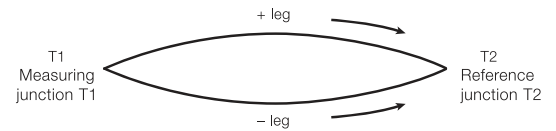


## 1. Operating Principles

A thermocouple consists of two wires, each made of a different metal, welded together at one end to form a circuit as shown in Fig.16. When a temperature different is produced between T1 and T2 by heating one end or by other means, a thermoelectromotive force specific to the metals used is produced in the circuit. This pair of wires is called a thermocouple and this effect, named after its discoverer, is known as the Seebeck effect. The effect is used to measure temperature. Three laws have been established concerning thermocouple characteristics. The first is the law of homogeneity. The second is the law of intermediate metals that no thermoelectromotive force is produced even when a different metal is inserted in the circuit as long as the temperature of its junctions is the same. The third is the law of successive or intermediate temperature that when the circuit has an intermediate junction, its thermoelectromotive force is added if the material used is the same.



Principles of Thermocouple Construction (Fig.16)

## 2. Thermocouple Type and Their Features (JIS-C 1602-1981) (Table 10)

Material symbol	Main materials		Operating temp. range (°C)		Features
	+ leg	- leg	In normal application	In overheated application	
B	Pt 70, Rh 30	Pt 94, Rh 6	1500	1700	Operates at the highest temperature of all JIS types.
R	Pt 87, Rh 13	Pt 100	1400	1600	The most widely used platinum type.
S	Pt 90, Rh 10	Pt 100	1400	1600	Widely used in Europe and U.S.A. All platinum type thermocouples are vulnerable to reducing atmosphere.
K	Ni, Cr	Ni, A	650~1000	850~1200	Extensively used because of wide operating temperature range, but vulnerable to reducing atmosphere.
E	Ni, Cr	Ni, Cu	450~700	500~800	Produces highest thermoelectromotive force of all JIS types.
J	Fe	Ni, Cu	400~600	500~750	Resistant to reducing atmosphere, but + leg has a tendency to oxidize.
T	Cu	Ni, Cu	200~300	250~350	Resistant to reducing atmosphere. Retains good characteristics down to relatively low temperature (300°C).

## 3. Non JIS Thermocouples (Table 11)

Material symbol	Main materials		Operating temp. range (°C)		Features
	+ leg	- leg	In normal application	In overheated application	
PR 13	Pt 87.3, Rh12.7	Pt 100	1400	1600	Dropped from JIS in 1981, Same characteristics as R type.
PR 20-40	Pt 60, Rh 40	Pt 80, Rh 20	1700	1900	Operates at the highest temperature of all platinum types.
WRe 0-26	W	W 74, Re 26	2000	2200	Very vulnerable to oxidizing atmosphere. Used in vacuum or inert gas.
WRe 5-26	W 95, Re 5	W 74, Re 26	2100	2300	+ leg contains 5% Re to increase strength.
AF	Ni, Cr	Au, Fe	+100~-269		Gold, iron - chromel thermocouple. Used in cryogenic application.
N	Ni, Cr	Ni, Si	650~1100	700~1200	Developed to replace the K thermocouple. Stable.
Ni-Mo	Ni	Ni 82, Mo 18	1000	1200	Used in high temperature up to 1200°C. Not for use in oxidizing atmosphere.
PN	Pt, Pd, Au	Pd, Au	1200	1300	Similar thermoelectromotive force to the K thermocouple. Used at relatively high temperature.

## 4. Temperature Tolerance of Thermocouples (Table 12)

Material symbol	Former symbol	Measuring temp. range	Class	Tolerance *
B	-	600°C up to 1700°C	Class 0.5	± 4°C or ± 0.5% of measuring temp.
R	-	0°C up to 1600°C	Class 0.25	± 1.5°C or ± 0.25% of measuring temp.
S				
K	CA	0°C up to 1000°C	Class 0.4	± 1.5°C or ± 0.4% of measuring temp.
		0°C up to 1200°C	Class 0.75	± 2.5°C or ± 0.75% of measuring temp.
		-200°C up to 0°C	Class 1.5	± 2.5°C or ± 1.5% of measuring temp.
E	CRC	0°C up to 800°C	Class 0.4	± 1.5°C or ± 0.4% of measuring temp.
		0°C up to 800°C	Class 0.75	± 2.5°C or ± 0.75% of measuring temp.
		-200°C up to 0°C	Class 1.5	± 2.5°C or ± 1.5% of measuring temp.
J	IC	0°C up to 750°C	Class 0.4	± 1.5°C or ± 0.4% of measuring temp.
		0°C up to 750°C	Class 0.75	± 2.5°C or ± 0.75% of measuring temp.
T	CC	0°C up to 350°C	Class 0.4	± 0.5°C or ± 0.45% of measuring temp.
		0°C up to 350°C	Class 0.75	± 1°C or ± 0.75% of measuring temp.
		-200°C up to 0°C	Class 1.5	± 1°C or ± 1.5% of measuring temp.

\* Tolerance is the maximum allowable difference between the temperature converted from the thermoelectromotive force according to the reference thermoelectromotive force table and the actual temperature of the measuring junction, it is the large of the two values.



Base metal thermowell assemblies are manufactured from drilled bar stock and have threaded NPT process connections or flanges for direct immersion into high pressure or corrosive applications. Base Metal Thermocouple types are composed of common, inexpensive metals such as nickel, iron and copper. The thermocouple element can be constructed of ceramic insulated thermocouple wires or mineral insulated cable for increased durability.

Type	J, K, T, E, N
Element size (MI)	3.0, 3.2, 4.8, 6.0, 6.4, 8.0 mm, Other sizes on request
Element size (Non-MI)	1.6, 2.0, 3.0, 3.2, 4.8, 6.0, 8.0, 9.5, 10 mm, Other sizes on request
Sheath Material	SS304, SS316, SS310, Inconel
Thermowell Material	HRS 446, INCONEL-600/601/800, Nickel, Hastalloy Titanium, Tantalum Sleeve, Ceramic 610 & C -799, Silicon Carbide, Monel etc
Configuration	Simplex/ Duplex/Multipoint

MI Thermocouple



Mineral insulated thermocouples consist of an outer metal sheath which protects the thermocouple elements from damage and contamination, this sheath is malleable so mineral insulated thermocouples can be easily bent and formed into a variety of shapes to suit your application. The inner thermocouple elements are insulated with magnesium oxide powder, tightly packed so no air is trapped inside, this provides great thermal conductivity. This construction provides an incredibly durable temperature sensor that can be adapted to a wide variety of applications.

Type	J, K, T, E, N, R, S
Element size (MI)	0.25, 0.5, 1.0, 1.5, 3.0, 4.5, 6.0, 8.0 mm Other sizes on request
Sheath Material	SS321, SS316, SS310, HRS 446, Inconel 600, Nimonic, Pyrosil, Platinum etc.
Configuration	Simplex/Duplex/Multipoint
Configuration	<ul style="list-style-type: none"> <li>• Miniature Thermocouples with minimum 0.25 mm Dia</li> <li>• Swaged Tip Thermocouples</li> <li>• Tube Temperature Skin Type Thermocouples</li> <li>• Special Sensors as per ASTM-E235 for critical application</li> <li>• High Wall Thickness</li> </ul>

## Noble Metal Thermocouple



Noble Metal Thermocouples are manufactured with precious or noble metals like Platinum and Rhodium. Noble metal thermocouples can be used in oxidizing or inert applications and must be used with a ceramic protection tube surrounding the thermocouple element. Noble Metal thermocouples are designed for high temperature applications, where it is essential that the thermocouple withstands the damaging effects of oxidation and corrosion.

