3	- 450	- CE22S	- R100	- B	- 12T	- TXISO/ATEX(0/100°C)

ATEX / IECEx Spring Loaded RTD Pt100 Sensors

RTD Pt100 Resistance Thermometers 3.0mm to 8.0mm dia.

These spring loaded flexible mineral insulated platinum resistance thermometers utilise, as standard, detector elements with a resistance of 100 ohms @ 0°C and a fundamental interval of 38.5 ohms to IEC 60751. The threaded flameproof extension is ideal for installation in thermowell pockets and where good contact with the process is required.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da (CE22S) and Ex II 2 GD Ex ib IIC Gb/IIIC Db (CE22/CE27)
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in B, A, 1/3, 1/5 and 1/10 grade accuracies
- Sheath diameters from 3.0mm to 8.0mm
- 316 seamless stainless steel sheath (other grades/materials available)
- Spring loaded RTD Pt100 insert with wide choice of process connections
- Wide operating temperature range of -200°C to +600°C
- UKAS calibration available



SECTION 1	N° of Elements	SECTION 2	Sheath Dia. (mm)	Sheath Dia. (Inches)	SECTION 3	N° of Wires	SECTION 4	Tolerance of Element (IEC 60751)		
1	Simplex	Standard Sizes	3.0mm	0.118"	2	2 wire	Grade	Accuracy @ 0°C	Accuracy @ 100°C	Order Code
2	Duplex		4.5mm	0.177"	3	3 wire		±0.30°C	±0.80°C	R100 - B
3	Triplex		6.0mm	0.236"	4	4 wire		±0.15°C	±0.35°C	R100 - A
			8.0mm	0.315"				±0.08°C	±0.19°C	R100 - 1/3
								±0.05°C	±0.15°C	R100 - 1/5
								±0.03°C	±0.12°C	R100 - 1/10

SECTION 5	Type of Terminal Head (supplied with an M20 cable entry as standard. Other sizes are available - see page 21 for details)		
CE22		CE22B	
Standard Die Cast Alloy Head Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.			
			Standard Die Cast Alloy Head (Blue) Weatherproof and explosion proof die cast alloy terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.
		CE22S	
			Standard Stainless Steel Head Weatherproof and explosion proof stainless steel terminal head with tube and cable entry at right angles to each other and ceramic terminal block. Suitable for simplex, duplex and triplex assemblies.

SECTION 6	Process Connection Thread	SECTION 7	Optional (Rotating Union) Fitting	SECTION 8	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)
Code	Thread Size	RUSS		TXISO/ATEX	 Fully Linearised
12T	1/2" BSPT				
12P	1/2" BSPP				
12N	1/2" NPT				
M20	M20 x 1.5mm				

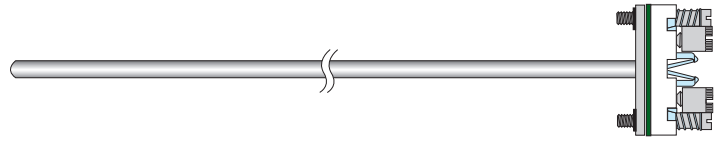
Order Code - Example												
Type N°	I.S. Version (Optional, please see page 25 for details)	N° of Elements (See section 1)	Length 'L' (See diagram)	Sheath Diameter (See section 2)	N° of Wires (See section 3)	Termination (See section 5)	Length 'L1' (See diagram)	Resistance Value of Element	Grade of Element (See section 4)	Process Thread (See section 6)	Rotating Union Fitting (Optional, see section 7)	Transmitter (Optional, see section 8)
58	- IS	- 1	- 300	- 4.5	- 3	- CE22	- 150	- R100	- B	- 12P	- RUSS	- TXISO/ATEX(0/100°C)

ATEX / IECEx RTD Pt100 Sensors with Terminal Block

RTD Pt100 Resistance Thermometers 6.0mm to 8.0mm dia.

These intrinsically safe spring loaded flexible mineral insulated platinum resistance thermometers utilise, as standard, detector elements with a resistance of 100 ohms @ 0°C and a fundamental interval of 38.5 ohms to IEC 60751.

- Approved to II 1 GD Ex ia IIC Ga (Gas) and Ex ia IIC Da (Dust)
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in B, A, 1/3, 1/5 and 1/10 grade accuracies
- Sheath diameters from 6.0mm to 8.0mm
- 316 seamless stainless steel sheath (other grades/materials available)
- Spring loaded RTD Pt100 insert with wide choice of process connections
- Wide operating temperature range of -200°C to +600°C
- UKAS calibration available



The above sensor must be terminated in a suitable ATEX / IECEx approved enclosure or box using appropriate glands



SECTION 1	N° of Elements	SECTION 2	Sheath Diameter (mm)	Sheath Diameter (Inches)	SECTION 3	N° of Wires
1	Simplex	Standard Sizes	6.0mm	0.236"	2	2 wire
2	Duplex		8.0mm	0.315"	3	3 wire
3	Triplex				4	4 wire

SECTION 4	Tolerance of Element (IEC 60751)			SECTION 5	Sheath Length	SECTION 6	Terminal Block
Grade	Accuracy @ 0°C	Accuracy @100°C	Order Code	As Required		3P20	
B	±0.30°C	±0.80°C	R100 - B				
A	±0.15°C	±0.35°C	R100 - A				
1/3	±0.08°C	±0.19°C	R100 - 1/3				
1/5	±0.05°C	±0.15°C	R100 - 1/5				
1/10	±0.03°C	±0.12°C	R100 - 1/10				

SECTION 7	Optional 4 to 20mA ATEX Approved Head Mounted Transmitter (please specify range in °C)	
TXISO/ATEX		Microprocessor based head mounted transmitter ATEX rated to Ex ia IIC T6. Fully scaleable and fully linearised for thermocouple input. The transmitter is pre-programmed to the required temperature range or, alternatively, it can be re-programmed easily by your PC using our software which should be ordered separately. Other types of transmitter are available on request.

