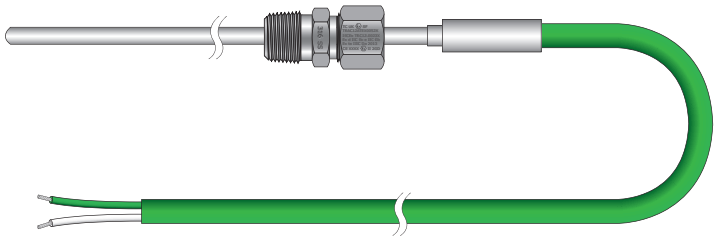
# ATEX / IECEx Thermocouples with Pot Seal

## 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. Please see page 14 for our full range of fittings.

- **Approved to II 2 GD Ex d IIC Gb (Gas) and Ex tb IIIC Db (Dust)**
- **Also suitable for use in intrinsically safe areas to Ex II 1 G Ex ia IIC Ga, see page 19 for details**
- **Temperature classification T6-T1, see page 20 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**

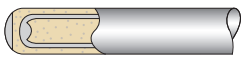


*The above sensor must be installed using the compression fitting supplied to maintain Ex d / Ex tb approval. For Ex ia applications a compression fitting is not required to maintain approval*

| 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 |
| 310 | 310 Stainless Steel (Type K) | Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. Has high oxidisation 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<br>2ID<br>2IT |  | **INSULATED**<br>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.<br><br>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 (105ºC) (Termination: 3P2L seal, temperature rating **90ºC**) |  |
| B55 | PFA Insulation (250ºC) (Termination: 3P2LA seal, temperature rating **230ºC**) |  |

** 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

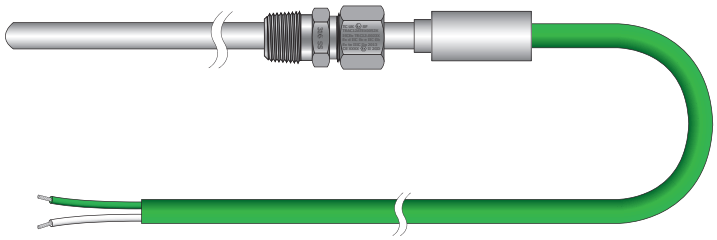
| Type Nº | I.S. Version (Optional, please see page 19 for details) | Thermocouple Type (See section 1) | Sheath Length in mm | Sheath Material (See section 2) | Sheath Diameter (See section 3) | Sensing Junction (See section 4) | Termination (Pot seal, see section 5) | Extension Cable (See section 5) | 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. Please see page 14 for our full range of fittings.

- **Approved to II 2 GD Ex d IIC Gb (Gas) and Ex tb IIIC Db (Dust)**
- **Also suitable for use in intrinsically safe areas to Ex II 1 G Ex ia IIC Ga, see page 19 for details**
- **Temperature classification T6-T1, see page 20 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**

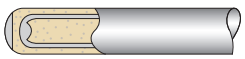


*The above sensor must be installed using the compression fitting supplied to maintain Ex d / Ex tb approval. For Ex ia applications a compression fitting is not required to maintain approval*

| 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 |
| 310 | 310 Stainless Steel (Type K) | Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. Has high oxidisation 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 temperaturess. 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<br>2ID<br>2IT |  | **INSULATED**<br>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.<br><br>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 (105ºC) (Termination: 3P4CL seal, temperature rating **90ºC**)  |
| B55 | PFA Insulation (250ºC) (Termination: 3P4CLA seal, temperature rating **230ºC**)  |

** 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.*

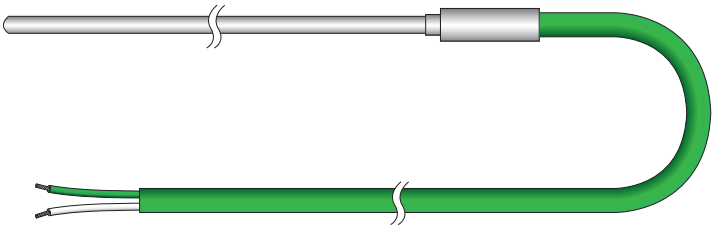
**Order Code** - Example

| Type Nº | I.S. Version (Optional, please see page 19 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 Pot Seal