Type	R, S, B
<b>Element Diameter</b>	0.30, 0.35, 0.4, 0.45, 0.5 mm, Other sizes on request
<b>Sheath Material</b>	Recrystallized Alumina Ceramic(C-799), 610, Inconel, Silicon Carbide, Platinum etc
<b>Configuration</b>	Simplex/Duplex/Multipoint
<b>Configuration</b>	<ul style="list-style-type: none"> <li>• Hot Blast &amp; Stove Dome Thermocouples</li> <li>• Tri Level Thermocouples</li> <li>• Crown Thermocouples</li> </ul>

## Refractory Thermocouples



Refractory Thermocouples are designed for use in oxidizing, neutral and reducing environments. Refractory Metal Thermocouples are manufactured with wire that is made from the exotic metals tungsten and Rhenium. These metals are expensive, difficult to manufacture and wires made with these metals are very brittle. Applications in all type of furnaces can be measured with these types of sensors. All standard refractory metal and noble metal thermocouple alloys are available in High-Temperature Thermocouples are defined as sensors used at temperatures of 2300°C and beyond.

Type	G, C, D
<b>Element Diameter</b>	1.6, 3.2, 6.4, 8.0 mm
<b>Sheath Material</b>	Tantalum, Molybdenum, Inconel 600, Ceramic etc
<b>Configuration</b>	SS316 or INCONEL
<b>Configuration</b>	Magnesium Oxide, Aluminium Oxide, Beryllium Oxide, Hafnium Oxide

**MT 1003**



Thermocouple, complete with small aluminium enclosure (IP65 rating), 304, 316, Inconel stainless steel sheath, constructed using mineral insulated cable, ungrounded junction.

Calibration	Diameter	Part No.	Ø	length
K	3mm	MT 1003 - K -	<input type="text" value="030"/>	- <input type="text"/>
K	6mm	MT 1003 - K -	<input type="text" value="060"/>	- <input type="text"/>
K	8mm	MT 1003 - K -	<input type="text" value="080"/>	- <input type="text"/>
J/T/E	5mm	MT 1003 - J -	<input type="text" value="050"/>	- <input type="text"/>
J/T/E	6mm	MT 1003 - J -	<input type="text" value="060"/>	- <input type="text"/>
J/T/E	8mm	MT 1003 - J -	<input type="text" value="080"/>	- <input type="text"/>

Insert part number when ordering diameter and length, eg. 6mm diameter 250mm long = MT 1003 - K -  -

**MT 1004**



Thermocouple, complete with large aluminium enclosure (IP65 rating), 304, 316, Inconel stainless steel sheath, constructed using mineral insulated cable, ungrounded junction.

Calibration	Diameter	Part No.	Ø	length
K	6mm	MT 1004 - K -	<input type="text" value="060"/>	- <input type="text"/>
K	8mm	MT 1004 - K -	<input type="text" value="080"/>	- <input type="text"/>
K	12mm	MT 1004 - K -	<input type="text" value="120"/>	- <input type="text"/>
J/T/E	6mm	MT 1004 - J -	<input type="text" value="060"/>	- <input type="text"/>
J/T/E	8mm	MT 1004 - J -	<input type="text" value="080"/>	- <input type="text"/>
J/T/E	12mm	MT 1004 - J -	<input type="text" value="120"/>	- <input type="text"/>

Insert part number when ordering diameter and length, eg. 6mm diameter 250mm long = MT 1004 - K -  -

**MT 1003a**



As for Model 101 complete with 1/2" BSP small enclosure 316 stainless steel fixed nipple, sanitary weld.

Calibration	Diameter	Part No.	Ø	length
K/J/T/E	3mm	MT 1003a -	<input type="text" value="030"/>	- <input type="text"/>
K/J/T/E	6mm	MT 1003a -	<input type="text" value="060"/>	- <input type="text"/>
K/J/T/E	8mm	MT 1003a -	<input type="text" value="080"/>	- <input type="text"/>

Insert part number when ordering diameter and length, eg. 3mm diameter 250mm long = MT 1003a -  -

**MT 1004a**



As for Model 102 complete with 1/2" BSP large enclose 316 stainless steel fixed nipple, sanitary weld.

Calibration	Diameter	Part No.	Ø	length
K/J/T/E	6mm	MT 1004a -	<input type="text" value="060"/>	- <input type="text"/>
K/J/T/E	8mm	MT 1004a -	<input type="text" value="080"/>	- <input type="text"/>
K/J/T/E	12mm	MT 1004a -	<input type="text" value="120"/>	- <input type="text"/>

Insert part number when ordering diameter and length, eg. 6mm diameter 250mm long = MT 1004a -  -

Thermocouples 2000 Series

**MT 2002**



Thermocouple, complete with 2 metres PVC lead. Fiber glass, screen braided, fiber, teflon, silicone, 304, 316, Inconel stainless steel sheath, constructed using mineral insulated cable, undergrounded junction.

Calibration	Diameter	Part No.	Ø	length
K	1mm	MT 2002 - K -	<input type="text" value="010"/>	- <input type="text"/>
K	1.5mm	MT 2002 - K -	<input type="text" value="015"/>	- <input type="text"/>
K	3mm	MT 2002 - K -	<input type="text" value="030"/>	- <input type="text"/>
J/T/E	3mm	MT 2002 - J -	<input type="text" value="030"/>	- <input type="text"/>
J/T/E	4.5mm	MT 2002 - J -	<input type="text" value="045"/>	- <input type="text"/>
J/T/E	6mm	MT 2002 - J -	<input type="text" value="060"/>	- <input type="text"/>

Insert part number when ordering diameter and length, eg. 6mm diameter 250mm long = MT 2002 - K -  -

**MT 2002a**



Thermocouple, complete with standard plug and tube adaptor, 304, 316, Inconel stainless steel sheath, constructed using mineral insulated cable, ungrounded junction.

Calibration	Diameter	Part No.	Ø	length
K	3mm	MT 2002a - K -	<input type="text" value="030"/>	- <input type="text"/>
K	4.5mm	MT 2002a - K -	<input type="text" value="045"/>	- <input type="text"/>
K	6mm	MT 2002a - K -	<input type="text" value="060"/>	- <input type="text"/>
J/T/E	3mm	MT 2002a - J -	<input type="text" value="030"/>	- <input type="text"/>
J/T/E	4.5mm	MT 2002a - J -	<input type="text" value="045"/>	- <input type="text"/>
J/T/E	6mm	MT 2002a - J -	<input type="text" value="060"/>	- <input type="text"/>

Insert part number when ordering diameter and length, eg. 3mm diameter 250mm long = MT 2002a - K -  -

**MT 401**



Thermocouple, complete with ceramic terminal block, constructed using ceramic insulators over 8/3.2 AWG thermocouple grade wire.