Order Code - Example

Type N°	N° of Elements (See section 1)	Sheath Diameter (See section 2)	N° of Wires (See section 3)	Sheath Length (mm)	Termination (See section 6)	Resistance Value of Element	Grade of Element (See section 4)	Transmitter (Optional, see section 7)
57 - IS	- 1	- 6.0	- 3	- 450	- CE20	- R100	- B	- TXISO/ATEX(0/100°C)

ATEX / IECEx RTD Pt100s with Termination Entry Gland

RTD Pt100 Resistance Thermometers 3.0mm to 8.0mm dia.

Our ATEX / IECEx approved mineral insulated platinum resistance thermometers utilise, as standard, detector elements with a resistance of 100 ohms @ 0°C and a fundamental interval of 38.5 ohms to IEC 60751. Single and duplex elements are available.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da, see page 25 for details
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in B, A, 1/3, 1/5 and 1/10 grade accuracies
- Sheath diameters from 3.0mm to 8.0mm
- 316 seamless stainless steel sheath (other grades/materials available)
- Terminated in a compression gland pot seal with 100mm Kapton® sleeved tails
- Wide operating temperature range of -200°C to +600°C
- UKAS calibration available



Model shown is fitted with connection tails.
A choice of cables is also available, see section 7

The above sensor must be terminated in a suitable ATEX / IECEx approved Enclosure or Box



SECTION 1	N° of Elements	SECTION 2	Sheath Diameter (mm)	Sheath Diameter (Inches)	SECTION 3	N° of Wires			SECTION 4	Sheath Length
1	Simplex	Standard Sizes	3.0mm	0.118"	2	2 wire				As Required
2	Duplex		4.5mm	0.177"	3	3 wire				
3	Triplex		6.0mm	0.236"	4	4 wire				
			8.0mm	0.315"						

SECTION 5	Termination Entry Gland (please use code number to specify thread size and material for the sensor diameter chosen)			SECTION 6	Tolerance of Element (IEC 60751)		
Dia.	Thread Size	Order Code for Brass	Order Code for Stainless Steel	Grade	Accuracy @ 0°C	Accuracy @100°C	Order Code
3.0mm	16mm ISO	SFBM16-30CBEX	SFSM16-30CBEX	B	±0.30°C	±0.80°C	R100 - B
4.5mm	16mm ISO	SFBM16-45CBEX	SFSM16-45CBEX	A	±0.15°C	±0.35°C	R100 - A
6.0mm	16mm ISO	SFBM16-60CBEX	SFSM16-60CBEX	1/3	±0.08°C	±0.19°C	R100 - 1/3
8.0mm	16mm ISO	SFBM16-80CBEX	SFSM16-80CBEX	1/5	±0.05°C	±0.15°C	R100 - 1/5
				1/10	±0.03°C	±0.12°C	R100 - 1/10

SECTION 7	Optional Extension Cables (please specify length in metres)		
RP	PVC Insulation (105°C) (Seal rating: 90°C)		RP37 (3-wire)
			RP47 (4-wire)
			RP67 (Duplex 3-wire)
RT	PFA Insulation (250°C) (Seal rating: 230°C)		RT37 (3-wire)
			RT47 (4-wire)
			RT67 (Duplex 3-wire)

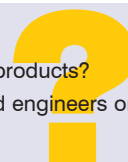
* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 100mm Kapton 'tails'.

SECTION 8	Optional Stainless Steel Adjustable Compression Fittings		
Dia.	1/8" BSPT	1/4" BSPT	1/2" BSPT
3.0mm	SFS18T30EX	SFS14T30EX	SFS12T30EX
4.5mm	SFS18T45EX	SFS14T45EX	SFS12T45EX
6.0mm	SFS18T60EX	SFS14T60EX	SFS12T60EX
8.0mm	—	SFS14T80EX	SFS12T80EX

Other thread sizes are available - please see page 14 for details.

Need advice

on using our **ATEX** approved products?
Contact one of our experienced engineers on
01-4146980
or send an email to atex@tc.ie



Order Code - Example

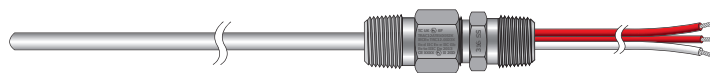
Type N°	I.S. Version (Optional, please see page 25 for details)	N° of Elements (See section 1)	Sheath Diameter (See section 2)	N° of Wires (See section 3)	Sheath Length (mm)	Termination (See section 5)	Resistance Value of Element	Grade of Element (See section 6)	Extension Cable (Optional, see section 7)	Compression Fitting (Optional, see section 8)
57	- IS	- 1	- 3.0	- 3	- 250	- SFSM2030CBEX	- R100	- B	- 1m RP37	- SFS14T30EX

ATEX / IECEx RTD Pt100s with Termination Entry Gland

RTD Pt100 Resistance Thermometers 3.0mm to 8.0mm dia.

Our ATEX / IECEx approved mineral insulated platinum resistance thermometers utilise, as standard, detector elements with a resistance of 100 ohms @ 0°C and a fundamental interval of 38.5 ohms to IEC 60751. Single and duplex elements are available.