**Mineral Insulated Thermocouples 0.5mm 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.



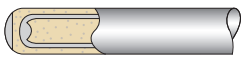
*The above sensor must be terminated in a suitable ATEX / IECEx approved enclosure or box using appropriate glands*

- **Approved to II 3 GD Ex nA IIC Gc (Gas) and Ex tc IIIC Dc (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 0.5mm to 3mm 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.**
- **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 | 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 |
| 310 | 310 Stainless Steel (Type K) | Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. Has high oxidisation 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 | 0.5mm | 0.020" |
| | 1.0mm | 0.039" |
| | 1.5mm | 0.059" |
| | 2.0mm | 0.079" |
| | 3.0mm | 0.118" |

| SECTION 4 | Type of Sensing Junction | |
|---|---|---|
| 2I<br>2ID<br>2IT |  | **INSULATED**<br>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.<br><br>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 **125°C**) |  |
| B55 | PFA Insulation (250°C) (Termination: 3P2LA seal, temperature rating **225°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 |
| 0.5mm | SFS18T05 | – | – |
| 1.0mm | SFS18T10 | SFS14T10 | – |
| 1.5mm | SFS18T15 | SFS14T15 | – |
| 2.0mm | SFS18T20 | SFS14T20 | – |
| 3.0mm | SFS18T30 | SFS14T30 | SFS12T30 |

*Other thread sizes and materials available. Contact us for details.*

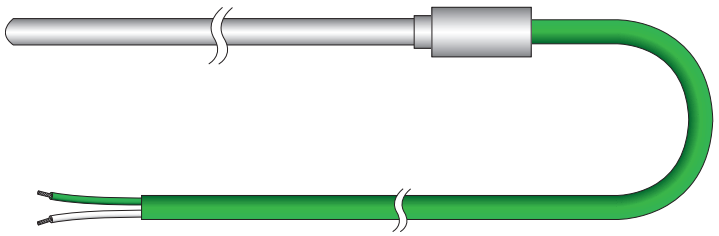
**Order Code** - Example

| Type N° | Thermocouple Type (See section 1) | Sheath Length in mm | Sheath Material (See section 2) | Sheath Dia. (See section 3) | Sensing Junction (See section 4) | Termination (pot seal) | Extension Cable (See section 5) | Compression Fitting (Optional, see section 6) |
|---|---|---|---|---|---|---|---|---|
| 32 | K | 450 | 321 | 3.0 | 2I | 3P2L | 2m A82KX | SFS18T30 |

# 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.



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

- **Approved to II 3 GD Ex nA IIC Gc (Gas) and Ex tc IIIC Dc (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 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.**
- **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 | 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 |
| 310 | 310 Stainless Steel (Type K) | Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. Has high oxidisation 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 temperaturess. 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 |

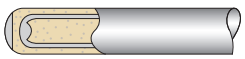
**SECTION 3**

| | 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: 3P4CL seal, temperature rating **125°C**)

**B55** PFA Insulation (250°C) (Termination: 3P4CLA seal, temperature rating **225°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 | SFS18T45 | SFS14T45 | SFS12T45 |
| 6.0mm | SFS18T60 | SFS14T60 | SFS12T60 |
| 8.0mm | – | SFS14T80 | SFS12T80 |

*Other thread sizes and materials available. Contact us for details.*

**Order Code** - Example

| Type N° | Thermocouple Type (See section 1) | Sheath Length in mm | Sheath Material (See section 2) | Sheath Dia. (See section 3) | Sensing Junction (See section 4) | Termination (pot seal) | Extension Cable (See section 5) | Compression Fitting (Optional, see section 6) |
|---|---|---|---|---|---|---|---|---|
| 32 | J | 450 | 321 | 6.0 | 2I | 3P4CLA | 2m B55JX | SFS12T60 |