Calibration	Part No.	length
K	MT 401 - K -	<input type="text"/>

**MT 402**



Thermocouple, complete with aluminium encloser, stainless steel support tube, enclosed within ceramic sheath.

Calibration	Part No.	length
K	MT 402 - K -	<input type="text"/>
R	MT 402 - R -	<input type="text"/>
S	MT 402 - S -	<input type="text"/>

Thermocouples MT-BYN Series

**YM3**



Bayonet cap type. Thermocouple complete with spring clamp and bayonet cap, constructed using thermocouple grade wires screen braided over fiber 4.8/6mm and/or screen braided over fiber glass (Round) diameter tip section, grounded junction.

Calibration	Part No.	length
K	MT - BYN - K -	<input type="text" value="1000"/>
J/T/E	MT - BYN - J -	<input type="text" value="1000"/>

**Adaptors**

Single pin 1/8" BSP thread to suit Model MT-BYN



Part No.
BF4
BF5
BF6
BF9

**MT-TCE 50**

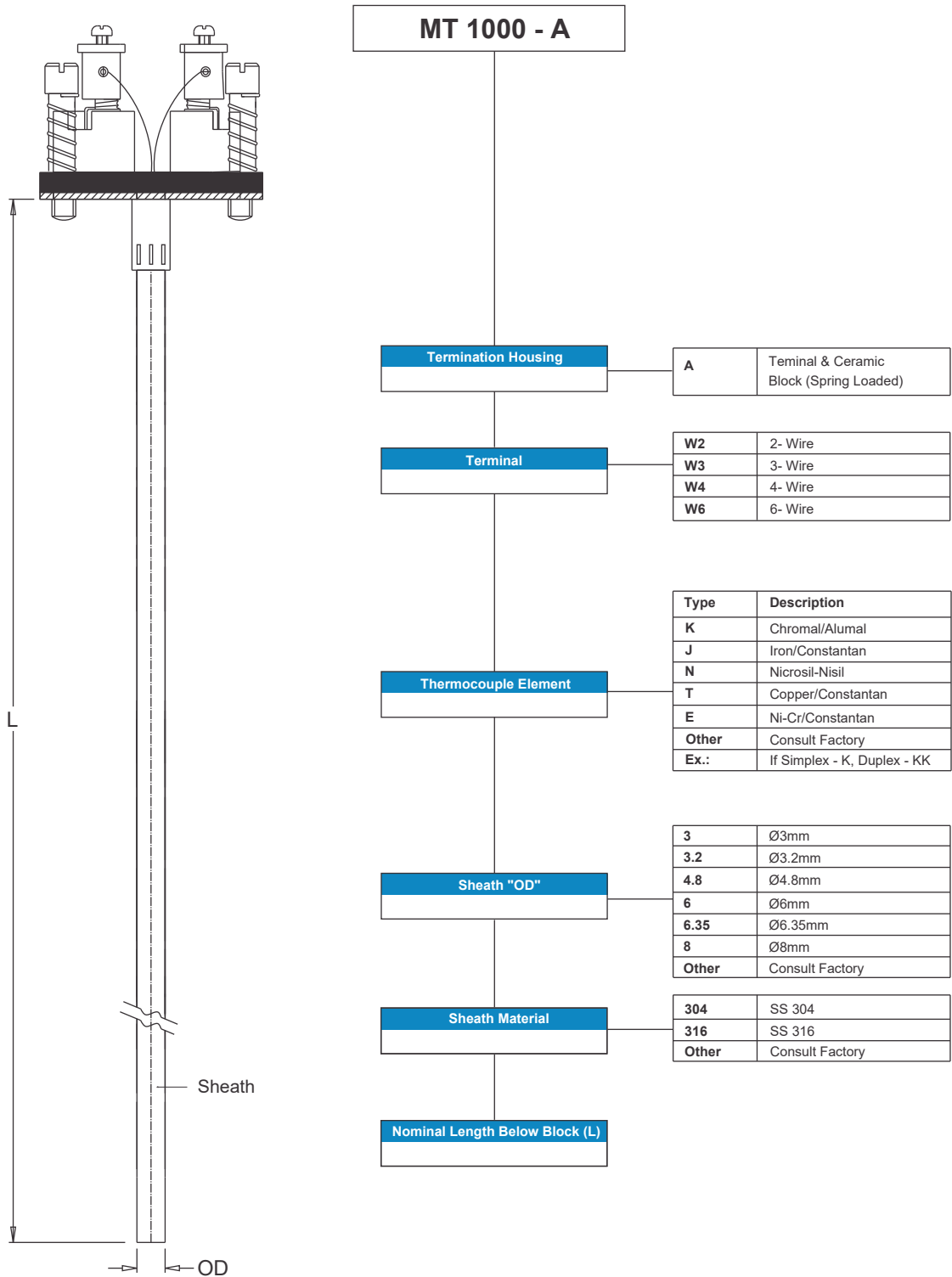
Bolt type 1/4 BSW thread. Thermocouple complete with swivel retaining bolt, constructed using thermocouple grade screen braided over fiber, grounded junction.



Calibration	length	Part No.
K	2M	MT-TCE 50K

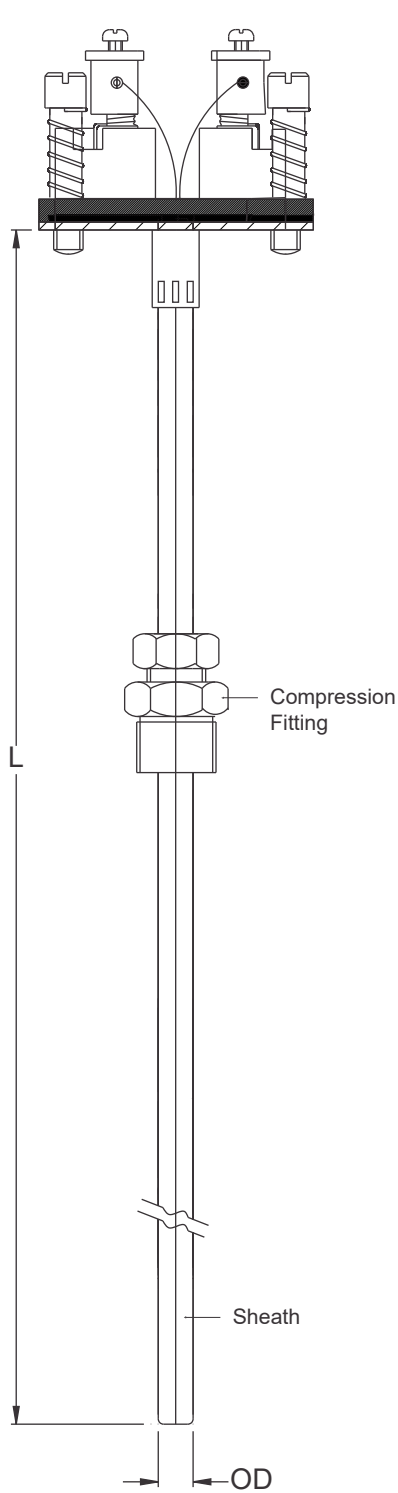
\*optional bolt M6/M8, ungrounded

# THERMOCOUPLE INSERT





# THERMOCOUPLE INSERT WITH COMPRESSION FITTING



MT 1000 - B

Termination Housing	A	Terminal & Ceramic Block (Spring Loaded)
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Terminal	W2	2- Wire
	W3	3- Wire
	W4	4- Wire
	W6	6- Wire