- Approved to II 2 GD Ex db IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- Also suitable for use in intrinsically safe areas to Ex II 1 GD Ex ia IIC Ga/IIIC Da, see page 25 for details
- Temperature classification T6-T1, see page 26 for stand-off requirements
- Available in B, A, 1/3, 1/5 and 1/10 grade accuracies
- Sheath diameters from 3.0mm to 8.0mm
- 316 seamless stainless steel sheath (other grades/materials available)
- Terminated in a compression gland pot seal with threaded process entry and 100mm Kapton® sleeved tails
- Wide operating temperature range of -200°C to +600°C
- UKAS calibration available



Model shown is fitted with connection tails.
A choice of cables is also available, see section 7

The above sensor must be terminated in a suitable ATEX / IECEx approved Enclosure or Box



SECTION 1	N° of Elements	SECTION 2	Sheath Diameter (mm)	Sheath Diameter (Inches)	SECTION 3	N° of Wires	SECTION 4	Sheath Length
1	Simplex	Standard Sizes	3.0mm	0.118"	2	2 wire		As Required
2	Duplex		4.5mm	0.177"	3	3 wire		
3	Triplex		6.0mm	0.236"	4	4 wire		
			8.0mm	0.315"				

SECTION 5	Termination Entry Gland (please use code number to specify thread size and material for the sensor diameter chosen)			SECTION 6	Tolerance of Element (IEC 60751)		
Dia.	Thread Size	Order Code for Brass	Order Code for Stainless Steel	Grade	Accuracy @ 0°C	Accuracy @ 100°C	Order Code
3.0mm	16mm ISO	SFBM16-30CBEX	SFSM16-30CBEX	B	±0.30°C	±0.80°C	R100 - B
4.5mm	16mm ISO	SFBM16-45CBEX	SFSM16-45CBEX	A	±0.15°C	±0.35°C	R100 - A
6.0mm	16mm ISO	SFBM16-60CBEX	SFSM16-60CBEX	1/3	±0.08°C	±0.19°C	R100 - 1/3
8.0mm	16mm ISO	SFBM16-80CBEX	SFSM16-80CBEX	1/5	±0.05°C	±0.15°C	R100 - 1/5
				1/10	±0.03°C	±0.12°C	R100 - 1/10

SECTION 7	Optional Extension Cables (please specify length in metres)		
RP	PVC Insulation (105°C) (Seal rating: 90°C)		RP37 (3-wire)
			RP47 (4-wire)
			RP67 (Duplex 3-wire)
RT	PFA Insulation (250°C) (Seal rating: 230°C)		RT37 (3-wire)
			RT47 (4-wire)
			RT67 (Duplex 3-wire)

* All cables have 7/0.2mm conductors. If no cable is required, leave this section of the order code blank and the sensor will be supplied with 100mm Kapton 'tails'.

SECTION 8	Process Connection Thread		
Code	Thread Size	Code	Thread Type
12	1/2"	T	BSPT
M16	M16 x 1.5mm	P	BSPP
M20	M20 x 1.5mm	N	NPT
		M	Metric

Need advice

on using our **ATEX** approved products?
Contact one of our experienced engineers on
01-4146980
or send an email to atex@tc.ie

Order Code - Example

Type N°	I.S. Version (Optional, please see page 25 for details)	N° of Elements (See section 1)	Sheath Diameter (See section 2)	N° of Wires (See section 3)	Sheath Length (mm)	Termination (See section 5)	Resistance Value of Element	Grade of Element (See section 6)	Extension Cable (Optional, see section 7)	Process Connection (Optional, see section 8)
57	- IS	- 1	- 3.0	- 3	- 250	- SFSM2030CBEX	- R100	- B	- 1m RP37	- 12T

ATEX / IECEx Compression Fittings

Our extensive range of ATEX / IECEx approved compression fittings is designed and tested for use in hazardous areas with type Ex d, Ex e and Ex tD protection concepts allowing them to be used for both gas and dust applications in zone 1 and 2 areas.

They are available from stock with a variety of thread types and sizes to suit various diameter sensors. As an alternative to 316 stainless steel we can also offer all varieties in Hastelloy X or C276 for more arduous applications.

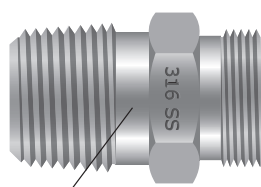
Compression fittings are essential when probes, sensors and other types of static elements need to be sealed as they pass into the area or enclosure.

Full approval rating is Ex II 2GD, Ex db IIC, Ex eb IIC Gb & Ex ta IIIC Da. Certificate Nos. TRAC12ATEX0052X (ATEX) / TRC12.0023X (IECEx) refer (available on request).

Single Ferrule Fittings - Features at a Glance

Ferrule

Seals against the media and grips the sensor



Main Body

Available in a wide range of imperial and metric thread sizes

Cap Nut

Compresses the fitting onto the tube

The single ferrule system gives a reliable seal against the media and ensures a good mechanical grip on the sensor itself.

SECTION 1	Material
S	Stainless Steel
B	Brass
H	Hastelloy

SECTION 2	Thread Size			
Code	Size	Code	Size	
18	1/8"	10	1"	
14	1/4"	M10	M10 x 1.0mm	
38	3/8"	M16	M16 x 1.5mm	
12	1/2"	M20	M20 x 1.5mm	
34	3/4"	M24	M24 x 1.5mm	

SECTION 3	Thread Type
Code	Type
T	BSPT
P	BSPP
N	NPT
M	ISO

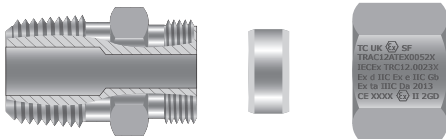
Stainless Steel Locknuts

Available in a range of sizes to suit our range of compression fittings and cable glands.



Code	Type
LN10S	M10 x 1.0mm
LN16S	M16 x 1.5mm
LN20S	M20 x 1.5mm
LN24S	M24 x 1.5mm
LN1/2S	1/2" BSPP

SECTION 4	Insert Diameter (diameter of sensor to suit)				
Code	Size	Code	Size	Code	Size
05	0.5mm	48	4.75mm (3/16")	120	12.0mm
10	1.0mm	55	5.5mm	127	12.7mm (1/2")
15	1.5mm	60	6.0mm	159	15.9mm (5/8")
16	1.59mm (1/16")	64	6.35mm (1/4")	190	19.05mm (3/4")
20	2.0mm	80	8.0mm	213	21.3mm (13/16")
30	3.0mm	95	9.53mm (3/8")	254	25.4mm (1")
32	3.175mm (1/8")	100	10.0mm		
45	4.5mm	108	10.8mm		

SECTION 5	Optional Counter Bore	
Code	Diagram	
CB		
	All fittings are available with counter bored bodies for use as termination entry glands when sealing probes (with pot seals) or feedthroughs into terminal heads / conduit boxes, etc.	

Order Code - Example					
Type No	Material (See section 1)	Thread Size and Type (See sections 2 and 3)	Insert Diameter (See section 4)	Counter Bore* (if required)	ATEX / IECEx
SF	S	12 T	60	CB	EX



ATEX / IECEx Cable Glands

Our range of cable glands is tailored to suit the terminal heads and extension cables available in this catalogue and will maintain the Zone 1/21 Ex d, Ex e and Ex tD approval. The glands are available in either brass or stainless steel and give a reliable IP66 and IP68 seal to 25 metres. An IP O-ring is supplied as standard on metric thread versions.

- Ex d / Ex e / Ex tD approved to zone 1/21
- IP66 and IP68 seal to 25 metres
- Supplied with a Neoprene seal which has an operating temperature -20 to +85°C
- Optional accessories include a locknut, earth tag, IP washers, shroud etc. - please contact us for details
- Generally ex-stock for quick delivery

Cable Gland Selection Table (diameter of sensor to suit)						
Type	Gland Size Code	Cable dia.	Thread Code	Thread Type	Material	Approval
CGA	16	4.0~8.4mm	M20	M20 x 1.5mm	B Brass S St./Steel	EX
	20S	7.2~11.7mm	12N	1/2" NPT		
	20	9.4~14.0mm	34N	3/4" NPT		

Order Code - Example				
Type No	Gland Size	Thread Code	Material	Approval
CGA	16	M20	B	EX

The above glands are a small part of our cable gland range, selected for use with the sensors and enclosures shown in this catalogue. For other cable types, gland sizes, materials etc., please contact TC Ltd for a quotation.

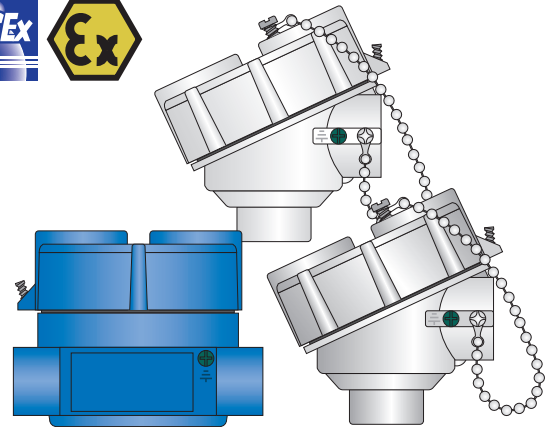


ATEX / IECEx Terminal Heads

Ex d Component Certified Terminal Heads & Enclosures

Our range of terminal heads and enclosures is available in a variety of sizes, materials and finishes and have ATEX / IECEx component approval to Ex db IIC T6 Gb (Gas) and Ex tb IIC Db (Dust) for zone 1 use. All terminal heads and enclosures are supplied without glands/fittings (available to purchase as separate items - see page 14 for details).

- Approved to Ex db IIC T6 Gb (Gas) & Ex tb IIC Db (Dust)
- Choice of die cast aluminium or 316 stainless steel for the most arduous applications
- Wide selection of BSPP, NPT & metric (ISO) threadforms
- Weatherproof to IP68
- Options for large devices and dual cable entry available
- Generally ex-stock for quick delivery
- See page 14 for termination entry glands and cable glands



Terminal Head Selection Table

Code	External View	Internal View	Thread Selection Tables		
P22			Code	PE - Probe Entry	CE - Cable Entry
			18	1/2" BSPP	1/2" BSPP
			04	1/2" BSPP	3/4" BSPP
			05	1/2" BSPP	M20 x 1.5mm
			49	3/4" BSPP	3/4" BSPP
			47	3/4" BSPP	M20 x 1.5mm
			02	1/2" NPT	1/2" NPT
			01	1/2" NPT	3/4" NPT
			08	1/2" NPT	M20 x 1.5mm
			33	3/4" NPT	3/4" NPT
			12	M20 x 1.5mm	M20 x 1.5mm
P22S			Code	PE - Probe Entry	CE - Cable Entry
			18	1/2" BSPP	1/2" BSPP
			04	1/2" BSPP	3/4" BSPP
			05	1/2" BSPP	M20 x 1.5mm
			49	3/4" BSPP	3/4" BSPP
			47	3/4" BSPP	M20 x 1.5mm
			02	1/2" NPT	1/2" NPT
			01	1/2" NPT	3/4" NPT
			08	1/2" NPT	M20 x 1.5mm
			33	3/4" NPT	3/4" NPT
			12	M20 x 1.5mm	M20 x 1.5mm
P27			Thread Selection Tables		
			Code	PE - Probe Entry	CE - Cable Entry
			02	M16 x 2.0mm*	3/4" NPT
			03	M16 x 2.0mm*	M20 x 1.5mm
			04	1/2" NPT	3/4" NPT
			05	1/2" NPT	1/2" NPT
			06	1/2" NPT	M20 x 1.5mm
			11	1/2" BSPP	1/2" NPT
			12	1/2" BSPP	M20 x 1.5mm
			Internal View		

* M16 x 2.0mm thread is supplied for use with pipe mount bracket 01 and is not a thru-hole.