Thermocouple Element	Type	Description
	K	Chromal/Alumal
	J	Iron/Constantan
	N	Nicrosil-Nisil
	T	Copper/Constantan
	E	Ni-Cr/Constantan
	Other	Consult Factory
	Ex.:	If Simplex - K, Duplex - KK

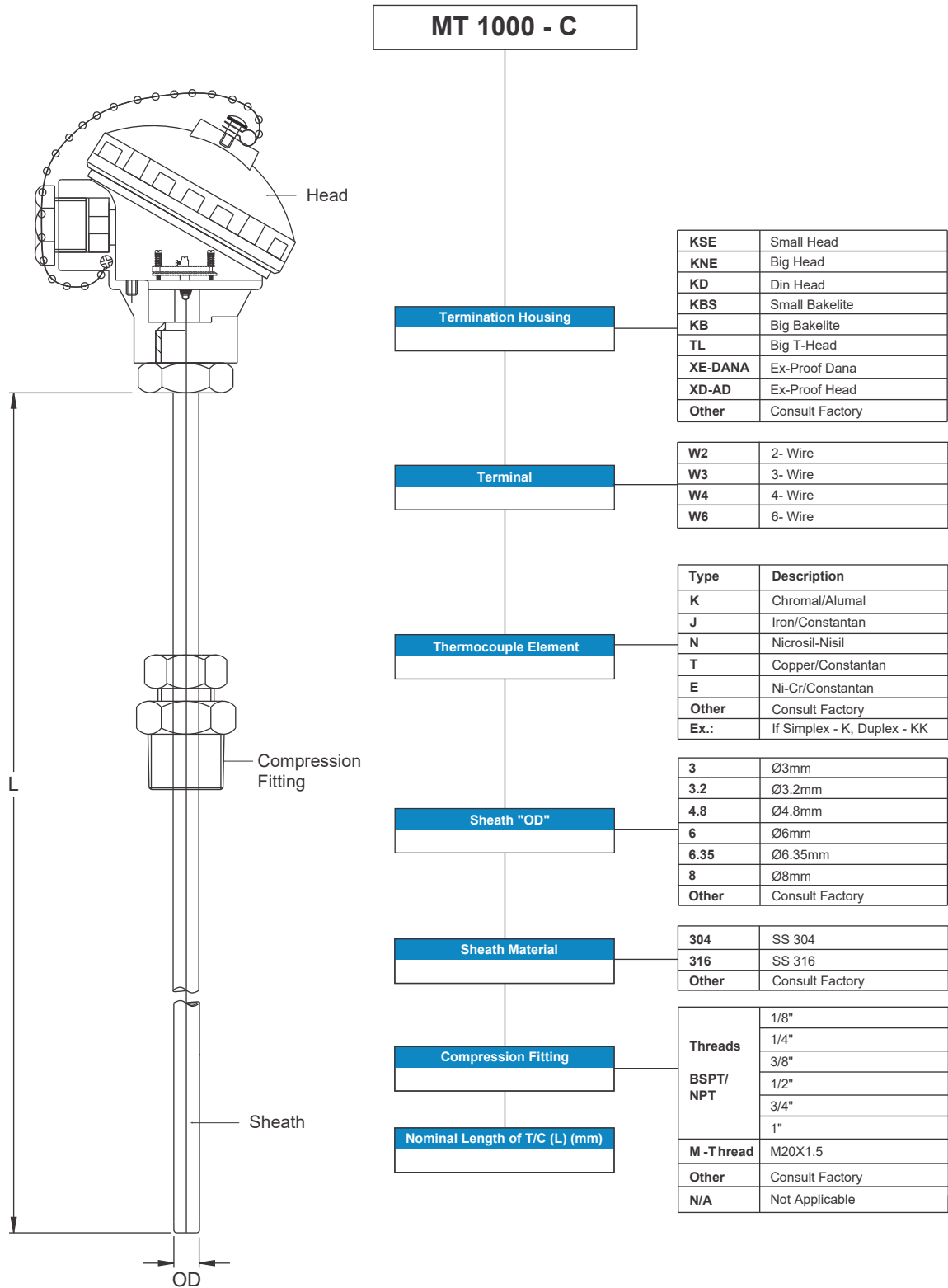
Sheath "OD"	3	Ø3mm
	3.2	Ø3.2mm
	4.8	Ø4.8mm
	6	Ø6mm
	6.35	Ø6.35mm
	8	Ø8mm
	Other	Consult Factory

Sheath Material	304	SS 304
	316	SS 316
	Other	Consult Factory

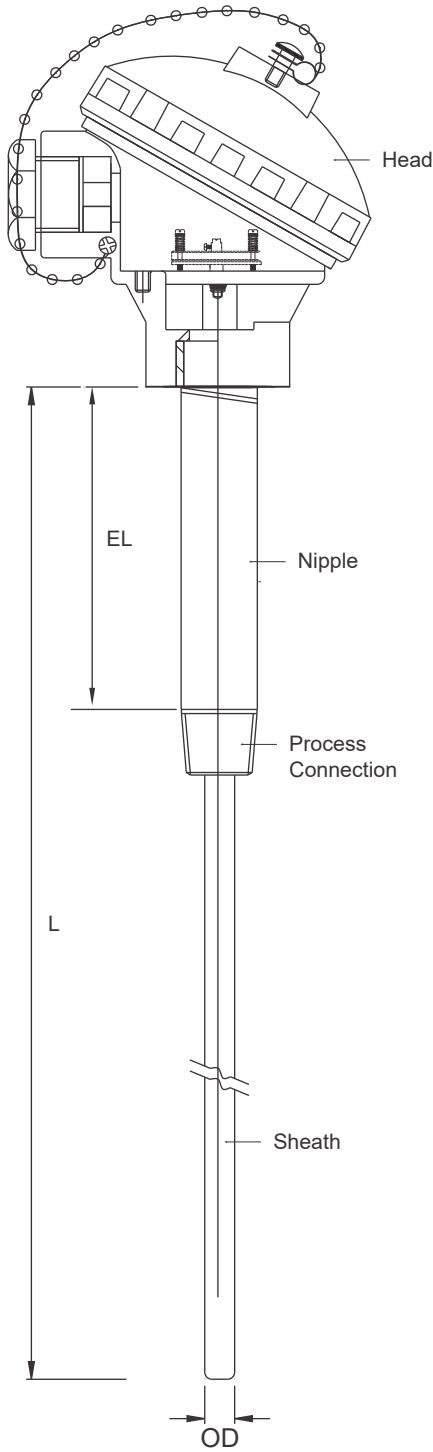
Compression Fitting	Threads	1/8"
		1/4"
		3/8"
	BSPT/ NPT	1/2"
		3/4"
		1"
	M - T thread	M20X1.5
	Other	Consult Factory
	N/A	Not Applicable