Order Code - Example

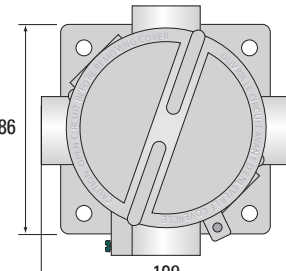
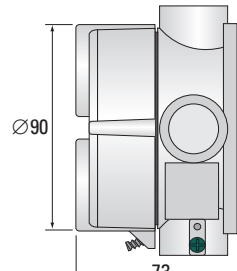
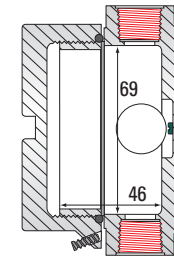
Enclosure Code No.	Thread Code
P22	- 05

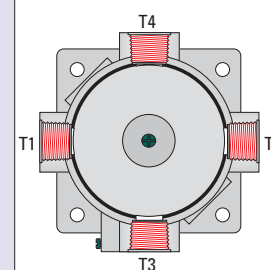
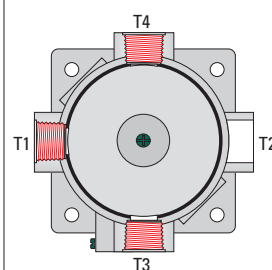
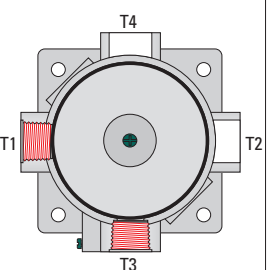
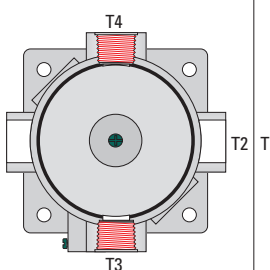
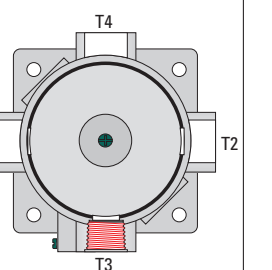


ATEX / IECEx Terminal Heads (continued)

SECTION 1

P30 Multiple Entry Junction Box Details and Thread Selection

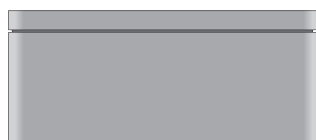
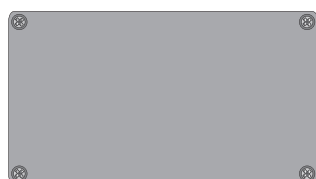
Code	Top View	Side View	Internal View	Thread Selection Tables	
P30				Code	T1, T2, T3 and T4
				02	1/2" NPT
				03	3/4" NPT
				04	M20 x 1.5mm
				05	1/2" BSPP
				06	1/2" BSPT
				Multiple entry die cast aluminium junction box with grey epoxy finish. Screw top lid. Weight 0.6kg. Suitable for use over the temperature range -40 to +85°C. IP68 Rated with O-ring supplied. Can be wall mounted using the integral bolt holes.	

SECTION 2 Entry Configuration					
Code	00	01	02	03	04
P30					
	4 ENTRIES	3 ENTRIES	2 ENTRIES AT 90°	2 ENTRIES AT 180°	1 ENTRY ONLY

Order Code - Example		
Enclosure Code No.	Entry Type (See section 2)	Thread Code (See section 1)
P30	- 01	- 05



Custom ATEX / IECEx Enclosures



In addition to the terminal heads and junction boxes shown above and on page 15, TC Measurement & Control Ltd can also provide a range of custom enclosures to suit a wide variety of hazardous areas and applications.

- Available in die cast aluminium, stainless steel and Polycarbonate materials
- ATEX & IECEx approved to Ex e, Ex d & Ex nA concepts to zones 1 & 2
- Over 20 sizes of enclosure available
- Wide operating temperature up to -40°C to +80°C (dependant on model selected)
- Ingress protection up to IP68
- Corrosion resistant
- Custom entries can be drilled and tapped to accommodate most threadforms on all sides
- Internal DIN rail and terminals can be supplied to suit a variety of equipment (sensors, barriers, transmitters, etc.)
- Please contact our sales department for more details and pricing information

Need advice

on using our **ATEX** approved products?
Contact one of our experienced engineers on
01-4146980
or send an email to atex@tc.ie

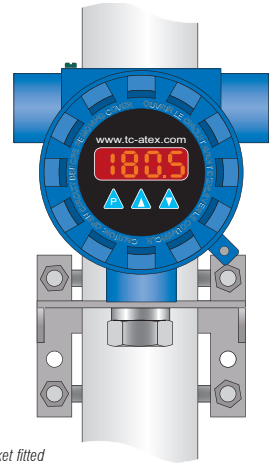


ATEX / IECEx 4 to 20mA Indicator

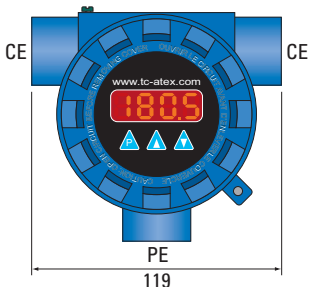
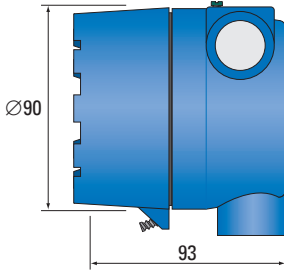
Explosion Proof 4~20mA Loop Powered Indicator

The P27D is a loop powered digital indicator, ATEX/IECEx approved to Ex d IIC T6 Gb (Gas) and Ex tb IIIC Db (Dust) for zone 1 use. It allows a process variable from any 4 to 20mA current source to be monitored. Since the unit derives its power from the loop, no additional power supply or wiring is needed. A low voltage drop (5 Volts at 20mA) means it can be incorporated into almost any 2 wire loop where local or remote indication is needed. The P27D has a 4 digit display which can be configured to read from -999 to 9999 with a 4 to 20mA input signal. The decimal point location and engineering units are adjusted using membrane switches and the indicator can be mounted directly to our thermocouple & RTD sensors or alternatively wall/pipe mounted using the mounting brackets shown below.

- Approved to Ex II 2 GD Ex d IIC Gb (Gas) and Ex tb IIIC Db (Dust)
- IP68 die cast alloy enclosure as standard, 316SS version available on request
- For local or remote indication of 4~20mA signal. Direct sensor or wall/pipe mounting options available.
- Can accommodate a head mount 4~20mA transmitter if required



P27D shown with 01 pipe mount bracket fitted

SECTION 1		Head Details																										
Code	Top View	Side View	Thread Selection Tables																									
P27D			<table><tr><th>Code</th><th>PE - Probe Entry</th><th>CE - Cable Entry</th></tr><tr><td>02</td><td>M16 x 2.0mm*</td><td>3/4" NPT</td></tr><tr><td>03</td><td>M16 x 2.0mm*</td><td>M20 x 1.5mm</td></tr><tr><td>04</td><td>1/2" NPT</td><td>3/4" NPT</td></tr><tr><td>05</td><td>1/2" NPT</td><td>1/2" NPT</td></tr><tr><td>06</td><td>1/2" NPT</td><td>M20 x 1.5mm</td></tr><tr><td>11</td><td>1/2" BSPP</td><td>1/2" NPT</td></tr><tr><td>12</td><td>1/2" BSPP</td><td>M20 x 1.5mm</td></tr></table>	Code	PE - Probe Entry	CE - Cable Entry	02	M16 x 2.0mm*	3/4" NPT	03	M16 x 2.0mm*	M20 x 1.5mm	04	1/2" NPT	3/4" NPT	05	1/2" NPT	1/2" NPT	06	1/2" NPT	M20 x 1.5mm	11	1/2" BSPP	1/2" NPT	12	1/2" BSPP	M20 x 1.5mm	
	Code	PE - Probe Entry	CE - Cable Entry																									
	02	M16 x 2.0mm*	3/4" NPT																									
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	05	1/2" NPT	1/2" NPT																									
	06	1/2" NPT	M20 x 1.5mm																									
	11	1/2" BSPP	1/2" NPT																									
12	1/2" BSPP	M20 x 1.5mm																										

* M16 x 2.0mm thread is supplied for use with pipe mount bracket 01 and is not a thru-hole.

Order Code - Example

Code No.	Thread Code	Optional Mounting Bracket (See section 2)
P27D	- 05	- 01

SECTION 2 Optional Mounting Brackets for P27D Indicator and P27 Head			
Code	01	02	03
	Simple 'L' shaped bracket made from stainless steel. Can be used to mount a P27/D on either a wall, panel or 2" dia. pipe using the 'U' bolts supplied in the kit.	Stainless steel bracket used to mount a P27/D on a 2" dia. pipe using the 'U' bolts supplied in the kit. Ideal for when all three ports on the enclosure are required.	Stainless steel bracket used to mount a P27/D on a wall or panel. Ideal for when all three ports on the enclosure are required.

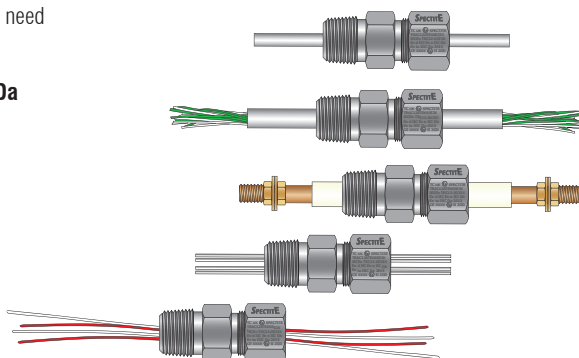
ATEX / IECEx Sealed Feedthroughs

ATEX / IECEx Pressure and Vacuum Sealed Feedthroughs

ATEX / IECEx approved Spectrite® sealed feedthroughs from TC are essential when probes, sensors, electrodes, wires and other types of static elements need to be sealed as they pass through a pressure or environmental boundary.

- Approved to Ex II 2G 1D, Ex db IIC Gb / Ex eb IIC Gb, Ex ta IIIC Da
- Inhibit the leakage of gas or other media
- Restrain the elements from moving in the assembly
- Wide choice of feedthroughs to suit most applications
- Wide temperature range
- Versions available to seal on both single and multiple elements
- Generally ex-stock for quick delivery
- Technical support and advice available

SPECTRITE®
from TC



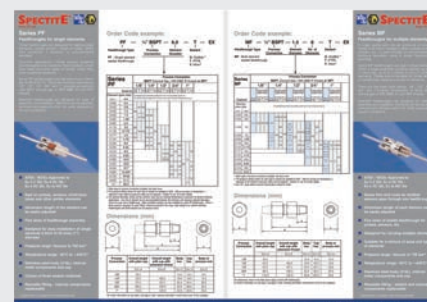
SECTION 1 Spectrite® Sealed Feedthroughs			
Series	Illustration	Features	Notes
PF	 Feedthroughs for single elements	• Seals on probes, sensors, small-bore tubes and other similar elements • Immersion length of the element can be easily adjusted • Vacuum to 700 bar	These feedthroughs are designed for sealing single elements, usually sensors, probes or tubes, where they penetrate a pressure or environmental boundary.
MF	 Feedthroughs for multiple elements	• Saves time and costs as multiple sensors pass through one feedthrough • Immersion length of the element can be easily adjusted • Vacuum to 700 bar	A single access port into an enclosure or process vessel is all that is needed to allow multiple probes, sensors, etc., to pass through an environmental or pressure boundary using a single feedthrough assembly.
WF	 Feedthroughs for multiple probes and wires	• Seal on Kapton® insulated copper or thermocouple wires - Series WFS • Seal on bare wires carrying instrumentation voltages / currents - Series WFR • Seal on small diameter sheathed sensors up to 3.2mm dia. - Series WFP	When multiple wires must pass through a pressure boundary, series WF feedthroughs can provide an efficient seal without recourse to epoxies or other non-adjustable fixture methods.
EF	 High voltage/current electrode feedthrough	• Copper or stainless steel electrodes • Three sizes of feedthrough assembly • Rated for use at 2KV up to 200A • Vacuum to 700 bar	The integral electrode mounted in these feedthroughs enables specifiers to provide high-voltage, high-current supplies in process enclosures, autoclaves, vacuum furnaces and reactor vessels to power heaters, electric motors and other devices needing high power supply.
HF	 High density wire feedthrough	• Saves time and costs as multiple sensor wires pass through one feedthrough • Sealed tubes with continuous, multiple, insulated conductors - without epoxies or glues • Copper or thermocouple material wires	A PTFE-lined, stainless steel tube is swaged over multiple, insulated, single-core copper and/or thermocouple-material wires to make a continuous wire, high-density, sealed feedthrough tube. These are used for thermocouples, resistance thermometers and low voltage instrumentation.