Nominal Length of T/C Below TCB (L) (mm)

# THERMOCOUPLE WITH COMPRESSION FITTING



# THERMOCOUPLE WITH NIPPLE



MT 1000 - D

Termination Housing

KSE	Small Head
KNE	Big Head
KD	Din Head
KBS	Small Bakelite
KB	Big Bakelite
TL	Big T-Head
XE-DANA	Ex-Proof Dana
XD-AD	Ex-Proof Head
Other	Consult Factory

Terminal

W2	2- Wire
W3	3- Wire
W4	4- Wire
W6	6- Wire

Thermocouple Element

Type	Description
K	Chromal/Alumal
J	Iron/Constantan
N	Nicrosil-Nisil
T	Copper/Constantan
E	Ni-Cr/Constantan
Other	Consult Factory
Ex.:	If Simplex - K, Duplex - KK

Sheath "OD"

3	Ø3mm
3.2	Ø3.2mm
4.8	Ø4.8mm
6	Ø6mm
6.35	Ø6.35mm
8	Ø8mm
Other	Consult Factory

Sheath Material

304	SS 304
316	SS 316
Other	Consult Factory

Nipple

1/2" SCH 40	OD X ID: 21.3 X 15.7mm
Other	Consult Factory

Compression Fitting

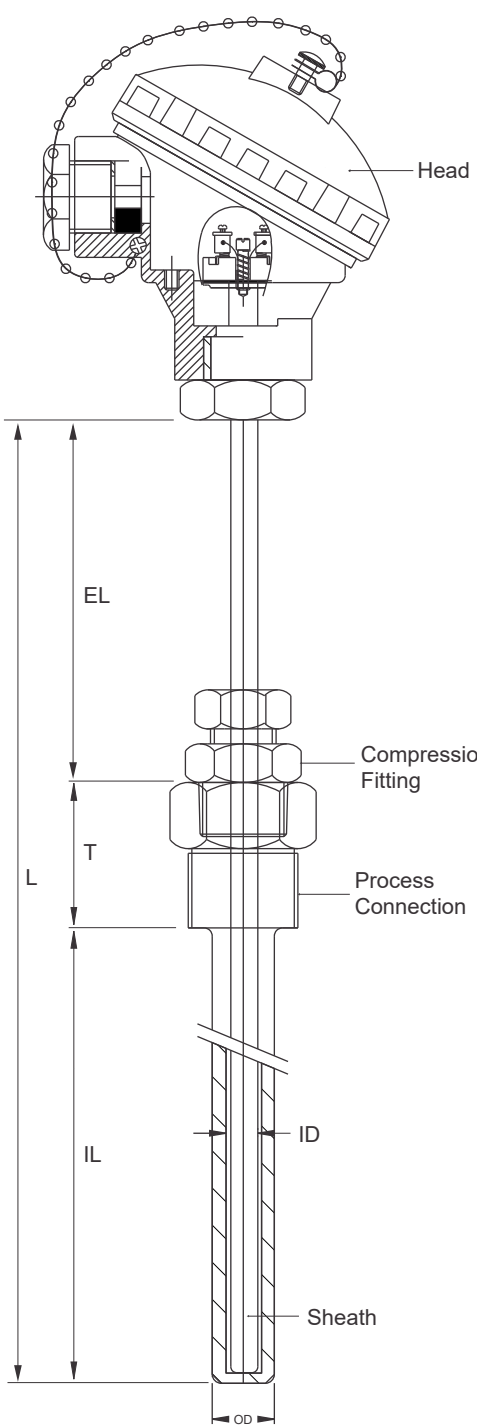
Threads BSPT/ NPT	1/8"
	1/4"
	3/8"
	1/2"
	3/4"
	1"
M - T thread	M20X1.5
Other	Consult Factory
N/A	Not Applicable

Extension Length of (E.L) (mm)

Nominal Length of T/C (L) (mm)

# THERMOCOUPLE WITH THERMOWELL COMPRESSION FITTING

MT 1000 - E



Termination Housing

Terminal

Thermocouple Element

Sheath "OD"

Sheath Material

Thermowell Material

Thermowell OD (mm)

Thermowell ID (mm)

Process Connection

Length of "T" (mm)

Instrument Connection

Insertion Length (I.L.) (mm)

Extension Length (E.L.) (mm)

Nominal Length of T/C "L" (mm)

KSE	Small Head
KNE	Big Head
KD	Din Head
KBS	Small Bakelite
KB	Big Bakelite
TL	Big T-Head
XE-DANA	Ex-Proof Dana
XD-AD	Ex-Proof Head
Other	Consult Factory

W2	2- Wire
W3	3- Wire
W4	4- Wire
W6	6- Wire

Type	Description
K	Chromal/Alumal
J	Iron/Constantan
N	Nicrosil-Nisil
T	Copper/Constantan
E	Ni-Cr/Constantan
Other	Consult Factory
Ex.:	If Simplex - K, Duplex - KK

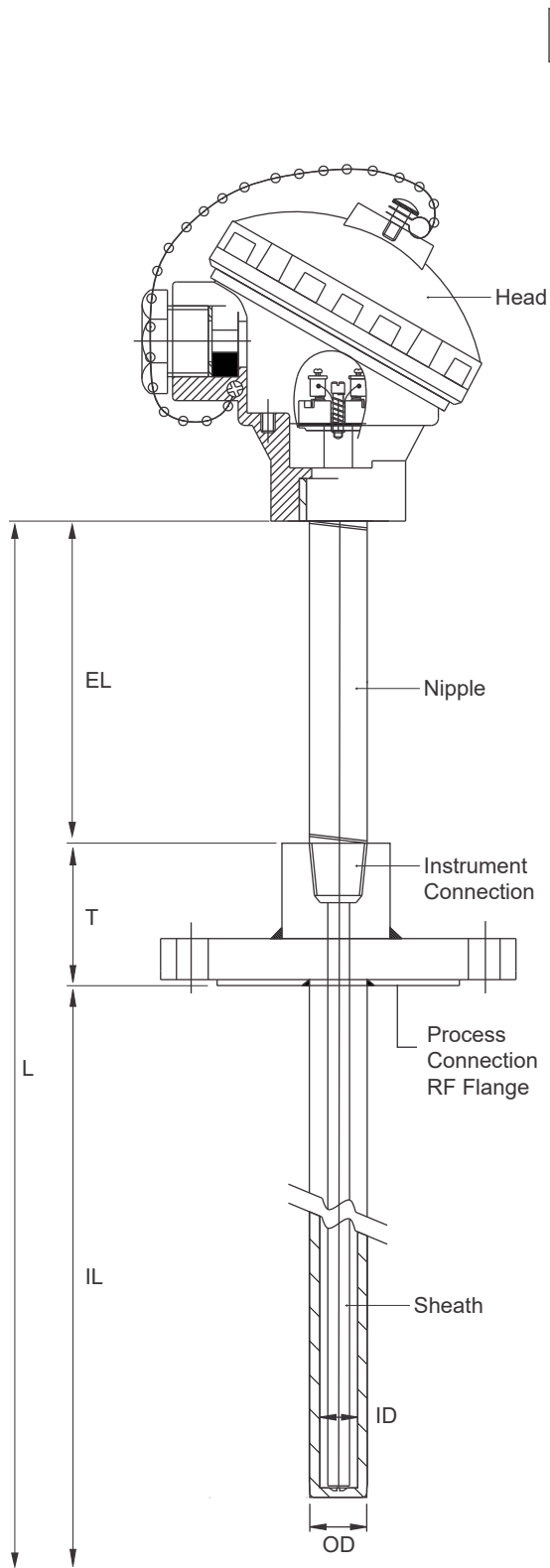
3	Ø3mm
3.2	Ø3.2mm
4.8	Ø4.8mm
6	Ø6mm
6.35	Ø6.35mm
8	Ø8mm
Other	Consult Factory

304	SS 304
316	SS 316
Other	Consult Factory

304	SS 304
316	SS 316
600	Inconel-600
Other	Consult Factory

Threads	1/8"
	1/4"
	3/8"
	1/2"
	3/4"
BSPT/ NPT	1"
M - T thread	M20X1.5
Other	Consult Factory
N/A	Not Applicable

# THERMOCOUPLE WITH NIPPLE & STRAIGHT THERMOWELL



MT 1000 - F

Termination Housing

Terminal

Thermocouple Element

Sheath "OD"

Sheath Material

Thermowell Material

Thermowell OD (mm)

ID (mm)

Nipple

Length of "T" (mm)

Process Connection

Flange Material

Instrument Connection

Insertion Length (I.L.) (mm)

Extension Length (E.L.) (mm)

Nominal Length of T/C "L" (mm)

KSE	Small Head
KNE	Big Head
KD	Din Head
KBS	Small Bakelite
KB	Big Bakelite
TL	Big T-Head
XE-DANA	Ex-Proof Dana
XD-AD	Ex-Proof Head
Other	Consult Factory

W2	2- Wire
W3	3- Wire
W4	4- Wire
W6	6- Wire

Type	Description
K	Chromal/Alumal
J	Iron/Constantan
N	Nicrosil-Nisil
T	Copper/Constantan
E	Ni-Cr/Constantan
Other	Consult Factory
Ex.:	If Simplex - K, Duplex - KK

3	Ø3mm
3.2	Ø3.2mm
4.8	Ø4.8mm
6	Ø6mm
6.35	Ø6.35mm
8	Ø8mm
Other	Consult Factory

304	SS 304
316	SS 316
Other	Consult Factory

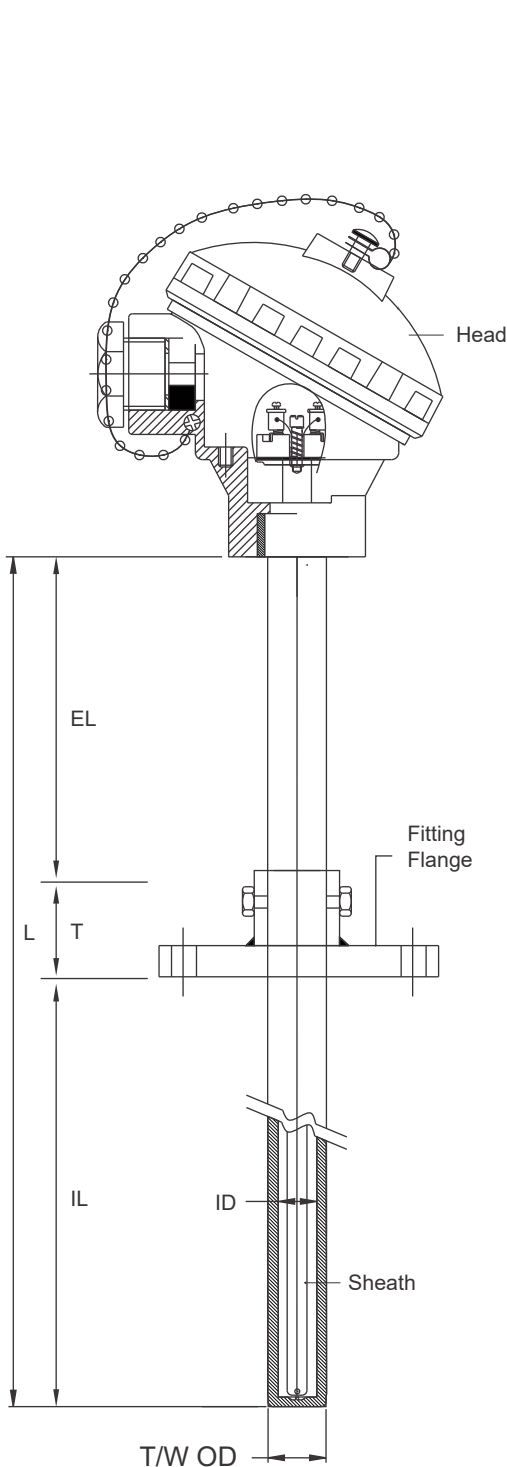
304	SS 304
316	SS 316
600	Inconel-600
Other	Consult Factory

1/2" SCH 40	OD X ID: 21.3 X 15.7mm
Other	Consult Factory

Flange Rating	Flange Size
JIS 5 K JIS 10 K	1/4"
	1/2"
	3/4"
ANSI 150 # ANSI 300 #	1"
	1 1/4"
	1 1/2"
	1 3/4"
	2"
Other	Consult Factory

Threads	1/8"
	1/4"
	3/8"
	1/2"
BSPT/ NPT	1/2"
	3/4"
	1"
M-Thread	M20X1.5
Other	Consult Factory
N/A	Not Applicable

# THERMOCOUPLE WITH ADJUSTABLE FLANGE THERMOWELL



**MT 1000 - G**

**Termination Housing**

**Terminal**

**Thermocouple Element**

**Sheath "OD"**

**Sheath Material**

**Thermowell "OD" (mm)**

**Thermowell "ID" (mm)**

**Thermowell Material**

**Process Connection**

**Flange Material**

**Nominal Length of T/C "L" (mm)**

<b>KSE</b>	Small Head
<b>KNE</b>	Big Head
<b>KD</b>	Din Head
<b>KBS</b>	Small Bakelite
<b>KB</b>	Big Bakelite
<b>TL</b>	Big T-Head
<b>XE-DANA</b>	Ex-Proof Dana
<b>XD-AD</b>	Ex-Proof Head
<b>Other</b>	Consult Factory

<b>W2</b>	2- Wire
<b>W3</b>	3- Wire
<b>W4</b>	4- Wire
<b>W6</b>	6- Wire

Type	Description
<b>K</b>	Chromal/Alumal
<b>J</b>	Iron/Constantan
<b>N</b>	Nicrosil-Nisil
<b>T</b>	Copper/Constantan
<b>E</b>	Ni-Cr/Constantan
<b>Other</b>	Consult Factory
<b>Ex.:</b>	If Simplex - K, Duplex - KK