Ask us about our dedicated

ATEX / IECEx Spectrite® Sealed Feedthrough Catalogue

featuring full feedthrough technical specifications, selection guide and ordering information. Contact one of our engineers on **01-4146980** to request your copy.



Notes for Intrinsically Safe Applications

Specifying Sensors for Ex ia/Ex ib Circuits

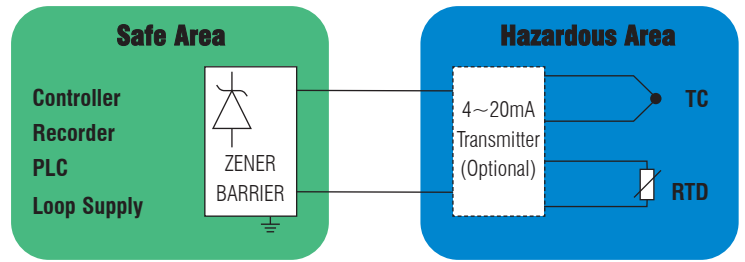
All thermocouple and RTD sensors shown in this catalogue are suitable for use in intrinsically safe (IS) applications when used with an appropriate barrier. The full classification is Ex II 1 GD Ex ia IIC Ga/IIC Da for pot seal and Stainless Steel head terminations. Where Aluminum terminal heads are used, the classification is Ex II 2 GD Ex ib IIC Gb/IIC Db. The mineral insulated construction gives suitable insulation resistance (minimum 1000 M Ω) to guarantee conformance. Extension leads can be supplied with blue outer sheaths upon request.

The barrier isolates the signal from the hazardous area and no further certification of the sensor is necessary.

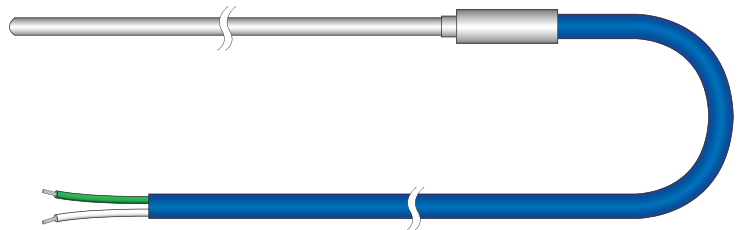
When a 4~20mA transmitter is selected this is also Ex ia approved. When specifying sensors for IS areas please add IS after the type reference i.e.

52-IS and we will provide the following documentation with the order:

- Ex ia/Ex ib certificate of conformity & letter of conformity from our notified body
- Ex ia/Ex ib tags
- ATEX certificate for transmitter (if required)



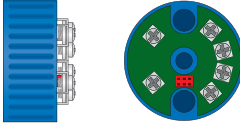
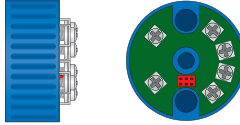
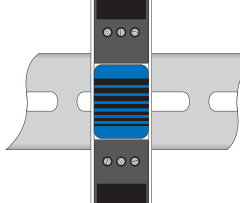
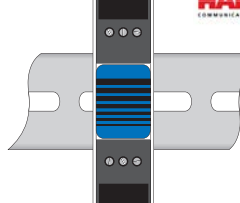
Example of an IS circuit.

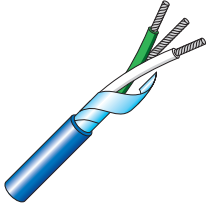
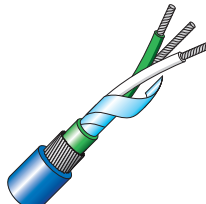
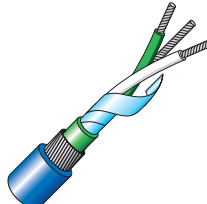
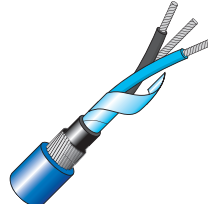


Example of an IS sensor.

Other Products available from TC to help complete your IS installation

(Please contact our sales engineers for further information and pricing)

4 to 20mA Transmitters			
 TXISO/ATEX ATEX Approved Head Mounted Transmitter • Approved to: Ex II 1 G Ex ia IIC Ga • Accepts input from all thermocouple and RTD sensors • Fully isolated and temperature linearised • Can be user configured with optional software kit	 TXISO/HART/ATEX HART® Protocol ATEX Approved Head Mounted Transmitter • Approved to: Ex II 1 G Ex ia IIC Ga • Accepts input from all thermocouple and RTD sensors • Fully isolated and temperature linearised • Can be configured by both HART enabled devices and software kit	 TDISO/ATEX ATEX Approved DIN Rail Mounted Transmitter • Approved to: Ex II 1 G Ex ia IIC Ga • Accepts input from all thermocouple and RTD sensors • Fully isolated and temperature linearised • Can be user configured with optional software kit	 TDISO/HART/ATEX HART® Protocol ATEX Approved DIN Rail Mounted Transmitter • Approved to: Ex II 1 G Ex ia IIC Ga • Accepts input from all thermocouple and RTD sensors • Fully isolated and temperature linearised • Can be configured by both HART enabled devices and software kit

Thermocouple Cables			Instrument Cables	
 GS29 XLPE insulated, Twisted with Screen (LSF) One pair of 16/0.2mm (0.5mm²) stranded conductors. Cores XLPE insulated. Pair twisted, screened with Mylar® aluminium tape and drain wire. LSF bedded. LSF sheathed overall (blue).	 GS94 XLPE insulated, Twisted with Screen and Armour (LSF) One pair of 16/0.2mm (0.5mm²) stranded conductors. Cores XLPE insulated. Pair twisted, screened with Mylar® aluminium tape and drain wire. LSF bedded. Steel wire armoured and LSF sheathed (blue).	 GS95 XLPE insulated, Twisted with Screen and Armour (LSF) One pair of 24/0.2mm (0.75mm²) stranded conductors. Cores XLPE insulated. Pair twisted, screened with Mylar® aluminium tape and drain wire. LSF bedded. Steel wire armoured and LSF sheathed (blue).	 M6101/BLUE BS5308 Part 1, Type 1 Instrument Cable 16/0.2mm (0.5mm²) copper conductors Polyethylene insulated. 2 cores twisted and screened with Mylar® aluminium tape and drainwire. FR PVC sheathed (blue).	 M6101/SWA/BLUE BS5308 Part 1, Type 2 Instrument Cable 16/0.2mm (0.5mm²) copper conductors Polyethylene insulated. 2 cores twisted and screened with Mylar® aluminium tape and drainwire. PE bedded. Steel wire armoured and FR PVC sheathed (blue).

General Specifications and Further Information

Process Connections

Feedthrough bodies can be specified with a choice of threaded process connections. Feedthroughs with the common tapered threadforms, BSPT (conical gas thread or 'R' thread) to BS21, DIN 2999 ISO 7/1 & JIS B0203 and NPT (national pipe tapered thread) to ANSI/ASME B1.20.1 are generally stocked items.

Feedthroughs with parallel threaded process connections, BSPP (parallel gas thread or 'G' thread) to BS2779, DIN ISO 228/1 & JIS B0202 UNF/UNEF to ANSI/ASME B1.20.1, PG to DIN 40430, ET to BS31 and ISO metric to DIN13, may also be specified. Feedthroughs with parallel mounting threads need an 'O' ring or a gasket seal (not supplied) to prevent leakage at the process connection.

Installation Guidelines:

Stand-Off Length: Our sensors are passive units and are not self-heating. However heat transfer along the sheath shall be considered when positioning the sensor in the process to maintain the temperature rating of the end seal termination. See value L2 shown on the typical installation diagram. The below table gives guidance for stand-off length based on the process temperature⁽¹⁾.

T Class: All the sensors and feedthroughs shown on this catalogue can be used with service temperatures up to 1250°C dependant on the sheath material used. Typically the hazardous area protection concept is applied to the portion of the assembly outside the process boundary as shown below. When selecting the appropriate sensor design for your application, overall temperature class shall be determined by either:

- (a) determined by process temperature as stated in the table below.
Or (b) The temperature class may be determined by temperature measurement on the actual installation. This must be performed when no flammable atmosphere is present. The overall temperature class of the assembly shall be established at the point of exit through the boundary wall into the zoned area. To ensure safe use both calculations (stand-off length to maintain end seal rating and overall t class of assembly) shall be considered.

Process Temperature (Tp) [°C]	Temperature class of the assembly	Max. surface temperature of the assembly at process installation point [°C]	To maintain temperature rating of end seal termination (Guideline values, see note ⁽¹⁾)	
			Recommended Stand-off L2 (mm) for pot seal and termination entry gland terminations ⁽²⁾	Recommended Stand-off L2 (mm) for terminal head terminations ⁽³⁾
≤80	T6	85°C	60	60
95	T5	100°C	75	75
130	T4	135°C	90	90
190	T3	200°C	105	165
290	T2	300°C	120	200
440	T1	450°C	130	210
>440	Tp + 10	Tp + 10	130	210

⁽¹⁾ The values given are considered "worst-case" for assemblies in a vertical installation. If method (b) is used to calculate overall t class then shorter stand-off lengths may also be considered by the same method.

⁽²⁾ Values for a standard resin filled pot seal with 90°C rating. High temperature pot seals can achieve shorter stand-off lengths which shall be calculated by temperature measurement on the actual installation as per method (b) above.

⁽³⁾ Terminal head terminations have a maximum rating of 60°C.

If you are in any doubt about whether your application meets the requirements of any of the mentioned standards in this catalogue, TC Measurement & Control Ltd recommend that independent advice be taken from the appropriate approving body. The technical data and guideline information presented in this publication is provided in good faith; however, no warranty, express or implied is given whatsoever as to its accuracy, and no liability is accepted for any errors or omissions. The suitability of any products described herein for a particular application is entirely at the discretion of the purchaser as being the best judge for that particular application.



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UKAS Calibration

We offer a full UKAS calibration service from our in-house accredited laboratory. With the drive towards higher product quality standards and energy efficiency, end users are demanding more certainty and traceability from the products they purchase.



A speedy, economical and reliable calibration service is provided in all respects. Our application engineers who have all been trained in our laboratory are available if required to give assistance in recommending a calibration strategy suitable for your application. Whilst there are some limitations as to which sensors can be calibrated, we can, if necessary custom build sensors in order to meet both the requirements of the application as well as the relevant calibration equipment.