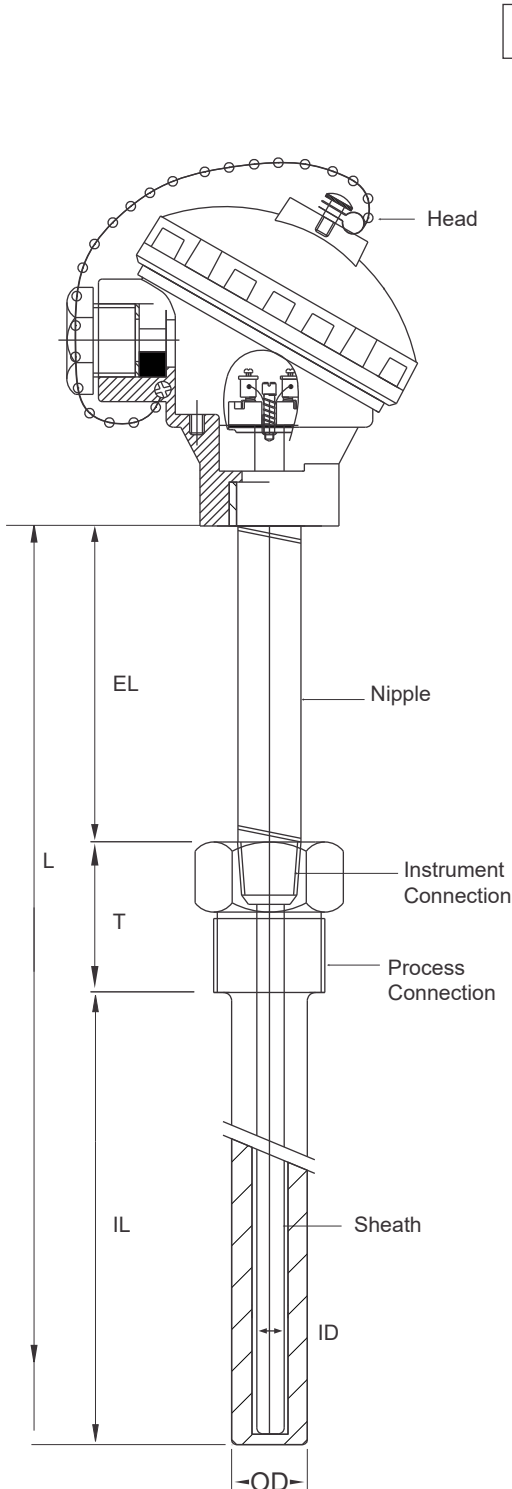
<b>3</b>	Ø3mm
<b>3.2</b>	Ø3.2mm
<b>4.8</b>	Ø4.8mm
<b>6</b>	Ø6mm
<b>6.35</b>	Ø6.35mm
<b>8</b>	Ø8mm
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>600</b>	Inconel-600
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>CS</b>	Cast-Steel
<b>Other</b>	Consult Factory

# THERMOCOUPLE WITH NIPPLE & FLANGE THERMOWELL



**MT 1000 - H**

**Termination Housing**

**Terminal**

**Thermocouple Element**

**Sheath "OD"**

**Sheath Material**

**Thermowell Material**

**Thermowell OD1 (mm)**

**Thermowell OD2 (mm)**

**Thermowell ID (mm)**

**Length of "T" (mm)**

**Process Connection**

**Instrument Connection**

**Insertion Length (I.L.) (mm)**

**Extension Length (E.L.) (mm)**

**Nominal Length of T/C "L" (mm)**

<b>KSE</b>	Small Head
<b>KNE</b>	Big Head
<b>KD</b>	Din Head
<b>KBS</b>	Small Bakelite
<b>KB</b>	Big Bakelite
<b>TL</b>	Big T-Head
<b>XE-DANA</b>	Ex-Proof Dana
<b>XD-AD</b>	Ex-Proof Head
<b>Other</b>	Consult Factory

<b>W2</b>	2- Wire
<b>W3</b>	3- Wire
<b>W4</b>	4- Wire
<b>W6</b>	6- Wire

Type	Description
<b>K</b>	Chromal/Alumal
<b>J</b>	Iron/Constantan
<b>N</b>	Nicrosil-Nisil
<b>T</b>	Copper/Constantan
<b>E</b>	Ni-Cr/Constantan
<b>Other</b>	Consult Factory
<b>Ex.:</b>	If Simplex - K, Duplex - KK

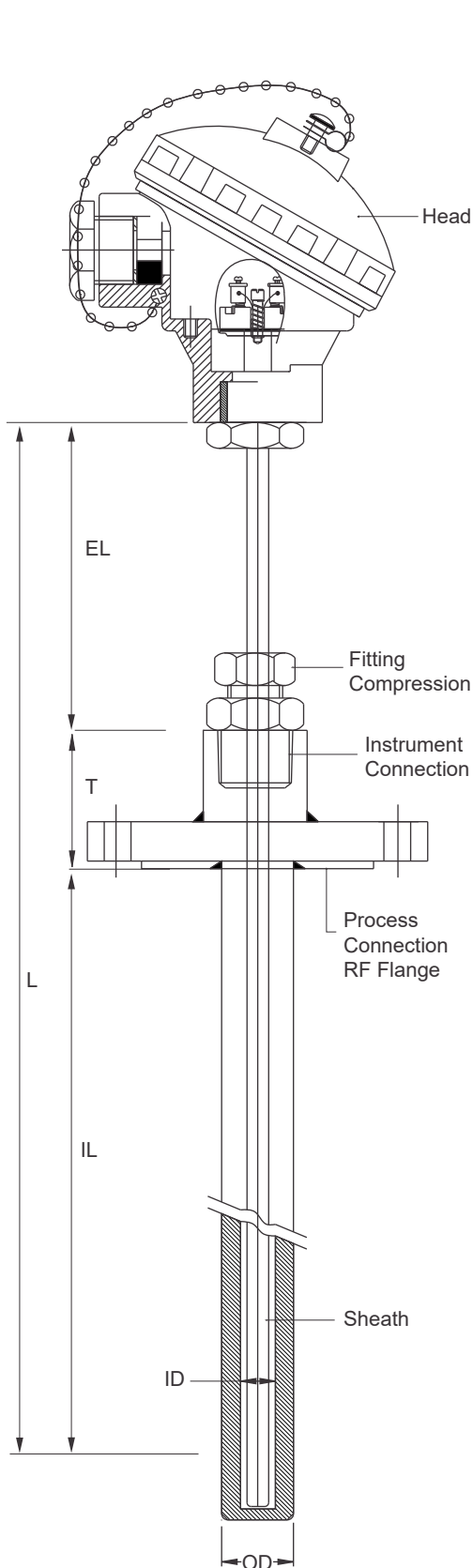
<b>3</b>	Ø3mm
<b>3.2</b>	Ø3.2mm
<b>4.8</b>	Ø4.8mm
<b>6</b>	Ø6mm
<b>6.35</b>	Ø6.35mm
<b>8</b>	Ø8mm
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>600</b>	Inconel-600
<b>Other</b>	Consult Factory

<b>Threads</b>	1/8"
	1/4"
	3/8"
	1"
<b>BSPT/ NPT</b>	1/2"
	3/4"
	1"
<b>M-T thread</b>	M20X1.5
<b>Other</b>	Consult Factory
<b>N/A</b>	Not Applicable

# THERMOCOUPLE WITH FLANGE THERMOWELL & COMPRESSION FITTING



**MT 1000 - I**

Termination Housing
Terminal
Thermocouple Element
Sheath "OD"
Sheath Material
Thermowell Material
Thermowell OD (mm)
ID (mm)
Length of "T" (mm)
Process Connection
Flange Material
Instrument Connection
Fitting Compression
Insertion Length (I.L.) (mm)
Extension Length (E.L.) (mm)
Nominal Length of T/C "L" (mm)

<b>KSE</b>	Small Head
<b>KNE</b>	Big Head
<b>KD</b>	Din Head
<b>KBS</b>	Small Bakelite
<b>KB</b>	Big Bakelite
<b>TL</b>	Big T-Head
<b>XE-DANA</b>	Ex-Proof Dana
<b>XD-AD</b>	Ex-Proof Head
<b>Other</b>	Consult Factory

<b>W2</b>	2- Wire
<b>W3</b>	3- Wire
<b>W4</b>	4- Wire
<b>W6</b>	6- Wire

Type	Description
<b>K</b>	Chromal/Alumal
<b>J</b>	Iron/Constantan
<b>N</b>	Nicrosil-Nisil
<b>T</b>	Copper/Constantan
<b>E</b>	Ni-Cr/Constantan
<b>Other</b>	Consult Factory
<b>Ex.:</b>	If Simplex - K, Duplex - KK

<b>3</b>	Ø3mm
<b>3.2</b>	Ø3.2mm
<b>4.8</b>	Ø4.8mm
<b>6</b>	Ø6mm
<b>6.35</b>	Ø6.35mm
<b>8</b>	Ø8mm
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>600</b>	Inconel-600
<b>Other</b>	Consult Factory

Flange Rating	Flange Size
<b>JIS 5 K</b>	1/4"
	1/2"
<b>JIS 10 K</b>	3/4"
	1"
<b>ANSI 150 #</b>	1 1/4"
	1 1/2"
	1 3/4"
	2"
<b>ANSI 300 #</b>	2"
<b>Other</b>	Consult Factory

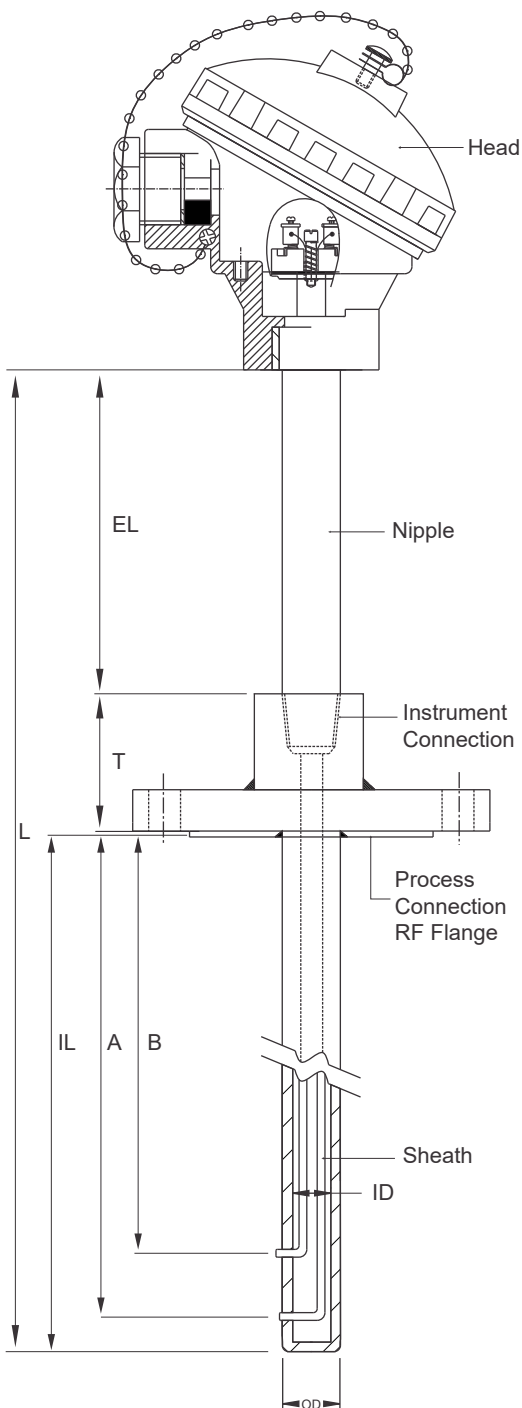
<b>Threads</b>	1/8"
	1/4"
	3/8"
	1/2"
	3/4"
<b>BSPT/ NPT</b>	1"
	1"

<b>M - T thread</b>	M20X1.5
<b>Other</b>	Consult Factory
<b>N/A</b>	Not Applicable



## TWO POINT THERMOCOUPLE

### MT 1000 - J



**Termination Housing**

**Terminal**

**Thermocouple Element**

**Sheath "OD"**

**Sheath Material**

**Thermowell Material**

**Thermowell OD (mm)**

**ID (mm)**

**Nipple**

**Length of "T" (mm)**

**Process Connection**

**Flange Material**

**Instrument Connection**

**Insertion Length (I.L.) (mm)**

**Extension Length (E.L.) (mm)**

**Nominal Length of T/C "L" (mm)**

<b>KSE</b>	Small Head
<b>KNE</b>	Big Head
<b>KD</b>	Din Head
<b>KBS</b>	Small Bakelite
<b>KB</b>	Big Bakelite
<b>TL</b>	Big T-Head
<b>XE-DANA</b>	Ex-Proof Dana
<b>XD-AD</b>	Ex-Proof Head
<b>Other</b>	Consult Factory

<b>W2</b>	2- Wire
<b>W3</b>	3- Wire
<b>W4</b>	4- Wire
<b>W6</b>	6- Wire

Type	Description
<b>K</b>	Chromal/Alumal
<b>J</b>	Iron/Constantan
<b>N</b>	Nicrosil-Nisil
<b>T</b>	Copper/Constantan
<b>E</b>	Ni-Cr/Constantan
<b>Other</b>	Consult Factory
<b>Ex.:</b>	If Simplex - K, Duplex - KK

<b>3</b>	Ø3mm
<b>3.2</b>	Ø3.2mm
<b>4.8</b>	Ø4.8mm
<b>6</b>	Ø6mm
<b>6.35</b>	Ø6.35mm
<b>8</b>	Ø8mm
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>Other</b>	Consult Factory

<b>304</b>	SS 304
<b>316</b>	SS 316
<b>600</b>	Inconel-600
<b>Other</b>	Consult Factory

<b>1/2" SCH 40</b>	OD X ID: 21.3 X 15.7mm
<b>Other</b>	Consult Factory

Flange Rating	Flange Size
<b>JIS 5 K</b>	1/4"
	1/2"
<b>JIS 10 K</b>	3/4"
	1"
<b>ANSI 150 #</b>	1 1/4"
	1 1/2"
<b>ANSI 300 #</b>	1 3/4"
	2"
<b>Other</b>	Consult Factory

<b>Threads</b>	1/8"
	1/4"
	3/8"
	1/2"
<b>BSPT/ NPT</b>	3/4"
	1"
	1 1/4"
<b>M - T thread</b>	M20X1.5
<b>Other</b>	Consult Factory
<b>N/A</b>	Not Applicable